

20th Annual

Student Scholars Day

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SSD Committee

Feryal Alayont	Mathematics
Colin Cumming	Office of Undergraduate Research and Scholarship
Matthew Hart	Chemistry
Christopher Kurby	Psychology
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 2015!

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, Colin Cumming, Brianna Stelly, Ruby Dockery, and Callie Zimmerman who made this process manageable and enjoyable. We thank the members of the 2015 SSD committee, Feryal Alayont, Amanda Dillard, Matthew Hart, Christopher Kurby, 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 Kirkhof Center staff, Fred Mooney, and Kellie Pnacek-Carter for their assistance and patience. We would also like to thank Jeff Woollet for assisting in the preparation of Henry Hall.

Thank you to Angeline Meitzler for her artistic contributions to this abstract book. "collision14.1.5" was one of several pieces submitted in response to a student competition hosted by the Office of Undergraduate Research and Scholarship. Angeline'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. Brian Fagan from the University of California at Santa Barbara. Today is sure to be a day of sharing and celebration.

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

Ross Reynolds
Professor, Physics
College of Liberal Arts & Sciences

Schedule of Events

Poster Presentations

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

Oral Presentations

Kirkhof Center
9:00 a.m. – 5:00 p.m.
See page 120 for detailed schedule.

Exhibition of Art

Mary Idema Pew Library Exhibition Space
9:00 a.m. – 6:00 p.m.
Artist Reception 5:00 p.m.
See page 171 for detailed schedule.

Panel Presentations

Mary Idema Pew Library Multi-Purpose Room
9am; 10am; 11am; 12pm; 2:30pm; 4pm
See page 165 for detailed schedule.

Film & Live Performance

Mary Idema Pew Library Multi-Purpose Room
1:00 p.m.; 5:00 p.m.
See page 179 for detailed schedule.

Keynote Lecture

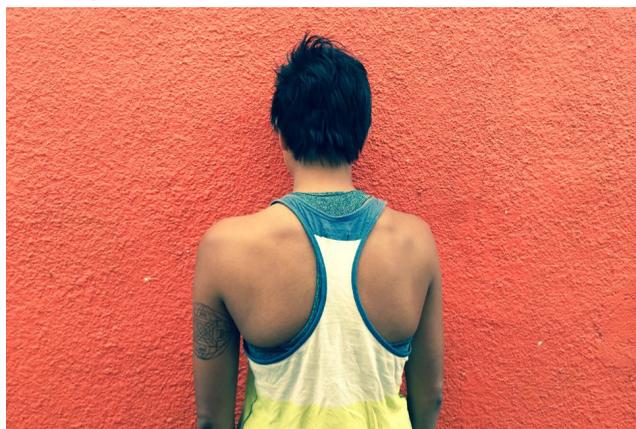
Kirkhof Center, 2250 Grand River Room
7:00 p.m. Lecture

Statement from the Cover Artist

Angeline Meitzler

collision14.1.5

This work is a representation of the accumulation of knowledge and skills I have learned during my time at Grand Valley. Going to a liberal college has influenced and encouraged me to cultivate from several different resources to create art. For example, to inspire me to create, I often research and integrated different ideas of philosophy and aspects of quantum physics. I feel that this has allowed my work to be accessible to a broader audience and give me an endless source of inspiration to pull from. In this particular piece, I layered various forms of atomic diagrams, maps and masses of figural bodies that are in motion. Grand Valley's interdisciplinary curriculum has allowed me to extend my interests into multiple fields of study and gain experience through hands on creative learning.



Keynote Lecture

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

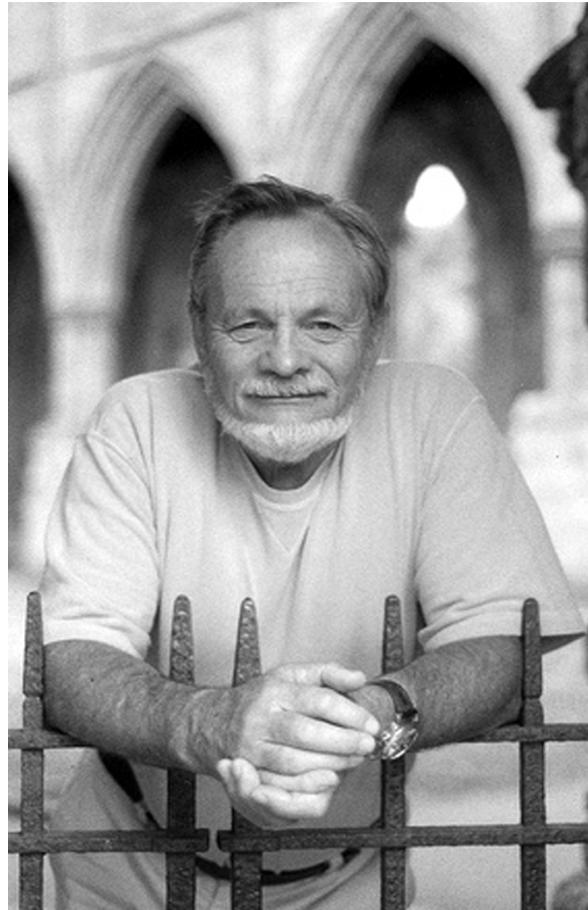
A warming world and changing seas: An archaeologist looks at climate change.

Brian Fagan takes us on a fascinating journey through the challenges of ancient (and modern) rising sea levels and the events of the Medieval Warm Period a thousand years ago, to look at the multidisciplinary research behind the study of ancient climate change.

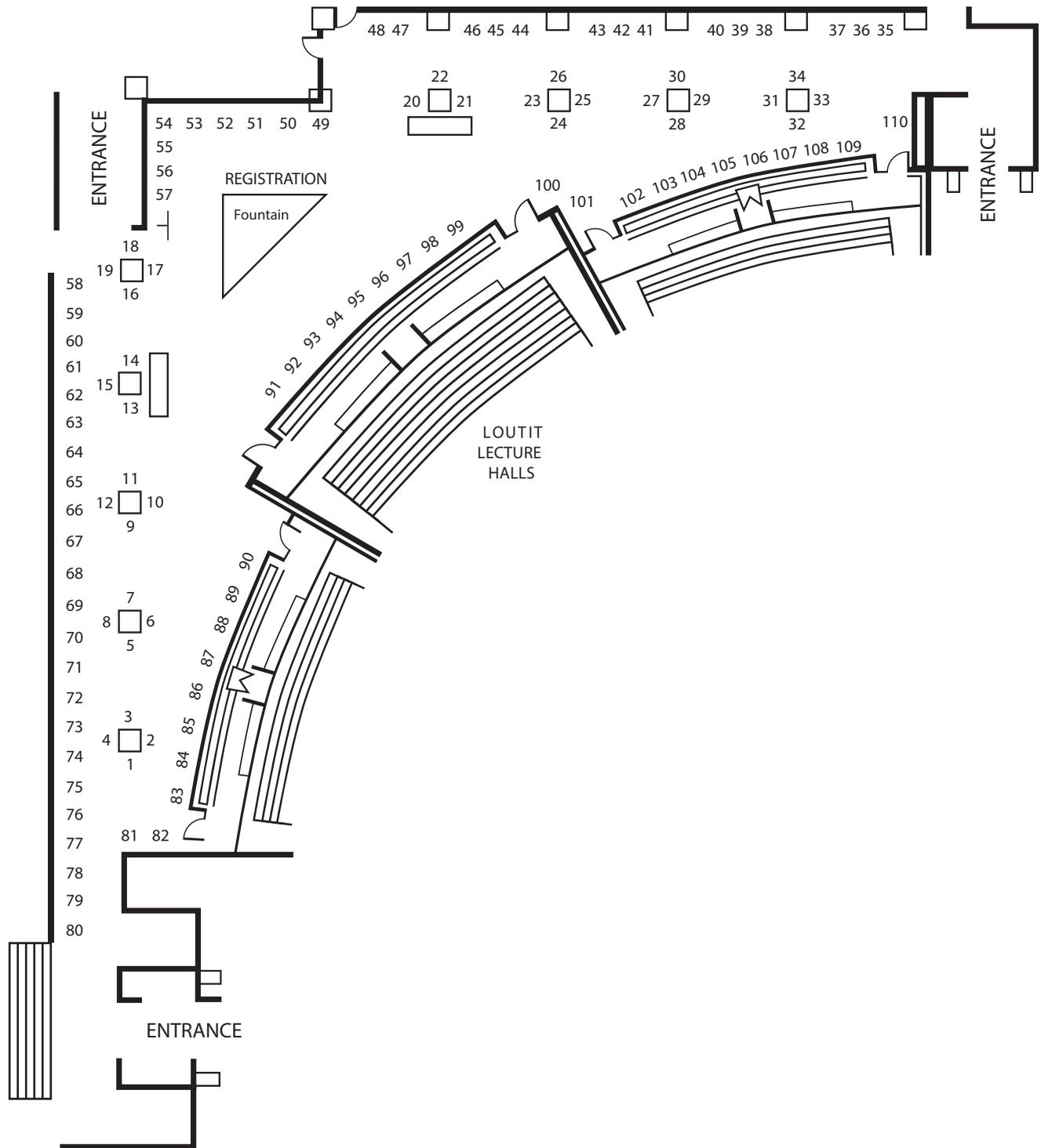
Dr. Brian Fagan

Dr. Fagan is a leading authority on the complex relationship between the environment, climate change and human society. Fagan has 46 books under his belt, including eight college textbooks familiar to two generations of archaeology students. For audiences ranging from business executives to high school students, his works position today's highly publicized climate crisis in a crucial historical context and describes how humans have adapted to environmental changes over the eons.

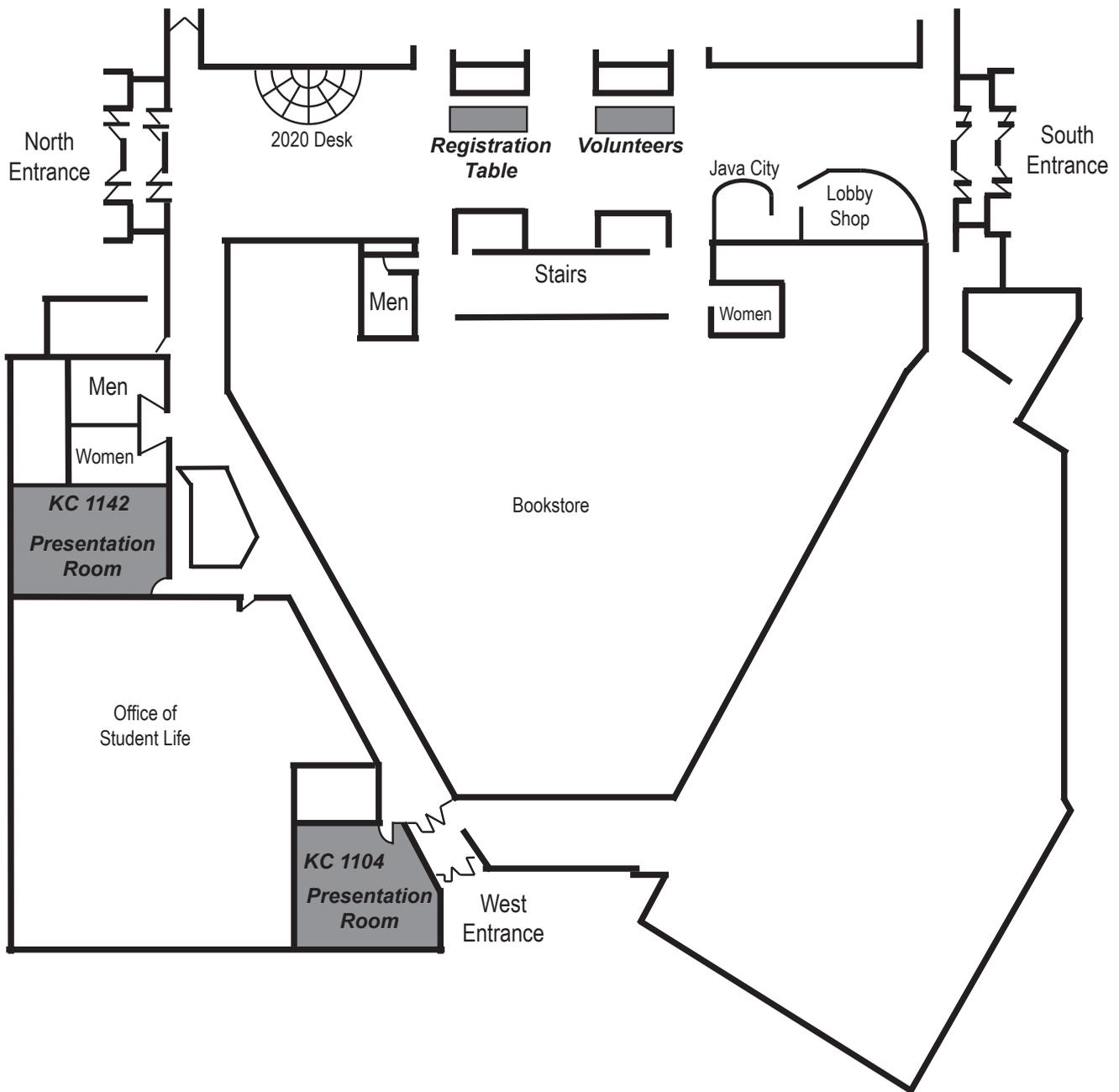
Fagan is currently Emeritus Professor of Anthropology at the University of California at Santa Barbara, where he has taught since 1967. He was born and educated in England, and spent six years as Keeper of Prehistory at the Livingstone Museum in Central Africa before relocating to the US. In addition to his books, Dr. Fagan has contributed more than 100 papers to scientific journals and has served as an archaeological consultant to the National Geographic Society, *Time/Life*, *Encyclopedia Britannica* and *Microsoft Encarta*.



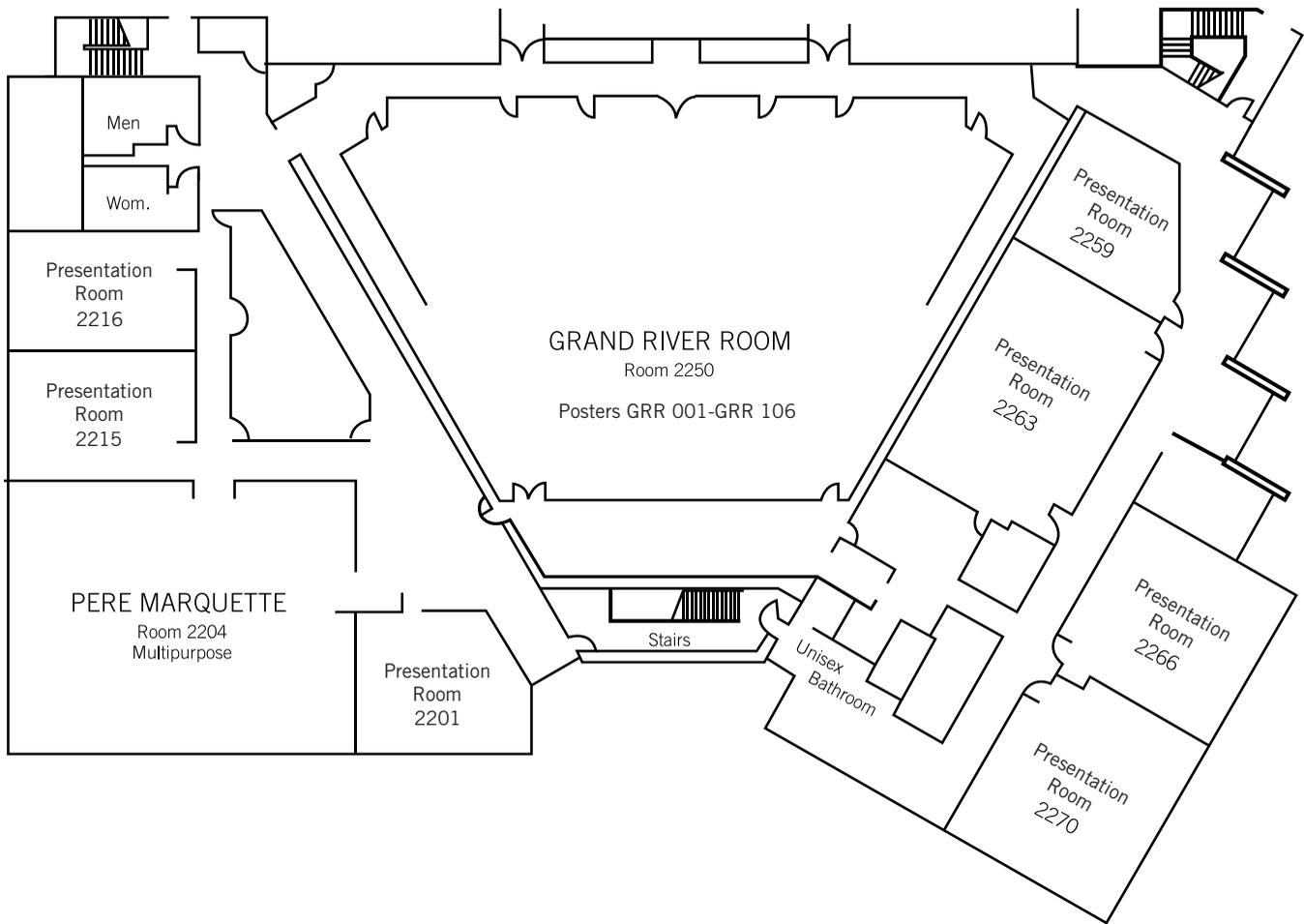
Henry Hall Map



Kirkhof Center First Floor Map



Kirkhof Center Second Floor Map



History of Student Scholars Day

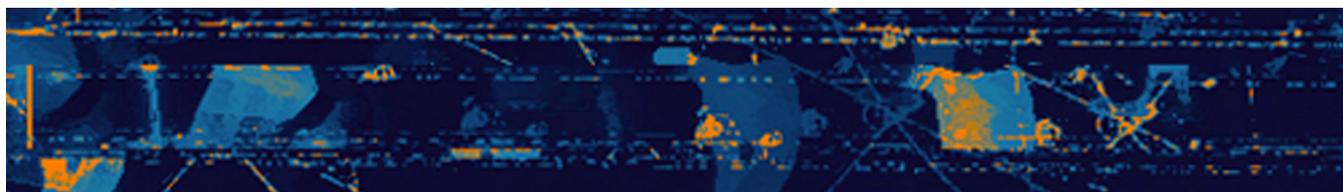
by Neal Rogness and Shelley Sickrey

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 12 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 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 2014 McNair Scholars presenting at this year's SSD include:

Crisol Beliz, Lauren Berry, Dorothy Butler, Delia Chapa, Kelsie Colley, Amaya Guthrie, Natosha Mercado, Irma Ramirez, Cody Robinson, Aron Rottier, Brittany Ward, and Leslie Wyman.

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 twelve 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 2014 Student Summer Scholars presenting at this year's SSD include:

Fatouma Abdoulaye, Kennedy Aldrich, Lindsay Babcock, Tina Daniels, Alicia Flores, John Hessler, Veena Janardan, Jessica Janecke, Ray Jeroso, Kevin Joffre, April Kaneshiro, Chelsea Kendziorski, Edwin Klein, Talon Kosak, Angela Kujawa, Barrett Kyle, Kirk Luca, Katherine McGuire, Samantha Morsches, Benjamin Nicholson, Chelsea Reiber, Meagan Roche, Dallas Rohraff, Christina Sarkissian, Isaac Simon, Scott St. Louis, Alison VanDine, Megan Wertheimer, and Alayna Zielinski.

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.

Department of Writing

The Student Reading Series presents a special reading by GVSU's AWP Intro Journals Project nominees and department contest winners in fiction, nonfiction, and poetry. This year it was held on Friday, January 30, 3 to 4.30 pm. Contact Oindrila Mukherjee, Writing Department, for future dates.

Liberal Studies Department

The Liberal Studies Department provides a senior showcase in Fall and Winter where Religious Studies and Liberal Studies award nominees present their research and compete for the Liberal Studies Wendy J. Wenner Thesis Award. This year's Showcase is to be held April 22 from 3-5 in KC 2270.

Annis Water Resources Institute

Each summer, the Annis Water Resources Institute (AWRI) offers internship opportunities to qualified undergraduates at GVSU who work with faculty members at AWRI. These internships provide financial support to the students, enabling them to pursue their educational objectives in both classroom and hands-on research environments. At the end of the internships, each student gives a short presentation summarizing their summer work experience.

Contact Paula Wicklund or visit <http://gvsu.edu/wri/> for more information.

Music and Dance Department

The Music and Dance Department seniors perform their Senior Shows each year in the Louis Armstrong Theatre and the Performing Arts Center. This year's Fall Senior Dance concert was on November 14 & 15, 2014. The Spring Senior Dance concert will be on April 17 & 18, 2015.

GVSU Music Student Recitals 2014-15 (as of 2015-02-19):

- Fri Oct 10, 2014: 5:30pm Alyssa Yeager Recital
- Sun Oct 19, 2014: 2:30pm Rachel Crees Recital
- Sat Nov 1, 2014: 2:30pm Kevin Bays Student Recital
- Tue Nov 11, 2014: 7:30pm Violin Studio Recital
- Sun Nov 16, 2014: 7:30pm Eamon Carmody Recital
- Sun Nov 23, 2014: 12pm Sabrina Sweeney Recital; 12pm Shawn Shefanski Recital; 7:30pm Martin Gabert Recital
- Sat Jan 17, 2015: 5:30pm Karsten Wimbush

Recital; 2:30pm Rebecca Durbin Recital
 •Sat Jan 31, 2015: 2:30pm Kaci Seager and Kati Bayer Recital
 •Fri Feb 13, 2015: 5:30pm Julia Bovee and Lukas Schroeder Recital
 •Sun Feb 22, 2015: 5:30pm Julia Gjebic Recital
 •Thu Feb 26, 2015: 7:30pm Bryan Westra Recital
 •Sat Mar 14, 2015: 7:30pm David Archambault and Krista Visnovsky Recital
 •Sun Mar 15, 2015: 5:30pm Mackenzie Ribesky Recital
 •Sat Mar 21, 2015: 12pm Kaitlyn Huisjen Recital; 3pm Devin Clark Recital; 5:30pm Karsten Wimbush Recital; 7:30pm Caleb Waters Recital
 •Sun Mar 22, 2015: 12pm Kevin Flynn Recital; 2:30pm Jana Zilova Recital; 7:30pm Hannah Tripp and Valerie Beck Recital
 •Thu Mar 26, 2015: 7:30pm Justin Auten Recital
 •Fri Mar 27, 2015: 5:30pm Claire Zavolta Recital; 7:30pm Matt Finch Recital; 7:30pm Kaitlyn Huisjen and Hannah Donnelly Recital
 •Sun Mar 29, 2015: 12:30pm Martin Malfroid Recital; 2:30pm Abbi Hollenbeck Recital;

5:30pm Richie Arndorfer Recital; 7:30pm Loren Matulis Recital
 •Wed Apr 1, 2015: 7:30pm Marie Engelsma Recital
 •Thu Apr 2, 2015: 7:30pm Ian McIntyre Recital
 •Sat Apr 4, 2015: 12pm Dutcher Snedeker Recital; 2:30pm Lindsay Meyers Recital; 5:30pm Tim Priest Recital; 7:30pm Karsten Wimbush Recital
 •Thu Apr 9, 2015: 7:30pm Drew Mayhew Recital in SVS
 •Fri Apr 10, 2015: 5:30pm Adelaide Clock Recital in CDC; 7:30pm Laura Wooden Half Recital in SVS
 •Sat Apr 11, 2015: 7:30pm Lissa Ford Recital in SVS
 •Sun Apr 12, 2015: 12pm Bailey Groendyke Recital in SVS; 2:30pm Rachel Crees Recital in SVS; 5pm Jessica Zavala in 1515; 5:30pm Thomas Duebner Recital in SVS; 7:30pm Sarah Dowell Recital in SVS
 •Friday, April 17, 2015: 7:30 pm Matthew Kobberstad with Symphonic Wind Ensemble in LAT

Art and Design Department

BFA in Studio Art Senior Project Exhibition Schedule - Winter 2015:

On Campus Exhibits: Allendale Campus

Mary Idema Pew Library, DeWitt Exhibition Space Gallery

March 21-March 27, 2015

Reception: March 26, 5 pm-7 pm

Morgan Eaton (Metals)

Shuying Vogt (Metals)

Stuart B. and Barbara H. Padnos Student Art and Design Gallery, Calder Art Center

March 30-April 2, 2015

Reception: April 2, 5 pm-7 pm

Aurora Grajeda (Printmaking)

Joy Lemon (Illustration)

Theresa Smith (Illustration)

GVSU Art Gallery, Performing Art Center

April 6-April 9, 2015

Reception: April 9, 5pm-7pm

Dan Beebe (Illustration)

Chrissie Hess (Illustration)

Sarah Lapp (Illustration)
Sienna McCone (Illustration)

Stuart B. and Barbara H. Padnos Student Art
and Design Gallery, Calder Art Center
April 6-April 9, 2015

Reception: April 9, 5pm-7pm
Jordan Hartz (Illustration)
Lynn Helmer (Illustration)
Josh Stauber (Illustration)
Kyla Traina (Illustration)

Stuart B. and Barbara H. Padnos Student Art
and Design Gallery, Calder Art Center
April 13-April 16, 2015

Reception: April 16, 5pm-7pm
Michael Koudelka (Illustration)
Matt Nemecek (Illustration)
Jennifer VandeWaa (Illustration)
Bridgette Wilhelmi (Illustration)

Off Campus Exhibits: Grand Rapids

Spiral Gallery, 44 S. Division, Grand Rapids, MI
49503

March 22-March 27, 2015
Reception: March 27, 6-8:30pm
Liz DeForest (Printmaking)
Jonathan Greenwold (Illustration)
Anna Hunt (Sculpture)

WMU Downtown, 200 Ionia Ave. SW, Grand
Rapids, MI 49503

April 9, 2015
Reception: April 9, 6-9 pm
Kelly Arrand (Graphic Design)
Tarie Carlson (Graphic Design)
Anna Dorsey (Graphic Design)
Morgan Gould (Graphic Design)
Leslie Harris (Graphic Design)
Bree Mullen (Graphic Design)
Kat Nowicki (Graphic Design)
Jay Park (Graphic Design)
David Shankin (Graphic Design)
Ross Tanner (Graphic Design)
Katie Ziolkowski (Graphic Design)

Craft House, 40 S. Division, Grand Rapids, MI
49503

April 12-April 18, 2015
Reception: April 17, 5-8pm
Tabitha Gibbs (Illustration)
Stephanie Mabie (Illustration)

Craft House, 40 S. Division, Grand Rapids, MI
49503

April 19-April 25, 2015
Reception: April 22, 5-8pm
Lucas Butcher (Sculpture)

SPRING 2015

fishladder

*A Student Journal of
Art and Writing*

Please Join Us!

ART EXHIBIT: Lake Ontario Hall, Red Wall Art Exhibit,
beginning March 20

UNVEILING: Honors, room # 148
Friday, April 17 at 6:00pm

Contributors:

Logan Bailey
Alice Billin
Kaylee Britton
Kelly Brown
Marissa Dillon
Katie Dooley
Audrey Fox
Jonathan Greenwald
Nathan Holtrey
Michelle Kuznicki
Yong Los
Krzysztof Lower
Stephanie Mabie
Jessica Magnan
Robert Manquen
Kenzie McLain

Bree Mullen
Sierra Nakano
Matt Oberski
Stephanie Oesch
Margaret Phillips
Allison Poschke
Kirk Rasmussen
Zach Sheneman
Shelby Sullivan
Jordan Szala
A.J. Teall
Kyla Traina
Jessica Uccello
Emily Vandenberghe
Daniel Wieten
Bridgette Wilhelmi

Poster Presentations, Abstracts & Schedule

HENRY HALL ATRIUM 001

The Effects of Past or Anticipated Regret on Students' Perceptions of the Regret Experience Related to Health Behaviors

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

Presenters: Steven Senglaub II, Megan Wertheimer

Mentor: Amanda Dillard

Regret has been theorized to influence health behavior, but few experimental studies have been conducted to test basic ideas related to their relationship. In this experiment, we examined the relationship between health behaviors and past and future regret and temporal limits to regret. Participants (N=177) were randomly assigned to write about either a past regret or a possible anticipated regret that was either two weeks or two years, in the past or future. Along with examining how these factors influenced the health behaviors participants chose to write about, we tested whether they influenced participants' perceptions of the regret. For example, would writing about a past regret versus a future regret influence perceived intensity or unpleasantness of the regret? We also examined whether these factors influenced the extent to which participants would want to change their past or anticipated behavior. The implications of findings for health behavior interventions will be discussed.

HENRY HALL ATRIUM 002

The Merida Initiative and US Border Security: An Assessment

Participants attending 1:00 PM - 2:00 PM

Presenter: Cody Robinson

Mentor: Andrew Schlewitz

The Merida Initiative began under the administration of George W. Bush in 2008 as part of the long "War on Drugs" that was launched over forty years ago. This Initiative is a partnership between the US and Mexico to crack down on drug-related organized crime and violence. The Barack Obama administration has continued this partnership, though it has added development goals to the Initiative. This study addresses the question of whether the Initiative has reduced drug-related violent crime along the US side of the border. I hypothesize that the violent crime has decreased, but not to the extent that the US government claims, nor can we determine with certainty that the decrease is the result of the Merida Initiative. To test the hypothesis, this study first examines the state and county level data on violent crime rates over the years 1990-2012. This study concludes with my assessment that in maybe five years we will see some significant results from the Merida Initiatives.

HENRY HALL ATRIUM 003

One Step Closer to Predicting Reaction Rates: Measuring a Pressure Broadening Coefficient of Carbon Monoxide Perturbed by Neon

Participants attending 10:00 AM - 11:00 AM

Presenter: Catlin Schalk

Mentors: George McBane, Stephanie Schaertel

One challenge that chemists face is determining reaction rates. These rates can be measured experimentally, but experiments involve time and money. What if there were a way to predict the reaction rates computationally? One molecular parameter that can open doors for getting closer to predicting rates is the pressure-broadening coefficient (PBC). In this work we are developing an experimental procedure to measure the pressure broadening coefficient for carbon monoxide colliding with neon. We use a home-built high resolution infrared spectrometer. Experimental measurements for the PBC values can be compared to theoretical calculations in order to better understand how pressure and collisions affect the rate of reactions and become one step closer to predicting reaction rates.

HENRY HALL ATRIUM 004

The Toyota Mirai: How Your Daily Routine is Now Helping the Environment

Participants attending 2:00 PM - 3:00 PM

Presenter: Daltyn Little

Mentor: Adrienne Wallace

Toyota is known as a leader in the automobile industry for their consistent commitment to quality, value, and fuel economy. According to Consumer Reports, Toyota scored the highest on overall brand perception in 2014, beating out top competitors like Ford and Honda. With a commitment to quality and the confidence of their brand army behind them, Toyota is going places. They are going places in their new Fuel Cell Vehicle (FCV), the Toyota Mirai. The question is: are they going alone? Toyota has the advancements in technology, the commitment to the environment, and the resources to make major waves in alternate fuel development. Research shows that consumers have low levels of trust for new technology, specifically electric-powered vehicles and those that run on alternate fuels. Toyota must create trust in the minds of consumers about the value of the vehicle itself and the hydrogen fuel cell technology that drives it.

HENRY HALL ATRIUM 005

Physical and Chemical Endothelial Denudation Techniques of Porcine Mesenteric Arteries

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

Presenters: Jack Bontekoe, Veena Janardan
Mentor: Francis Sylvester

Vascular reactivity is regulated by multiple factors. Prior to 1980, it was thought that only the vascular smooth muscle layer was responsible for mediating arterial contractions and dilations. The work of Furchgott and Zawadzki showed that the tunica interna (endothelium) plays a role in modulating reactivity as well. Our previous work used porcine mesenteric arteries in which the endothelium was physically removed (“denuded”) with one technique, but the extent of denudation was not verified. The present study employed four techniques: three physical and one chemical. The reactivity of denuded vessels was compared to intact vessels to determine if the endothelium was removed. KCl/phenylephrine and acetylcholine (ACh) were used to induce constriction and dilation respectively. Since ACh-induced dilation is endothelium-dependent, denuded arteries were not expected to dilate in response to ACh. We hypothesize the chemical denudation technique to be the best due to greater replicability.

HENRY HALL ATRIUM 006

Identifying the c-MET Phosphorylation Site Regulated by CD82 in Prostate Tumor Cells

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

Presenters: Veena Janardan, Justin Shady

Mentor: Suganthi Sridhar

CD82 (KAI), a metastasis suppressor protein is under-expressed in prostate as well as other types of cancers. It inhibits cancer metastasis, but this regulation mechanism remains unknown. Various pathways are being explored in this lab, including regulation of c-MET, a growth factor receptor observed to have increased activation in tumor cells. CD82 and c-MET do not co-localize, suggesting that CD82 indirectly downregulates c-MET. C-MET is expressed through binding to its ligand, HGF, which encourages phosphorylation of c-MET and consequently activates it. C-Met has four tyrosine phosphorylation sites. Knowing how each phosphorylation site of c-Met affects downstream signaling, our lab is focused in identifying which site is regulated by CD82. Another tetraspanin CD151, promotes tumor progression and has been shown to associate with c-Met, another aspect we are exploring. This will provide additional insight into how CD82 overall regulates c-Met and prevents prostate tumor metastasis.

HENRY HALL ATRIUM 007

The Dynamics of Many Particle Systems

Participants attending 9:00 AM - 10:00 AM

Presenter: Sven Kardol

Mentor: Maja Krcmar

We constantly interact with many particle systems in everyday life, like gases, liquids, and solids. Standard Newtonian mechanics can be used to describe an object moving at a small scale and non-relativistic speeds. However once a system contains many particles, these interactions become impossible to solve by hand. This is where computational physics comes in handy. Computational physics allows us to simulate the dynamics of many particle systems.

HENRY HALL ATRIUM 008

The Cordell and Engadine Formations at Seul Choix Point, Upper Michigan: Implications for Silurian (Llandovery-Wenlock) Paleoenvironments

Participants attending 1:00 PM - 2:00 PM

Presenter: Brittany Ward

Mentor: Patrick Colgan

Past studies of the Cordell Formation detail stratigraphic and fossil fauna descriptions and classifications, while only recent studies have proposed potential depositional environments. This study is a paleoenvironmental analysis of the Cordell dolostone exposed at Seul Choix Point, Michigan.

Hand samples and thin sections show the presence of packstones and wackestones. Fossil abundance analysis determine a coral-algal community. Orientation data of cephalopod shells result in three modes of direction: 165/345 degrees, 25/205 degrees, and 65/245 degrees. The Cordell and younger Engadine Formation were sampled for $\delta^{13}\text{C}$ analysis to constrain the age of the contact.

Lithological and fossil classification indicate a moderate energy environment at or above the effective wave base. Past studies suggest depths of 10 to 30 meters. Cephalopod orientations suggest shells align perpendicular to ocean currents. Results of $\delta^{13}\text{C}$ analysis indicate Cordell and Engadine contact dates to 428.5 mya.

HENRY HALL ATRIUM 009

Flexibility in Baton Twirlers: Can Practice Increase Range of Motion?

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

Presenter: Moriah Muscaro

Mentor: David Kurjaka

In sports where flexibility is integral to successful performance, athletes spend much time trying

to improve their range of motion. Focusing specifically on baton twirling, we hypothesized that more time practicing would lead to flexibility improvement. In our baton twirling study population (n=28), we measured initial flexibility, hours spent training during a 7-week period, and post-training flexibility. We found that during the study period, participants' flexibility improved in three of four joints studied. While initial flexibility (less flexibility showed greatest improvement) was a strong contributor across the four joints, time practicing was a minor contributor in only two of the joints studied. We concluded that a focus on flexibility improvement should be in the younger and less experienced populations, with others focusing more on maintaining existing flexibility. The implications for this research will be important in determining the most effective use of practice time.

HENRY HALL ATRIUM 010

Geospatial Examination of Breast Cancer Across the State of Michigan

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

Presenter: Mackenzie Kohler

Mentor: Paul Stephenson

Geographic Information Systems (GIS) are used to provide visualization of data to ascertain whether or not systematic trends developed throughout a specific region. To appropriately investigate these trends, proper statistical methods must be used. Calculating the Moran's *I* statistic allows researchers to determine if incidence data is distributed uniformly throughout a region. This method of data analysis will be demonstrated by looking at breast cancer rates by county throughout the state of Michigan.

HENRY HALL ATRIUM 011

Population Trends of Aquatic Macroinvertebrates in Relation to Drought Recovery

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

Presenters: Alyssabeth Beadle, Mackenzie Kohler

Mentors: John Gabrosek, Keith Piccard

Professor Keith Piccard from the biology department has been studying the overall population trends of aquatic macroinvertebrates in relation to drought recovery. As consultants, our role is to interpret trends in the population of macroinvertebrates over a ten year span. This presentation will highlight our roles as statistical consultants and bring awareness to macroinvertebrate trends.

HENRY HALL ATRIUM 012

Physical Differences Between Tree Swallows that Fledge Early and Late in

the Breeding Season

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: Amanda Grant, Karena Hacker, Diana Lee, Colleen Potter

Mentors: Michael Lombardo, Patrick Thorpe

Reproductive fitness in birds is estimated by the number of their offspring that become reproductives (local recruits). We monitored the production of local recruits by Tree Swallows nesting in boxes on the GVSU campus. Between 1992-2006, most local recruits fledged from clutches initiated from 10-25 May. We measured the mass and the lengths of the keels, wings, and tails of fledglings in 1996 and 2009-2014 to determine if early fledglings had a size advantage over late ones. When a Tree Swallow fledged influenced its size in complicated ways. Early fledglings had longer keels but lower mass; those from mid-season had longer wings and tails than those fledging early or late. We think that the “relative age effect” has the greatest influence on a fledgling’s chances of becoming a local recruit; Tree Swallows that fledge earlier in the season have more time to prepare for fall migration. This increases their chances of survival during migration and winter and become local recruits.

HENRY HALL ATRIUM 013

Establishing the Importin Protein Imp1 as Significant Nuclear Transporter of Mid1 and its Subsequent Effects on Cell Division in Fission Yeast

Participants attending 9:00 AM - 10:00 AM

Presenter: Gabrielle Foxa

Mentor: Dawn Hart

A developmental process that organisms undergo is cell division. During this process in fission yeast cells, a cytokinetic ring forms in the center of the cell. This is where new cell wall material is constructed and the cell divides. The protein responsible for placing the ring is Mid1. Therefore, the localization of Mid1 throughout the cell cycle is vital. Previous research indicates that Mid1 localization is regulated through phosphorylation. When residues targeted for phosphorylation are non-phosphorylatable, Mid1 is primarily cytoplasmic. Prior research also shows that in the absence of the transport protein Imp1, Mid1 is incapable of nuclear localization. To further investigate Mid1 transport, we created a phosphosite mutant lacking Imp1. Fluorescence microscopy during various cell cycle stages reveals Mid1 phosphorylation and Imp1 control Mid1 localization. Furthermore, mutants lacking Imp1, arrested in a late mitotic stage, display severe cell division and polarity defects.

HENRY HALL ATRIUM 014

Acute Effects of N.O.-Xplode® on Muscle Contraction

Participants attending 11:00 AM - 12:00 PM

Presenter: Cody Ciaramitaro

Mentor: Francis Sylvester

Many studies have been performed to identify the potential effects of stimulants used in pre-workout supplements on muscle performance. This study assesses the acute effects of a supplement (N.O.-Xplode®) on muscle performance. N.O.-Xplode® contains many common ingredients used to enhance performance, such as creatine monohydrate, taurine, beta-alanine, citrulline malate, and caffeine. Studies have identified the benefits of using the ingredients individually, but potential collective effects have not been thoroughly tested. This study will use a paired design on an animal model. Change in performance will be evaluated by testing the muscle's strength of contraction before and after use of the pre-workout supplement.

HENRY HALL ATRIUM 015

The Pharmacokinetics of Risperdal and Its Weight Gaining Side Effects in Adolescents with Irritability Due to Autism and Disruptive Behavior Disorders

Participants attending 3:00 PM - 4:00 PM

Presenter: Chelsea Vink

Mentor: Glenn Valdez

Data: Research and data collection still in progress. Bibliography available upon request.

Methodology: This research project primarily consists of information and data taken from research articles and medical journals from the Grand Valley State University databases, in addition to information and advice from GVSU professors.

Findings: Although some articles argue that the weight gaining side effects of Risperdal are of considerable concern, others have no mention of it. Risperdal is approved by the U.S. FDA for children and adolescents and is therefore a safe and effective method of treatment for teens with irritability due to autism and behavioral disorders, however the question of whether or not there is a better alternative is still under research.

HENRY HALL ATRIUM 016

Sunspot Decay Dependencies

Participants attending 11:00 AM - 12:00 PM

Presenter: Farrah Brink
Mentor: Dirk Pandel

Sunspots are comparatively cooler regions on the solar surface that form when the strong magnetic fields of active regions inhibit the convective heating of the plasma. On account of their dark appearance with respect to the surrounding “quiet Sun” photosphere, sunspots are highly visible solar features that can be observed and tracked with relative ease. For this reason, they have historically been, and continue to be, important in efforts to understand the solar dynamo. Sunspots are characterized by a comparatively dim umbra enclosed by a less-dark penumbra, the collective area of which are regarded as the sunspot’s area. The objective of this project is to use observations from the Debrecen Photoheliographic Database (DPD) to investigate which factors affect a sunspot’s area decay rate and what the results imply regarding the underlying magnetic fields.

HENRY HALL ATRIUM 017

Social Integration Incorporation in the Healing Process of Children with Immune Compromising Diseases

Participants attending 3:00 PM - 4:00 PM

Presenter: Kelly Koerner

Mentor: Julia VanderMolen

Children undergoing treatment for various illnesses are often residing in a hospital room when they are trying to recover. Treatments such as chemotherapy, bone marrow transplants, and more leave children’s immune systems in a weakened state and many children are forced to lie in bed leaving them isolated from the world. It is easy for a child to begin feeling stressed, anxious, and even depressed during treatment and the recovery period. Many children who have experienced the struggles involved in a prolonged hospital stay or long-term illness require therapy from psychologists or help from school counselors. Peer interaction in a clean, safe environment throughout the recovery phase may help to speed up recovery and promote a healthy social life for children who have been affected by illness.

HENRY HALL ATRIUM 018

Examination of Lethal Deletions Generated by *Minos* Transposon Excision from the *Hdc* Gene Region in *Drosophila melanogaster*

Participants attending 9:00 AM - 10:00 AM

Presenters: Aaron Ripley, Paul Weber

Mentor: Martin Burg

Histamine is a neurotransmitter found in the nervous system of *Drosophila melanogaster*, and the gene encoding the enzyme that synthesizes histamine, **H**istidine **d**ecarboxylase (*Hdc*) has been disrupted by point mutations, resulting in flies that lack histamine. Thus far, deletions of the *Hdc* gene have not been reported and it is not known whether this type of genetic disruption could lead to a lethal phenotype. A *D. melanogaster* strain (*Mi(ET1)Hdc^{MB07212}*) which contains a *Minos* transposon in the *Hdc* gene region was subjected to transposon excision of the *Minos* element. A number of flies obtained from the *Minos* excision event contained a recessive lethal mutation. These fly lines are now being examined for reduction in histamine levels, abnormalities of the chromosome, and physical breakpoints of each potential deletion. These experiments should confirm whether excision of the *Minos* element generated a deletion in the *Hdc* coding region and whether the deletion of *Hdc* is lethal.

HENRY HALL ATRIUM 019

I Want To Be The Inquiry Guy!: How Research Experience for Teachers Transforms Beliefs about Teaching Science as Inquiry

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

Presenter: Molly Edwards

Mentor: Deborah Herrington

Professional development (PD) programs that immerse teachers in authentic science experience are needed to bridge the need for reformed science instruction and teachers' experiences with traditional practices. The Target Inquiry (TI) PD program at GVSU begins with a research experiences for teachers (RET) to help science teachers develop more authentic beliefs about scientific knowledge construction. Such experiences show positive impacts on teachers, yet we still need to understand how such activities affect teachers' beliefs about science teaching and learning. To explore the effect of TI's RET on teachers' beliefs and their classroom practices, post-RET interviews were conducted and coded to identify teachers' changing beliefs related to teaching science as inquiry. This poster will highlight the changes in teachers' beliefs and attitudes, the features of the RET identified as influential in precipitating these changes, and implications for PD program design.

HENRY HALL ATRIUM 020

Treatments to Combat the 2014 West Africa Ebola Virus Outbreak

Participants attending 9:00 AM - 10:00 AM

Presenter: Sarah Thornton

Mentor: Steven Hecht

To date, there have been 22,525 cases of Ebola virus in Guinea, Liberia, and Sierra Leone,

with 13,855 being laboratory-confirmed. With no definitive treatment, there have been 9,004 deaths as a result of this filovirus. There are some prospective treatments currently undergoing clinical evaluation; however, evidence of their effectiveness in humans is lacking. Current therapeutics include antiviral medications and immunotherapeutics such as whole blood and plasma transfusions and monoclonal antibody combinations. With all of these potential treatments, there are still barriers that must be overcome, such as lack of supplies and equipment and the unavailability of hospitals in rural areas of West Africa.

HENRY HALL ATRIUM 021

OS for Accurate Timing

Participants attending 10:00 AM - 11:00 AM

Presenter: David Beerens

Mentor: Zachary Kurmas

The focus of this project is to develop a system that allows students to easily and accurately determine how long an Intel or AMD CPU takes to run a segment of code. To achieve this, I'll be writing code that runs in place of an operating system off of a USB flash drive. For my solution, I am focusing on fulfilling two main aspects. The first one is accuracy. As described in the rationale section below, CPU timing can be difficult if not done properly. I will be researching modern methods for accurate timing, and implementing them as best as I can in my solution. The main reason for writing code that runs in place of the operating system is to avoid the inaccuracies caused by normal operation of the operating system.

HENRY HALL ATRIUM 022

Do Microbial Communities Influence Herbicide Sensitivity Versus Resistance In The Invasive Aquatic Plant, Eurasian Watermilfoil?

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: Fatouma Abdoulaye Idrissa

Mentor: Ryan Thum

Eurasian watermilfoil is an invasive freshwater plant heavily managed with herbicides to mitigate its ecological and economic impacts. Previous research has proven that while many genotypes are sensitive to herbicides, some exhibit resistance, but the mechanism(s) is unknown. One hypothesis is that resistant genotypes harbor microbial communities that block the uptake and/or metabolize herbicide, leading to reduction of its efficacy. To test it, we studied four different genotypes known to exhibit different susceptibilities to the commonly used herbicide 2,4-Dichlorophenoxyacetic acid (2,4-D). We exposed three clones of each genotype to 500 μ g L⁻¹ 2,4-D for 48 hours, and

compared them to the control. Microbial DNA was extracted from their roots and shoots. 16S DNA barcoding is being used to determine the microbial composition using next-generation sequencing. The data will help determine if sensitive and resistant genotypes have predictably distinct microbial communities.

HENRY HALL ATRIUM 023

Arsenic Biosand Filters

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: Jepakoch Kottutt

Mentor: Richard Rediske

Arsenic is a common pollutant in many developing countries and has been linked to cancer and cardiovascular disease. In this research, biosand filters (BSFs) were modified with iron filings to remove arsenic from contaminated water. Six BSFs (3 with 1 kg of iron filings and three without iron filings) were simultaneously dosed with 20 liters Muskegon Lake water that contained 100 ug/L of arsenic for 30 days. Arsenic concentrations were determined using a Hach Low Range test kit. The mean arsenic removal rate for all 3 BSF with iron filings was 100% for 13 days, but later was reduced to 60% as one of the units flow decreased. Mean arsenic removal in BSFs without iron filings started at 50% and declined to 0% after 14 days as the natural iron in the sand was saturated with arsenic. The arsenic removal rate for all BSF with iron filings was ~94% and ~22% without. Iron filings are a common waste product and our results suggest they may be useful in removing arsenic from water.

HENRY HALL ATRIUM 024

Real-Time Histamine Measurements In Vivo Using Fast-Scan Cyclic Voltammetry

Participants attending 12:00 PM - 1:00 PM

Presenter: Rhiannon Robke

Mentor: Parastoo Hashemi

Histamine (HA) is involved in brain functions including awakening, the control of pituitary hormone secretion, and cognitive functions. HA has been speculated to be involved in brain diseases such as Alzheimer's, Parkinson's, and depression. HA's similar electrochemical signature to adenosine and hydrogen peroxide has made it difficult to characterize in vivo. Using an optimized histamine-sensitive waveform with fast-scan cyclic voltammetry (FSCV) has now led to a better understanding of the innervations of HA within the mouse brain. Highly sensitive carbon fiber micro electrodes with pharmacological analysis permits measurements of HA levels in the substantial

nigra reticular (SNr), cerebral cortex (CX), and ventral pallidum (VP) via stimulation of the HA cell bodies in the tuberomammillary nucleus (TM). Robust in vivo detection of HA using FSCV can be used to effectively study, characterize, and implicate the identification of a precise chemical profile of HA in future studies.

HENRY HALL ATRIUM 025

Effects Of Dehydration And Passive Hyperthermia On Physiological And Cognitive Function in Healthy Humans

Participants attending 9:00 AM - 10:00 AM

Presenters: Benjamin Leppek, Trevor Rigney

Mentor: Ross Sherman

Background: Dehydration and hyperthermia have been shown to possibly have a negative effect on maximal voluntary contraction (MVC) and cognitive abilities. **Purpose:** The aim of the study was to determine the effect of dehydration and arm cooling on cognitive skills and MVC after passive hyperthermia. **Methods:** 10 healthy subjects were recruited from GVSU. Subjects came in for familiarization to the cognitive motor skill and MVC tests. Subjects then came in either hydrated (USG <1.02) or dehydrated (USG >1.02) for a passive cooling trial and an arm cooling trial. Each trial was composed of a heating phase until core temperature (T_c) reached 39.5°C and a cooling phase until T_c <38°C. Core temperature, skin temperature, heart rate, and thermal sensation were all recorded every five minutes. Cognitive tests were recorded every 15 minutes. MVC was recorded before heating, at T_c 39.5°C, and every 15 minutes during cooling. **Results:** The study is currently ongoing and data will be presented at SSD.

HENRY HALL ATRIUM 026

Effects of Combined Head and Neck Cooling and Passive Hyperthermia on Physiological and Cognitive Function

Participants attending 11:00 AM - 12:00 PM

Presenters: Steven Ferguson, Danielle Johnson, Kyle Wesche

Mentor: Ross Sherman

Background: Neck cooling may be more effective than cooling elsewhere during exercise, and may improve cognitive performance in complex cognitive tasks. There is currently no research on combined head and selective torso cooling. **Purpose:** Determine if head and neck cooling have any effect on cognitive motor skill and thermo-physiological function following passive hyperthermia. **Methods:** 10 healthy subjects from GVSU between 18-44 years of age were recruited. Subjects were passively heated in a water tank at 42°C until their core body temperature (T_c) reached 39.5°C. Subjects were then cooled in two conditions; no cooling and cooling using a head and

neck wrap. Cooling was maintained until $T_c < 38^\circ\text{C}$. Cognitive tests were assessed every 15 minutes while T_c , skin temperature, heart rate, and thermal sensation were assessed every 5 minutes throughout the heating and cooling phases. Results: The study is currently ongoing and data will be presented at SSD.

HENRY HALL ATRIUM 027

Mark Recapture Population Study of the Eastern Massasauga Rattlesnake: Effects of Prey Abundance on Habitat Use

Participants attending 2:00 PM - 3:00 PM

Presenters: Jeffrey Bartman, Nathan Kudla

Mentor: Jennifer Moore

Long term mark recapture studies are important to understand the population dynamics of a threatened species and to develop proper management strategies. During the summer of 2014, a mark recapture study was conducted on the eastern massasauga rattlesnakes at Pierce Cedar Creek Institute located in Hastings, Michigan. Adult male ($n=27$) and female ($n=20$) rattlesnakes were collected and used to estimate abundance and annual survival. We estimated abundance to be 30 adult females, 35 adult males, with a total estimate of 66 rattlesnakes in the population. Adult male annual survival was estimated at 0.7 and 0.65 for adult females. We also conducted a small mammal mark recapture study in an effort to correlate rattlesnake habitat use with prey abundance. We found a negative correlation between rattlesnake and prey habitat use equal to -1.72 with an R^2 value equal to 0.716. Our findings show the small population trend of the eastern massasauga rattlesnake continues today.

HENRY HALL ATRIUM 028

Sand Prairie Restoration Impacts on Plant Communities

Participants attending 11:00 AM - 12:00 PM

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 2009 to evaluate different seeding methods to encourage increasing species diversity of native plants in a degraded sand prairie. Specifically, we examine how different native, warm-season grass seeding densities (High grass: 10,000 seeds/ m^2 , Low grass: 1000 seeds/ m^2 , No grass: 0 seeds/ m^2) in combination with forb seeding affect the overall plant community. Results from 2014 will be used to determine which seeding approaches best achieve ecological objectives in a sand prairie restoration.

HENRY HALL ATRIUM 029

Working to Understand the Social and Genetic Aspects of Down Syndrome

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

Presenter: Molly Ford

Mentor: Bruce Ostrow

Down syndrome is a common human genetic disorder known to cause intellectual disabilities and other health problems. This project focuses on the programs available to people in West Michigan and examines the way this disorder affects individual families. I worked with the Down Syndrome Association of West Michigan to create a “new parent pamphlet” that gives expecting families an idea of what it is like to raise a child with Down syndrome and a list of resources available to them. I had interviews with parents of children with Down syndrome to learn what resources the DSAWM had provided to them and to find out the most important things for new parents to know. The current etiology of the disorder was examined through literary research. Down syndrome—or trisomy 21—is most commonly caused by the presence of an extra copy of chromosome 21, but the biochemical and cellular mechanisms by which the varying phenotypes of this disorder arise are not well understood.

HENRY HALL ATRIUM 030

#ITooAmGVSU (I, too, am GVSU)

Participants attending 1:00 PM - 2:00 PM

Presenters: Carlos Ceppi, Irma Y Ramirez

Mentor: Jennifer Stewart

Black feminist epistemology challenges the status quo of knowledge by advocating for information from personal lived experiences and the presence of emotion within dialogue. Inspired by black feminist epistemology and the “I, too, am Harvard” campaign, the goal of this project was to provide alternative knowledge about the experiences of students of color at a predominantly white institution. Students were asked to respond to the following question: If you were to address race and ethnicity at GVSU, what would you want to voice towards the Grand Valley community? Students posed with their responses written on whiteboards or had an ally pose on their behalf. The messages indicate the importance of personal narratives to further discussion and inquiry about marginalized experiences at a predominately white institution. We invite the viewer to reflect on other social identities: what would this project look like if it was along the lines of gender, class, sexuality, etc?

HENRY HALL ATRIUM 031

Microgeographic Population Genetic Structure of *Baylisascaris procyonis*

(Nematoda: Ascaroidae) in Western Michigan Indicates the Grand River is a Barrier to Gene Flow

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

Presenter: Christina Sarkissian

Mentor: Douglas Graham

We developed eight polymorphic microsatellites from the parasitic nematode *Baylisascaris procyonis*. Amplification of these loci in a sample of 74 worms collected from 10 raccoons in Western Michigan revealed significant population structure. Bayesian clustering indicates two subpopulations, one on either side of the Grand River which bisects the region sampled. Estimates of F_{ST} , and results from AMOVA and isolation by distance further corroborate a scenario whereby the river is acting as a barrier to gene flow, a rather unusual finding given the high vagility of raccoons and microgeographic scale of the analysis. We describe one possible mechanism for how this pattern of structure could have become established.

HENRY HALL ATRIUM 032

Carbohydrate Consumption Prior to Exercise Increases Post-Exercise Blood Glucose Levels

Participants attending 12:00 PM - 1:00 PM

Presenters: Victoria Anderson, Catherine DeYonker

Mentor: Ross Sherman

Background: Intramuscular glycogen and blood glucose are the primary energy sources in the body, and during exercise there is an increased ATP use in skeletal muscles. As exercise continues, blood glucose is depleted as it is transported into the cells and the liver breaks down glycogen to replenish blood glucose. **Purpose:** The purpose of this study was to determine how pre-exercise CHO consumption affects blood glucose levels during and after exercise. **Methods:** Six healthy people participated in the randomized cross-over, double-blind design study. Blood glucose levels were tested at baseline prior to CHO consumption, and before and after a 30-minute treadmill run, set at an intensity of 60% of maximal O_2 uptake. Participants consumed 5 ml per kg^{-1} body mass of either 6% CHO or placebo at least 60 minutes before the exercise bout. Expired gas analysis was performed during exercise to determine CHO oxidation. **Results:** Data collected will be presented at SSD.

HENRY HALL ATRIUM 033

Where is the Lone Pair?

Participants attending 2:00 PM - 3:00 PM

Presenter: Eva Gulotty

Mentor: Randy Winchester

To share, or not to share? The sila-allyl anion has two resonance structures, with the lone pair of electrons located on either a carbon or silicon atom. We are interested in determining the location of the lone pair of electrons in order to determine the importance of resonance in the stability of this anion. We have synthesized vinyl-tris(trimethylsilyl)silane and studied its reactions with potassium tert-butoxide and methyllithium. The products are the vinyl-bis(trimethylsilyl)silyl anion with potassium or lithium as the counter-ion, and we have quenched the anion with deuterium oxide as well as other electrophiles. Further, the anions have been characterized in THF solution via ^1H , ^{13}C and ^{29}Si NMR. The results of our experiments will be presented, and implications for the relative contribution of the two resonance structures will be discussed.

HENRY HALL ATRIUM 034

Effects of Chronic Low-Dose Anti-Telomerase and Chemotherapeutic Drugs on Breast Cancer Cells

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

Presenter: Chelsea Reiber

Mentor: Osman Patel

Breast cancer is the most common tumor affecting females globally. Among the sub-types, Triple-Negative Breast Cancer (TNBC) remains the most aggressive and has the worst prognosis, decreased overall survival rate and no targeted therapy available. Therefore, this study's objective was to compare and contrast the effects of continuous low-dose of BIBR 1532 (GV1), a novel analogue of BIBR 1532 (GV6) developed at GVSU, and Doxorubicin on TNBC (MDAMB 231) breast cancer cells. MDAMB 231 cells were seeded (5.0×10^5 cells/flask) and supplemented with GV1 or GV6 or Doxorubicin (Dox) or a combination of Dox+GV1 or Dox+GV6 for 21 days ($n=4-8$). The number of viable cells decreased by 55% ($P < 0.05$) and 60% ($P < 0.05$) in the GV6+Dox and GV1+Dox compared to Control by day 21, respectively. Our results indicate that continuous low dose anti-telomerase and chemotherapeutic drugs do inhibit breast cancer cell proliferation and merits further investigation.

HENRY HALL ATRIUM 035

Fatal Falls in the Elderly

Participants attending 11:00 AM - 12:00 PM

Presenter: Kelsey VanAmberg

Mentors: Dawn Richiert, Timothy Strickler, Melissa Tallman, Cynthia Thompson

In many individuals, a fall that results in a bone fracture heals easily. In some though, especially

the elderly, a fall can be fatal. A bone fracture could bleed extensively and an individual could die due to blood loss, or a fracture could lead to a clot, causing a stroke or a pulmonary embolism. The risk of mortality is increased in patients with osteoporotic fractures. The dissection of a cadaver age 73 revealed that he sustained a complete fracture at the surgical neck of the humerus due to a ground level fall, and died one day later. The fatal outcome of this fall could have been due to many causes, and the possibilities were investigated by a full dissection of the body as a part of the course requirements in BMS 460 and my HNR 499 research project.

HENRY HALL ATRIUM 036

Undergraduates as Consulting Ethnographers: How Classroom Space Impacts Teaching and Learning

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

Presenters: Andrea Antvelink, Gabrielle Talos, Michael Viales-Lanuza, Alison Wilcoxson

Mentors: Elizabeth Arnold, Tara Hefferan, Deana Weibel-Swanson

An anthropological internship at Grand Valley State University links undergraduate students with the Faculty Facilities Planning Advisory Committee to carry out ethnographic research on the use of classroom space. Through data collection, participant observation, in-depth interviews with students and faculty, and surveying student responses to classroom spaces, student researchers have identified a number of classroom issues that may impact teaching and learning. Better documentation and understanding of how accessibility, noise, and technological problems are experienced in the classroom will benefit planning for future classroom spaces. The current Winter 2015 study focuses on hybrid classrooms at Grand Valley State University.

HENRY HALL ATRIUM 037

Maternal-Mind-Mindedness and School-Age Children's Emotion Understanding

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

Presenter: Challie Frostick

Mentor: Naomi J. Aldrich

Research suggests that maternal-mind-mindedness (MMM; treating a child as an individual with a mind rather than a being with needs to be fulfilled) is beneficial for preschoolers' social cognition. Few studies, however, have examined MMM in relation to older children's abilities. Mothers of 5-to-11-year-olds ($N=79$) completed a MMM interview that was coded for 1) proportion of mental characteristics attributed to their child and 2) valence of the mental attributes; and children were given a test of emotion comprehension. Contrary to expectations, children of mothers with a

high degree of MMM exhibited less emotion understanding. However, this was due to mothers describing their children's mental attributes in a negative (e.g., *stubborn*, *easily stressed*), rather than positive (e.g., *smart*, *thoughtful*) manner. Thus, we suggest that future research should account for valence when examining the complex association between MMM and children's social cognition beyond the preschool years.

HENRY HALL ATRIUM 038

Synthesis of Novel Ureas as Potential Antimicrobial Agents

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

Presenters: Eva Gulotty, Aaron Rosenberg, Adam Wigger, Alexander Wong

Mentor: Matthew Hart

The growing problem of antibiotic resistant bacteria is one of the world's most pressing problems. The number of antibiotic resistant strains of bacteria has increased significantly in the past few decades. During this same time the number of novel antibiotics approved for use has dropped significantly. The development of novel antimicrobial agents will be crucial in solving the problem of resistant strains. In an effort to explore new antimicrobial agents our sophomore organic chemistry lab (CHM 248) will be synthesizing and testing novel diphenyl ureas that are loosely based on the oxazolidinone class of antibiotics. The project herein reports the progress towards the synthesis of these diphenyl ureas and some initial antimicrobial tests.

HENRY HALL ATRIUM 039

Synthesis of Biphenyl Urea Derivatives of 3-Iodothyronamine

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

Presenter: Auguste Niyibizi

Mentor: Matthew Hart

The thyroid hormone (TH) is known to actively participate in many biological processes including metabolisms, cardiovascular function, brain development and growth. Decreased or increased TH levels, conditions known as hypo- and hyperthyroidism, can lead to severe heart and metabolic problems if untreated. Unfortunately, treatment options are minimal. Recently, 3-iodothyronamine (T₁AM) was demonstrated to act on the trace amine associated receptors (TAAR) to induce physiological effects in opposition to those of TH, including hypothermia and cardiac depression in mice. Our lab has worked to develop a structural understanding of T₁AM mediated TAAR regulation. The project herein is an extension of previous work and examines the synthesis of biphenyl urea derivatives with varying substitution patterns. A greater understanding of TAAR

regulators may have medicinal applications, especially for those patients with thyroid hormone irregularities.

HENRY HALL ATRIUM 040

Diet of Kit-rearing Female Martens in Northern Michigan

Participants attending 11:00 AM - 12:00 PM

Presenter: Angela Kujawa

Mentors: Joseph Jacquot, Paul Keenlance

The American marten (*Martes americana*) is a small, carnivorous mammal found in upper North America and in fragmented populations of Michigan's lower peninsula. A large limiting factor on marten populations is food availability due to their high metabolism and low fat storage. This can be especially important for lactating females that may have up to five kits to sustain. We sought to obtain an understanding of reproducing female marten diets. Female martens in the Manistee National Forest were fitted with radio collars and tracked using radio telemetry. Remotely-triggered cameras were used to confirm den sites and monitor prey brought back to the den. Scat was collected and identifiable components evaluated to delineate diet. Females consumed small prey more often, but obtained the majority of their caloric needs from larger prey. We also documented the consumption of moles and multiple prey being delivered to the den at a time which were previously unreported for this species.

HENRY HALL ATRIUM 041

Effects of Hippotherapy on Coordination of Speech in a Person with Traumatic Brain Injury: A Single Subject Research Design

Participants attending 3:00 PM - 4:00 PM

Presenters: Matthew Moser, Ana Thrall

Mentor: Beth Macauley

Hippotherapy occurs when physical therapists, occupational therapists, and speech-language pathologists use the movement of the horse as a treatment strategy. There is considerable evidence published about the benefits of hippotherapy on gross motor function such as walking, reaching, standing balance, and trunk control following treatment that incorporates hippotherapy. However, no study to date has investigated the effect of hippotherapy on fine motor control such as speech. The purpose of this study was to investigate the effects of hippotherapy on speech motor control in persons with traumatic brain injury. Speech-language pathologists who have board certification in hippotherapy were asked to send us de-identified case files of their clients with TBI. One file was received. We reviewed the chart and extrapolated the speech motor control data. Results indicated immediate improvement in speech motor control with continued improvement

through session 10.

HENRY HALL ATRIUM 042

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

Participants attending 2:00 PM - 3:00 PM

Presenter: Anna Barry

Mentor: Dawn Hart

Human cells divide by mitosis where a cleavage furrow is formed and two daughter cells are created through cytokinesis. *Schizosaccharomyces pombe* is a family of fission yeast cells that divide by medial fission and are a very good model to study human cell division to help understand how and where cells divide. Within *S. pombe* are numerous proteins, one of which is the serine/threonine phosphatase Dis2. Previous experiments from our lab determined that Mid1 is a substrate of Dis2. In order to further explore the possible direct interaction between Dis2 and Mid1 *in vivo*, we created a phosphatase dead version of Dis2. A paper published in 2012 researched the mammalian serine/threonine phosphatase PP1 and determined that histidine 124 is responsible for catalytic activity (Yamano et al). By creating a H124A mutation in the Dis2 gene, we can observe the consequence of inactive Dis2 on Mid1. Current experiments involve imaging mutated and wild type Dis2 cells.

HENRY HALL ATRIUM 043

Hand and Forearm, but not Neck, Cooling Reduces Thermophysiological and Perceptual Strain Following Passive Hyperthermia

Participants attending 11:00 AM - 12:00 PM

Presenters: Mackenzie Abeare, Samantha Orr

Mentor: Ross Sherman

The study aim was to determine the effect of cooling on body temperature, HR and thermal sensation following passive hyperthermia. Eleven participants were heated to 39°C rectal temperature (T_{re}) by 40°C whole-body immersion. They were removed from the water and cooled using a towel on their neck (NT), hand and forearm immersion in cool water (H) and passively (C), all until T_{re} reached 38°C. HR, T_{re} , mean skin temperature (T_{sk}), and thermal sensation (TS) were measured pre- and post-immersion, and every 5 minutes during cooling. Time to cool was faster with H compared to C and NT. There was lower T_{re} after 10 minutes and 15 minutes H cooling compared to NT and C. There was also a lower T_{sk} when using H compared to NT and C. Mean HR was lower during H recovery compared to both NT and C. Perceived TS was lower with H compared to NT and C. NT cooling was an ineffective hyperthermia recovery strategy. H cooling

effectively reduced T_c , T_{sk} and recovery time, decreased HR and improved perceptual responses.

HENRY HALL ATRIUM 044

Impact of Pre-Exercise Caffeine Consumption on Sprint Performance in Healthy Individuals

Participants attending 1:00 PM - 2:00 PM

Presenters: Erin Kishman, Alisha Le Mire, Amanda Woodruff

Mentor: Ross Sherman

Background: Short-term exercise lasting less than 10 seconds requires maximal energy output through use of creatine phosphate. Performance improvement can be correlated to caffeine ingestion, which causes a positive effect on energy availability and the central nervous system's sensation of effort. **Purpose:** The purpose of this study was to determine if pre-exercise ingestion of caffeine would improve repeat sprint performance. **Methods:** Eight healthy college students, who all had low habitual caffeine consumption, participated in the double-blind randomized cross-over design study. Participants consumed 12 oz. of water mixed with either 5 g per kg⁻¹ body mass caffeine or placebo 90 minutes prior to exercise. Peak power output and fatigue during 10 consecutive 6-second maximal sprints was determined, and pre- and post-exercise heart rate, capillary blood glucose and lactate levels, and perceived exertion were measured. **Results:** Data will be collected and presented at SSD.

HENRY HALL ATRIUM 045

Investigation of Nucleophilic Ring Openings of Aziridine

Participants attending 10:00 AM - 11:00 AM

Presenter: Justin Tarahomi

Mentor: Matthew Hart

Nitrogen containing natural products are abundant and can exhibit a variety biological properties. The synthesis of nitrogen containing natural products is of great interest in order to generate novel analogs. Through the synthesis of analogs we can learn more about the biological activity of these natural product. Aziridines are three membered heterocycles comprised of two carbon atoms and one nitrogen atom. Through the use of aziridines we can carefully control the location of nitrogens in our final structures. The project described herein is focused on the synthesis and reactivity of phenyl substituted aziridines. Several aziridines were synthesized bearing different groups attached to the nitrogen. These aziridines were reacted with nucleophiles to gain a better understanding of ring opening substitution reactions. The investigation of these ring opening reactions may lead to the novel synthesis of amine containing compounds.

HENRY HALL ATRIUM 046

Mechanistic Studies on the BBr_3 -Catalyzed Cyclization of *o*-Alkynylanisoles to Form Benzofurans

Participants attending 9:00 AM - 10:00 AM

Presenter: Matthew Barylski

Mentors: Andrew Korich, Richard Lord

In a previous study in the Korich group, *o*-alkynylanisole was shown to cyclize to form benzofuran, an important pharmaceutical precursor, in the presence of BBr_3 . We explored mechanistic possibilities to explain this unexpected observation using computational chemistry. In particular, geometry optimizations of reactants, intermediates, products, and transition states connecting these species were optimized at the B3LYP/6-31G(d) level of theory. Based on these findings we propose a new mechanism that plausibly explains the experimental results.

HENRY HALL ATRIUM 047

Identifying merchants in the Early Bronze Age city of Tell es-Safi. Isotopic analysis of a sacrificial ass.

Participants attending 12:00 PM - 1:00 PM

Presenter: Lindsay Babcock

Mentor: Elizabeth Arnold

A young, healthy adult female ass was recovered under the floor of an EB III house at the site of Tell es-Safi/Gath, Israel. The animal was located within a commoner domestic neighborhood at the edge of the city, where residing merchants would have relied upon asses as beasts of burden in local and inter-regional exchange (Greenfield et al. 2012). Stable isotope analyses, obtained through sequential intra-tooth sampling and carbon, oxygen and strontium isotope analyses of the asses teeth, are used to evaluate this merchant hypothesis. If supported, the isotopic signature should show high mobility - with strontium isotope ratios outside the local signature and a high diversity in strontium isotope values. Analysis will enable reconstruction of the life history, diet, mobility, seasonality of movement and management practices of domestic asses during the EB of the southern Levant. The importance of this taxon to the religious and economic realms of the EBA of the Near East is discussed.

HENRY HALL ATRIUM 048

Effect of Dynamic Stretching on Vertical Jump Height

Participants attending 4:00 PM - 5:00 PM

Presenters: Paige Howard, Ashley Lustre, Molly McEntire

Mentor: Ross Sherman

Background: Dynamic stretching techniques have been utilized to enhance physical performance activities. **Aim:** The aim of the study was to investigate whether pre-exercise dynamic stretching had a greater positive impact on vertical power output than static stretching. **Methods:** Eight healthy participants volunteered for this randomized cross-over design study. The study was split into two sessions completed on different days. Participants completed either a time matched dynamic or static stretching routine followed by four repetitions of a standard vertical jump test. The two stretching routines targeted the soft tissues of the lower extremities of the body. **Results:** Data will be collected and presented at SSD.

HENRY HALL ATRIUM 049

Magnetic Susceptibility Apparatus

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

Presenter: Joshua LaMie

Mentors: Ross Reynolds, Harold Schnyders

Knowing the magnetic susceptibility of materials gives us greater understanding into ways to use these materials in new technology. Non-contact forces such as magnetism are used everywhere we use electricity. My project consists of an apparatus similar to one created by A. Edgar and J. W. Quilty from Victoria University, Wellington, where I use inductance coils to determine magnetic susceptibility of materials by placing them inside one of the coils. Using two parallel inductance coils within a temperature controlled environment I measure the difference of inductance between the coils with and without the test material. This difference is directly related to the magnetic susceptibility of said test material. A summary of methods for producing samples, the electronics of the test circuit, and a comparison between measured susceptibilities and expected values will be presented.

HENRY HALL ATRIUM 050

Choosing the Right Horse for Hippotherapy: A Comparison of Movement Patterns and Treatment Outcomes

Participants attending 3:00 PM - 4:00 PM

Presenter: Emily Macauley

Mentor: Beth Macauley

Hippotherapy is a subtype of Equine-Assisted Therapy that occurs when physical, occupational, or speech therapists use the movement of a walking horse to facilitate improved neurological function of their clients. However, horses have a three-dimensional walk that includes up-down, side-side, and rotational components. Different horses have different walking gaits and therefore

provide different movement patterns to the client. It is not known which type of movement works best for which discipline or treatment goal. The purpose of the present study was to retrospectively compare session outcomes when different horses were used with the same speech therapy client. The goal was to create an initial hypothesis of which horse, and which type of movement, appears to work best within speech therapy.

HENRY HALL ATRIUM 051

The Impact of 12-Hour Dehydration on Physiological Function During Hyperthermia

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

Presenters: Jack Klingbiel, Dylan Lambertson, Matthew Nunn

Mentor: Ross Sherman

Background: Humans require water to survive, but as the water content of tissue falls either through restricted intake or excessive loss, the body's ability to regulate its core body temperature is impaired. **Aim:** The aim of the study was to compare the effect of an overnight dehydration on thermo-physiological responses to hyperthermia. **Methods:** Four healthy college-aged participants completed the study. They were asked to immerse themselves, above the level of their shoulders, in 104°F water until their core body temperature (T_C) reached 39°C on two different occasions. On one occasion they refrained from any fluid intake for 12 hours prior to the immersion, and on the other occasion they continued to drink fluid normally. Hydration status was assessed using a urine sample, with dehydration identified when USG >1.02. As well as T_C , heart rate and thermal sensation was measured during the immersion. **Results:** All data is yet to be collected and will be presented at SSD.

HENRY HALL ATRIUM 052

Testing Metric Methods for Age Estimation on Human Skeletal Remains From Umm-el-Jimal

Participants attending 12:00 PM - 1:00 PM

Presenters: Teresa Moreno, Heather Pitcher

Mentor: Gwyn Madden

Human remains were examined from Umm-el-Jimal, a Late Roman to Early Byzantine site, located in northern Jordan. The two vault tomb produced an unusual burial population of 31 individuals, with a shocking 77.4% juvenile remains. These 24 individuals range in age from fetal through late adolescence. The current study employed new metric methods to estimate juvenile age at death in individuals found in archaeological or forensic settings, based on metrics taken from the distal femoral epiphysis, the ilium, talus and calcaneus. Application of these methods to the Umm-el-

Jimal remains was undertaken to assess comparability between the new metric methods and earlier traditional methods of age at death assessment. The age at death estimates developed using the new metric method on the distal femoral epiphysis, ilium, talus, and calcaneus for the juvenile remains at Umm-el-Jimal fit within the prior age assessment made using the traditional methods.

HENRY HALL ATRIUM 053

The Effect of Environmental Factors on Health Related Quality of Life in People Diagnosed with Obesity-related Nonalcoholic Fatty Liver Disease: A Secondary Analysis

Participants attending 9:00 AM - 10:00 AM

Presenter: Jennifer Awad

Mentor: Lori Houghton-Rahrig PhD RN

Obesity-related Non-Alcoholic Fatty Liver Disease (NAFLD) is a rapidly emerging worldwide health concern estimated to be affecting 96 million people in the United States alone. The *PNPLA3* (rs738409) gene polymorphism is well established as a disproportionate contributing factor to progression of the disease. Little evidence exists regarding NAFLD and hazardous environmental exposure. The purpose of this secondary analysis is to evaluate the influence of hazardous environmental exposure in people with NAFLD on HRQOL.

The demographic and disease characteristics of age, genotype, and BMI, as well as hazardous environmental exposures will be compared with HRQOL. This descriptive study is a secondary analysis of previously collected data.

Due to the small sample size, the Kruskal-Wallis H test and linear regression will be used to determine the differences in hazardous environmental exposure, and demographic and disease characteristics on HRQOL.

HENRY HALL ATRIUM 054

Timing of Pre-Exercise Carbohydrate Ingestion on Blood Glucose Before and After Exercise

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

Presenters: Kevin Amidon, Katelynn Krause, Blaise Nsengiyumva

Mentor: Ross Sherman

Background: Intramuscular glycogen and blood glucose are the primary energy sources in the body. During exercise, blood glucose is depleted as it is transported into skeletal muscle cells. The

liver also breaks down glycogen to replenish blood glucose. **Purpose:** The purpose of this study was to determine whether the time at which pre-exercise CHO consumption occurs altered blood glucose levels before, during, and after exercise. **Methods:** Eight healthy people participated in the randomized cross-over, double-blind design study. Blood glucose levels were tested at baseline, prior to CHO consumption, and before and after a 30 min treadmill run at an intensity of 60% of maximal oxygen uptake. Participants consumed 4.0 ml·kg⁻¹ body mass of 6% CHO sports drink either 60 min or 15 min before the exercise bout. Expired gas analysis was performed during exercise to determine CHO oxidation. **Results:** Data will be collected and presented at SSD.

HENRY HALL ATRIUM 055

Role of Pre-Exercise Caffeine on Repeat Sprint Performance in Healthy College-Aged Individuals

Participants attending 2:00 PM - 3:00 PM

Presenters: Anastacia Nelson, Riley Pashak, Alexandria Walker

Mentor: Ross Sherman

Background: Caffeine has positive effects on endurance performance as it blocks adenosine within the central nervous system. However, caffeine's potential ergogenic effects on repeat anaerobic performance is not clear. **Purpose:** The purpose of this study was to determine how ingestion of a caffeine supplement before exercise affects repeat sprint performance. **Methods:** Eight healthy and caffeine naïve college students participated in a double-blind randomized cross-over research design study. On two separate days of testing, participants consumed 12 oz of water mixed with either 5g per kg⁻¹ body mass caffeine or placebo 90 minutes prior to exercise. Peak power output from 10 consecutive 6-s maximal sprints was measured, and pre- and post-exercise heart rate, perceived exertion, and blood lactate and glucose levels were recorded. **Results:** Data will be collected and presented at SSD.

HENRY HALL ATRIUM 056

Effect of Prior Physical Activity on Postprandial Lipemia in College-Aged Individuals

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

Presenters: YeonHee Kim, Billy Ong, Theresa Swastek

Mentor: Ross Sherman

Background: A rise in triglyceride lipoprotein after eating, postprandial lipemia, is common in humans. After low intensity physical activity, metabolism increases and breaks down lipids at a more rapid rate. As the activity continues, depletion of triglyceride lipoproteins increase and postprandial lipemia decreases. **Purpose:** The purpose of this study was to determine how prior

physical activity affects lipid level in the blood stream pre-prandial and postprandial. **Methods:** Eight college students participated in a low intensity walk for one hour during the late evening. After the walk, no food or liquid, except for water, were consumed until the next morning. The next morning a finger prick blood sample was taken 30 min before and 30 min after a standardized hot breakfast. Blood was analyzed for total, HDL, and LDL cholesterol, as well as triglyceride content. **Results:** Data will be collected and presented on SSD.

HENRY HALL ATRIUM 057

Decline of Benthic *Diporeia*

Participants attending 1:00 PM - 2:00 PM

Presenter: Courtney Cave

Mentor: Kevin Strychar

Populations of the freshwater amphipod *Diporeia* spp. have steadily declined in Lake Michigan since the late 1980s. Prior studies have provided inconclusive data on possible reasons for their decline. In this project, the possibility of pathogens as the cause of the collapse of *Diporeia* has been examined. Linear regression modeling shows a significant positive linear association between percent of *Diporeia* exhibiting a pathogenic infection and year ($r=0.7202264$, $p\leq 0.0124$). Chi-square testing for independence was also used to test if there was an association between year and percent infection ($\chi^2 = 50$, $df = 10$, $p\leq 0.0001$), implying significant association between year and infection. Hence, the introduction of zebra mussels and the diseases they carry may have played a significant role in the population crash of *Diporeia*.

HENRY HALL ATRIUM 058

Impact of Dynamic Stretching Compared to Static Stretching on Vertical Jump Height in College-Aged Individuals

Participants attending 2:00 PM - 3:00 PM

Presenters: Cortney Blair, Joshua Corgan, Shelby Gort

Mentor: Ross Sherman

Background: An active warm up has the ability to reduce muscle stiffness and improve anaerobic metabolism and nerve conduction. **Purpose:** The purpose of this study was to determine if there is a performance improvement when using pre-exercise dynamic stretching compared to static stretching. **Methods:** Eight individuals volunteered to participate in this randomized cross-over design study. Each individual participated in a ten minute static stretching session on one day, and then completed a ten minute dynamic stretching session on another day, at least two days later. Four repetitions of a vertical jump test were completed following each stretching session to determine vertical power output. **Results:** Data will be collected and presented at SSD.

HENRY HALL ATRIUM 059

Screening for Mutant Phenotypes in *Arabidopsis thaliana*

Participants attending 12:00 PM - 1:00 PM

Presenter: Alicia Doornbos

Mentor: Matthew Christians

To maintain normal cellular functions, a cell must break down proteins to regulate cellular processes. Ubiquitination targets proteins in a highly specific manner for degradation by the cell. This process is necessary for organismal development and response to stimuli. Bric-a-brac/Tramtrac/Broad Complex (BTB) proteins play a role in regulation of this pathway, as they function to add a small protein (ubiquitin) onto other targets which leads to their degradation. Our aim is to determine the role of specific BTB genes in plant development by screening for mutant phenotypes in genetic crosses of *Arabidopsis thaliana*. Through making crosses between two plants mutated in separate BTB genes we have characterized a mutant triple cotyledon phenotype. However attempts to identify the location of these mutations have been unsuccessful. Currently, we are investigating the location of the mutations in our triple-cotyledon phenotype to determine which genes may control seedling development.

HENRY HALL ATRIUM 060

Impact of Dehydration on Thermoregulation and Heart Rate During Warm-Water Immersion

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

Presenters: Crystal Bischoff, Christine Dominiak, Reynaldo Soto

Mentor: Ross Sherman

Background: Dehydration negatively impacts thermoregulation in a heated environment. When dehydrated, the body has impaired sweating and therefore core body temperature and heart rate will increase. **Purpose:** The purpose of this study was to determine the effect of a 12-hour dehydration on thermoregulation. **Methods:** Eight healthy individuals participated in this study, which used a randomized cross-over design. Participants either refrained from drinking fluids or maintained normal fluid intake for 12 hours prior to being immersed in 40°C water. Hydration status was assessed using a urine sample and refractometry, with dehydration accepted as USG >1.02. Nude body mass was measured before entering the tank. Participants stayed in the water until core body temperature (T_c) reached 39°C. As well as T_c , skin temperature, heart rate, thermal sensation, time taken to reach 39°C, and post-immersion nude body mass was recorded. **Results:** Data will be collected and presented at SSD.

HENRY HALL ATRIUM 061

Effect of Low Intensity Exercise 12 Hours Before Breakfast on Post-Prandial Lipemia in College-Aged Individuals

Participants attending 1:00 PM - 2:00 PM

Presenters: Kristin Forman, James LaFave, Holly VanderKooi, Jamie Vetterli

Mentor: Ross Sherman

Background: Low to moderate intensity exercise has been shown to reduce blood lipid values. Studies have been conducted to test the immediate effects of exercise but there is a lack of published work on the prolonged effects of low intensity exercise on blood lipid levels. **Purpose:** The purpose of this study was to examine the effect of low intensity exercise 12 hours before breakfast on postprandial lipemia. **Methods:** Eight healthy, college-aged individuals participated in this randomized cross-over design study. They either walked around a 300 m indoor running track or rested quietly for an hour in the evening before bedtime. The following morning blood lipid values were taken from a capillary sample 30 minutes before and after a standardized cooked breakfast. **Results:** Data will be collected and presented at SSD.

HENRY HALL ATRIUM 062

Co-Occurrences Between Verbs and Body Parts in Speech Between Parents and Children

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

Presenters: Amaya Guthrie, Sultan Hubbard, Alexes Jackson, Grace Wentworth

Mentor: Josita Maouene-Cavin

An important challenge to the early embodied connection between body parts and verb meaning is that these associations could be nested in totality in the co-occurrences between verbs and body parts in the speech of and to children. A computer program extracted the first noun before and after 103 early learned verbs in children and parental speech, from two age groups, 12-18 months and 18-24 months, from 36 corpora from the CHILDES database. The first result reveals that overall the proportion of body parts used by both children and parents is significantly lower (between 0% and 5% of the nouns) in comparison to proper nouns (22%). The second result shows that body parts are mainly used with a restricted number of verb types in toddlers and parental speech to these children. Between 1/5 and 1/4 of the verbs were used with body parts in both age groups. This challenges the assumption that only explicit production of body parts is responsible for the body related verb connections in toddlers.

HENRY HALL ATRIUM 063

Characterizing an Inhibitory Compound to Combat Antibiotic Resistance in

Acinetobacter

Participants attending 1:00 PM - 2:00 PM

Presenter: Alison VanDine

Mentor: Bradley Wallar

A strain of pathogenic bacteria, *Acinetobacter baumannii*, is developing resistance at an alarming rate to β -lactam antibiotics. Much of this resistance is attributed to the expression of class C β -lactamases, termed Acinetobacter-derived Cephalosporinases (ADCs). One of these β -lactamases, ADC-7, can deactivate the β -lactam ring present in a broad spectrum of existing antibiotics. A novel class of inhibitors, boronic acid transition state inhibitors (BATSI), has been synthesized to combat this resistance mechanism. In this study, an inhibitor (CR157) was characterized for its ability to bind and inhibit ADC-7. CR157 bound to ADC-7 with high affinity and inhibited its ability to deactivate a common antibiotic. Additionally, the X-ray crystal structure of the ADC-7/CR157 complex was determined at 2.03 Å. The ADC-7/CR157 complex provides insight to the inhibitory capabilities of CR157, as well as contributing to the structure-based optimization of future β -lactamase inhibitors.

HENRY HALL ATRIUM 064

Investigations of Microwave Assisted Catalytic Hydrogenation

Participants attending 11:00 AM - 12:00 PM

Presenter: Kelsie Nauta

Mentor: Matthew Hart

The reduction of alkene and nitro groups with catalytic hydrogenation is a common laboratory technique. Our lab was interested in exploring the use of microwave activation in these reactions as a way of optimizing one of our synthetic routes. The use of a Microwave Assisted Reactor System (MARS) is ideal for this application. This system allows us to control the irradiation and temperature in a closed system. The project herein describes the investigation of optimal conditions for the transfer hydrogenation of 4-nitrotoluene were investigated utilizing the MARS microwave reactor. Several conditions were examined to determine the optimal catalytic system. Based on these results we applied the reaction to a lab currently being run the CHM 241 course, the hydrogenation of olive oil.

HENRY HALL ATRIUM 065

Stratigraphy and Lithology of Tills in the Hemlock Crossing Core, Ottawa County, Michigan: Possible Insights on Till Provenance and Lobe History

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

Presenter: Christopher Vanderlip

Mentor: Patrick Colgan

We analyzed a core from Ottawa Co. to differentiate till units. Previous work defines tills based on stratigraphy, texture, and clay minerals. Till texture and clay mineral ratios from the core were analyzed and a sample of the bedrock was also analyzed. Four till units are present in the core. The tills are varying loams that get sandier with depth. Clay mineral ratios have a bimodal distribution, with the upper and middle tills having a mean of 0.9 ± 0.1 , and the lower tills at 1.2 ± 0.1 . All tills cluster around the mean values for the bedrock. We interpret all four units as basal tills separated by glacial lake sediments. Lithologic differences suggest that the upper two tills incorporated bedrock and glacial lake sediments from the Lake Michigan Basin. The texture and clay minerals in the lower two tills suggest that they have a different source, perhaps as a west/southwest flowing Saginaw lobe during a pre-late Wisconsin glaciation.

HENRY HALL ATRIUM 066

Exploring how Snapchat is Shaping Relationships, Identity, and Communication

Participants attending 10:00 AM - 11:00 AM

Presenters: Megan Kiplinger, Irma Y Ramirez, Cassandra Skinner

Mentor: Rachel Campbell

Snapchat is a relatively new smartphone application that serves as a means of communication through temporary photo sharing. Snapchat possesses many facets that distinguish it from other forms of social media, such as impermanence, which gives Snapchat the potential to impact how its users communicate. To date there has been little research regarding the usage and implications of Snapchat. The purpose of this poster is to present literature on new media and critically reflect on how the construction of relationships and identity may be changing as result of this unique form of communication. This preliminary research focuses on understanding the Snapchat corporation and photo sharing technologies, exploring the roles that social media play in communication, and questioning the relationships between social media and identity. Our goal is to use existing literature to construct a theoretical framework with which to analyze the usage and effects of Snapchat in future research.

HENRY HALL ATRIUM 067

Kappa Opioid Regulation of Depressive-like Behavior During Protracted Withdrawal from Ethanol

Participants attending 4:00 PM - 5:00 PM

Presenters: Delia Chapa, Lindsay Dean, Elise Devitt, Sorscha Jarman, Hannah Tropiano

Mentor: Glenn Valdez

Alcohol withdrawal can create long-term changes in brain physiology, which may lead to mood disturbances. Recent studies suggest that changes in the dynorphin (DYN)/kappa opioid receptor (KOR) system may influence these changes in mood. The current study examined the role of the DYN/KOR system on depressive-like behavior during protracted withdrawal from alcohol. Male Wistar rats were placed on an ethanol or control liquid diet for approximately 28 days. Three weeks following removal of the liquid diet, rats received injections of saline or 20 mg/kg norbinaltorphimine (nor-BNI). 24 hours later, rats were subjected to an initial ten minute forced swim test. The next day, rats were exposed to a five minute forced swim test, which was videotaped. These test sessions are currently being analyzed by trained observers. The results of this experiment should provide further insight about the role of the DYN/KOR system on the long-term behavioral changes associated with alcohol withdrawal.

HENRY HALL ATRIUM 068

A Statistical Consulting Experience: Predictive Baseball Analytics

Participants attending 10:00 AM - 11:00 AM

Presenters: Fatoumata Kaba, Devin Michalec

Mentors: John Gabrosek, Del Young

When it comes to the game of baseball, there is a lot of in game strategy and each team does whatever it can to gain the upper hand. In sports, numbers are often used in order to do this. Grand Valley State University assistant baseball coach Del Young wants us to look at every pitch from the 2014 post-season and try to find different trends. If you can figure out what pitch your batters hit best and what count that pitch comes on, you can greatly increase your batters' success. We will also be looking at specific counts to see which players should be swinging early in an at-bat and which players should sit and see more pitches. We are excited for our first statistical consulting experience and hope to learn a lot from Coach Young and the data provided.

HENRY HALL ATRIUM 069

The Effects of Weight Support on the Metabolic Demands of Running

Participants attending 10:00 AM - 11:00 AM

Presenter: Jessica Janecke

Mentor: Kyle Barnes

Running velocity and body weight (BW) support affect the metabolic demands of running. The Alter-G treadmill is a BW support ergometer used to reduce the risks of overground running, however little is known about the metabolic demands of running at reduced BW. The aim of this study was to determine the relationship between running velocity, BW support and metabolic

demand. 15 runners completed a test composed of four intervals at fixed BW percentages ranging from 70-100%. Each interval consisted of increasing speed 1 mph every 3 min, during which expired gases were collected. Using regression analyses, a conversion table was created for running speeds of 5-12 mph and BW of 70-100% (see poster). In general, a runner must run 0.5-0.7 mph faster per 10% reduction in BW to elicit similar metabolic responses as running at 100% BW. This information can assist coaches or practitioners to prescribe exercise on an Alter-G treadmill to elicit similar metabolic responses to overground running.

HENRY HALL ATRIUM 070

Copper(I) Catalyzed Triazole Synthesis: A Computational Exploration

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

Presenter: Samantha Bidwell

Mentor: Richard Lord

The development of transition metal catalysts for facilitating efficient and economical organic transformations is an active and critical area of chemical research. One such reaction is copper-catalyzed selective azide-alkyne cycloaddition. While this “click chemistry” reaction offers a number of attractive synthetic features, the governing reaction mechanism remains largely unknown. Using density functional theory, we have investigated an interesting potential mechanism recently posited in the literature. Our results dispute that proposed mechanism, and we have sought a possible alternative route that is consistent with a number of well-established and published experimental results.

HENRY HALL ATRIUM 071

Correlations between Bone Shape and Muscle Characteristics in Four Species of Primates

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

Presenter: Moriah Muscaro

Mentor: Melissa Tallman

Muscles attach to specific points of the bones that they move and oftentimes leave a muscle scar on the bone. It is believed that the more raised the muscle scar, the larger and more forceful the muscle inserting at that point. Therefore, muscle characteristics such as length and weight could predict aspects of bone shape. We examined the correlation between muscle weights and bony form in four species of old world monkeys. Wet tissue data was obtained through dissection of primate upper limbs, while hard tissue data were collected in the form of landmark data on laser scans of the corresponding arm bones. The specific muscles we will examine include: pronators, supinators, biceps, triceps, and rotator cuff muscles, as well as ratios of biceps to triceps and

forearm flexors to extensors. We will compare these muscle groups to aspects of the shape of the bones on which they work to see if muscle size can predict bone shape and vice versa.

HENRY HALL ATRIUM 072

Muscle Activation Patterns Using Unstable Weights: Statistical Consulting

Participants attending 10:00 AM - 11:00 AM

Presenters: Brianna Gildner, Joel Smith

Mentors: John Gabrosek, Stephen Glass

Weight training increases strength and improves function, but is performed under stable, balanced conditions. Functional daily movements involve challenges in balance and stabilization, making weight training less specific to function. Strength training that also includes an unstable component may activate use of more muscles during balance and movement. Dr. Steve Glass has designed a study to test non-stable and stable water filled weights with this goal in mind. To study the effectiveness of this water filled barbell three types of exercises were measured using a stable, partially unstable, and completely unstable water movement settings. As statistical consultants working on this project our goal was to analyze the collected data to determine if these new weights were more effective than traditional weights and if there was any difference in effectiveness for male and female subjects. The methods used for our data analysis will be shown.

HENRY HALL ATRIUM 073

Comparative Decision Making: Age Differences in Stopping Rule Selection

Participants attending 1:00 PM - 2:00 PM

Presenter: Tessa Johnson

Mentor: Mario Fific

The purpose of this study is to assess whether adolescents, ages ranging from 8-17, adhere to Stopping Rule Selection Theory (SRS), which hypothesizes that a decision maker is able to use multiple stopping rules for a variety of decision tasks. We compared decision making strategies among children and adults via a computerized, deferred decision making task. The objective was to make a decision to buy or not to buy a product based on the recommendations consulted. The first goal is to investigate how source reliability affects the number of recommendations consulted and the accuracy of the decision. The second goal is to observe how the dynamics of stopping rule selection changes across age groups, and whether the decision making departs from optimality. Results showed striking differences in the number of reviews consulted and in accuracy with respect to changes in source reliability and subject age.

HENRY HALL ATRIUM 074

A Physical Perspective on Oboe Reeds

Participants attending 9:00 AM - 10:00 AM

Presenter: Julia Gjebic

Mentors: Karen Gipson, Marlena Vavrikova

As oboists make their own reeds, information about the effect of a reed's structure on its harmonic spectrum is invaluable to all players. An oboe reed consists of two blades of the grass *Arundo donax* bound to a conical metal tube such that the edges of the blades meet and vibrate against one another when stimulated. While these materials and this basic structure are constant across makers, the specific physical characteristics of reeds vary significantly between individual styles of reed-making. In this study, we systematically varied the final stage of reed-making (*scraping*) and studied how the changes in the reed structure affected the spectrum. We then used this information to try to determine which areas of the finished reed influence which segments of the harmonic series. This information is of great interest to oboists as it allows them quantitative insight into how their individual scrape affects their overall tone quality and timbre.

HENRY HALL ATRIUM 075

The Zoo Crew: A Statistical Consulting Experience

Participants attending 2:00 PM - 3:00 PM

Presenters: Roxanne Evers, Jenna Mervyn

Mentors: Jackson Fox, John Gabrosek

Jackson Fox from GVSU's Statistics Department has been working with the John Ball Zoo administrative staff to determine how factors such as events, weather, etc. affect attendance. As statistical consultants on this project, we were asked to analyze the data to determine what effects these factors have on attendance. Accurately estimating attendance is important information for helping the Zoo to be properly staffed. Special insight provided by the Zoo's administrative staff will be utilized to provide analyses conducted through statistical software, such as SAS, about what days are most popular and what seems to draw people to the Zoo. This information will be presented to the Zoo staff to improve their marketing efforts and provide better staffing. We will also discuss what we learned about statistical consulting.

HENRY HALL ATRIUM 076

“He seems a little bit jealous.” “Yeah and doesn't look like he's happy.”

School-Age Friends Fictional Narratives about Interpersonal Rivalry

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

Presenter: Jessica Fritzler

Mentor: Naomi J. Aldrich

Relationship-dependent differences in children's emotion language may reflect distinctive social processes within socio-cognitive development. Unlike parental-socialization models, early adolescents' criticisms of same-sex friends' emotions do not deter their peers' subsequent emotional discourse about conflict. Extending this research, we examined 6-to-8-year-olds' responses to a peer's emotional discourse within mixed-sex and same-sex dyads. Children (n=144) were tested for emotion knowledge and co-narrated a story about an aggressive, jealous frog that was coded for responses (supportive, dismissive, neutral) to their peer's use of emotion terms. While dyads did not differ in emotion terms or knowledge, girl-girl and girl-boy dyads included more supportive responses than boy-boy dyads. Our findings emphasize the need for further investigations of peer influences on discourse about rivalry at ages when children increasingly rely on friendships as opportunities for emotional disclosure.

HENRY HALL ATRIUM 077

Does Self-objectification Hinder Women's Experience of Peak Motivational States?

Participants attending 11:00 AM - 12:00 PM

Presenter: Lauren Yoder

Mentor: Donna Henderson-King

Objectification theory posits that living in a culture that objectifies women leads girls and women to adopt an observer's perspective on the self, resulting in self-objectification. This is proposed to cause many consequences including diminished ability to reach peak motivational states, or flow, due to a disruption in focused attention. In the current study, I examined whether exposure to ideal images could affect the ability to experience flow among women who were high vs low on trait self-objectification. It was found that participants low in trait self-objectification who viewed ideal images experienced more flow than those women who viewed neutral images; for women high in trait self-objectification there was no difference between image conditions.

HENRY HALL ATRIUM 079

X-ray Crystallographic and Functional Characterization of BshC: The Third and Final Step of Bacillithiol Biosynthesis

Participants attending 10:00 AM - 11:00 AM

Presenter: Andrew VanDuinen

Mentor: Paul Cook

It has recently been determined that bacillithiol (BSH), a thiol present in some Gram-positive

bacteria, plays a key role in resistance to the FDA-approved antibiotic fosfomycin. The biosynthesis of BSH is believed to occur via a three step pathway. The structure and exact function of BshC from this pathway was unknown. Presented here is the first ever structure of BshC from *Bacillus subtilis*. The active site is contained within a Rossmann fold domain. The function of an ADP bound pocket distinct from the active site remains highly uncertain as the amino acid residues among species that produce BSH are not highly conserved. Progress is reported toward a structure of BshC from *S. aureus* to gain insight into these two regions of interest. Functional analysis of BshC was also pursued to clue into the mechanism dictating its activity. Understanding how BshC functions will allow specific inhibitors to be designed to stop BSH and re-establish fosfomycin as an effective antibiotic once again.

HENRY HALL ATRIUM 080

Preparation of Trisubstituted Phosphines from Triphenylphosphine and Halides via Phosphine-lithium Reagents Generated In Situ

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

Presenters: Talon Kosak, Sean Riley

Mentor: John Bender

Trisubstituted phosphine compounds have been utilized for over a century as effective co-catalysts, increasing the efficiency and selectivity of many medically and industrially relevant syntheses. Although much of the existing research on the synthesis of such compounds predates the 21st century, in this work we seek to further explore and expand upon the preparation of these highly utilized compounds. To do so, we carried out the reduction of triphenylphosphine with elemental lithium under dry, inert conditions, to produce the respective phosphine-lithium and alkyl-lithium species. This alkyl-lithium species was then terminated via an E2 reaction with tertbutylchloride, in situ, enabling subsequent addition of alkyl and aryl halides to generate trisubstituted phosphines in modest yield. Furthermore, various stoichiometric ratios of reactants were investigated in order to optimize the efficiency of these reactions.

HENRY HALL ATRIUM 081

Genes Necessary for Biofilm Formation in *Escherichia coli* in Aerobic Versus Anaerobic Conditions

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

Presenters: Adam Pickrum, Steven Wilkinson, Jordan Zhou

Mentor: Michael Baxter

The ability of bacteria to form a biofilm is considered to be an important virulence factor. Biofilms act as a platform for bacterial communication during pathogenesis, enhance adherence, and

make the bacteria more resilient to therapeutic agents and other immune related chemicals. Biofilm formation involves many genes that regulate via sensing environmental signals, including temperature, pH, and oxygen levels. We hypothesize that the ability of *Escherichia coli* to form a biofilm will differ between aerobic and anaerobic environments due to the signals received via various gene regulators. Currently our efforts have resulted in the development of a biofilm assay capable of determining the amount of biofilm formation. Additionally, we have begun creating a library of random *E. coli* transposon mutants. These mutants will be assayed in an effort to identify genes that contribute to biofilm formation differently in aerobic versus anaerobic conditions.

HENRY HALL ATRIUM 082

Species Differences in Urinary Specific Gravity of Various Nonhuman Primates

Participants attending 2:00 PM - 3:00 PM

Presenter: Patricia Drake

Mentor: Cynthia Thompson

Specific gravity is a urinalysis parameter that measures the concentration of excreted molecules in urine. Clinically, specific gravity measures the kidney's ability to dilute or concentrate urine. We explored the species differences in the specific gravity of various primates' urine samples, including *Alouatta palliata*, *Alouatta caraya*, *Callithrix jacchus*, *Sapajus apella*, and *Saimiri sciureus*, and how these differences can be explained by differences in renal physiology. A pocket refractometer was used to measure the urine samples. The urine samples obtained from the wild howler monkeys, *Alouatta palliata*, had a higher specific gravity than the other primate species' samples, which were all obtained from captive animals and did not have differing values. These results held true even when controlling for individual differences between animals. Our results indicate that open access to water while in captivity affects specific gravity more than species differences in renal physiology.

HENRY HALL ATRIUM 083

Crystallographic Analysis of BshB from *Bacillus subtilis*, the Deacetylase Involved in Bacillithiol Biosynthesis

Participants attending 9:00 AM - 10:00 AM

Presenter: Chelsea Meloche

Mentor: Paul Cook

Gram-positive bacteria such as *Bacillus subtilis*, *Staphylococcus aureus*, and *Bacillus anthracis* utilize bacillithiol to maintain cellular redox balance. Resistance to the antibiotic fosfomycin depends on a thiol-dependent enzyme FosB, which utilizes bacillithiol as a crucial substrate. The biosynthesis of bacillithiol involves a three step pathway. BshB hydrolyses the *N*-acetyl moiety from

N-acetylglucosamine-malate. Here we present the 1.9 Å resolution X-ray crystallographic structure of BshB. This structure reveals an α/β fold, consisting of seven helices surrounding a central parallel β -sheet. Analysis of the unit cell content suggests that BshB functions as a trimer. Enclosed in a deep cavity reside three residues, His 12, Asp 15 and His 113, which constitute a metal-binding site associated with Zn^{2+} . This citrate bound structure indicates how the carboxylates of the product are accommodated. Therapeutic benefits may be provided due to these key findings.

HENRY HALL ATRIUM 084

Analysis of the Relationship Between Bite Force and Orbit Size and Shape in Primates

Participants attending 2:00 PM - 3:00 PM

Presenter: Rachel Hughart

Mentor: Melissa Tallman

The aim of this study was to better understand the evolutionary forces that operate to shape craniofacial variation. A sample of 340 crania from various primate taxa was landmarked. These data were used to calculate bite force at 3 bite points: molar, incisor and canine and were compared to the orbit shape for each individual. Results indicated a significant relationship between molar bite force and orbit size/shape in pooled New World Monkey data and *Alouatta* and *Callicebus*. Additionally a significant relationship was found for canine bite force in pooled Old World Monkey data and *Papio Theropithecus*. The unique, folivorous diet of *Alouatta* and *Callicebus*'s diet of tough fruits and small molars may contribute to the correlation between bite force and orbit size. The longer snout in *Papio Theropithecus* is poorer at dissipating stresses associated with mastication and may play a role in the correlation between bite force and orbit size.

HENRY HALL ATRIUM 085

Removing Unwanted Noise from Cerenkov Luminescence Images

Participants attending 10:00 AM - 11:00 AM

Presenter: Michael Dykstra

Mentor: Ross Reynolds

Cerenkov Luminescent Imaging (CLI) is a technique which utilizes visible light created by the radioactive decay of isotopes. The phenomenon is exhibited primarily by high-energy β -emitters. As positrons or electrons travel through a medium such as water or soft tissue, they are able to travel faster than the speed of light in those mediums. Optical imaging systems designed for fluorescence and bioluminescence imaging are often capable of imaging Cerenkov luminescence as well. In addition to visible light, charge coupled devices (CCDs) detect the gamma rays that are simultaneously emitted by positron-electron annihilation or impure β -emitters. These events

appear as a uniform distribution of small, high-intensity spikes across the field of view. Such high-intensity spikes are detrimental to the quantitative data obtained in CLI by overpowering weaker optical signals. An adaptive filter localizes tainted pixels and replaces them with the values of surrounding, unaffected pixels.

HENRY HALL ATRIUM 086

“Good luck with that!”: Teaching Machines to Detect Sarcasm

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

Presenter: Xinyi Ou

Mentor: Gregory Wolffe

Sarcastic text messages run the risk of misinterpretation, primarily because the reader does not have access to the sender’s body language or tone of voice to help intuit the original intentions of the author. However, if machines could be taught to accurately detect sarcasm, those on the receiving end could be forewarned about the presence of sarcastic content. This is more than a frivolous pursuit; similar software is employed by the U.S. government to distinguish serious threats against the country from sarcastic commentary. While current sarcasm detection is based on word analysis, the increasing popularity of dictation (speech-to-text) software has made additional vocal cues available for machine use. Using a collection of sarcastic/sincere audio clips of the main character Lorelei from *Gilmore Girls*, this project will combine machine-based text analysis with voice/tone signal processing analysis to build a more complex—and hopefully more accurate—model of sarcasm detection.

HENRY HALL ATRIUM 087

An Investigation of the Intrinsic and Extrinsic Influences on the Aggressive Behavior of Crayfish

Participants attending 9:00 AM - 10:00 AM

Presenter: Edwin Klein

Mentor: Daniel Bergman

Several influences have been identified as important in determining aggressive (i.e. agonistic) hierarchy formation in crayfish, however the relative significance of these factors has yet to be determined. This study compares several aggressive influences, including previous winning or losing experiences, prior shelter possession, food deprivation, olfaction obstruction, and control treatments to determine which of these factors affect aggressive interactions to the greatest extent. The analysis will reveal which of these effects is strongest when directly confronted against one another. Each crayfish received one of the above treatments and then interacts with another size-matched crayfish that received a different treatment. All trials were recorded and then analyzed

using a blind analysis scheme. All of the trials have been completed to date and analyses are currently being performed.

HENRY HALL ATRIUM 088

Cyclic Peptides in *Salmonella*

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

Presenters: Adam Pickrum, Steven Wilkinson, Jordan Zhou

Mentor: Michael Baxter

Salmonella enterica serovar Typhimurium causes gastroenteritis humans. Its ability to cause disease is via the activation of many genes in what is known as Salmonella Pathogenicity Island 1. Expression of these genes is controlled by environmental factors that feed their signal to an activator known as hilA. Due to increases in antibiotic resistance, alternatives for dealing with this organism are being studied. In collaboration with Brad Jones at the University of Iowa, we acquired a plasmid library that produces random cyclic peptides in the presence of arabinose. Studies have shown that cyclic peptides can have regulatory effects on various genes. In an effort to identify cyclic peptides that affect hilA expression we utilized a hilA::lacZY reporter. With this system, we are screening the cyclic peptide library to identify peptides that repress hilA expression. Cells that are positive for the screen will be characterized to determine how the cyclic peptide is affecting hilA.

HENRY HALL ATRIUM 089

Papa Bear's Porridge: Louis Zukofsky's Epic Work "A"

Participants attending 2:00 PM - 3:00 PM

Presenter: Kelsey May

Mentor: Christopher Haven

I chose to research Louis Zukofsky's poem "A" because of the wide variety of content the poem covers. At first, this poem seemed to be out of my reach in terms of poetic analysis skills. The poem is stylistically complex, changing from unfinished line segments to prose to disjointed line breaks that speed up the rhythm of the poem. The grammar is unconventional and difficult to follow. However, this is what makes the piece great. One has to work to uncover its meanings, allusions, and purpose. "A" itself was so long that it took Zukofsky's entire career to complete. It contains twenty-four sections, of which I will look at three in depth. During Student Scholars Day, I intend to display my work in a tri-fold poster design, as well as have copies of the three sections of "A" for attendees to read.

HENRY HALL ATRIUM 090

A Statistical Consulting Experience: Barriers and Facilitators for Non-Traditional Nursing Students

Participants attending 9:00 AM - 10:00 AM

Presenters: Andrew Holly, Jessica TerVeen

Mentor: John Gabrosek

Dr. Elaine Van Doren and the Kirkhof College of Nursing are seeking to understand the factors that contribute to the successes and shortcomings of non-traditional nursing students who are pursuing a BSN after the completion of an ADN degree. Using data from a Nursing Workforce Diversity grant project questionnaire, our goals were to assess which variables were significant determiners of the successes and failures of nursing students, as well as to compare responses between three cohorts of nursing students. Our conclusions are intended to inform policies and programs designed to eliminate barriers for degree-seeking nursing students. The presentation will also include insights about our growth as statistical consultants.

HENRY HALL ATRIUM 091

Keeping the Wild: A Literary Analysis

Participants attending 2:00 PM - 3:00 PM

Presenter: Emily Davidson

Mentor: Neil MacDonald

Keeping the Wild: Against the Domestication of the Earth is an essayist book that displays the viewpoints of those who are either for or against the new Anthropocene era. Some feel that unnecessary humanitarianism has destroyed the natural land that we walk on while others believe that our impact is inevitable. Contributors of this book range from professors to economists to conservationists, each individual offering a unique perspective on this topic that doesn't just involve wildlife enthusiasts and "neo-greens." The future of this planet and its management is not a one-sided argument; it's a multi-faceted discussion that calls in to question how we deal with the increasing urbanization and denaturalization of the world. My poster will represent each side to this conversation and highlight the main arguments that are displayed within these points of view.

HENRY HALL ATRIUM 092

Does Experiential Processing Moderate the Effects of a Health Narrative on Risk Perceptions and Behavior?

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

Presenters: Sarah Hayes, Jessica Naftaly

Mentor: Amanda Dillard

In this study, we examined whether priming experiential (affective) vs. analytical (logical) processing would moderate responsiveness to a narrative. Female college student tanners were randomly assigned to complete a word scramble task that would activate either their analytical or experiential system. Participants then read a first-person narrative about a young woman who went to her doctor after noticing a skin change. The narrative was accompanied by a photograph of the woman, either expressing a thoughtful (analytical) or happy (experiential) expression. Participants then reported their risk perceptions of developing skin cancer and intentions to change their tanning behavior. We examined whether those participants who were using experiential processing were more likely to increase their risk perceptions and behavior intentions.

HENRY HALL ATRIUM 093

GVSU Student Perspective on Antibiotics and Resistance

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

Presenters: Julie Cole, Stephen Graeser, Christopher Royer, Leslie Wyman

Mentor: Osman Patel

Antibiotic resistance is a growing health threat. Overuse and misuse of antibiotics is a major contributor to the recent rise in infections caused by bacteria. In 2015, a Grand Valley State University student-based, paper survey was conducted to gauge students' knowledge and attitudes of antibiotic use. When asked what types of infections antibiotics treat about half of the students responded correctly, however, only a small portion of those students correctly identified which illnesses were caused by bacteria. The majority of respondents were aware of antibiotic resistance; but only a fraction of them understood that the bacteria develop resistance rather than humans. Many students were also not aware that antibiotic resistance is a global health crisis. To combat the growing threat of antibiotic resistance, a greater effort needs to be made to educate the public on the overuse and misuse of antibiotics.

HENRY HALL ATRIUM 094

3D Printing Mathematically-Inspired Objects

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

Presenter: Lindsay Czap

Mentor: Edward Aboufadel

The field of 3-D printing continues to grow and more academics and educators are gaining access to this new technology. Our goal with this project was to utilize this technology to help facilitate visualizing 3-dimensional concepts taught in geometry and calculus courses. We

accomplished this using programs such as Mathematica and OpenSCAD to create programs that model our desired objects. This project has helped us to develop a collection of easily accessed, printable mathematical models that can be used by geometry and calculus students within their coursework. While creating these printable models, we have also compiled a collection of advice and techniques that can be utilized by other mathematicians interested in printing mathematically-inspired objects.

HENRY HALL ATRIUM 095

How Does BBr₃ Cleave Ethers? A DFT Mechanistic Study

Participants attending 2:00 PM - 3:00 PM

Presenters: Heidi Conrad, Talon Kosak

Mentors: Andrew Korich, Richard Lord

Nature provides us with a wide array of chemicals that have beneficial uses. Cyclization reactions are important in the man-made creation of these chemicals. Past research by S3 scholar Samantha Ellis in Prof. Korich's lab showed an unexpected cyclization reaction with o-alkynylanisoles in the presence of BBr₃ instead of the expected demethylation reaction. We sought to understand this unusual reactivity using computational chemistry by comparing the energies of these competing pathways. However, we discovered that previously considered mechanisms for BBr₃ assisted ether demethylation are incomplete. In this work we present both computational and experimental evidence for an alternative mechanism for ether demethylation.

HENRY HALL ATRIUM 096

A Statistical Learning Experience: Analysis of the Writing Center Consulting Program

Participants attending 12:00 PM - 1:00 PM

Presenters: John Eber, Jay Wallace

Mentors: John Gabrosek, Patrick Johnson, Melanie Rabine

The Frederik Meijer Writing Center located in Lake Ontario Hall consults with students on writing and editing of projects across most disciplines. Students can make appointments for specific help or just drop in for general advice. The Writing Center is working with the Statistics department and allowing students to view data related to the consulting sessions to give sound consulting advice. Our role as statistical consultants is to look at the trends over the last three years to see what the majority of students require help on regarding their projects. In doing so, the Writing Center can effectively prepare their consultants for situations they might encounter during sessions.

We will also share what we learned in our role as statistical consultants.

HENRY HALL ATRIUM 097

A Statistical Consulting Experience: Analyzing Teaching Strategies for Biology

Participants attending 1:00 PM - 2:00 PM

Presenters: Josh Quinlan, Alec White

Mentors: John Gabrosek, Jennifer Jenkins

Doctor Jenkins has come to us asking for help in analyzing two different teaching strategies for her two sections of intro level biology. She used the two strategies to teach cell division and wanted to look at how the two teaching strategies affect students' learning. To assess the two teaching methods, Doctor Jenkins had her students complete a pre and a post assessment quiz. Our goal as statistical consultants is to pinpoint similarities and differences between the two techniques that Doctor Jenkins used so she can enhance the learning of her students. A poster presentation will explain our role as statistical consultants and will feature our results.

HENRY HALL ATRIUM 098

GVSU Students and Designer Babies

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

Presenters: Haley Callewaert, Shelby Kuzma, Christopher May, Jaclyn Schymanski

Mentor: Osman Patel

A total of 120 Grand Valley State University students were surveyed around campus on their thoughts on Designer Babies. These students spanned a variety of class standings, majors, and religious backgrounds. While the majority of students said that they would not choose specific physical features for their child, many indicated that they would elect to eradicate certain genetic diseases. Around half of the participants were against in vitro fertilization. More than half of our participants did not think that this type of technology should be covered by insurance, while nearly all of those who took the survey believed that this technology should be heavily regulated. Over half of the students who participated in the survey said that they had heard of the term designer babies, and of those students over half said that they only agreed 'somewhat' with the use of this technology.

HENRY HALL ATRIUM 099

Brain Chips: Not Just Food for Thought

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

Presenters: Tyler Beard, Andrew Hintz, Sarah Pitt, Gage Vander Clay

Mentor: Osman Patel

The focus of our study was the popular opinion about using cybernetic enhancements to augment human abilities. One hundred Grand Valley students of varying class standings took part in a voluntary survey that asked how they viewed the possibility of such technology and what possible concerns they might have. The survey was based on the idea of a hypothetical “chip” implanted into the brain that would increase learning aptitude and memory. Results indicated that participants were split on whether they would make use of such a chip if it were available and whether it would be fair to have to compete against someone who had the chip if they did not. When asked who should have access to the technology the greatest number of participants felt that the technology should be used to help the mentally impaired. The survey also revealed that the most common concern was that the technology would be under the control of private companies who might abuse it.

HENRY HALL ATRIUM 100

The Influence of Knowledge and Morals Over the Opinions Governing Genetic Modification

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

Presenters: Heidi Conrad, Erin Harkness, Jessie Jones, Hannah Mico

Mentor: Osman Patel

The objective of this study was to measure the correlation between GVSU students' morals and their perception of genetic modification. It was found that most students had limited knowledge of the topic. Those with limited knowledge on the topic were more likely to agree with the proposal that all food containing DNA be labeled. The majority of participants also admitted having little to no knowledge of the regulations currently governing GM products. Participants exhibited a willingness to learn by indicating their feelings of curiosity upon hearing the words “genetic modification” and their preference of increasing labeling on such products in order to inform consumers. Students agreed that genetically modifying an organism is acceptable when dealing with certain problems in society, such as developing medical technology. This indicates that there is some level of security overriding the insufficient knowledge base when genetic modification is applied to different areas of society.

HENRY HALL ATRIUM 101

Effectiveness of a Multidisciplinary Team to Reduce Opioid Usage in Chronic Pain Patients

Participants attending 9:00 AM - 10:00 AM

Presenters: Blayne Baggett, Raymond Torbet, Evan VandenBosch

Mentor: Jill Ellis

Opioid use in chronic pain management is ubiquitous and associated with complications including addiction, diversion to unintended users, and side effects from drowsiness and constipation to potentially fatal respiratory depression. Efforts to reduce unnecessary opioid prescribing are underway through various services including national legislation and internal pharmacy audits to identify high volume prescribers. Reducing opioid use is a priority and alternatives for chronic pain patients include physical activity, cognitive-behavioral therapy, complimentary and alternative medicines, or other medications and devices with their own risks and benefits. This study evaluates the effectiveness of a multidisciplinary team to reduce opioid usage among chronic pain patients participating in a treatment program utilizing physical therapy, occupational therapy, psychiatry, and medical management. Results showed a statistically significant reduction in opioid usage among the sample population.

HENRY HALL ATRIUM 102

Effect of 12-Hour Dehydration on Thermoregulation and Physiological Function during Hyperthermia in College-Aged Individuals

Participants attending 10:00 AM - 11:00 AM

Presenters: Lindsay Gauche, Jordan Pike, Dylan Runions

Mentor: Ross Sherman

Background: Studies have shown reduced water content in the body, i.e. dehydration, to adversely affect the normal thermoregulatory response. **Purpose:** To see if a 12-hour dehydration would impact thermo-physiological function. **Methods:** Eight healthy college-aged individuals participated in the study. Participants either refrained from consuming any fluid for 12 hours or maintained normal fluid intake. A sample of urine was taken to test for hydration, with dehydration set at USG >1.02. Nude body mass was taken before and after the warm water (40°C) immersion. Baseline values for core body temperature (T_C), skin temperature, heart rate, and thermal sensation were taken prior to and then every 5-min during the immersion. Termination of the immersion occurred when T_C reached 39°C. **Results:** The results are being collected and will be presented at SSD.

HENRY HALL ATRIUM 103

Making a New Model for Vasospasms

Participants attending 9:00 AM - 10:00 AM

Presenter: David Fucinari

Mentor: Francis Sylvester

Cardiovascular disease is the leading cause of mortality and morbidity in the United States. Many types of cardiovascular disease are caused by vasospasm (i.e. the inappropriate constriction of a

vessel such that downstream blood flow is disrupted). Vasospasms may occur in coronary arteries resulting in the alteration of blood flow within the coronary circulation; this constitutes a mechanism for inducing a heart attack. A model of arterial vasospasm is a major goal of this research project. Anterior interventricular arteries were dissected from porcine hearts and stored overnight in different concentrations of potassium chloride (KCl). Following the prolonged incubation with KCl, the vessels were cut into rings and mounted on force transducers for study in isolated organ baths. Changes in vascular tension were then recorded in response to various stimuli.

HENRY HALL ATRIUM 104

Geographic Analysis of Portions of the 2010 Ghana Census

Participants attending 9:00 AM - 10:00 AM

Presenters: Kyle Gregory, Saray Morales

Mentor: Peter Wampler

Ghana lies along the Golden Coast of Africa situated between Cote D' Ivoire and Togo occupying 238,837 sqkm, which makes it similar in size to Great Britain or the state of Oregon. Population of Ghana is estimated to be around 20 million with roughly 10 percent of which live in or around the capital, coastal city of Accra. There are more than seventy languages and major dialects spoken throughout Ghana. We will be pulling data from the 2010 Ghana Census to import into Excel spreadsheets and ArcMap 10.1 to create thematic maps. Tables from the Census data such as the distribution of literacy between urban and rural regions of Ghana and the distribution of literacy and languages used between males and females of the regions, will be used to make inferences in regards to urbanization and economics for the country.

HENRY HALL ATRIUM 105

Challenges Associated with Studying the Physiological Response of Coronary Arteries to Alkylphenols

Participants attending 9:00 AM - 10:00 AM

Presenter: Austin Meadows

Mentor: Francis Sylvester

Since cardiovascular disease is the leading cause of morbidity and mortality in the United States, research on coronary arteries constitutes a highly relevant field of study. We hypothesize that alkylphenols, a potential environmental toxin, are deleterious to cardiac function. Currently, our lab is studying the possible effects of alkylphenols on altering the ability of coronary arteries to constrict and dilate, thus altering blood flow regulation within the circulation of the heart. Using a porcine model, segments of the anterior interventricular artery were dissected and mounted on a force transducer in order to measure vascular tension. After assessing vessel viability, dose responses

to nonylphenol (an alkylphenol) were recorded and analyzed in order to observe alterations in constriction or dilation. Based on prior research, our hypothesis is that nonylphenol causes a dilator response in the coronary arteries.

HENRY HALL ATRIUM 106

Child Maltreatment Effects on Language and Motor Development

Participants attending 9:00 AM - 10:00 AM

Presenter: Erica Lord

Mentor: Gwenden Dueker

This literature review analyzed the effects of child maltreatment on linguistic and speech development. In non-maltreated children, social play and engagement from a parent positively influenced the child's language production. Parents of maltreated children did not provide a stimulating environment that modeled diverse communication or responsiveness to the child. Children who experienced this impoverished environment had negative effects on language production because parents did not provide contingent positive responses to the child's vocalizations.

Language development is the building of sounds into words and sentences, whereas speech development is the motor coordination of articulating the sounds. Maltreatment affects language and motor development. Speech is the most complex motoric act but has not been studied in relation to maltreatment. The effects of maltreatment on language development may actually reflect speech delay or deficits in both language and speech development.

HENRY HALL ATRIUM 107

Agriculture's Impact on Antibiotic Resistance

Participants attending 9:00 AM - 10:00 AM

Presenters: Karli Gormley, Darby Naheedy, Kali Smolen

Mentor: Sarah King

Bacteria are all around us: on the surfaces which we touch, in the soil on which we walk, and in the meat which we eat. Bacteria are also naturally occurring within our own bodies. For many people, bacteria are associated with infection and illness, which occur once a certain type of bacteria overcomes our body's natural defenses. This necessitates the use of antibiotics. However, in the last decade, antibiotics have become less effective at treating infection as the bacteria have become resistant. The overuse of antibiotics is a major contributor to antibiotic resistance around the globe, and nearly three quarters of all antibiotics produced are used in agriculture. Our project investigates just how antibiotic use in meat production contributes to the emerging crisis of

antibiotic resistance. Steps to improve public awareness, such as our project, are essential to make a change in our society's agricultural practices.

HENRY HALL ATRIUM 108

Teaching Old Dogs New Tricks: Qualitative Analysis of Training for Therapy Dog Teams

Participants attending 9:00 AM - 10:00 AM

Presenter: Alison Wilcoxson

Mentor: Heather VanWormer

In the summer of 2013 the Anthropology Department ethnographic field school studied a local non-profit volunteer organization, West Michigan Therapy Dogs. Part of the project examined the training and testing process involved in preparing a dog therapy team for working in various health, therapy, residential and other institutions. This research continues this focus by surveying other dog therapy organizations in order to examine the spectrum of therapy dog team training. Through comparative qualitative analysis of 20 organizations throughout the country, a distinct image of standard training techniques and qualifications are presented in this poster demonstrating the significant differences in both the level and quality of training required to become a dog therapy team. The intention of this research is to inform the public on what is involved in training to become a dog therapy team, and hopefully encourage confidence in the use of therapy dogs in all of their volunteer settings.

HENRY HALL ATRIUM 109

Pinning Down PKN

Participants attending 9:00 AM - 10:00 AM

Presenter: Ali Salame

Mentor: Georgette Sass

Rho1 functions as a key signal transducer that regulates and integrates a number of different signaling pathways involved in a range of cellular processes. The downstream functions of Rho1 effectors are of great interest as they represent potential therapeutic targets given their key role in various cell processes. Therefore, we aim to understand the function of Protein kinase N (PKN), an effector of Rho1. PKN is a protein kinase that has been implicated in the process of migration and fusion of cells similar to the events in wound healing. However, the mechanism by which PKN might be acting has yet to be determined. Preliminary work in our lab suggests that PKN may be functioning indirectly. Our work also suggests that PKN either promotes cell death or limits cell survival. Our goal is to validate genetic results with biochemical evidence of PKN function by confirming protein interactions between PKN and candidate proteins known to exhibit genetic

interactions.

KIRKHOF CENTER GRR 001

Classification of Seven-Dimensional Lie Algebras with Six-Dimensional Abelian Nilradical

Participants attending 12:00 PM - 1:00 PM

Presenter: Kyle Ferguson

Mentor: Firas Hindeleh

This poster is the first in a series that examine seven-dimensional solvable Lie Algebras with a six-dimensional nilradical. Low dimensional solvable Lie Algebra classification was begun in 1963 by Mubarakzyanov. They were 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 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 nilradical case. In this project we focus on the class where the nilradical is six-dimensional abelian, i.e isomorphic to R^6 .

KIRKHOF CENTER GRR 002

Themes of Sexualization, Racialization, and Intersectional Objectification in University "Crush Pages" on Twitter

Participants attending 1:00 PM - 2:00 PM

Presenter: Mackenzie Kibbe

Mentor: Debjani Chakravarty

The aim of my proposed research is to perform a feminist textual analysis of four universities' "crush pages" on Twitter and to conduct focus groups to record and analyze university students' reactions to and experiences with crush pages. I am interested in investigating if there is evidence of sexualization, racialization, and intersectional objectification in tweets posted on these pages and if these same themes are discussed in focus group sessions. My initial exploration of crush pages revealed that – masked as admiration – tweets posted on these pages could possibly be a form of sexual harassment based on the way sex and race are talked about by users. If target students are aware of these tweets and perceive them as sexual harassment, this might have negative implications in their everyday lives. Overall, this project seeks to extend the conversation on sexualization and racialization as they occur online.

KIRKHOF CENTER GRR 003

Belief Memory Bias

Participants attending 9:00 AM - 10:00 AM

Presenters: John Hessler, Isaac Simon

Mentors: Todd Williams, Michael Wolfe

We explore the relationship between belief change and recollection of previous beliefs. Subjects reported beliefs about TV violence. Later, subjects read a one-sided, belief-inconsistent text. We manipulated whether subjects reported beliefs after reading first, or recollected previous beliefs first. A third group were told their previous beliefs before reporting current beliefs. Recollections were not improved when subjects recollected beliefs first. When told previous beliefs, belief change was reduced, suggesting a desire to appear consistent.

KIRKHOF CENTER GRR 004

Reducing the Impact Bias in Colorectal Cancer Screening Expectations

Participants attending 3:00 PM - 4:00 PM

Presenter: Megan Wertheimer

Mentor: Amanda Dillard

Past research has shown that when predicting how a future event will make them feel, people over-estimate the intensity and duration of their emotions, a phenomenon known as the impact bias. When it comes to deciding about colorectal cancer screening, older adults face many psychological barriers related to the anticipated embarrassment, disgust, and pain of screening. Qualitative research suggests these barriers may be characterized by an impact bias. In this study, 17 older adult participants were presented with a message about colon cancer and screening. We tested whether highlighting some participants' adaptive potential would lower their expectations of intensity and duration of these barriers. Findings showed that relative to a control condition, participants who wrote about a time when they emotionally adapted to a past event gave lower maximum pain estimates and marginally lower perceived duration of pain estimates.

KIRKHOF CENTER GRR 005

Faculty, Staff and Student Reactions to a University Smoking Policy: Perceptions for Change

Participants attending 9:00 AM - 10:00 AM

Presenter: Laura Johnson

Mentor: Julia VanderMolen

Research conducted by the American Nonsmokers' Rights Foundation (2014), revealed that "1,372 college or university campuses in the U.S. have adopted 100% smoke-free campus policies that eliminate smoking in indoor and outdoor areas across the entire campus, including residences.

Of these, 938 are 100% tobacco-free, and 176 prohibit the use of e-cigarettes anywhere on campus". In 2008 members of the Grand Valley State University Smoking Policy Committee made recommendations for a new university smoking policy. The policy aimed to respect the rights of those who choose to smoke as well as non-smokers who did not want to be exposed to second-hand smoke. The goal of this survey study is to determine how a smoke-free policy will impact college campuses.

KIRKHOF CENTER GRR 006

A Structural and Functional Analysis of BshA from *Bacillus subtilis*: The First Enzyme of the Bacillithiol Biosynthesis Pathway.

Participants attending 12:00 PM - 1:00 PM

Presenter: Kelsey Winchell

Mentor: Paul Cook

Bacillithiol (BSH) is a sulfur-containing compound involved in bacterial resistance to fosfomycin, a common antibiotic. BSH is produced by common pathogenic bacteria such as *Bacillus anthracis* and *Staphylococcus aureus*. The biosynthetic pathway for BSH has been determined to include three enzymes: BshA, BshB and BshC. BshA functions as a glycosyltransferase, removing the UDP group from UDP-*N*-acetylglucosamine and attaching malate in the first step of BSH synthesis. A post-catalytic structure has been obtained with the product and UMP in the active site. A site-directed mutagenic study was conducted to examine the roles of active site amino acid residues. A functional assay was used to obtain K_M and k_{cat} values for both wild type and mutant proteins. Taken together, these structural and functional studies support the proposed S_Ni-like catalytic mechanism and provide a foundation upon which to design and characterize BshA inhibitors in an effort to combat resistance to fosfomycin.

KIRKHOF CENTER GRR 007

Religiosity and Trust as a Function of Shared Identity

Participants attending 11:00 AM - 12:00 PM

Presenters: Sarah Dahlstrom, Lindsey Dopheide, Katelin Leahy

Mentor: Luke Galen

Although previous research has indicated that religiosity may be associated with greater trust as measured by economic forwarding to others, it has not fully controlled for the shared 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. Results indicated that greater participant religiosity was associated with lower trust (i.e., forwarded amounts). Factors such as participant personality and attributed partner warmth partially mediated trusting behavior.

KIRKHOF CENTER GRR 008

Exploring the Potential of Arylboronic Acids as OXA-24²-lactamase Inhibitors

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

Presenter: Josephine Werner

Mentor: Rachel Powers

Beta-lactam antibiotics are crucial to the field of medicine. Due to over-use, many bacteria have developed resistance by expressing β -lactamase enzymes, which hydrolyze the amide bond of the β -lactam ring. One way to overcome resistance is through inhibition of these enzymes. There is a critical need for novel non- β -lactam inhibitors. The carbapenem-hydrolyzing class D β -lactamases (CHDLs) are of particular concern, since they hydrolyze potent carbapenem antibiotics and are not inhibited by current β -lactamase inhibitors. Boronic acids lack a β -lactam ring and are known transition state analog inhibitors of class A and C β -lactamases, but are not well characterized in class D β -lactamases. Sixteen arylboronic acids were ordered and tested for inhibition of the CHDL, OXA-24. Several were identified as good inhibitors, with K_i values from 33.7 mM to 5 mM. These compounds serve as a starting point in optimization efforts for the development of novel inhibitors of class D β -lactamases.

KIRKHOF CENTER GRR 009

Fly on the Wall: Disruption of Courtship Behavior in Histamine-deficient Mutants of *Drosophila melanogaster*

Participants attending 10:00 AM - 11:00 AM

Presenters: Tina Daniels, Laura Schroeder

Mentor: Martin Burg

The neurotransmitter histamine has been shown to have effects on the visual and mechanosensory systems in *Drosophila melanogaster*, both functions that can be ascribed to histamine in peripheral sensory cells. This study was initiated to determine whether central brain histamine function could be identified by studying courtship behavior in flies lacking central brain histamine. Mutant flies were developed and tested in single pair mating experiments, in which the behaviors were visually documented and recorded. Analysis of results showed that as the level of histamine present in the fly increased, so did copulation success. Individual behaviors varied based on the genotype of each fly in the pair being observed. It was found that several alterations in courtship behavior could

be ascribed to central brain histamine function. This result could have implications in behavioral disorders in humans as *Drosophila melanogaster* carry similar genes and serve as good experimental models.

KIRKHOF CENTER GRR 010

A Website for Writers

Participants attending 12:00 PM - 1:00 PM

Presenter: Farrah Brink

Mentor: Roger Ferguson

Many hobbyist writers enjoy discussing or sharing their work with a supportive community or group of friends who are willing and able to give meaningful feedback. The Internet, where the needs for a common place and time of meeting are erased, makes it a simpler matter for a writer to find this desired flavor of social interaction. An array of websites have formed to provide the gathering places for individuals who have an interest in writing, or reading what others have written, or both.

My project, a website that I am calling *Inklings*, is intended to be a prototype of just such a venue. It provides users with the ability to edit, store, and share manuscripts, to review another's writing, and to communicate through forums. In addition, it has several writer's tools available as resources. *Inklings* was implemented using the Ruby on Rails web application framework. The key programming languages used in building the website were Ruby, HTML, CSS, and JavaScript.

KIRKHOF CENTER GRR 011

Values and Financial Behavior

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

Presenters: Sarah Dahlstrom, Ashley Dunlap

Mentor: Mihaela Friedlmeier

This study examines relationships between the values of emerging adults and their current financial behaviors. Three hundred freshmen college students participated in a survey. Findings suggest significant relations between specific values and positive financial behaviors, and the latter are linked to financial well-being and broad domains of life satisfaction. Students who scored highly on the values of security, conformity, tradition, and benevolence were more likely to have positive financial behaviors such as saving for the future and tracking monthly expenses. Financial well-being seems to affect one's greater life satisfaction.

KIRKHOF CENTER GRR 012

Portrayals of Assimilation in Chicano/a Poetry

Participants attending 1:00 PM - 2:00 PM

Presenter: Crisol Beliz

Mentor: James Persoon

I became interested in the topic of assimilation due to its impact on my family, which has not fully assimilated into Anglo-American culture although we have lived in the United States for a few generations. To better understand myself and my family's experience, I decided to explore the topic of assimilation by reading and researching poetry by Chicanos (i.e., Mexican-Americans). My research studies the concept of assimilation as a common theme in Chicano poetry. My research question was how Chicano/a authors have dealt with assimilation in their poetry. When I began my research I noticed that authors used different approaches toward assimilation. This led me to my thesis, which is that there are four thematic approaches to assimilation. These four thematic approaches include resistance toward assimilation, a struggle to assimilate, a recovery from assimilation, and culture blending.

KIRKHOF CENTER GRR 013

An Eye-Tracking Analysis of Four Female Older Adults with Normal Cognition to Identify Changes in Wayfinding Strategies in a Virtual Environment

Participants attending 9:00 AM - 10:00 AM

Presenter: Brandy Alexander

Mentor: Rebecca Davis

Individuals' ability to find their way, called wayfinding, has been shown to decline with normal aging. The purpose of this study is to describe how fixations on salient cues influence wayfinding initially and over time in cued and un-cued environments. Four older women were asked to find their way in a virtual reality senior living facility; one cue condition had no salient cues and one had salient cues. Participants had five trials in each cue condition and navigated both cue conditions each day yielding a total of 80 trials for the study. The number of fixations, the number of successful trials, as well as the latency and distance traveled for each trial were analyzed. Study results showed that participants had improved wayfinding in the cue condition with salient cues and had improved wayfinding on the second day. By enhancing individuals' wayfinding abilities, quality of life can be improved through the maintenance of independence and greater environmental safety.

KIRKHOF CENTER GRR 014

Analyzing the Roles of Rfg1 and Tup1 in the Interactions Between *Candida albicans* and Other Microbes

Participants attending 2:00 PM - 3:00 PM

Presenter: Dorothy Butler
Mentor: Derek Thomas

Nosocomial *Candida albicans* infections are on the rise in the United States, primarily due to an increased number of invasive procedures, transplants, and use of broad range antibiotics and immunosuppressive agents. One important virulence factor in *Candida* species is its ability to transition between two morphologies, yeast and filamentous cells. Filament formation is controlled by several transcription factors that induce filamentation and several negative regulators that repress filamentation. Rfg1 is one of several partner proteins thought to function in combination with Tup1 to repress genes associated with filamentation and thus potentially influence the virulence of *Candida*. Here we investigate the negative regulators Tup1 and Rfg1 in *Candida* and their effect on interactions between *Candida albicans* and various bacteria.

KIRKHOF CENTER GRR 015

Examining the Effects of Personality and Deception in the Role of Narrative Recall

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

Presenters: John Hessler, Isaac Simon, Marisa Simoni

Mentors: Todd Williams, Michael Wolfe

Past research has demonstrated that lying about an event interferes with one's later recall of that event (Zaragoza, M. S., Belli, R. F., & Payment, K. E., 2007). The present study examined the extent that individual differences in Machiavellianism (Christie & Geis, 1970) moderated the effect of lying on memory. Participants were asked to either recount or lie about the events depicted in a film clip. One week later, participants recalled the actual events of the film clip. Results showed that lying led to a decrease in the number of events and details that participants were able to recall. This effect was moderated by participants' levels of Machiavellianism such that low levels of Machiavellianism were associated with less memory bias whereas higher levels of Machiavellianism was related to increased memory bias. These results suggest that low Machiavellian individuals are better able to differentiate between self-generated fabrications and actual events than high Machiavellian individuals.

KIRKHOF CENTER GRR 016

Characterization of Genetic Differences Between Divergent Populations of *Phidippus audax* as a Means of Understanding Early Species Differentiation

Participants attending 9:00 AM - 10:00 AM

Presenter: Brandon Beltz

Mentor: Michael Henshaw

Allopatric speciation is a biological phenomenon in which differentiation often leads to reproductive isolation that prevents members of different populations from interbreeding. The key to understanding differentiation and isolation is to find species within which these processes may be explored; the bold jumping spider, *Phidippus audax*, is one such species. *P. audax* is easily studied, and also shows morphological differentiation and evidence of interbreeding between divergent populations. We 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. Characterizing and identifying the causes of these genetic differences will allow the determination of what may drive the processes of differentiation and speciation.

KIRKHOF CENTER GRR 017

The Effect of Foam Rolling Duration on Range of Motion of the Hamstring

Participants attending 1:00 PM - 2:00 PM

Presenters: Grace Couture, Dustin Karlik

Mentor: Stephen Glass

Myofascia is a connective tissue surrounding the muscle that can restrict range of motion if injured, inactive, or inflamed. Foam rolling is a manual-therapy used to reduce fascial adhesions and improve function through pressure stimulation. Support for foam rolling is new and limited in research evidence. There is little information regarding the amount of time needed for foam rolling to attain a therapeutic effect and current protocols vary as a result. Therefore, the intent of this project was to investigate the effect of foam rolling duration on range of motion. Hamstring range of motion changes were assessed following two different foam rolling treatment durations. Assessments were made using a supine knee extension test after rolling treatments of two sets of ten seconds and four sets of thirty seconds administered on different days. Results to be discussed.

KIRKHOF CENTER GRR 018

Effects of Parenting Style on Students' Financial Socialization

Participants attending 11:00 AM - 12:00 PM

Presenters: Diane Belcher, Shelby Herpst, Heather Thompke

Mentor: Mihaela Friedlmeier

Parents play a critical role in shaping their children's financial skills and attitudes through modeling, reinforcement, and intentional teaching (Danes & Haberman, 2007). Three hundred freshmen college students participated in a survey-based study that examines the relationship between perceived parenting behaviors and children's financial behaviors and attitudes. Students evaluated

maternal and paternal responsiveness, psychological control, behavioral control, and autonomy support. For the financial behaviors component, students evaluated their engagement in four different positive financial behaviors (track monthly expenses, spend within budget, save money each month for the future, and invest for long-term financial goals). Preliminary findings suggest a much stronger impact of fathers' parenting on students' financial behaviors and attitudes compared to mothers' parenting. Results will be discussed using a developmental perspective.

KIRKHOF CENTER GRR 019

Discovery of Cell Cycle Protein Binding Events and Their Role In Fission Yeast Cytokinesis

Participants attending 1:00 PM - 2:00 PM

Presenter: Timothy Gilbert

Mentor: Dawn Hart

Protein phosphatases are widely characterized regulatory proteins of dynamic function. Of present interest are the protein phosphatase 1's, a specialized variant with understood roles in mitosis, cytokinesis, and protein synthesis. This class of protein demonstrates substantial eukaryotic homology. Within *Schizosaccharomyces pombe* is Dis2, a catalytic PP1 subunit. The cytokinetic precursor Mid1, which recruits contractile ring components, has atypical localization patterns in Dis2's absence. Current work establishes Mid1 as a substrate of Dis2. Western blot analysis indicates direct binding between Dis2-GFP and GST-Mid1. This binding event was visualized using fluorescent antibodies. Both termini of Mid1 bind independently to Dis2-GFP. Specific Mid1 loci were mutated to abolish Dis2 affinity. The details of this Mid1/Dis2 interaction must be further understood if we are to know all the complexities of cell proliferation within eukaryotic systems.

KIRKHOF CENTER GRR 020

Molecular Dynamics Simulations of *N*-acetyl--D-glucosaminyl L-malate Synthase to Explore Putative Ligand Binding Sites

Participants attending 1:00 PM - 2:00 PM

Presenter: Paul Egeler

Mentors: Paul Cook, Mary Karpen

Bacillithiol is a low-molecular weight thiol found in Gram-positive bacteria such as *Staphylococcus aureus* and several *Bacillus* species. Bacillithiol has been implicated in the maintenance of cytosol redox homeostasis and microbial resistance to the antibiotic fosfomycin. The first step in synthesis of bacillithiol is the formation of *N*-acetyl- α -D-glucosaminyl L-malate by transfer of L-malate onto UDP-*N*-acetyl-D-glucosamine (UDP-GlcNAc) by the glycosyltransferase protein called BshA. This computational study uses BshA protein structures provided by X-ray crystallographic methods

to explore ligand binding space and protein dynamics. The biologically active protein dimer and ligands were parameterized for computational analysis. L-Malate and UDP-GlcNAc were placed in the protein structure in various conformations and protein-ligand interactions were observed. These results will inform further mechanistic studies of the BshA system.

KIRKHOF CENTER GRR 021

Racial Formation in West Michigan

Participants attending 2:00 PM - 3:00 PM

Presenter: De'Chelle Richards

Mentor: Joel Wendland

I analyze the history of African Americans in Michigan in order to begin to understand their history in the framework of racial formation. My poster will show primary source photographs depicting everyday life, as well as a timeline of significant events connecting local to national racial politics. I have conducted research, extracting information from primary sources such as court documents, audio recordings, photographs, newspapers and other periodicals, and the archives at the Grand Rapids Public Library. My secondary sources include books and scholarly articles published over the last several decades. Specifically, topics include African American resistance to white efforts to enforce segregation in public facilities, joint interracial protest against housing and school segregation by race, the use of recreational spaces as a means to build education, and identity as a technology of resistance to white supremacy.

KIRKHOF CENTER GRR 022

Comparing Population Density, Total Impervious Surface Cover and Average Annual Precipitation per State

Participants attending 1:00 PM - 2:00 PM

Presenter: Brittany Jacobs

Mentor: Kin Ma

The purpose of this research poster is to display the U.S. states with the highest impervious surfaces, while also comparing population density and average annual precipitation per state from 2010. An impervious surface is any surface that stormwater does not infiltrate into the ground naturally without running off. Population density is determined by the number of persons per square mile. Areas of high population density were linked to areas of high impervious surface cover due to increased manmade infrastructures. Average annual precipitation data were also collected for comparison. By using ArcGIS, comparison choropleth and proportional symbol maps were generated. Overall, total impervious surfaces per state were higher in states with higher population density and increases in population density (2000-2010). Eastern coastal states have

more frequent heavy rain events causing increased runoff because of high population densities corresponding to high percentages of impervious surfaces.

KIRKHOF CENTER GRR 023

What Makes a House a Home?

Participants attending 11:00 AM - 12:00 PM

Presenters: Kelsey Clapp, Katherine Dana, Hailey LaBar, Christina Stephenson

Mentor: Katalin Zaszlavik

Over the Fall 2014 - Winter 2015 semester the Art Education students worked together with 24 special needs students age 16-24 in the Calder Art Center on the GVSU campus. Each Art Education student worked with a group of 6 Art Buddy students who have various disabilities. 'What Makes a House a Home?' In this project Art Education students practiced their teaching techniques by a.) Brainstorming b.) Researching c.) Preparing presentations and d.) Implementing the art lesson. The students learned about each of their Art Buddies and their individual learning styles. The events were documented and accompanied by written reflections after each class then discussed. The experience was celebrated in an exhibition in the Calder Art Center.

KIRKHOF CENTER GRR 024

Research on the Synthesis and Investigation of a Silole Anion

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

Presenter: Catherine Duke

Mentor: Randy Winchester

Resonance has a central role in organic chemistry, as it is used to understand the relative reactivity and selectivity of many intermediates in reactions. Finding the electronic barrier to rotation around specific bonds can provide a measurement of a system's resonance. But what would happen if a carbon atom was changed to its heavier group 14 neighbor, silicon? Silicon has many similarities, but also many differences that must be taken into account such as size and electronegativity. One such system we are investigating in this way is the vinyl silole anion, which is analogous to the carbon cyclopentadiene anion. This investigation has started with the difficult synthesis of a vinyl silole derivative, the vinyl tetraphenylsilole anion, and plans to investigate the system's resonance through a series of experiments. We are also looking at this project from a computational viewpoint, and will present results from various calculations performed with this molecule.

KIRKHOF CENTER GRR 025

Barx2 is Sufficient to Drive Cadherin-6 Expression in the Nervous System

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

Presenter: Katherine McGuire
Mentor: Merritt Taylor

Barx2 is a homeobox transcription factor linked to cell adhesion, motility, and tumorigenic potential. Cadherin-6 (Cad6) is a cell adhesion molecule with similar expression patterns as Barx2 in the renal epithelium. Collagen Type II Alpha 1 (Col2A1) encodes for the collagen found in cartilage, and Col2A1 and Barx2 were shown to be co-expressed in the developing neural tube, important for differentiating cell lines in segmentation of the spinal cord. It is not known if overexpression of Barx2 will show an upregulation in the expression pattern for Cad6 or Col2A1 in the nervous system. In this experiment we will overexpress Barx2 via electroporation and monitor the effect on Cad6 and Col2A1 using immunofluorescence. We found that the expression of Cad-6 was in a higher number of cells, but for Col2A1, Col2A1 levels were unchanged when Barx2 was overexpressed. These patterns indicate that overexpression of Barx2 results in an upregulation of Cad-6, but not of Col2A1.

KIRKHOF CENTER GRR 026

Effect of an Instability Training Device on Muscle Activation During the Overhead Squat

Participants attending 9:00 AM - 10:00 AM, 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, Ellyn Goncer, Dustin Karlik, Trevor Rigney
Mentor: Stephen Glass

An exercise trend called “functional training” requires individuals to use core muscles (abdominal and back) in order to maintain posture and complete a movement. Functional training is performed with kettle bells, flex bars, and standing on unstable surfaces. A novel exercise device has been created that provided unstable loads as the weight itself is lifted. The purpose of this study was to examine the muscle activation patterns of the shoulder, leg and primary core muscles while using an instability training device during an overhead squat. Surface electromyography (EMG) was utilized to analyze the electrical activity of musculature noted above during an overhead squat. Male subjects completed a 30 second set at the stable, partially stable, and unstable settings in a randomized order using a 25 pound water filled (partially) lifting tube. Raw data were filtered and integrated across contraction. Results of the activation patterns will be discussed.

KIRKHOF CENTER GRR 027

Nursing Home (NH) to Emergency Department (ED) Transfers: Ensuring Quality of Care

Participants attending 9:00 AM - 10:00 AM

Presenter: Emily Vegter
Mentor: Lori Houghton-Rahrig PhD RN

The inappropriate use of ED (emergency department) services by NH (nursing home) patients is an increasing problem in the United States. The purpose of this paper was to examine the determinants of health which impact the population of NH residents who utilize ED resources and to formulate expectations for management of care that may lead to better outcomes. A literature search was performed using the CINAHL database, leading to 691 articles; 12 articles were studied in depth. A revised version of Patrick and Stein's "Determinants of health-related quality of life" model was used to determine which variables impact this population. The use of ED services by NH patients are high compared to community-dwelling populations; these patients also have worse outcomes in the ED. NH patients require higher levels of care and their visits are more costly. Strategies to prevent this problem include more comprehensive management of chronic conditions within NHs by advanced practitioners and increased communication between facilities.

KIRKHOF CENTER GRR 028

A Liar's Guide to Lying: An Analysis of the Verbal and Nonverbal Components of Deceptive Interpersonal Communication

Participants attending 11:00 AM - 12:00 PM

Presenter: Isaac Simon

Mentor: Corey Anton

Lying and the act of deception are an ingrained component of human communication. The effects that communicative variables have on interpersonal interactions that contain deceptive intent provides a multifaceted example of the complexities involved in deceptive interactions. The variables explored are presented as features that are affected by the interaction, the strategic activity involved in the interaction, and the effect that the presence of suspicion has on the interaction. An explication of both verbal and non-verbal communicative elements is provided to depict the necessary complexity employed during the interaction as well as the significance of deceptive interactions.

KIRKHOF CENTER GRR 029

The Evaluation of Essential Oils as Antibiotics

Participants attending 11:00 AM - 12:00 PM

Presenter: Dallas Rohraff

Mentor: Roderick Morgan

The emergence of antibiotic resistant bacteria is of pressing concern as health care associated

infections kill 99,000 people a year in the United States alone. Researchers are currently looking for new antibiotics in alternative sources. Essential oils are traditionally known to have medical benefits, and cinnamon bark, tea tree, and eucalyptus oils have shown antibiotic activity. Initial testing via standard microbiological protocols found minimum inhibitory concentration (MIC) values of 0.0391% for cinnamon bark, 1.25% for tea tree, and 0.313% for eucalyptus. All three oils proved effective against both Gram-positive and Gram-negative bacteria. As cinnamon bark oil had the lowest MIC, a more thorough microbiological analysis revealed that it retained antibacterial activity in the presence of 10.0% human serum protein. Results of a time kill assay indicated cinnamon bark oil had bactericidal activity. Results suggested that cinnamon bark oil may contain a promising novel antibiotic.

KIRKHOF CENTER GRR 030

Gini Coefficient for Agriculture in Michigan

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

Presenters: Amanda Lowery, Melissa Morris

Mentor: Leslie Muller

The Gini Coefficient can be used to measure the distribution of land ownership in the agricultural industry within Michigan. We will use this measurement to analyze the crop yield of farmland production of large companies in comparison to smaller scale companies, in terms of the land that each owns. At the state level, the data from the distribution of crop yield from agricultural businesses to retail companies, in addition to the analysis of the Gini Coefficient, can give insight to predict whether land is allotted to satisfy the consumption needs of households in Michigan. We will also acknowledge certain markets that are supplemented by government subsidies and how non-subsidized farmland compares in regards to production. Our research will be gathered by facts utilizing agricultural censuses as well as outside sources of Michigan research with statistics in regards to animal agriculture and crop yield.

KIRKHOF CENTER GRR 031

Storm events or sediment supply variance: Determining causation of cyclic patterns in the Kope Formation, Northern Kentucky

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

Presenters: Gabrielle LaFayette, Kayla Lockmiller, Thomas Valachovics, Brittany Ward

Mentor: Peter Riemersma

The Upper Ordovician Kope Formation is recognized as one of the most fossiliferous limestone formations in the world. It is dominantly shale with interbedded carbonate facies that consist of thin

to medium bedded skeletal grainstones and packstones. Past studies suggest that these cyclic beds are the result of storm events, with the shale representing distal (deep water) facies caused by minor storm events and the carbonate representing proximal (shallow water) facies caused by major storm events. Modern studies have found evidence that variance in sediment supply rates, rather than storm events, have caused the cyclic pattern of facies. This study aims to analyze hand samples and thin sections to find evidence of features that occur due to sediment variance rather than storm events. These features include storm related sedimentary structures in both mudstones and limestones, evidence of deep sea fauna, and others.

KIRKHOF CENTER GRR 032

Associations Among Somatotype, Functional Movement Screening, and Athletic Identity and Motivation Among Recreationally Active Individuals

Participants attending 12:00 PM - 1:00 PM

Presenters: Curtis Clark, Ian Heinicke

Mentor: Christina Beaudoin

The highest level of sport is pursued by many, and information pertaining to improved performance is highly valued. The purpose of this study is to examine relationships between somatotype characteristics, functional movement screening (FMS), physical fitness, and athletic identity and motivation among a convenience sample of 45-60 recreationally active individuals. Athletic Identity and sports motivation are being measured through surveys. Participants will complete a variety of anthropometric and physical tests including: 3-minute submaximal run test, 1-minute sit-up test, sit and reach test, indirect 1 RM leg press, agility, and maximal vertical jump test. Preliminary results will be presented. The results may have implications to help attribute performance strengths and weaknesses based on somatotype, athletic identity, and motivation.

KIRKHOF CENTER GRR 033

The Importance of Internships: A Statistical Consulting Experience

Participants attending 9:00 AM - 10:00 AM

Presenters: Lauren Berry, Andrew DiLernia

Mentor: John Gabrosek

The importance of an internship can be easily overlooked by many college students. Providing students with invaluable work experience, networking opportunities, and countless other benefits; internships are vital to students' success. The Career Center at Grand Valley State University coordinates with many students seeking internships each semester. Our client, Rachel Becklin, gathered information from 2009 through 2014 regarding internships. Our task as consultants is to investigate how most internships are found, the typical duration of an internship, how many are

paid, and the impact they have. We will discuss our experience as consultants, the results of our analyses, and implications for future internships.

KIRKHOF CENTER GRR 034

Structural and Functional Studies of GDP-6-Deoxy-Talose and GDP-Rhamnose Biosynthetic Enzymes

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

Presenter: Benjamin Nicholson

Mentor: Paul Cook

GDP-6-deoxy-D-talose and its 4-epimer GDP-D-rhamnose are unusual sugars found on the cell surface of certain Gram-negative bacteria. GDP-6-deoxy-talose and GDP-rhamnose are produced by enzymes called GTS and RMD, respectively. We have determined a novel X-ray crystallographic structure of RMD from *Pseudomonas aeruginosa* that contains its cosubstrate NADPH within the active site. Further studies will be performed to determine the structure of GTS and both enzymes will be assessed via steady state kinetics. Characterization of GTS and RMD will allow for an understanding of how bacteria utilize these sugars and may give insight into the pathogenicity of certain Gram-negative bacteria. Furthermore, an understanding of the production of unusual sugars can allow for the derivitization of existing antibiotics in an effort to combat bacterial resistance.

KIRKHOF CENTER GRR 035

New Approaches to Measuring the Kinetics of Metal Olefin Substitution in Asymmetric Iron Olefin Complexes

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

Presenters: Jacob Griffin, Kelsey Hodge

Mentor: Stephen Matchett

The rate of nucleophilic attack on metal olefin complexes has long been speculated to be a function of the asymmetry in the metal to olefin bond. To date, no systematic study of this effect has been done. Work in our lab has centered on firmly establishing this relationship by measuring the reaction rates across a range of compounds we synthesized having varying degrees of asymmetry. Unfortunately, the acidity of some of these complexes has complicated the kinetics for reactions with basic nucleophiles. Current research in our lab is centered in two areas, kinetic measurements with non-basic nucleophiles and synthesis of non-acidic metal olefin complexes. Current progress for both approaches will be discussed.

KIRKHOF CENTER GRR 036

Nature and Origin of the Deformation Within the Upper Ordovician Point Pleasant Formation, Northern Kentucky

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

Presenters: Kayla Deciechi, Waverly Ferguson, Jessika Lynn, Lydia Spears

Mentor: Peter Riemersma

The Upper Ordovician Point Pleasant Formation (Northern Kentucky) contains a deformed zone, which consists of two deformed grainstone beds, a chaotic layer, a nodular mudstone, and two conglomerate beds that are interpreted as debris flows. The deformed grainstone beds may be the product of turbidity currents, debris flows or storm events. In our study we will use photographs from an outcrop that exposes the deformed zone of the Point Pleasant Formation, as well as hand samples and thin sections of samples taken from this outcrop to examine the nature and origin of the deformation that took place in the Point Pleasant Formation. We can analyze deformation characteristics of the grains in thin section and compare and contrast the undeformed and deformed beds to better understand the mechanisms of deformation in this zone.

KIRKHOF CENTER GRR 037

Exploring Unethical Behavior in Group and Individual Contexts

Participants attending 12:00 PM - 1:00 PM

Presenter: Lauren Berry

Mentor: Ernest Park

Research studying the behavior of group and individuals in situations where they may elicit disinhibited behavior is important as it provides a framework necessary for understanding social situations. One potential way people might change from being in a group is to be less inhibited. When people are inhibited they control their immediate urge to act, and reflect on their impulses in a cautious way. They want to avoid negative consequences associated with the behaviors they are contemplating. When inhibited, people tend to be more vigilant and think in a slower and more deliberate manner. Since inhibition is effortful, people tend to inhibit only to the degree they feel negative outcomes are likely, or when people don't know how to respond. On the flip side, to the extent people feel certain about how to act or feel safe from harm, they are disinhibited and act with less restraint. This suggests individual and group contexts are inherently different.

KIRKHOF CENTER GRR 038

Optimization of Fragment Inhibitors for the Class D β -lactamase OXA-24

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

Presenter: Ryan Hoogmoed

Mentor: Rachel Powers

Since the discovery of the penicillin, β -lactam antibiotics have become the most widely used antimicrobial agents. Bacteria, however, have developed resistance to these therapeutics through the expression of β -lactamase enzymes. Currently all clinically available inhibitors of β -lactamases contain the same recognizable β -lactam ring scaffold found in β -lactam antibiotics. Additionally, these available inhibitors fail to effectively inhibit the class D β -lactamases, one of the four classes of β -lactamases. To address these problems, molecular docking was used to search for novel inhibitors of the class D enzyme, OXA-24. Two commercially available chemical fragments with K_i values of less than 5 mM were discovered and their structures in complex with OXA-24 were determined to 1.67 Å and 1.78 Å resolution. Analogs of the fragment inhibitors were ordered and tested for improved inhibition of OXA-24. The insights gained will be used to develop a new series of novel β -lactamase inhibitors.

KIRKHOF CENTER GRR 039

Genesis of Ball and Pillow Structures in the Middle to Late Ordovician Fairview Formation, Northern Kentucky

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

Presenters: Samuel DeYoung, Reece Elling, Katy Reminga, Natalie Renkes

Mentor: Peter Riemersma

The Fairview Formation is a unique marine facies containing evidence of chaotic soft sediment deformation. It is interpreted as a deep subtidal facies containing limestone, calcareous silts and shale. The abundance of smaller, delicate organisms within the formation indicates an environment of deposition related to storms. Sudden deposition of sediment over clay during storms can cause a density instability that can allow for the liquefaction and fluidization of the sediment, forming ball and pillow structures. Episodic initiation of these soft sediment deformations has been linked to seismic activity. Through the use of hand samples, thin sections, and index fossils, we plan to determine the composition and genesis of the ball and pillow structures and their possible relationship to storm deposits and seismic activity. In particular we plan to compare deformed to undeformed samples and look for evidence of liquefaction by characterizing grain density and orientation.

KIRKHOF CENTER GRR 040

The Effect of Alkylphenols on Action Potential Propagation Rate

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

Presenters: Michaela Kastura, Leah Starks

Mentor: Francis Sylvester

Alkylphenols are chemicals that are used in the application of agricultural sprays since they have excellent adhesive properties and have been shown to be inert. The goal of this research is to study a possible link between alkylphenol exposure and impaired neuronal function. Using a nerve chamber, the action potential propagation of the frog's sciatic nerve can be recorded and analyzed. Action potentials will be recorded in the presence and absence of alkylphenol.

KIRKHOF CENTER GRR 041

Effects of Combining Paleo Diet and Exercise Intervention on Cardiovascular Health

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

Presenters: Ellen Day, Chelsea Horvath, Paige Lundberg, Sarah Robertson, Sarah Veldman

Mentor: Amy Gyorkos

INTRODUCTION: The mismatch theory suggests that the traits that evolved for humans to survive and flourish are incompatible with the current environment and this may help to explain the rising cardiovascular disease epidemic of modern man. Diet and exercise that more closely resembles that of our ancestors, including fruit, vegetables, meats, and nuts, may help delay or prevent the onset of cardiovascular risk factors. **PURPOSE:** To investigate whether adopting an ancestral lifestyle, including diet and exercise, may help modern-day humans reduce risk factors for cardiovascular disease. **METHODS:** Cardiovascular risk factors including heart rate, blood pressure, waist-to-hip ratios, body fat %, fitness level (VO₂max), fasting glucose and lipid panels were assessed for each subject before and after a two-week intervention comparing Paleo Diet & Exercise, Paleo Diet & No Exercise, and Western Diet & Exercise groups. **RESULTS & DISCUSSION:** Data are currently under collection and analysis.

KIRKHOF CENTER GRR 042

Applying Unit Testing to Digital Logic Simulation

Participants attending 2:00 PM - 3:00 PM

Presenter: Joseph Bentley

Mentor: Zachary Kurmas

Students in Computer Organization and Computer Architecture (CIS 251 and CIS 451) use a tool called JLS to simulate the building of computer hardware circuits. DLUnit is a computer program that verifies the correctness of a circuit built using JLS. Instructors can use DLUnit to thoroughly evaluate student submissions for errors. Students can use DLUnit to quickly and efficiently verify that their assignments are working correctly before submitting them. DLUnit replaces an older testing framework that is more difficult to use. The older framework uses a custom syntax that can

be difficult for students to learn. In contrast, DJUnit is based on the Java unit testing framework JUnit. It is expected that DJUnit will be easier to use because most Computer Science students have prior experience with using JUnit.

KIRKHOF CENTER GRR 043

Femoroacetabular Dislocation with Accompanied Ligamentum Teres and Acetabular Labral Involvement: A Case Report

Participants attending 3:00 PM - 4:00 PM

Presenter: Andrew Magirl

Mentor: Brian Hatzel

The onset of injury for athletes can be traumatic and outcomes vary based on severity and whether or not surgical intervention is required. We present a case study detailing the diagnosis and management of a 16-year old football player who suffered a femoroacetabular dislocation with associated acetabular labral and ligamentum teres involvement. Dislocation can occur anteriorly or posteriorly and urgent reduction is necessary to reduce the risk of avascular necrosis of the femoral head. The athlete opted not to undergo surgery and subsequently received rehabilitation to prepare him for return to participation. The athlete returned to play with an improved physical profile, but continued to have pain upon return to play. Upon reassessment it was determined that the physical rehabilitation could not overcome the damage caused by the injury and that the athlete required surgery.

KIRKHOF CENTER GRR 044

Chimpanzees and Space Use at John Ball Zoo

Participants attending 1:00 PM - 2:00 PM

Presenter: Ashleigh Lewis

Mentor: Christopher Shaffer

Having a comprehensive understanding of the relationship between the physical environment and nonhuman primate behavior is a key element for the effective care and management of captive great apes. Physical features within a captive environment including gross useable space and environmental complexity can have a vast influence on the behavior of the primate. In this study, the researcher endeavors to analyze the space use of a captive Chimpanzee enclosure housed at John Ball Zoo, Grand Rapids, MI.

KIRKHOF CENTER GRR 045

Synthesis of *cis*-1,2,-bis(diphenylphosphino)ethylene and *cis*-1-(diphenylthiophosphoryl)-2-(diphenylselenophosphoryl)ethylene

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

Presenters: Alyssa Cabelof, Kelsey Hodge

Mentor: John Bender

The synthesis plan of *cis*-1-(diphenylthiophosphoryl)-2-(diphenylselenophosphoryl)ethylene follows the slow sequential stoichiometric addition of the two chalcogenides, sulfur and selenium to *cis*-1,2,-bis(diphenylphosphino)ethylene. When sulfur is added to the reaction first a di-substituted product with both phosphorus atoms bonded to sulfur is formed in both benzene and chloroform. Selenium is used as the first chalcogenide added to the *cis*-1,2,-bis(phenylphosphino)ethylene in benzene so the major product is the mono-substituted one. Benzyl-diphenylphosphine was also synthesized. The starting material, *cis*-1,2,-bis(diphenylphosphino)ethylene, is also intended to be synthesized.

KIRKHOF CENTER GRR 046

Investigation Representational Competence in Chemistry

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

Presenters: Serafina Vitale, Thomas Weiss

Mentor: Jessica VandenPlas

This project looked at the correlation between spatial ability and representational competence. The ability to distinguish between different structures of molecules helps chemists at the very basic level of understanding chemistry. Students took a spatial ability test and also a test in which they had to incorporate their own 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.

KIRKHOF CENTER GRR 047

Investigating the Potential of Arylboronic Acids as Novel OXA-1 Class D β -Lactamase Inhibitors

Participants attending 11:00 AM - 12:00 PM

Presenter: Michael Brunner

Mentor: Rachel Powers

β -lactamase enzymes represent one of the most serious clinical threats in medicine today. Capable of hydrolyzing the β -lactam ring found in β -lactam antibiotics, like penicillin, β -lactamases are the main threat observed in antibiotic resistant bacteria. Development of clinical β -lactamase inhibitors,

such as clavulanic acid, have helped the situation, but β -lactamases have quickly evolved resistance to these inhibitors as well. Class D β -lactamases, which are completely resistant to all known clinical inhibitors and capable of hydrolyzing carbapenems, represent the most urgent need for development of novel clinical inhibitors. Boronic acids are known transition-state-analog inhibitors for classes A and C provide a novel way to inhibit Class β -lactamases. 42 different arylboronic acids were tested for inhibition of the class D β -lactamase OXA-1 based on their hypothesized structural favorability with the enzyme. Compound **18** offered the most encouraging lead with a K_i value of 110 μ M.

KIRKHOF CENTER GRR 048

A Hydrological Assessment of Undeveloped GVSU Land Under Different Development Scenarios

Participants attending 1:00 PM - 2:00 PM

Presenters: Nicholas Colaianne, Youssef Darwich

Mentor: Peter Wampler

Grand Valley State University is emerging as a national leader in sustainable practices. However, rapid growth and development around the university has increased the pressure on the surrounding landscapes to serve multiple functions. GVSU owns a significant amount of farmland surrounding the university, which has been leased while long term plans are formulated. Yet, historical agricultural practices have significantly altered site hydrology. In order to create plans that best manage our water resources, future developments must consider the impacts on the watershed. ArcMap 10.1 geographical information system will be used to model the hydrology of 100 acres of GVSU land currently leased for farming. LIDAR and soil data will be used to analyze current watershed boundaries, infiltration rates, stream channels, and run-off volumes under different development scenarios.

KIRKHOF CENTER GRR 049

Modeled Subsurface Extent of Organics Near Hemlock Crossing Park, Ottawa County, MI

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

Presenters: Andrew Barrette, Kayla Lockmiller, Katy Reminga

Mentors: Tara Kneeshaw, Peter Wampler

Groundwater ammonium concentrations near Hemlock Crossing Park in Ottawa County, MI are negatively affecting water quality of the area. The park visitor center initially noted the ammonium problem when fish in a tank filled with well water were killed. As a result, the park prohibited the use of visitor center well water for consumption. No other suitable aquifers have been identified to

provide potable water for the visitor center. A study conducted by a Western Michigan University graduate student concluded that the ammonium concentration is the result of the decay of organic matter below the aquifer. This study aims to further characterize the extent of the organics in an effort to guide future studies. Locations of reported organics in water well logs are interpolated in GIS to model the subsurface extent. These data are used to recommend depths and localities of future monitoring wells.

KIRKHOF CENTER GRR 050

Investigating the role of EER5 in Ethylene Signaling by Protein Interaction Studies with EIN2

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

Presenter: Matthew Wieckhorst

Mentor: Matthew Christians

Ethylene is a major phytohormone that controls numerous developmental processes in plants. Ethylene Insensitive 2 (EIN2) is a major component of the ethylene signaling pathway and has been shown to interact with Enhanced Ethylene Response 5 (EER5), a negative regulator of the ethylene response. Upon ethylene stimulus, EIN2 is cleaved, and the C-terminal portion translocates into the nucleus. This process is regulated by phosphorylation of the C-terminal end of EIN2. However, the exact mechanisms involved in cleavage of EIN2 are not well understood. Here, we investigate whether or not the interaction between these two regulators is phosphorylation dependent. EIN2 phosphorylation mutants and wild-type EER5 were transformed into *S. cerevisiae* and their interaction was tested via a yeast two-hybrid assay. This project will contribute to our understanding of the mechanisms involved in ethylene signaling.

KIRKHOF CENTER GRR 051

Research Applications in *Drosophila* Genomics: A Course Enhancing the Understanding of Genomics Research Through A Classroom Based Experience

Participants attending 9:00 AM - 10:00 AM, 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: Katrina Abbas, Khy Bradley, Morgan Bueter, Karina Cooke, Shelby Falkenhagen, Rosa Fleming, Lonnie Riley, Caitlyn Ritter, Christopher Timmer

Mentor: Martin Burg

With the support of the Genomics Education Partnership (GEP; <http://gep.wustl.edu/>), students were presented with a specified DNA sequence from *D. elegans* to 'annotate' (or model) genes in the DNA sequence. DNA sequences must be proofread to improve inconsistencies by detecting

sequencing errors that cause difficulties in gene annotation. This classroom experience provides undergraduate students the opportunity to learn, through a hands-on approach, while working with the latest annotation tools in a fast-paced field of study. In addition to annotating protein-coding regions, students also explored newer annotation goals, such as identifying 3' and 5' **un**translated **r**egions (UTRs), **t**ranscription **s**tart **s**ites (TSS), and other motif identifications within the fruit fly genome. This type of analysis allows for the detailed comparison of fine gene structure between species that may lead to a better understanding of gene function, as well as helping students to explore the scientific process.

KIRKHOF CENTER GRR 052

Conversion of Coffee Grounds to Biodiesel

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

Presenters: Kodey Kamstra, Jeremy Schmaltz

Mentor: Dalila Kovacs

Petroleum production is limited and harmful towards the environment. Biodiesel is becoming one of the most researched, ecofriendly fuels throughout the world. Many resources are being tested in terms of efficiency and environmental friendliness in producing biodiesel, including rapeseeds, peanuts, cotton seeds, and soybeans; however with the waste in high volumes, coffee grounds are gaining serious consideration. Coffee grounds contain triglycerides which are the main source in biodiesel fuel production. The results obtained in our labs along with an update of existing literature will be presented.

KIRKHOF CENTER GRR 053

The Effect of Anthropomorphic Interactions on Black Bear (*Ursus americanus*) Behavior and How to Mitigate Future Human-Bear Conflicts

Participants attending 1:00 PM - 2:00 PM

Presenter: Michael Habel

Mentor: Joseph Jacquot

As American black bears (*Ursus americanus*) natural habitats and food sources are being removed, they have begun to venture into urban landscapes in search of potential food and shelter. This close proximity to humans has drastically altered the bear's lifestyle both in terms of their diet and behavior. As bears become increasingly reliant on these anthropomorphic resources there has been a drastic increase in the rates of human-bear conflicts. Therefore, it was my goal for this project to examine the primary literature in order to better understand these changes and how they have affected the bear population. By gaining a better understanding of the problem we can hopefully find potential non-lethal management solutions to avoid future human-bear conflicts.

KIRKHOF CENTER GRR 054

Computer Controlled AC Differential Scanning Calorimeter

Participants attending 9:00 AM - 10:00 AM

Presenter: Luke Albertson

Mentor: Harold Schnyders

A computer controlled differential scanning calorimeter, implementing the ac method, suitable for thermodynamic analysis of small (100 – 300 mg) metallic samples is constructed. The instrument is tested in a low temperature setting by analyzing the temperature dependence of Tin's heat capacity in the region of its Debye temperature (200 K).

KIRKHOF CENTER GRR 055

Flow Cell Technology Using Aqueous Organic Electrolytes

Participants attending 2:00 PM - 3:00 PM

Presenter: Emily Peters

Mentor: Andrew Lantz

Flow cells are rechargeable battery systems that use two compatible redox electrolytes dissolved in solutions which are pumped from external reservoirs to a primary reaction cell. Research in flow cell batteries continues to escalate as the need to store energy from intermittent renewable sources (e.g. wind, solar, etc.) increases. Cyclic voltammetry was used to measure the potentials and electrochemical characteristics of various quinone derivatives to determine the most optimal quinone pair for use in the flow cell. The purities of novel synthesized quinones were also analyzed by cyclic voltammetry and capillary electrophoresis. Charge/discharge cycles of these quinone electrolytes were collected using a small 4W flow cell prototype, along with the electrolytes' energy efficiency, current density, and relative energy capacity. These quinones were also tested using a larger scale flow cell battery apparatus to assess their scale-up potential.

KIRKHOF CENTER GRR 056

The Statistical Consulting Gateway to Data Analysis of Biomechanical Gait Models

Participants attending 9:00 AM - 10:00 AM

Presenters: Alivia Howell, Ashley Reed

Mentors: Gordon Alderink, John Gabrosek

Three-dimensional biomechanical gait analysis has been used in both research and clinical settings. In clinical settings the gait of persons with disability is compared to a normal control data set. It is important for each lab to establish their own control sets and to evaluate the validity and

reliability of the biomechanical model used. Our roles as statistical consultants was to assist in the evaluation of the intra-tester and inter-tester reliability of two distinct biomechanical gait models used at the GVSU Biomechanics and Motor Performance Laboratory. We are excited to present the results of this study and share about our consulting experience.

KIRKHOF CENTER GRR 057

Analysis of Chert Nodules Within Dolomite Structure of the Silurian Brassfield Formation in Northern Kentucky

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

Presenters: Michael Bair, Angela Bologna, Timothy Walters

Mentor: Peter Riemersma

The Silurian Brassfield formation initially consisted of fossiliferous limestone that later underwent dolomitization and localized chert diagenesis. As dolomitization destroys the fossil fabric, the relative timing between chert and dolomite formation can be evaluated by examining if fossils are preserved in the silica rich nodules. Using thin sections from the Brassfield Formation outcrop, our group will determine the formation processes of dolomite and chert via petrography and point count method. Size, shape, and crystal structure of dolomite will also be examined. Additionally, examination of fossils contained in the outcrop will lend evidence towards the relative age and origin of the chert nodules encompassed in the Brassfield formation.

KIRKHOF CENTER GRR 058

A Molecular Phylogeny of the African Plant Genus *Palisota* (family Commelinaceae)

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

Presenter: Jessica Fritzler

Mentor: Timothy Evans

The plant family Commelinaceae displays a range of variation in vegetative, floral and inflorescence morphology. This variation, particularly among the reproductive parts, makes assessment of homology among morphological characters difficult. Recent molecular data have revealed that the African genus *Palisota* occupies a position near the base of Commelinaceae, indicating an early divergence from most of the family. The primary goal of this study is to use DNA sequence data from two chloroplast (*matK* and *rbcl*) and one nuclear (AT103) gene to evaluate phylogenetic relationships among *Palisota* species and related genera. Specifically, we wish to: 1) determine whether *Palisota* is a monophyletic ("natural") group; 2) assess its position within the family Commelinaceae; and 3) resolve phylogenetic relationships among *Palisota* species. Preliminary data indicate that *Palisota* is monophyletic, but they do not consistently place it near

the base of the family, contradicting earlier work.

KIRKHOF CENTER GRR 059

Meter-Scale Cyclicity Within the Fairview Formation: Analysis of Evidence for Depositional Processes During the Upper Ordovician in Northern Kentucky

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

Presenters: Nicholas Colaianne, Alexander Kiewit, Evan Lavery, Brian Schrottenboer

Mentor: Peter Riemersma

The Fairview Formation in the Cincinnati Arch is renowned for its marine-invertebrate fossil facies recording the presence of a prehistoric epicontinental sea. Repeating meter-scale beds of shale and fossiliferous packstones provide evidence of cyclical alternation of depositional processes in this sea during the Upper Ordovician. Several methods of formation have been proposed to explain the presence of fossil-rich layers including mud winnowing via wave action, sediment supply modification, and storm deposition. In order to determine which, if any, of these explanations best agree with evidence present in the rock record, we will examine hand samples, thin-sections, and stratigraphic columns. The characteristic lithology, petrology, and faunal patterns in our samples will be described and interpreted. In this study we seek to determine the driving force for the cyclic deposition of packstone and shale in the Fairview Formation.

KIRKHOF CENTER GRR 060

Using Geochemical and Textural Characteristics to Explain the Origin of Dolomite in the Middle Silurian Bisher Formation

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

Presenters: Spencer Brower, Logan Knoper, McKenna Smith, Barrett Walquist

Mentor: Peter Riemersma

The Middle Silurian Bisher Formation is located in northern Kentucky and is approximately 442 million years old; this particular formation is highly dolomitized. We will be researching dolomite formation in which we will use textural as well as geochemical characteristics to support a model suggesting a particular environment of formation. More specifically, we will explore whether the dolomite in the Bisher formation was formed in an environment rich in organic material or an environment rich in sulfate reducing bacteria. To differentiate between the types we will be primarily looking for pyrite nodules which would suggest a sulfate reducing environment. We will be characterizing dolomite crystal size and texture by analyzing hand samples as well as thin sections, in addition to conducting an XRD analysis in order to determine the true origins of the Bisher formation dolomite.

KIRKHOF CENTER GRR 061

DDS/DGEBA Epoxy Used as a Method for Studying Polymer Attachment in Polymer Nanocomposites

Participants attending 11:00 AM - 12:00 PM

Presenter: Danielle Harris

Mentor: Richard Vallery

An interesting class of materials is polymer nanocomposites (PNC). Essentially, PNCs are polymer matrices with nanoparticles dispersed within them. These nanoparticles provide a surface for attachment within the polymer, potentially resulting in alterations of macroscopic properties such as conductivity, hardness, and flame-retardance. This change in attachment can also alter microscopic properties, such as voids in the polymer. Since polymers made of diglycidyl ether bisphenol A (DGEBA) with 4,4'-diaminodiphenyl sulfone (DDS) hardener have been well studied, it is an ideal model system for studying polymer attachment to silica nanoparticles (15-20 nm in diameter for this study). Using Positronium Annihilation Lifetime Spectroscopy (PALS), we can study these voids by analyzing the lifetime of positronium, which tends to localize in the voids of the polymer matrix. We will investigate how the polymer attachment changes with respect to temperature as well as nanoparticle concentrations.

KIRKHOF CENTER GRR 062

Dirty Details

Participants attending 4:00 PM - 5:00 PM

Presenter: Emily Tascone

Mentor: Julia Mason

Dirty Details is my contribution to enhancing the sexual health resources at GVSU. By framing my methodology according to the nursing process, I explore and confront this gendered issue through a community health lens - fusing the fields of Nursing and Women and Gender Studies (WGS). Upon completion, I will have assessed the situation, diagnosed areas for improvement, developed and implemented interventions, and prepared recommendations to improve future outcomes. Through synthesizing peer-reviewed literature, assessment tool findings, and perspectives from Student Development, Healthcare, and WGS personnel, I am developing a comprehensive understanding of the issue, desired outcomes, and potential solutions that reflect the efficacy of my multidisciplinary education. By sharing this journey, I hope to empower students with complete and reliable sexual health knowledge; promote lifelong, self-directed learning; and inspire my peers to become activists for their own passions.

KIRKHOF CENTER GRR 063

Can a Drug for Alzheimer's Disease be of Benefit in Glaucoma? Results from ACh Release and Cell Culture Experiments

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

Presenters: Justin Bria, Lindsey Lusardi, Emma Schroder, Lindsey Schroedter

Mentor: David Linn

Glaucoma, a neurodegenerative disease, is a leading cause of blindness. Evidence suggests activation of acetylcholine (ACh) receptors can have neuroprotective effects against this neurodegeneration. We have been examining whether a potential Alzheimer's drug (DMP 543) can increase ACh release in the retina, as in the brain, to activate these protective receptors. Previous studies found that DMP 543 had a dose-dependent effect on the basal release of ACh from the pig retina. Using our "retina in a dish", a dissociated retinal cell culture system, the addition of DMP 543 was found to have a dose-dependent effect on the survival of cells in our culture system. This indicates the presence of cholinergic cells which can be induced to increase the release of ACh, and thereby increase the survival of retinal neurons. Future experiments include determining the identity of which cholinergic receptor(s) are involved in this increased survival.

KIRKHOF CENTER GRR 064

A Novel Synthesis of a Hetero-Disubstituted Phosphine and Organolithium Reaction with Triphenylphosphine

Participants attending 1:00 PM - 2:00 PM

Presenters: Michael Maddalena, Tanner Remick

Mentor: John Bender

106 mg Se-cis-Ph₂PCH=CHPh₂ was synthesized at a 34.4 % yield from 250 mg cis-Ph₂PCH=CHPh₂ and excess Se metal. A column chromatography was attempted to separate the minor substituted product, but didn't work. 4.045 g of crude bis(CF₃)bromobenzene-diphenylphosphine was synthesized from triphenylphosphine, Li metal and quenched with *t*-BuCl. A recrystallization was performed on the crude product, but analysis has not yet been done on the recrystallized product. Two more reactions will be attempted; one with lithium diphenylphosphine and cis-dichloroethene, and another with lithium diphenylphosphine and 1,2-dihalobenzene.

KIRKHOF CENTER GRR 065

Categorization of Food Values via Crayfish Aggression

Participants attending 1:00 PM - 2:00 PM

Presenter: Justin Tran

Mentor: Daniel Bergman

In numerous species, social interactions play a key role in deciding the allocation of resources. Aggression is a tactic that crayfish utilize to become dominant, which allows them to acquire higher quality resources. Many studies of aggression and agonistic interactions have used crayfish because they are known to be innately aggressive and are quick to become involved in agonistic interactions that may escalate into fighting. The primary objective of this study is to elucidate the relationship between differing food resources and their effect on aggression of crayfish. It is hypothesized that increased desirability for the food resource will induce more aggressive interactions to obtain it. Trials were conducted with three different crayfish species - *Orconectes propinquus*, *Orconectes rusticus*, and *Orconectes virilis* - in collaboration with Saginaw Valley State University and Elizabethtown College. Crayfish interactions were analyzed using an ethogram to grade intensity levels.

KIRKHOF CENTER GRR 066

Assessment of Polar Growth of a *Physcomitrella patens* Insertional Mutant

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

Presenter: Ronald Kamgang

Mentor: Margaret Dietrich

Tip growth is critical for fertilization via pollen tube growth in flowering plants, and it increases the total root surface area for water and nutrient acquisition. Protonemal patterning and developmental timing depend on tip growth in the moss, *Physcomitrella patens*, a model organism for tip growth studies. We assessed the recovery of polar growth from protoplasts using high and low Ca^{2+} media, with the aim of determining the effect of the disrupted genome in a mutant strain. The wild type and the mutant recover polar growth with similar timing. In the low Ca^{2+} media, only the mutant is defective in cell differentiation, and the filament branching pattern is atypical in the mutant. However, the phenotypes of both strains are affected on the high Ca^{2+} medium, with the wild type being more affected. An influx of Ca^{2+} is required for tip growth in most organisms and our results imply that the genome disruption has affected the mutant's tip cell-associated Ca^{2+} biology.

KIRKHOF CENTER GRR 067

Isolation of Retinal Ganglion Cells with MACS

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

Presenters: Emma Schroder, Lindsey Schroedter

Mentor: David Linn

Retinal ganglion cells (RGCs) are one of several types of cells in the retina. RGCs play an

important role in vision and their death leads to disease (e.g. glaucoma). Future studies on RGC apoptosis would benefit from having isolated RGCs. However, separating cells by type can be challenging. In this project, we use a magnetic bead system to isolate RGCs. Magnetic “microbeads” are incubated with a mixture of retinal cells. The beads consist of antibodies attached to magnetic nanoparticles. The antibodies recognize and bind to CD90.1 receptors on the surface of RGCs. The cell mixture is then applied to a paramagnetic column in a strong magnetic field. RGCs are retained in the column, while other cell types pass through. Finally, the column is removed from the magnetic field and the RGCs are washed free. This technique is called Magnetic-Activated Cell Sorting™ (Miltenyi Biotec). Preliminary results show low cell yield. The goal of the current project is to increase cell yield.

KIRKHOF CENTER GRR 068

Kava Kava for Treating Anxiety Symptoms and St. John’s Wort for Treating Mild to Moderate Depression

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

Presenter: Katelyn Smith

Mentor: Claudia Leiras

Mental health has been a rising concern on university campuses since college students are prone to great amounts of pressure throughout the school year. Kava Kava and St. John’s wort are two supplements that have been evaluated for their potential ability to improve mood disorders, such as anxiety and depression. They can also be bought at a local drugstore without a prescription, thus making them highly accessible to college students. Two article searches were conducted using databases PubMed, CINAHL, and PsycINFO: one with key terms associated with Kava Kava’s anxiolytic effects and ability to treat generalized anxiety disorder; another with St. John’s wort and ICD-10 or DSM-IV diagnosed mild or moderate depression. The purpose of this systematic review is to determine if Kava Kava is an effective treatment for anxiety and if St. John’s wort is an effective treatment for depression.

KIRKHOF CENTER GRR 069

Investigation of Ebola Virus Disease in the Creation of Disease Simulation Model Utilizing Call Data Records

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

Presenter: Christopher Theisen

Mentor: Jonathan Leidig

While working within a multidisciplinary team toward the creation of an Ebola disease simulation model, research was conducted on Ebola and biological aspects within an individual as well as the

population level. These aspects aided the understanding of person-person transmissions and their contribution to the spreading of the disease within a population. Population modeling and human mobility aspects were implemented with the use of mobile phone call detail records (CDRs), which capture the time and location of an individual upon sending/receiving a call or text message. The investigation of mobility and social mixing patterns within the context of Ebola disease was essential to the creation of the simulation model.

KIRKHOF CENTER GRR 070

Energy Expenditure is Overestimated by the Treadmill During Submaximal Running in College-Aged Individuals

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

Presenters: Grace Couture, Kelli Crosby, Nina Ohrling, Abigail Ryskey

Mentor: Ross Sherman

Background: Information displayed by exercise equipment includes calories but these cannot be measured directly in a recreational setting, so equipment relies on prediction equations to estimate energy expenditure. **Aim:** The aim of this study was to determine the validity of a treadmill calorie count during submaximal running. **Methods:** 10 healthy participants (3 males and 7 females; age 20 ± 1 year) completed a submaximal ramp protocol to VO_2 max, to determine running speed for the test. At least two days later, participants ran for 30 minutes at a speed corresponding to 60% of their VO_2 max. whilst connected to a metabolic cart, which analyzed expired gas. Results: The treadmill over-estimated energy estimation by 7% greater, compared to actual measured energy expenditure. **Conclusion:** This study suggested that caution should be used when using exercise equipment to determine caloric cost of an exercise bout.

KIRKHOF CENTER GRR 071

Kappa Opioid Regulation of Acute and Protracted Alcohol Withdrawal

Participants attending 10:00 AM - 11:00 AM

Presenter: Delia Chapa

Mentor: Glenn Valdez

Alcoholism impacts Americans both personally and economically. Individuals dependent on alcohol continue to consume to avoid the severe withdrawal symptoms. Depression, anxiety and other stress-related symptoms are the primary causes of relapse. The dynorphin/kappa opioid receptor (DYN/KOR) system has been linked to one's ability to manage these symptoms. The research reported here investigated the role of DYN/KOR in regulating alcohol self-administration during acute and protracted withdrawal in alcohol dependent rats. Wistar rats were trained to self-administer ethanol. The rats were then fed an ethanol liquid diet to induce physical dependence.

The rats' repeated self-administration and the ability of the KOR antagonist, nor-binaltorphimine (nor-BNI), to reduce self-administration was examined. We found that nor-BNI selectively decreased self-administration in ethanol dependent animals during both the acute and protracted time frame.

KIRKHOF CENTER GRR 072

Development of a Novel Biofilm Assay using a Luciferase Reporter

Participants attending 10:00 AM - 11:00 AM

Presenter: Jordan Zhou

Mentor: Michael Baxter

Biofilms are very important for bacteria when they are trying to establish themselves within a host. One of the most popular methods for quantifying bacterial biofilms is the crystal violet assay. A problem with this assay is that it is time consuming and also very sensitive to error. The slightest bit of debris landing inside of the well can throw off the results drastically. Another popular assay is the enumeration assay. The enumeration assay is very accurate because it allows direct calculation of the number of colony forming units in the original well through a series of dilutions. However, the enumeration assay takes an extra day to perform while waiting for dilutions to grow before any calculations can be done. This is why I am working on a new assay using a luciferase reporter. This assay would theoretically be very accurate, and at the same time take less time to complete.

KIRKHOF CENTER GRR 073

Use of Clark Type Electrode to Measure Oxygen in Hyperbaric Research Chamber

Participants attending 9:00 AM - 10:00 AM

Presenters: Kyle Horr, Bradley Ophoff

Mentor: Francis Sylvester

This experiment shows the varying oxygen levels in a hyperbaric chamber measured by a Clark-style electrode. There were significant differences in the percent of oxygen present inside the hyperbaric chamber when pressurized with different gases. The gases, which included pure oxygen, pure nitrogen, room air, and compressed room air, were pressurized in the chamber and measured by the electrode which was submerged in physiological buffer. All gases were measured for a period of twenty minutes at 27 PSI. The results indicate that the amount of oxygen present inside the chamber for each gas was significantly different after 8 minutes ($p < 0.05$, ANOVA).

KIRKHOF CENTER GRR 074

In What Ways are U.S. Enterprises in China's Apparel Market Affected by

Legal and Non-legal Factors?

Participants attending 9:00 AM - 10:00 AM

Presenter: Derson Figuereo

Mentor: Yi Zhao

As China's economy continues to grow and more foreign enterprises seek to profit in China's apparel market, many legal and non-legal factors must be taken into consideration. This research focuses on four main opportunities, five main challenges, and four main solutions to these challenges that U.S. apparel enterprises face in China. By analyzing China's apparel market opportunities, this research shows how foreign enterprises can benefit from China's stability, low cost, consumer market, and growing regions. Also, by examining China's apparel market challenges, this research shows how foreign enterprises are hurt by China's corruption, preferential treatment, intellectual property, contract laws, and labor issues. Further, by comparing these challenges and opportunities, this research will show how enterprises can overcome their challenges through managing, relationship networks, safeguards for intellectual property, and a good start up plan.

KIRKHOF CENTER GRR 075

Effect of an Unstable Training Device on Muscle Activation During Leg Extension

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: Emma Gasinski, Joshua Sackleh, Kathryn Siroonian

Mentor: Stephen Glass

Core muscles are essential for balance and coordination. Functional training is performed when using kettle balls, flex bars, and when standing on unstable surfaces. Previous studies have assessed unstable exercise surfaces but not lifting an unstable load. It is not known to what degree this training device causes muscle activation. The purpose of this study was to examine the muscle activation patterns of the vastus medialis, vastus lateralis, rectus abdominis, and paraspinal muscles while using an unstable training device during a leg extension. Electromyography (EMG) was utilized to analyze the electrical activity of musculature. Two male and two female subjects completed approximately eight repetitions at stable, partially stable, and unstable water flow settings in a counterbalanced order using a 25 pound lifting tube. Raw data were filtered, rectified, and integrated across contractions. Results of the activation patterns will be discussed.

KIRKHOF CENTER GRR 077

Erosion, Exhumation and Implications for Energy Resource Exploration in the Caucasus Mountains, Azerbaijan

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

Presenters: Matthew Raymond, Brian Schrottenboer

Mentors: Peter Wampler, John Weber

The Caucasus Mountains in Azerbaijan are a poorly understood, actively forming, collisional mountain belt associated with vast energy resources in the flanking Caspian and Absheron basins. I propose to study: 1) the rates of rock exhumation and erosion in the Caucasus Mountains, 2) the geomorphology of active tectonic features, and 3) the implications for energy resource exploration. First, I will create a Geographic Information System (GIS) database of the Azeri Caucasus Mountains, including layers for geology, topography, surface hydrology, and field samples. Digital Elevation Models (DEM), from the Shuttle Mission Radar Topography (SRTM) data will be used to determine stream profiles to analyze uplift and erosion patterns. Field samples will be processed for exhumation rate (e.g. fission-track) data.

KIRKHOF CENTER GRR 078

Assessment of Parkinson's disease specific microRNAs in Alzheimer's disease

Participants attending 2:00 PM - 3:00 PM

Presenter: Sayantoni Mukhopadhyay

Mentor: Sok Kean Khoo

Alzheimer's disease (AD) is a neurodegenerative disease related to aging. There is no cure and definitive diagnosis of AD is achieved by autopsy. Although AD and Parkinson's disease (PD) are distinct conditions, mounting evidence shows possible links between the genetics and brain changes associated with them such as cognitive impairment and aggregation of misfolded proteins, suggest crossdisease association. MicroRNAs (miRNAs) belong to a class of small, noncoding regulatory RNA molecules that are involved in gene expression at the posttranscriptional level. Here, we plan to evaluate PDrelated miRNAs on AD patients to shed light on the similarity between AD and PD.

KIRKHOF CENTER GRR 079

Computational Investigation of Erythritol Hydrogenolysis

Participants attending 3:00 PM - 4:00 PM

Presenter: Aaron Hillsamer

Mentor: Dalila Kovacs

Erythritol can undergo catalyzed hydrogenolysis to ultimately form butane, a valuable fuel source. The heterogeneous process is complex, with multiple pathways being followed simultaneously. Each hydrogenolysis step has competing pathways to different products. Our goal is to find the thermodynamically preferred pathways by which the reaction proceeds, by finding the lowest energy conformations for each compound involved and comparing them. We used computational software WebMO to model the thermodynamic aspects of the overall process. Geometry optimized energies were obtained for reactants, intermediates, and products, using semi-empirical, ab initio, and density functional theory calculations. These calculations were compared, where possible, with experimental heats of formations. The results also allow us to determine what type and level of calculation is better suited for the erythritol system.

KIRKHOF CENTER GRR 080

Growth Rates and Climate Influences on Neonatal Eastern Box Turtles after Egress Following Their First Overwintering

Participants attending 12:00 PM - 1:00 PM

Presenter: Kirk Luca

Mentor: Jennifer Moore

Eastern box turtles *Terrapene carolina caroline* (EBT) are uncommon in the Great Lakes region and are protected in Michigan as a species of special concern. Like many reptiles, little is known about hatchlings EBTs, particularly growth and activity of neonates following egress. Neonatal growth was monitored in EBTs in Mainstee National Forest via radio telemetry. During their first overwintering, neonates lost approximately 10% of their body weight. Each neonate had overwintering refugia of varying depths; these depths did not correlate with how much mass was lost. The mean weight for turtles alive four weeks after egress was 7.9936 g with a 0.142 standard error. The absence of a significant weight gain may be the result of adverse weather conditions during the study. This may have led to a lack of readily available food and difficulty in foraging. It is critical to understand those factors that affect growth rates and promote longevity in EBTs to ensure they reach maturity.

KIRKHOF CENTER GRR 081

Assessment of Maternal-Mind-Mindedness within a Child-Maltreatment Prevention Program

Participants attending 10:00 AM - 11:00 AM

Presenters: Sylvia Ciszek, Alena Kenyon, Amarachi Nnebedum

Mentors: Naomi J. Aldrich, Jing Chen

Mind-Mindedness (MM) is defined as a caregiver's ability to understand their children by seeing

them as individuals with their own thoughts and feelings (e.g., Meins et al., 1998). Research indicates that “mind-minded” mothers are less likely to direct hostile behaviors towards their child and experience less stress/difficulties within parent-child interactions. Instead, they demonstrate higher sensitivity and are more likely to form secure attachment with their children. The current study assessed the MM in a community sample enrolled in Family Future’s Connections Program (a non-profit, child maltreatment prevention program). We analyzed responses from 239 individuals and our results suggest that the degree of MM increases as a function of child age. Findings are discussed in relation to the efficacy of MM assessment in mothers of children across the first five years of children’s lives.

KIRKHOF CENTER GRR 082

Influences on Technology Use in High School Anatomy and Physiology Instruction

Participants attending 12:00 PM - 1:00 PM

Presenter: Frazier Firovich

Mentor: Thomas Pentecost

This project investigated the use of classroom technology in high school anatomy and physiology courses. The goal of the research was to identify aspects of technology that influence instructors’ decisions to use or not use various forms of instructional technology. Instructors in high school anatomy and physiology courses in the area surrounding Grand Valley State University were contacted and interviewed by the researcher. A purposeful sampling of high schools was used to select the targeted high schools. They represent a cross-section of size and urban/semi-urban and rural schools. The interviews were transcribed and coded using open-coding. This poster will describe the interview process, the coding process, and the development of the themes that appear to influence teachers’ adoption of technology in high school anatomy and physiology.

KIRKHOF CENTER GRR 083

GIS Mapping of Road and Trail Networks for a Rural Haitian Hospital

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

Presenters: Michael Bair, Zachary Curry, Denise Peterson, Mitchell Slachter

Mentor: Peter Wampler

Hôpital Albert Schweitzer, commonly referred to as HAS, is a regional hospital located in Deschapelles, Haiti. HAS is a 131-bed facility that provides care for more than 350,000 people dispersed over 610-square miles within 14 districts. A serious issue that HAS contends with is limited access to patients due to steep terrain and lack of road infrastructure. The focus of this research project is to delineate, digitize, and provide road and trail network data to HAS. This will

provide visiting doctors, hospital staff, and potential patients, within the service area of HAS, more accurate mapping that will improve emergency response time. This could also be used to evaluate where resources could be allocated to construct new roads and improve infrastructure.

KIRKHOF CENTER GRR 084

Does Mood Interact with Self-affirmation to Reduce Defensiveness to Freshman Weight Gain Message?

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

Presenters: Steven Senglaub II, Paige Spence

Mentor: Amanda Dillard

According to self-affirmation theory, when people think about a value that is important to them they will respond less defensively to potentially threatening health messages. Although affect has been proposed as a potential moderator of self-affirmation, few experimental studies have been conducted. In this experiment, we tested if mood would interact with self-affirmation to influence freshman students' responses to a health message about weight gain. Participants were randomly assigned to one of four mood conditions: happy, angry, afraid, and neutral, followed by either a self-affirmation or not. Self-affirmation was varied by having participants write about a value important to them (self-affirming) or someone else (non self-affirming). Following these manipulations, participants read the weight gain message, and completed questions that assessed outcomes such as openness to the information, risk perceptions, and behavior intentions related to reducing their risk of weight gain.

KIRKHOF CENTER GRR 085

Quantification of Microcystin in Fish Tissue from Saginaw Bay, Lake Huron: Determining Safe Fish Consumption Levels

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

Presenters: Kaitlyn Denney, Heather Snyder

Mentor: M Woller-Skar

The frequency and intensity of cyanobacterial blooms are rising, resulting in an increase in cyanotoxins such as microcystin. Microcystin is a hepatotoxin that is harmful if ingested and increasing levels of the toxin are a cause for concern from a human health perspective. Although microcystin exposure through water consumption is closely monitored in areas of concern, the consumption of microcystin through fish is not generally regulated. A total of 10 walleye, 10 white bass, and 10 channel catfish were collected by the Department of Environmental Quality from Saginaw Bay, Lake Huron. Fish muscle tissue was tested for microcystin using Enzyme Linked Immunosorbent Assay (ELISA) as well as with Liquid Chromatography double mass spectrometry

(LC/MS-MS). ELISA concentrations ranged from 0.000243 ug/g to 0.002062 ug/g. Results from ELISA and LC-MS were compared to current consumption advisories.

KIRKHOF CENTER GRR 086

Designing Guided-Inquiry Organic Chemistry Laboratory Procedures to Promote Critical Thinking

Participants attending 12:00 PM - 1:00 PM

Presenter: Kathleen Venhuizen

Mentor: Felix Ngassa

The organic chemistry course for second-year undergraduate students introduces many new concepts that must be incorporated in laboratory experiments. Procedures for these experiments must be designed so that they are both a guide for students new to the laboratory and a tool to promote inquiry-based learning. We present four procedures that have been developed that fit the current organic chemistry curriculum and incorporate inquiry-based learning. Many experiments currently used are out-of-date, therefore, current literature was researched to find experiments that reflect advances in chemistry and had potential to incorporate elements that promote critical thinking. The experiments were then reproduced in a student laboratory, questions were designed to stimulate inquiry-based learning, and then were added to the final procedures. These procedures will be instrumental in redirecting laboratory experiences from temporary memorization of skills to lasting retention of lecture material.

KIRKHOF CENTER GRR 087

Synthesis of Hetero-substituted Bidentate Ligands and Aryl Phosphines : An Attempt to Further Research Nuclear Waste Remediation

Participants attending 2:00 PM - 3:00 PM

Presenters: Nicholas Bostater, Jeremy Cunningham

Mentor: John Bender

The Advanced Synthesis course (CHM 452) at Grand Valley State University explored the preparation of trisubstituted phosphines using alkali metal, in addition to the reaction selectivity of unsymmetrical dichalcogenide phosphoryl ligands. Research currently being done at GVSU on actinide separations provides promising results with symmetrical bidentate ligands, however the synthesis of unsymmetrical ligands was previously unexplored. Successful synthesis of the monosubstituted selenide was completed (^{31}P NMR (CDCl_3) δ : 22.2ppm (d) and -27.5ppm (d). The inability to form the monosubstituted sulfide in various solvent systems indicated a fast kinetic reaction to the disubstituted phosphine. The starting material for this reaction may also have an effect on the extraction ability, Successful synthesis of benzyl(diphenyl)phosphine (^{31}P NMR

(CDCl₃) δ : -8.7ppm (t), was completed through a Grignard reaction, additional work needs to be done in order to form the diphosphine.

KIRKHOF CENTER GRR 089

Swipeless — iPhone App Design

Participants attending 11:00 AM - 12:00 PM

Presenter: Nick Ciliak

Mentor: Vinicius Rebello Lima

Swipeless helps you improve your spending habits by categorizing each purchase you make as a want or a need. Reviewing your transactions in a simple, organized way lets you see where your money is going. Swipeless analyzes your spending habits over time and trains you to make better decisions with your money. I began this project by researching current finance-based apps and defined the problem that Swipeless would solve. From there, I began to define the solution through sketches and wireframes. These ideas were tested and improved upon using prototypes. Finally, the visual elements of Swipeless were designed to make the app look friendly and polished.

KIRKHOF CENTER GRR 090

Computational Analysis of Ligand binding and Protein Dynamics in Bacillithiol Biosynthesis Protein BshC

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

Presenter: Ian Green

Mentors: Paul Cook, Mary Karpen

BshC is an enzyme required for the synthesis of the antibiotic resistance molecule bacillithiol in several Gram-positive bacteria. Using molecular dynamics simulations, we modeled the ligand binding and protein motion of BshC. We explore possible binding sites for various BshC ligands to determine important enzyme side chain-ligand interactions. The previously solved crystal structure revealed a unique coiled-coil motif of unknown function with an ADP bound nearby. We probe the effect of ATP and ADP binding at this auxiliary binding site on coiled-coil conformation.

KIRKHOF CENTER GRR 091

Determination of Palatal Bone Density to Aid in Oral Mini-Implant Surgical Success

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

Presenter: Alicia Flores

Mentor: James Reed

Mini-implants are titanium alloy rods implanted in the bone of the hard palate to help secure dental prostheses such as dentures, fixed crowns, and bridge installations. Recent research suggests presurgical determination of bone density quality provides increased mini-implant surgical success rates. In replication of these methods, we evaluated 19 living individual CT scans from Saint Mary's Hospital, using Osirix 8.5 imaging software. Bone density was recorded at 90 separate coordinates using Hounsfield units, measured at three millimeter intervals (mediolaterally and anteroposteriorly starting at the incisive foramen). The data were then analyzed for age differences and average bone density throughout different regions of the hard palate including intra- and interobserver analysis. Because researchers have indicated that women may have a different palatal bone density than men, sex difference was closely investigated in this study.

KIRKHOF CENTER GRR 092

Biological Testing of Novel Telomerase Inhibitors

Participants attending 10:00 AM - 11:00 AM

Presenters: Basma Khudhur, Katie Uhl

Mentor: Suganthi Sridhar

Cancer was one of the leading cause of death in the United States. Cancer cells are often referred to as being "immortal", because of their ability to divide a seemingly infinite number of times. Normal cells are limited in the number of times they can divide by telomere caps on the ends of the chromosomes. In this study, we synthesized three novel compounds and they were tested for anticancer properties on metastatic prostate cancer cell lines. The efficacy of these compounds were compared against to that of BIBR 1532, an approved telomerase inhibitor, in order to determine if these novel compounds would prove to be adequate cancer treatments. Our results show that all three compounds demonstrate anti-cancer properties, the effect of which is greater than BIBR 1532. The optimum effective dose was determined by drug assay. A TRAP Assay will be performed to determine if telomerase inhibition is the mechanism behind the demonstrated anti-cancer activity.

KIRKHOF CENTER GRR 093

Modification of Aromatic Groups on Carbamoylmethylphosphine Oxide Ligands for Sensitizing Lanthanide Luminescence

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

Presenters: Alyssa Kulesza, Erin Leach

Mentor: Shannon Biros

Through synthesizing several new modifications on carbamoylmethylphosphine oxide (CMPO) ligands, we have been successful at increasing the sensitivity of lanthanide luminescence.

We investigated how the placement and composition of aromatic groups on the carbonyl and phosphoryl groups of the ligands make a difference in the sensitization. Our CMPO ligands have been successful in sensitizing terbium, europium, dysprosium, and samarium. Detailed fluorescence data that has been taken of the complexes and crystal structures of the modified CMPO ligands will be presented.

KIRKHOF CENTER GRR 094

Characteristics and Fruit and Vegetable Intake of Low-Income YMCA Veggie Van Participants in Grand Rapids and Muskegon, MI

Participants attending 10:00 AM - 11:00 AM

Presenter: Sarah Craven

Mentor: Deborah Lown

The objective of this study was to characterize the individuals utilizing the Veggie Van in low-income areas of Grand Rapids and Muskegon, MI, including food security status and fruit and vegetable servings. Each participant completed a survey. Fruit and vegetable servings were measured with three 24-hour recalls. The majority of participants who completed the survey were of low food security (60%). Some of the respondents participated in food assistance programs such as SNAP (80%), WIC (40%) and Double-Up Food Bucks (40%). The median fruit and vegetable (excluding potatoes) servings of participants that completed the 24-hour recalls was 1.44 (IQR 0.56, 1.46) and 1.46 (IQR .93, 2.83). At low-income sites, the YMCA Veggie Van is reaching primarily low-income individuals with potentially low food security. The fruit and vegetable servings of Veggie Van participants is much lower than the recommendation of 5-7 servings per day.

KIRKHOF CENTER GRR 095

Influence of Timing of Pre-Exercise Carbohydrate Ingestion on Blood Glucose

Participants attending 1:00 PM - 2:00 PM

Presenters: Kyle Bloom, Gene Lanier, Zachary Whipple

Mentor: Ross Sherman

Background: Carbohydrate (CHO) is one of the main energy sources within the human body. Consumption of CHO before exercise has been shown to alter circulating and stored levels of CHO, and especially when considering the timing of the CHO intake. **Purpose:** The purpose of this study was to determine the effect of 15 min and 60 min pre-exercise CHO consumption on resting and pre- and post-exercise blood glucose. **Methods:** Eight healthy students participated in the randomized cross-over, double-blind, design study. Participants consumed 350 ml of water containing either 4.0 g·kg⁻¹ body mass CHO or placebo either 60 or 15 min before exercise.

Blood glucose levels were tested at baseline, prior to CHO consumption, and again pre- and post-exercise. Expired gas analysis was performed during a 30-min treadmill run at 60% of maximal oxygen uptake to determine CHO oxidation. **Results:** Data will be collected and presented at SSD.

KIRKHOF CENTER GRR 096

Medication Adherence in the Geriatric Population

Participants attending 9:00 AM - 10:00 AM

Presenter: Jessica Naftaly

Mentor: Mary Russa

Due to the multiple chronic illnesses and number of medications that the geriatric population faces, medication adherence is especially important in this population. Non-adherence affects patient health and quality of life, but it also has real financial costs. This poster reviews the role of health care providers, patients, and broader social support systems in improving adherence. Areas for further research are also identified.

KIRKHOF CENTER GRR 097

Mothers' Promotion and Support of Toddlers' Positive Emotion in a Cross-Cultural Perspective

Participants attending 9:00 AM - 10:00 AM

Presenters: Rachel Charbonneau, Sarah Vitale

Mentor: Wolfgang Friedlmeier

European-American norms encourage strong positive emotion expression while Turks and Romanians value more moderate expression. This study aimed to test socialization effects by analyzing cultural differences regarding mothers' promotion and support of their toddlers' positive emotions. We hypothesized that European-American (EA) mothers will encourage positive expression more than mothers in Turkey and Romania, and accordingly, EA toddlers will express more positive emotions. A total of 52 EA, 63 Turkish, and 42 Romanian mother-toddler dyads were observed during a joyful task. Overall, EA mothers expressed positive emotions more strongly than Turkish mothers and EA toddlers showed stronger expression than Turkish toddlers. Cultural differences of mothers' attempts to promote children's positive emotion only occurred in a gender-specific way: EA mothers initiated positive expressions more with daughters than sons while Turkish and Romanian mothers showed less such gender-related differences.

KIRKHOF CENTER GRR 098

Using the Metatarsals as an Additional Method for Assessing Stature at

Verteba Cave.

Participants attending 9:00 AM - 10:00 AM

Presenter: Melissa Strowenjans

Mentor: Gwyn Madden

Human remains excavated from Verteba Cave associated with the Trypolie Culture, indicate the dead were left exposed and remaining parts were eventually deposited in the cave in a commingled yet ritual fashion. Preservation in the cave is excellent. A few elements display sun bleaching and carnivore tooth marks. Minimum number of individuals estimated at Verteba Cave is 36, with 14 males, 8 females, 4 unidentified adults, and 10 subadults. The metatarsals were used as a check against the long bone used to assess stature. Using 36 individuals for the MNI, the 52 metatarsals represents low presence of the expected 360 metatarsals if preservation was perfect. Methods employed in this study to establish stature include Byers et al. (1989), Bidmos (2008), and Cordeiro et al. (2009). Based on metric methods for assessment of stature in the long bones, including the femur, tibia, fibula, humerus, radius, and ulna a comparison is made to stature estimates from the metatarsals.

KIRKHOF CENTER GRR 099

Who am I? An Exploration of Identity Formation: A Vegetarian in a Meat Market

Participants attending 3:00 PM - 4:00 PM

Presenter: Thomas Worm

Mentor: Christine Yalda

This paper explores the development and discovery of an individual as he learns and is exposed to new ideas. Background in relevant information is presented and used to evaluate a later narrative. The conclusion of the paper discusses the interplay between the individual self and the social self.

KIRKHOF CENTER GRR 100

Who Needs Goals: An Analog Experiment Comparing Goal-Free Evaluation & Goal-Based Evaluation Utility

Participants attending 10:00 AM - 11:00 AM

Presenter: Alayna Zielinski

Mentor: Brandon Youker

Systematic research on evaluation can greatly improve a program but in making informed decisions about which evaluation model to choose, there needs to be adequate research literature on the evaluation types. One nearly unexamined type of evaluation is goal-free evaluation (GFE).

GFE is designed to keep evaluators purposefully ignorant of the program's stated goals and objectives. The idea behind GFE is that the evaluator may uncover unintended side effects, or additional goals, which would have gone unnoticed looking solely for specific goals and objectives. In this analog experiment, GFE is compared with goal-based evaluation (GBE). GFE and a GBE were simultaneously and independently used to evaluate the same training program. After reading each of the evaluation reports, thirty evaluation users completed a semantic differential questionnaire to assess their attitudes toward the utility of each report and then participated in a follow-up focus group.

KIRKHOF CENTER GRR 101

Quantification of Light and Gravity Effects on the Giant Internodal Cells of *Chara*

Participants attending 9:00 AM - 10:00 AM

Presenter: Barrett Kyle

Mentor: Mark Staves

Light and gravity have a profound effect on plant development. The goal of this study was to observe the effects of light and gravity on the growth response of the large internodal cells of the plant, *Chara*. Time lapse video was used to monitor the effects of light and gravity on these plants. Blue light at a light intensity of 2.4 μE induced the strongest phototropic response. When the plants were observed in red light at 0.10 μE , no response was shown. This light source was used to observe the gravity response in the plants. Gravitropic curvature was slower than light-induced curvature and had to be observed over 20 hours instead of the 10 hours in the light experiments. This is the first time light- and gravity-induced growth responses were observed on a single cell. A medium-term goal is to isolate RNA from single cells to determine the different genes expressed during the light and gravity responses. We show that we are able to isolate RNA from a single cell.

KIRKHOF CENTER GRR 102

Role of Docosahexaenoic Acid (DHA) and Other Polyunsaturated Fatty Acids on Neural Stem Cell Differentiation

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

Presenters: Daniel Doyle, Steven Durham, Maxwell Phillips

Mentor: Merritt Taylor

Long chain fatty acids have been shown to play a role in the generation of new neurons, or neurogenesis, *in vitro*. In this study, the effects of long chain fatty acids are investigated *in vivo*. Docosahexaenoic acid (DHA) is a long chain fatty acid that has been shown to promote neurogenesis *in vitro*. In this *in vivo* study chicken embryos were injected with Docosahexaenoic

acid (DHA). After incubation, the tissue samples were analyzed to determine the effect of DHA on neurogenesis. The DHA injected samples in early neurogenesis showed a significant increase in neurons (NeuN+ cells) as compared to the control (BSA only). As neurogenesis progressed, the number of neurons in the control increased, but the number of neurons in the DHA injected samples remained the same. These results suggest that DHA drives differentiation in early neurogenesis at the expense of neural stem progenitor cells in later neurogenesis.

KIRKHOF CENTER GRR 103

The Independent and Interactive Effects of Self-Construal, Regulatory Fit, and Hedonic Experience During Goal Pursuit

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

Presenter: Kelsie Colley

Mentor: Kristy Dean

Hedonic experience, “feeling good” about a goal pursuit, impacts motivation (Bandura, 1997). Also, literature shows that regulatory fit, or “feeling right” from pursuing a goal in a way that sustains one’s orientation toward the goal, can also bolster motivation and subjective experiences (Higgins, 2000). The current study examines whether “feeling good” and “feeling right” have independent or interactive influences on motivation during goal pursuit. We approach this question by defining fit as the consistency between self-construal (independent vs. interdependent) and motivational means (eager vs. vigilant; Lee, Aaker, & Gardner, 2000). The results show that, although hedonic experience influences subjective experiences, regulatory fit also interacts with hedonic experience to dictate when “feeling good” is used to guide subjective experiences. Discussion will center on implications for existing theories and applications for bolstering goal pursuit success.

KIRKHOF CENTER GRR 104

Using the iPad to Promote Self-Management of Social Initiations for a High School Student with Autism Spectrum Disorder (ASD)

Participants attending 2:00 PM - 3:00 PM

Presenters: Hannah Poore, Stephanie Spruit, Jordyn VanderMolen

Mentor: Jamie Owen-DeSchryver

Self-management has been identified as an evidence-based practice for students with autism spectrum disorders (ASD). Traditional self-management systems involve teaching individuals to track and record their behavior using pencil and paper methods. However, due to recent changes in technology, mobile devices can be leveraged to implement self-management systems. In this study, an iPad self-management application was developed and implemented with one high-school student with ASD. We evaluated the effectiveness of this intervention in improving social

initiations using a multiple baseline design across three settings. An increase in the participant's social initiations was found in the intervention phase as compared to baseline data. These results suggest the potential benefit of using the iPad to implement self-management systems, given that the technology is age-appropriate and could be applied to teach a variety of skills to promote independence and social interaction.

KIRKHOF CENTER GRR 105

Arbuscular Mycorrhizal Associations in Fruit Trees at GVSU 's Sustainable Agriculture Project

Participants attending 3:00 PM - 4:00 PM

Presenter: Kennedy Aldrich

Mentor: Jennifer Winther

Most plant species have a symbiotic relationship with fungi called an arbuscular mycorrhizal (AM) association. AM associations have numerous beneficial effects for plants, including increased drought tolerance, pest resistance, plant growth, and improved soil structure. This research characterized the AM associations in the roots of ten fruit trees found at GVSU's Sustainable Agriculture Program using molecular techniques to identify the fungal species based on DNA sequences. Both morphological and sequence data were analyzed to characterize the nature of these associations. A total of 21 unique fungal genotypes were recovered from the fruit trees and the percent of fungal colonization ranged from 11-43%. Our analyses show variation between both the fungal diversity and percent colonization between the different fruit trees. In the future, comparisons between fungal data and nutrient analysis of plants could lead to development of a fungal inoculum designed to benefit plant growth.

KIRKHOF CENTER GRR 106

The Effect of Verb Aspect on Perceived Criminal Intentionality

Participants attending 12:00 PM - 1:00 PM

Presenter: Mackenzie Kibbe

Mentor: Christopher Kurby

Events can be described as currently ongoing or completed through the use of verb aspect. The perfective aspect implies that an action is completed, as in "He *fired* his gun", while the imperfective aspect suggests that an action is ongoing, like in "He *was firing* his gun." Research by Hart and Albarracín (2011) suggests that verb aspect influences attributions of intentionality. When actions were presented in the imperfective verb aspect, participants indicated that actors were more intentional in their actions, the event descriptions elicited more vivid mental images of the actions, and the actors had more criminal intent. Our experiment is part of an American Psychology

Society replication project. Students read a case report and answered questions that assessed criminal intent, detailed processing, and intention attribution. Analyses indicated that the results did not replicate, which reduces our confidence that verb aspect changes perceptions of actor intentionality.

KIRKHOF CENTER GRR 107

Advancement in Parkinson s Diagnosis: MicroRNAs as Parkinson’s Disease (PD) Biomarkers.

Participants attending 2:00 PM - 3:00 PM

Presenters: Aaron Ripley, Sapana Shinde

Mentor: Sok Kean Khoo

Parkinson’s Disease (PD) is the second most common neurodegenerative disorder affecting 1-2% of the population over 60 years old. The disease is clinically characterized by motor symptoms such as resting tremor, slow muscular movement, rigidity and general postural instability. Regrettably, PD is currently incurable and early detection of PD is challenging. MicroRNAs (miRNAs) have been used as biomarkers for cancer detection and prognosis. Here, an exploratory study was conducted to determine the usefulness of miRNA biomarkers for detecting Parkinson’s Disease using blood serum. In a discovery set, GE microarray analysis identified miRNA expression patterns significantly different in PD patients from normal patients. From these, qRT-PCR was used to demonstrate the reproducibility of the expression of these miRNAs with 91% sensitivity and 100% specificity. A validation set of new patients had a predictive power of 83% sensitivity and 75% specificity using this method.

KIRKHOF CENTER GRR 108

US and Israeli Toddlers’ Emotion Regulatory Skills in a Waiting Task

Participants attending 1:00 PM - 2:00 PM

Presenters: Samantha Schires, Stephanie Spruit

Mentor: Wolfgang Friedlmeier

Research has shown the importance of effective emotion regulation strategies on the development of emotional and social competence in preschool children (Thompson & Goodwin, 2007). We were interested to study younger children in a cross-cultural perspective by comparing European American with Israeli-Jewish and Israeli-Arab toddlers regarding their emotion expression and regulatory skills. N = 111 toddlers and their mothers were observed in a waiting task (delay of gratification). We coded toddlers’ emotion expression and regulatory attempts (self-initiated regulation strategies, mother-dependent strategies, and non-adaptive strategies).

Results showed that cultural differences in toddlers' emotion and regulation efforts were smaller than interindividual differences within each country. Across all three cultural groups, independent strategies were the most effective strategy group for down-regulating negative emotions; non-adaptive strategies rather increased negative emotions.

KIRKHOF CENTER GRR 109

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, 11:00 AM - 12:00 PM

Presenters: Nolan Hayden, Kristi Ruvina

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 110

Does Physical Insecurity Increase Social Sensitivity?

Participants attending 4:00 PM - 5:00 PM

Presenter: Alexander Simmons

Mentor: Kristy Dean

Past research suggests that feelings of social exclusion increase social sensitivity, for example, the ability to distinguish real and fake smiles (Wesselmann et al., 2012). We suspect that this effect occurs because exclusion fosters security concerns, which motivate perceptual and behavioral processes aimed at reconnection. Thus, the current study examines whether survival concerns increase ability to distinguish between genuine and false signs of acceptance. After completing a questionnaire assessing belief in a dangerous world, participants imagined experiencing a survival threat or exercising (control condition) and completed a smile identification task. Preliminary results show that security is associated with more accurate detection of real smiles, but only when the world is viewed as relatively safe. Discussion will center on strategies for coping with physical insecurity and exclusion.

KIRKHOF CENTER GRR 111

Shedding Light on the Phytochrome System: Modification of the LRB E3 Ligase

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

Presenter: Aron Rottier

Mentor: Matthew Christians

Plants utilize a complex system of light responsive pathways to initiate discrete changes in the plant cell's growth and development. The Light Regulating BTB (LRB) E3 ligase is utilized in the ubiquitin-proteasome system (UPS) to target a group of photoreceptors, the phytochromes, for degradation. The Phytochrome B complex is stable in far-red light, but broken down in red light by the LRBs. Evidence suggests that the LRBs become activated in red by forming a complete E3 ligase complex which includes the protein Cul3. We propose to investigate how the LRBs become activated in red light in the model plant *Arabidopsis thaliana*. Specifically, we want to investigate the possibility that the LRB proteins are modified by Nedd8 (a small ubiquitin-like modifier) in response to red light. The results of an in vitro assay will improve our understanding of how plants respond to different light environments, and also provide insight into neddylation and its effect on protein activity.

KIRKHOF CENTER GRR 112

Intermodulation Distortion in Superconductive Passive Circuits

Participants attending 10:00 AM - 11:00 AM

Presenter: Sean Hamilton

Mentor: Geoffrey Lenters

Microwave intermodulation distortion (IMD) was examined in a YBCO superconducting thin-film hairpin resonator at 840 MHz. Measurements of the temperature dependence of IMD near TC support the view that the nonlinear Meissner effect is responsible for the occurrence of both 2nd and 3rd order IMD tones near TC as well as their suppression in an applied magnetic field. However, at lower reduced temperatures (T/TC less than 0.95), where the influence of the nonlinear Meissner effect is less pronounced, 3rd order IMD is unaffected by a static magnetic field, while 2nd order IMD decays exponentially after a static magnetic field is removed with a temperature dependent time constant. It is apparent that the magnetically induced remnant vortex state contributes to the 2nd order nonlinearity, but not to the 3rd order nonlinearity, and that this effect is diminished close to TC due to degradation of the remnant vortex state.

KIRKHOF CENTER GRR 113

Investigating Facile Methods for the Synthesis of Alpha-Halo Ketones

Participants attending 1:00 PM - 2:00 PM

Presenter: Amanda Stevens

Mentor: Felix Ngassa

Alpha-halo ketones are versatile synthetic intermediates. A novel alpha-halogenation of acyclic and cyclic ketones using NBS has been developed. The scope and limitations of this method using NBS and other halogenating reagents is being investigated. Preliminary results will be presented.

KIRKHOF CENTER GRR 114

Ru/C-Catalyzed Reactions of HMF

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

Presenter: Joel Francis

Mentor: Dalila Kovacs

Ru/C-Catalyzed Reactions of HMF

5-hydroxymethylfurfural (HMF) is a versatile agent in the synthesis of biofuels from biomass. HMF can be hydrogenated to 2,5-dimethylfuran (DMF), and DMF can be further hydrogenated to form 2,5-dimethyltetrahydrofuran (DMTHF). Both DMF and DMTHF are promising fuel additives, and their syntheses are under investigation. This project was inspired by recent literature (Mitra *et. al*, 2014) in which Pd/C was used to catalyze the reactions of HMF. In this study, Ru/C is used to catalyze the decarbonylation, hydrogenation and hydrogenolysis of HMF. Decarbonylation to furfuryl alcohol is carried out in an open-vessel setting, with no additives. Hydrogenolysis and hydrogenation are carried out in a Parr reactor. The products are analyzed by NMR with mesitylene or nitromethane as external standards. The results of our study allow us to compare the efficiency and specificity of Ru/C vs. Pd/C as catalysts in HMF conversion to biofuel additives.

KIRKHOF CENTER GRR 115

Access & Inclusion - Our Needs as LGBT and Disabled Participants

Participants attending 12:00 PM - 1:00 PM

Presenter: Leslie Boker

Mentor: Kathleen Underwood

Starting from the social model of disability and the joined history of discrimination on the basis of gender nonconformity, disability, race, and immigration status, I will explore the intersection between LGBT and Disabled experience to illuminate ways of thinking about gender, ability, and marginalization.

KIRKHOF CENTER GRR 116

GIS Compilation of GVSU Ravine Geomorphology and Geology Mapping

Participants attending 11:00 AM - 12:00 PM

Presenter: Ashley Brady

Mentor: Peter Wampler

Grand Valley State University has been a growing commuter campus since its establishment 1960. As the student population has grown, the demand for infrastructure has increased. This increase in impermeable surfaces, such as parking lots and buildings, throughout campus has accelerated erosion throughout the fragile ravine system in close proximity due to stormwater runoff. A Field Methods class at Grand Valley State University has collected geologic and geomorphic data since early 2000s on the ravine systems throughout campus. This data includes mass wasting features, erosion control structures, other geomorphic features, and geologic layers found within the ravines. These paper maps will be imported to ArcMap by mapping geologic and geomorphic features as lines, points, and polygons. The compilation of this data will 1. demonstrate the erosion the ravines have observed since 2003 and 2. help in future recommendations for restoring and reducing erosion within this fragile system.

KIRKHOF CENTER GRR 117

Modern Humans vs. Non-Human Primates

Participants attending 1:00 PM - 2:00 PM

Presenter: Brandi Fleming

Mentor: Melissa Tallman

The purpose of this project is to show the similarities and differences between the arm musculature of non-human primates and modern humans in detail. I will look at the difference in the proportion of muscle mass in the non-human primate compared to that of a modern human. The non-human primate has different upper limb muscles because they are quadrupedal, meaning that they use their arms as well as legs in locomotion. This project will also examine gross differences in musculature, such as the fact that humans have one anconeus muscle and non-human primates have two. Finally, the ways that individual differences that helped each species adapt to their specific environment will be analyzed.

KIRKHOF CENTER GRR 118

Clinical Mutations of the Class D β -Lactamase OXA-51, and Their Effect on Hydrolytic Efficiency Against Various β -Lactam Antibiotics

Participants attending 9:00 AM - 10:00 AM

Presenter: Kyle Sugg

Mentor: David Leonard

There are four classes of β -lactam antibiotics, all of which possess a β -lactam ring (i.e. a four-membered cyclic amide). It is this ring that allows the antibiotic to bind to the bacterial cell wall synthesis machinery, and prevent further growth. To combat this, bacteria produce β -lactamase enzymes, which hydrolyze the β -lactam antibiotics. OXA-51 (a class D β -lactamase) is only weakly able to hydrolyze β -lactam antibiotics. Clinical mutations of OXA-51 have shown many of the same active site residues being mutated into a few select amino acids. The purpose of this project is to perform mutagenesis, isolate the mutant protein and run enzyme kinetics to understand how these amino acid changes alter the binding affinity (K_m) and turnover rate (k_{cat}) of the enzyme. Our results show that the OXA-173 mutant (OXA-51 I129V W222L P226L) displays a large gain of function across all four classes of β -lactam antibiotics.

KIRKHOF CENTER GRR 119

How do CMPO Ligands Bind to Lanthanides? A Combined Experimental and Computational Study

Participants attending 9:00 AM - 10:00 AM

Presenter: Andrew Vanderweide

Mentor: Richard Lord

In the modern world the sustainability of energy resources is of paramount importance. One of the most important energy options is nuclear energy, however, the lanthanide and actinide waste associated with these processes can be detrimental to the environment and human health. Our goal is to design molecules which sequester the associated wastes so they may be disposed of in a responsible manner. A first step in the rational design of these sequestering ligands is to understand how they interact with a metal center. Experimental and computational results towards understanding the fundamental interactions between CMPO ligands and lanthanide metals will be presented.

KIRKHOF CENTER GRR 120

Comparison of the Effect of Dynamic Stretching and Cardio Warm Up Procedures on the Peak Torque Output at the Knee Joint

Participants attending 9:00 AM - 10:00 AM

Presenter: Alexandra Hickox

Mentor: Heather Gulgin

Stretching and warming up muscles have both been traditional ways of preparing for athletic

events. Studies have indicated that both dynamic stretching and a cardio warm-up can decrease the risk of injury and increase muscle power. However, previous studies often mixed a warm-up with stretching in the methods and thus the results are inconclusive as to the independent effects on muscle power. Thus, the purpose of this pilot study is to test muscle power of the quadriceps and hamstrings in three different conditions (no warm-up or dynamic stretching, only warm-up, only dynamic stretching). One subject will have their quadriceps and hamstring peak torque recorded on a Biodex dynamometer for each condition. The Biodex will use the peak torque values to calculate muscle power.

Oral Presentations, Abstracts & Schedule

Beginning at 9:00 AM

KIRKHOF CENTER 1104

An Oak Wilt Risk Assessment: Distribution, Density, and Health of *Quercus* spp. in P.J. Hoffmaster State Park

Presenter: Jack Gibson

Mentor: Carol Griffin

The fungal pathogen *Ceratocystis fagacearum* and its associated tree disease —oak wilt—are causing damage to the old growth forest of P.J. Hoffmaster State Park in Muskegon, Michigan. The disease was first discovered in the park in 2006, and with time it has continued to do damage. Firewood cut from infected oaks and brought into the park by campers is the suspected source of the pathogen. Oak wilt warrants special attention due to its ability to spread rapidly underground once established, killing trees in the red oak family within six weeks. Whole stands are at risk due to the ability of the disease to transmit from tree to tree via their root grafts. This study produced a risk assessment map of the Hoffmaster Campground and adjacent dune areas, and will provide baseline quantitative data (e.g., DBH and height) for the threatened oaks. Park managers and scientists can use the risk assessment map to streamline control efforts.

KIRKHOF CENTER 1142

The Effects of Exercise as an Intervention for Persons Diagnosed With Cancer

Presenters: Myah Callahan, Ashley Heick, Jennifer Huang, Chelsey York

Mentor: Teresa Beck

The American Cancer Society estimates there will be more than 1.6 million new cases of cancer diagnosed in 2015. Persons diagnosed with cancer often experience a variety of adverse effects from treatment including anxiety, fatigue, and pain. Persons diagnosed with cancer and undergoing treatment were once told to get additional rest and avoid activities that were physically demanding. In the past several years, the use of exercise as an intervention has increased due to its physical and psychological benefits for a growing number of cancer populations. This presentation will review the empirical evidence gathered from a systematic review of literature of the effects of exercise as intervention for persons diagnosed with cancer.

KIRKHOF CENTER 2201

Let's Talk: Conventional Medicine and Complementary and Alternative Medicine Practitioners

Presenters: Julia Bradley, Lauren Wiltshire

Mentor: Haiying Kong

The heightened consumerism nowadays has prompted patients to actively seek care and utilize a large range of medical practices, such as Complementary and Alternative Medicine (CAM), beyond the domain of Western conventional medicine (biomedicine). This qualitative research takes a different aspect from previous research to explore how chiropractors perceive their roles in the health care system and what can be done to promote communication and collaboration with the conventional health care providers to offer the best care to patients.

KIRKHOF CENTER 2215

Loading Impacts on Sawyer Creek and the Pigeon River Watershed and Best Management Plans.

Presenter: Schae Stevens

Mentor: Erik Nordman

The Pigeon River watershed has been a site of intense research due to high levels of loading. Research done by MacDonald et al. found that much of the Pigeon River is polluted by high levels of phosphates, nitrates and sediments. The objective of this study was to find the main sources of pollution in the stream, and develop management plans for the locations in order to better the health of the stream and not reduce the farming production too much. Sawyer Creek, a tributary of the Pigeon River, is the focus of this study. Several locations were tested for phosphates, nitrates, and suspended solids by taking a water sample and evaluating it in the lab. Discharge was also taken, and macroinvertebrates sampled at each location. Each of these samples were also taken at base flow and peak flow to better understand the amount of pollutants flowing through the stream at all times of the year. High levels of nutrients were found, and this information allows us to better manage the stream land.

KIRKHOF CENTER 2216

Soil Remediation of Degraded Agriculture Field

Presenter: Joseph Grose

Mentor: Erik Nordman

A 27 acre plot of land in Ottawa County has been used for corn and soybean agriculture, with one third of the plot serving as a wetlands area. However, water does not percolate through the soil, or

flow properly into the wetland area, which has reduced crop yields. With the vision of turning the agriculture section of land into an organic, sustainable farm, the drainage needs to be corrected. A soil remediation plan has been developed that would improve the percolation and drainage over the entire area. We will be using native plants and grasses to break through the compacted soil, which will also help replenish soil nutrients. When remediated, the farm and wetland area will be used for community education of sustainable farming practices, provide produce for the community, and provide a wetland habitat for many different animal species.

KIRKHOF CENTER 2263

The Helsinki Accords

Presenters: Kendra Smith, Joseph Williams

Mentor: James Goode

The Helsinki Accords, occurring in 1975, was a controversial conference for the US to attend. The conference was suggested by the Soviet Union to settle post-World War II borders. The American people believed that if President Ford attended the conference, he was appeasing the Soviets. The conference included discussion of borders and also a section on human rights. The conference had benefits, such as officially ending World War II. However, the treaty signed at the conference was considered a weak document. The short-term effects included Ford's loss in the 1976 election, but the long-term effects brought about the disbandment of the Soviet Union.

KIRKHOF CENTER 2266

Student Opinion Surveys: What's the Use?

Presenter: Kristen Daniels

Mentor: Mary Banghart

Student Opinion Surveys (SOS) and Student Course Evaluations (CSE) continue to spark debates about their reliability and validity as measurements of student learning and teaching effectiveness. Are students really reporting the truth in their scoring and comments or does miscommunication jeopardize the validity of reporting? Much research has been done on the topic but it is missing one key element, the student's perspective. In this presentation, we will discuss the history of these surveys, what current literature has to say on the topic, as well as examine strategies to ensure students' honest participation in these surveys. By creating a shared understanding of why these instruments are so important to both faculty members and students, this project hopes to enhance their utility as an effective means for improving student learning.

Beginning at 9:30 AM

KIRKHOF CENTER 1104

An Assessment of the West Michigan Environmental Action Council's Environmental Education Program

Presenter: Alyssa Ellen

Mentor: Carol Griffin

Research indicates that students in K-12 classrooms have misconceptions about the environment. To ensure students and teachers both have correct information about environmental issues, environmental education programs can be introduced to schools. Locally, the West Michigan Environmental Action Council has created the Teach for the Watershed Program, an environmental education program focused on watersheds. The hope is to get students interested in the environment when they are in middle school so that they can make environmentally-conscious decisions as they grow into adulthood. To gauge its effectiveness, tests given to participants in this program were analyzed. An independent samples t-test was performed on the average pre-test and post-test scores to see if a significant change had occurred. For the 2013-2014 school year, preliminary analysis indicates that this program has increased students' knowledge of nonpoint source pollution and its associated impacts on local waterways.

KIRKHOF CENTER 1142

The Benefits of Adventure Therapy as an Intervention for Youth at Risk

Presenters: Katherine Andert, Ethan Hunter, Kristen Kelly, Kathleen Neaton

Mentor: Teresa Beck

Today's youth are exposed to a variety of influences that can make them more at risk for injury, academic failure and poor health. Teens whom are likely to be more at-risk are usually those that lack a strong support system at home, as well as teens who are not coping well with the different challenges that they are facing. Adventure therapy is an intervention that is often used when programming for youth at risk. Adventure therapy utilizes ropes courses, problem-solving activities, wilderness experiences, and trust and teambuilding activities to promote growth. This presentation will share the results of a systematic review of literature that was conducted to determine the benefits and outcomes from using adventure therapy as an intervention with youth at risk.

KIRKHOF CENTER 2201

Continued Study on the Effects of Embryonic Lead Exposure in Zebrafish

Presenter: Natosha Mercado-Idziak

Mentor: Xiaojuan Xu

Lead (Pb^{2+}) is a common environmental toxin that is known to have harmful effects on nervous

system development. The zebrafish has become a useful model for studying the effects of environmental toxins because of the ease with which zebrafish can be bred and cared for. Previously, we showed that embryonic Pb^{2+} exposure may impair zebrafish learning. However, our sample sizes were small, so the current study focused on increasing sample sizes. The active avoidance paradigm was used to further explore the effects of early Pb^{2+} exposure. Adult zebrafish were placed in a shuttle-box separated into two compartments by a divider. On Experimental Day 1, they were trained to associate a light with an electrical shock and to avoid the shock by swimming under the divider to the dark compartment. Testing for avoidance learning occurred on Experimental Day 3. The results showed that embryonic Pb^{2+} exposure significantly impaired learning in adult zebrafish in a dose-dependent manner.

KIRKHOF CENTER 2215

Adaptive Management Plan for Reestablishing Native Vegetation in a Garden in North Branch, Michigan

Presenter: Lauren Lucas

Mentor: Erik Nordman

An adaptive management plan served to solve a variety of problems that arose from an unmanaged garden in North Branch, Michigan. Cultivation for exotic flowers, exposed soil, decreased soil quality, and invasion of undesired plant species had led to degradation of the site. Vegetation sampling was conducted to collect information about what species were present, the number of individuals, and their average stem density. Soil samples were collected in order to identify the texture, organic matter fraction, pH levels, and any nutrients. Undesired plants were removed manually or treated with herbicides. Soil quality was improved by applying fertilizer, compost, and sulfur or lime. Historically native plants were researched and planted. Improved soil quality benefited native vegetation growth which provides cover to protect from moisture loss or nutrient leaching. Native plants require less fertilizing, watering, or pesticide treatments, and they provide habitats for insects and wildlife.

KIRKHOF CENTER 2216

Democratic Peace? A Case Study on Overthrow of Mohammad Mossadegh

Presenter: Amanda Lowery

Mentor: Thomas Walker

Peace between democratic states is one of the strongest findings in international relations. According to Bruce Russett (1993) "the culture, perceptions, and practices that permit compromise and the peaceful resolution of conflicts without the threat of violence" can explain why democracies are at peace with one another. The coup d'état in 1953, orchestrated by the United States and

Great Britain, overthrew the democratically elected Prime Minister Mohammad Mossadegh of Iran challenges the cultural expectations of the Democratic Peace Theory. In this study, I explore why the United States and Great Britain failed to compromise and work toward a peaceful resolution of this conflict. This case raises questions in regard to the cultural explanations of the Democratic Peace Theory.

KIRKHOF CENTER 2263

Gay and Greek: A Pilot Study on the Deployment of Gender by Gay Men in Greek Life

Presenter: Anthony Clemons

Mentor: Laurel Westbrook

Using data from qualitative interviews, this pilot study aims to highlight the lived experiences of gay men within fraternities at a large Midwestern university. The data suggests that gay men in fraternities conceal behavior socially labeled as “gay” and therefore non-masculine. They do this due to the rules of hegemonic masculinity within organizations that value heterosexuality. This concealing leads members to create special intragroup networks within their organizations where they aim to find validation and support that they may not receive from the rest of their brothers. Using West and Zimmerman’s (1987) theory of “doing gender,” the author argues that gay men’s involvement in Greek Life influences how these men strategically deploy their gender. There are embedded inequities in the Greek system that promote certain expressions of gender over others while also adding to gay men’s college experience, preparing them for the “real world” where the gender system operates.

KIRKHOF CENTER 2266

Using Climate Models to Investigate the Effects of Climate Change on the Mediterranean Sea Fish Species

Presenter: McKenna Smith

Mentor: Elena Lioubimtseva

The Mediterranean Sea with its warm waters and ease of accessibility, is one of Europe’s primary sources for fishing. I will investigate the detrimental effects that climate change for the Mediterranean Sea would have not only on the species living inside, but the economies that are reliant on fishing as well. Utilizing data from IPCC, the Model for the Assessment of Greenhouse-gas Induced Climate Change a Regional Climate Scenario Generator, Global Ocean Data Analysis Project, and peer reviewed literature will allow me to make predictions on the warming of the Mediterranean Sea in the next 85 years. I expect to see that this increase in water temperature will directly change the fish species living in the sea, but also will have a ripple effect with the fisherman

who make a living off them, and the people all over Europe, Africa, and Asia who benefit from the fishing industry in the Mediterranean.

KIRKHOF CENTER 2270

Does an Increase in Religious Behavior and Commitment Have an Effect on Party Identification in American Catholics?

Presenter: Theodore Woodcock

Mentors: Paul Cornish, Whitt Kilburn

American Catholics are the largest religious voting bloc in the United States. They have traditionally been affiliated with the Democratic Party, but recently there has been a shift in their political party identification. With the shift of Catholics to a more neutral-right position, the Democratic Party can no longer count on the Catholic vote to turn out for their candidate. Are there factors that have an influence on which political party preference American Catholics choose? Using the American Catholics' responses to the American National Election Studies (ANES), two factors were used to determine whether the strength of religious commitment in behavior changed political identifications. When the two factors are incorporated in the model, the results are not so clear. There is little evidence to show the higher levels of religious behavior and commitments play a role in political party identification among American Catholics.

Beginning at 10:00 AM

KIRKHOF CENTER 1104

Policy Adaptation and Changes in Natural Resource Management in the United States and Latin America: How the U.S. Model has Evolved

Presenter: Sarah Orchard

Mentor: Carol Griffin

The United State (U.S.) has long been recognized as the father of modern natural resource management. Our policies and practices have been adopted and modified worldwide by other nations. One key proponent to early U.S. natural resource management was obtaining resource-rich land and prohibiting human habitation within its boundaries. However, this practice is no longer acceptable or practical forcing nations to use different approaches to secure or manage high natural resource areas. This report discusses and compares the history and changes made to the U.S. natural resource management model pertaining to forest management in both the U.S. and Latin America, as Latin America is restructuring their forest management to better fit acceptable practices. This report examines the difficulties and impact such policies have had culturally and from an implementation and management perspective within each area respectively.

KIRKHOF CENTER 1142

Benefits of Dance as an Intervention for Individuals Diagnosed with Depression and Depressive Symptoms

Presenters: Lisa Bloom, Alissa Cohen, Abigail Dykstra, Kristen Emmorey, Rebecca Roeters
Mentor: Teresa Beck

Dance and movement have been used for many centuries to improve the mental and physical well-being of a person. While dance is a form of creative expression, it can also help a person cope with emotional problems, including depression. Individuals who participate in dance gain a fuller understanding of their experiences. It helps individuals become more familiar with themselves, the way their body feels, and the way they feel within their body; they become engaged. A systematic review of literature will be presented describing the therapeutic use of dance and its effects on depression and depressive symptoms.

KIRKHOF CENTER 2201

How Teen Mothers in Grand Rapids Feel About Reading

Presenter: Kevin Joffre
Mentor: Amy Masko

Research suggests that teen mothers tend to provide fewer literacy opportunities for their children than older mothers do. This is problematic, since low literacy has been linked to poor academic achievement. As a result, teen mothers and their children tend to be drawn into cycles of poverty. The goal of this project was to interview teen mothers in the Grand Rapids community in order to better understand their perceptions of reading and discover the kinds of books that interest them. Based on their responses, we have recommended a reading intervention program that targets the unique interests and needs of this population. The purpose of such a program is to encourage teen mothers to read more often, as well as make literacy a larger part of their children's lives.

KIRKHOF CENTER 2215

Rogue River Adaptive Management Plan for Monitoring and Improving Water Quality via Macroinvertebrates as Bioindicators

Presenter: Dane Gorris
Mentor: Erik Nordman

The Rogue River, which drains over 200 square miles of southwest Michigan, terminates in the Grand River, Michigan's longest river. Given such a close proximity to Grand Rapids the Rogue River is subject to a host of negative influences. Agricultural runoff, riparian zone fragmentation, damming of the mainstem, human waste introduction, and increasing developmental encroachment

threaten the ecological health of the Rogue River. If conventional agricultural, industrial, or residential practices within the watershed continue, the risks of losing this unique and valuable resource become even further quantifiable. To sustain the ecological health and benefits of the river and provide cold, clean water for the continuing benefit of the metropolitan residents, a management plan must be enacted to monitor and save the Rogue River from further degradation. This study seeks to examine the current conditions of the Rogue River and to establish a monitoring plan to improve water quality of the river for future generations.

KIRKHOF CENTER 2216

Removal of *Elaeagnus umbellata* (autumn olive) from Farmlands Located in the Northeastern Portion of Michigan's Lower Peninsula

Presenter: Autumn Clements

Mentor: Erik Nordman

Elaeagnus umbellata (autumn olive) is an invasive plant species that commonly takes over old fields, and once the shrub becomes present it spreads at a rapid rate. This causes a decrease in productivity of fields, costing farmers money. The management plan that will be created will focus on one of these farms. To solve this problem baseline data will be collected, including the number of autumn olive shrubs present, canopy cover and stem diameter. The hay production of the fields with autumn olive could be greatly increased with the removal of this species. This is important because it decreases the production value of the land, reducing money received from hay sales or what could be food for animals.

KIRKHOF CENTER 2263

Reconsidering Revolutions: The Impact of Breakthrough Elections on Democratization in Croatia, Serbia, Moldova, and Georgia

Presenter: Chelsea Kendzierski

Mentor: Heather Tafel

Recent research highlights the democratizing impact of breakthrough elections in post-communist Eurasia, some of which have been accompanied by the so-called color revolutions. Scholars have noted improvements in democratic procedures in countries where electoral breakthroughs occurred. Drawing on evidence from Croatia, Serbia, Moldova, and Georgia, this paper investigates the extent to which individual breakthrough elections contributed to democratic development. While these countries have experienced overall progress, improvements in some areas, such as civil society development and the autonomy of media outlets, have been less robust than one would expect. Contrary to the conclusions of previous studies that this uneven democratization process is the result of longer-term structural conditions, this analysis examines the ways in which actors

respond to domestic and international structures to show how elite decisions can be critical in shaping governance trajectories.

KIRKHOF CENTER 2266

The Practicality, Necessity, and Methodology in Consciously Constructing Our Philosophical Questions

Presenter: Jeremiah Cameron

Mentor: Stephen Rowe

This essay not only explores the necessity in understanding presuppositions within our philosophical and other questions, but also attempts to discuss the method by which this understanding may be reached. The essay uses a background of mindfulness and contemplative thought as well, as a phenomenological disposition, to parse how such a presupposition-less understanding may regularly be reached. In addition, this essay discusses the practicality, even necessity, in using such a disposition (referred to in this essay as “making transparent”), such that questions, as well as ontic knowledge, and their necessary presuppositions may be more consciously constructed. The essay concludes by applying this method of presupposition-less understanding in order to “make transparent” a few current and historical philosophical questions.

KIRKHOF CENTER 2270

Donor Registries, First-Person Consent Legislation, and the Supply of Deceased Organ Donors

Presenter: Adelin Levin

Mentor: Kevin Callison

From 1988 to 2001 the supply of transplantable organs grew by 140%, an accomplishment overshadowed by the 650% increase in the number of individuals awaiting a transplant. In response to the growing shortage and historically high family refusal rates, nearly all states have established donor registries and passed first-person consent (FPC) legislation, which allows a donor card or one’s name on a state donor registry to stand as sufficient consent to donate and prevents the family from overriding the decision of the donor. We exploit varied timing in state adoption of donor registries and FPC legislation to examine the corresponding change in the supply of organ donors. We find that relative to non-adopting states, simultaneous adoption of a donor registry and FPC law leads to increases in donation rates of 9-16%. We provide evidence that the increase in donation rates is driven by the adoption of donor registries and that FPC legislation has little effect on its own.

Beginning at 10:30 AM

KIRKHOF CENTER 1104

The Catholic Enlightenment in Europe

Presenter: Cayla Dwyer

Mentors: Ellen Adams, David Eick

The complexities of the age of Enlightenment allowed for the existence of a Counter-Enlightenment as well as another distinct group, commonly referred to as the Catholic Enlightenment. The Catholic Enlightenment occurred from about the eighteenth to the early nineteenth century, and accepted the idea that society was in need of improvement, going so far as to call for institutional reforms of the church itself. Simultaneously, it rejected the radical ideas of the philosophes, using reason to scrutinize and disprove the critiques of Catholicism. This movement was the middle ground between the two extremes, advocating for a moderate Enlightenment which would still allow for the Church to maintain its position in society. In this way the Catholic Enlightenment represents an intellectual movement that was poised in a precarious and essentially contradictory situation of maintaining traditional values while simultaneously entreating for reform.

KIRKHOF CENTER 1142

The Effects of Bibliotherapy on Children Who Have Experienced Traumatic Events

Presenters: Zoe Brennan, Melissa Lankin, Rachel Morse, Brandi Rix

Mentor: Teresa Beck

Bibliotherapy can assist children in healing and developing social skills due to social, emotional, or personal problems. By reading stories about and identifying with characters and problems within a book, children can relate themes and experiences to their own lives. Bibliotherapy includes storytelling, reading literature, children's drawings, and many other specific bibliotherapy techniques. This presentation provides the findings from a systematic literature review which examined the outcomes of bibliotherapy when used with children who have experienced traumatic events. The use of bibliotherapy as a recreational therapy intervention will be discussed in terms of improving children and family outcomes and in advancing professional practice.

KIRKHOF CENTER 2201

Popular Opinion of Ujamaa in Igoda, Tanzania

Presenter: Nina Fader

Mentor: Norma Flores

While studying abroad in Tanzania, snowball sample research was conducted to find what the personal narratives of thirteen rural villagers in Igoda who experienced Ujamaa reveal about the implementation of Operation Vijiji and the achievement of Ujamaa goals. Ujamaa was a post-

independence socialist policy implemented by president Julius Nyerere. He had a grand plan to make Tanzania self-reliant that entailed the people living close together in new settlements and farming on a communal plot to hopefully increase food production and make social services available to everyone. The execution of Ujamaa relied heavily on the relocation of millions of Tanzanians under Operation Vijiji. Academic literature would suggest that Ujamaa was a failure for various reasons, but the goal of this research was to hear the popular opinion on Ujamaa. Was it as neo-colonialist as literature would suggest or did communal living positively affect the lives of Tanzanians?

KIRKHOF CENTER 2215

Sand Prairie Restoration in the Huron-Manistee National Forest Using Fire and Herbicide

Presenter: Kaitlin Alvarez

Mentor: Erik Nordman

Sand prairies in Michigan have rapidly declined both in quality and quantity due to agriculture, residential development, and fire suppression. The few prairie ecosystems that remain have been taken over by non-native species. We established a sand prairie restoration experiment in the Huron-Manistee National Forest, Michigan in 2013 to evaluate different restoration methods for increasing species diversity and density of native plants while also decreasing density of non-native plants. Specifically, we are testing combinations of herbicide and fire treatments to determine the best method for a full sand prairie restoration. Results from 2014 will be used in this analysis to determine which approach works best for achieving ecological objectives in a sand prairie restoration.

KIRKHOF CENTER 2216

Solar Panel Implementation at GVSU

Presenter: Jeremiah Hepner

Mentor: Erik Nordman

Grand Valley State University relies too much on unsustainable energy that is detrimental to the overall health of the community and the planet. Therefore, it is crucial to find a more desirable alternative to supply GVSU's energy needs without causing other negative effects. The objective of this study is to reduce GVSU's reliance on unsustainable energy and to evaluate the potential effects that solar panels will have on GVSU and the surrounding areas. The solar panels would be installed on nearby fields and will have a detrimental effect on habitat suitability for some species. However, using the energy from the sun in conjunction with electricity from the grid would cut the costs of GVSU's energy needs by 10% by 2030. It is crucial to implement these solar panels while

causing the least amount of harm to the vegetation and wildlife in the area as possible.

KIRKHOF CENTER 2263

A Fight So Impassioned: The Struggle Over School Consolidation in Michigan, 1950-1970

Presenter: Ray Anthony Kim Jeroso

Mentor: Matthew Daley

Few things symbolize community spirit more than the local school. The issue of consolidating public schools has been a heated topic in the United States since their creation in the nineteenth century. The consolidation of rural and small town schools reflects the broader changes in population, educational achievement goals, cultural attitudes, and public policy. This project examines the debates at the state and local level that occurred in Michigan regarding school consolidation during the peak years from the 1950s to the 1970s. The increased role of the state in education policy, funding, the creation of county-level Intermediate School Districts (ISDs) and Regional Educational Service Agencies (RESAs), and the merging of school districts in Michigan significantly altered the interaction of schools and their communities. The rapid growth of suburbs, racial and class segregation, and funding shaped these debates in ways their participants did not always realize.

KIRKHOF CENTER 2266

Saracen Souvenirs and Islam: The Crusades, Memory, and Contemporary French Identity

Presenter: Meagan Roche

Mentor: Deana Weibel-Swanson

Recently France's Muslim immigrant population has grown substantially, creating tension between features of Islam and what France defines as distinctly French. The question of national identity makes France's history with Islam in the Crusades (and Reconquista) particularly relevant. With the Crusades marking the reclamation of an imagined European identity, this history connects to the perceived Islamic threat in modern times. Tourism surrounding this history both engages and represents contemporary understandings, with responses varying from fantastical simplification to vandalism. This study explores France's contemporary "identity crisis" fought in the retelling of history at tourist sites linked to the Crusades.

KIRKHOF CENTER 2270

Rising Veterinary Student Debt, U.S. Veterinary Maldistribution Issues, and the Veterinary Medicine Loan Repayment Program

Presenter: Whitney Wells
Mentor: Terry Trier

The purpose of this research is to analyze various aspects of the Veterinary Medicine Loan Repayment Program and promote awareness of the issues surrounding it. This was accomplished by reviewing articles published in scholarly veterinary journals. The program was designed primarily to alleviate shortages of food-animal veterinarians in rural areas. There is not necessarily a nationwide veterinary shortage, but more of a maldistribution of veterinarians both geographically and within sectors of the field. Veterinarians who settle in designated shortage areas and fail to meet the requirements to participate in the program often struggle to succeed financially due to low population densities and limited economic wealth. Increased student debt is worsening their chances of survival. A lack of data about the veterinary workforce has caused significant problems in improving the Veterinary Medicine Loan Repayment Program as well as implementing other ways to aid the current situations.

Beginning at 11:00 AM

KIRKHOF CENTER 1104

Writing in Motion: Using Technology to Teach Composition

Presenter: Larissa Babak
Mentor: Laurence Jose

Since the late 1990s, writing studies research has shown the growing relevance of technology in the writing classroom. Scholars like Cynthia Selfe, Gunther Kress, and the New London Group have emphasized the role of technology for expanding our definitions of texts and complicating our approaches to literacy and writing.

Drawing from the latest theories of composition and multiliteracies, this presentation will explore how technology and multimedia can be used in the writing classroom. Specifically, I will discuss the ways in which recasting written texts in a multimodal format allows readers to identify, emphasize, and explore the deeper meanings of the alphabetical mode. To provide a case study for the discussion, I will illustrate the theory by showing examples of kinetic texts that I created and explain how I used technology to emphasize rhetorical moves and specific aspects of the original texts.

KIRKHOF CENTER 1142

Therapeutic Outcomes of Animal Assisted Therapy as an Intervention for Children with Disabilities

Presenters: Brianna Bunker, Erika Junge, Zoe Stiemann, Rachel Winqest

Mentor: Teresa Beck

Animals and humans have a long history of having a special bond. This bond has been a source of comfort for persons experiencing physical or emotional challenges. Animal Assisted Therapy (AAT) builds on this pre-existing animal-human bond. Due to this natural relationship, AAT has the ability to assist persons increase their physical, social, emotional, and cognitive functioning. This presentation will provide the outcomes of using AAT as a therapeutic intervention for children with disabilities as identified from a systematic review of the literature.

KIRKHOF CENTER 2201

A Problème des Rencontres

Presenters: Jeremy Kleine Deters, Anna Plant

Mentor: Feryal Alayont

A rook polynomial is a polynomial that counts the placements of non-attacking rooks on a board. One of the applications of rook polynomials is pairing up two items with restrictions on which items can and cannot be paired. An example of this is at a secret santa party with 5 people. Each person brings a gift to give to another person and no person can receive the gift that they brought. We create a board so that the people bringing gifts correspond to the rows of the board and the gifts themselves correspond to the columns. Each placement of a rook on the board will be interpreted as the gift given to a specific person. This helps us count the total number of ways that each person can receive a gift that is not their own. We will describe how to solve this classical problem in two dimensions, and discuss how the problem and its solutions can be generalized to three and higher dimensions using the theory of higher dimensional rook polynomials.

KIRKHOF CENTER 2215

Increasing Food Accessibility in West Michigan: A Case Study in the City of Grand Rapids

Presenter: Ashley Stoltenberg

Mentor: Erik Nordman

A food desert is a low-income census tract, where a significant number of residents in an urban area are 1 mile from the nearest supermarket. There is currently one main food desert within the city of Grand Rapids, located between Highland Park and Kent Country Club, with a total population around 3,000 residents. These residents are susceptible to food insecurity, meaning they have low access and availability to nutritious food sources. With the creation of community food gardens the access and availability of food sources will increase, ultimately leading to higher household food security. Through utilizing baseline data supplied by the USDA and the community

garden guidelines put forth by the NRCS, this adaptive management plan will provide an outline for the implementation of community gardens within the food desert of Grand Rapids, with the end goal of alleviating the stress of food insecurity.

KIRKHOF CENTER 2216

Removal of Invasive Species at Grand Valley State University

Presenter: Kristen Ryan

Mentor: Erik Nordman

Grand Valley State University's campus has been invaded by invasive plant species, such as Autumn olive, Amur honeysuckle, and Multiflora rose. These plants are not native to the area and alter their surrounding ecosystem by outcompeting the native vegetation for resources. Plans for removal are crucial so we can return the environment back to its native, vegetative state. Several eradication methods, such as cuts, pulls, and chemical applications, will be performed in order to reduce the total volume of these invasive plants by at least 40% by the year 2020. This is important for maintaining biodiversity. The baseline population is below satisfactory. Ideally, invasive population should be nonexistent; however, this is not realistic. The objectives set for this project should be achievable and are expected to greatly improve the population of the native vegetation on campus.

KIRKHOF CENTER 2263

Cross-listing for an Interdisciplinary Education

Presenter: Anthony Clemons

Mentor: Julia Mason

This study explores two questions: 1) How do the Women, Gender, and Sexuality Studies (WGS) department's cross-listed courses fulfill the mission of the WGS department? 2) How do these courses align with feminist understandings of the world and feminist epistemology? Using WGS cross-listed courses' syllabi, concepts including gender, intersectionality, inequality, equity, empowerment, patriarchy, and capitalism were coded for. Recommendations will be presented on what can and/or needs to be done to best fit the needs and wants of the degree programs within the WGS department. By setting forth clear and defined expectations the WGS department can ensure that the education they want their students to attain, and the knowledge they want their students to have, is being done in accordance to best practices in the field of women's studies.

KIRKHOF CENTER 2266

Structure-based Discovery of a Novel Inhibitor of OXA-1 β -lactamase

Presenter: Leslie Wyman

Mentor: Rachel Powers

β -lactams, like penicillin, are the most clinically prescribed antibiotics. However, due to their overuse, resistance has developed. β -lactamases are the most common mechanism used by bacteria to combat antibiotics. In response, β -lactamase inhibitors were created to disrupt this type of resistance. Their chemical similarity allows for resistance to develop against the inhibitors as well. Therefore, there is an urgent need for the discovery of novel β -lactamase inhibitors. A computational approach was used to discover potential novel β -lactamase inhibitors of the class D β -lactamase OXA-1. The program DOCK screened the ZINC database of commercially available compounds. Compounds were ordered and tested experimentally for inhibition. Twelve compounds inhibited OXA-1 with K_i values <5 mM. Subsequently, the structure of OXA-1 in complex with fragment **19** ($K_i=0.469$ mM) was determined to 1.98 Å resolution. This structure will serve as a template for optimization of a novel OXA-1 inhibitor.

KIRKHOF CENTER 2270

Coxeter Groups and Triangle Tilings

Presenters: Jacob Adams, Evan Peters, Birane Seck

Mentor: Brian Drake

We investigate how to tile the Euclidean plane with triangles and how tilings relate to group theory. We define the length of a triangle in a tiling in two different ways, set up an algebraic system to model these tilings, and extend the models to non-Euclidean planes.

Beginning at 11:30 AM

KIRKHOF CENTER 1104

A Transformational Journey: Identity Construction in Graffignys *Letters From a Peruvian Woman*

Presenter: Connor Butch

Mentor: Diane Wright

In this analysis, I will examine the age-old motif of the multi-faceted journey, undergone by the dynamic protagonist, Zilia and its possible implications on the work as a whole. Specifically, I will illustrate how this journey ultimately leads to Zilia's enlightenment and to the creation of a culturally unique identity separate from a dependence on men, which constituted a completely novel idea in the time in which it was published in eighteenth-century France.

KIRKHOF CENTER 1142

The Effectiveness of Therapeutic Use of Humor with Clinical Depression

Presenters: A'via Coleman, Alexis Hutchinson, Erin Lane, Jennie Paggeot, Breanna Vetter

Mentor: Teresa Beck

Humor therapy is the use of humor for the relief of physical or emotional pain and stress. It is used as a complementary method to promote health and cope with illness. While humor cannot cure, it can reduce stress and enhance a person's quality of life. Humor has physical effects because it can improve the immune system, relieve pain, and improve mood. Clinical depression, also known as major depressive disorder, is characterized with the symptoms of depressed mood, diminished interest or pleasure in activities, weight loss, fatigue, feelings of worthlessness and decreased ability to concentrate or make decisions. This systematic literature review will look at the effectiveness and outcomes of humor as a complementary intervention with persons diagnosed with clinical depression.

KIRKHOF CENTER 2201

Is a Picture Always Worth a Thousand Words?: Helping Educators Engage Reluctant Readers by Selecting Beneficial Graphic Novels

Presenter: Anne Weston

Mentor: Robert Rozema

Reluctant and struggling readers are a common problem that English teachers must face within the secondary classroom. Researchers praise the benefits of graphic novels for reluctant readers; however, one cannot assume that *all* graphic novels have the same educational merit. Although scholars have recently begun exploring this idea, few have determined criteria for evaluating the effectiveness of graphic novels specifically for reluctant readers. Therefore, to begin closing this gap, this presentation sets forth a criteria focusing upon a graphic novel's relevance to educational goals, clarity of dialogue and characters, and coherence of layout in order to determine if a graphic novel would benefit reluctant readers. To demonstrate these criteria, two graphic novels – *Anne Frank: The Anne Frank House Authorized Graphic Biography* by Sid Jacobson and Ernie Colón and *American Born Chinese* by Gene Yang – will be analyzed as case studies.

KIRKHOF CENTER 2215

Managing for Natural Trophic Relations in the Bass River Watershed

Presenter: Lee Martin

Mentor: Erik Nordman

Bass River is a stream located in Ottawa Co., MI. This River is surrounded by agricultural

operations whose plowing, fertilization, waste production, and application of herbicides and pesticides have impaired the river's structure and function. Ecological processes, species composition, and nutrient cycles have been altered within, in addition to degradation of the water's quality and safety. This management plan seeks to restore natural food webs and trophic structure to this stream through the use of sustainable farming practices, implementation of larger riparian buffers, and addition of woody debris to the river. To obtain baseline data about this river's ability to process energy, I made leaf packs, placed them in the river, removed two per week for 8 weeks and measured the rate at which the stream decomposes this energy source. Diagnostic macroinvertebrate diversity and abundances were also sampled to explore which key resources currently support this river's biotic community.

KIRKHOF CENTER 2259

Non-State Actors in the Democratization of Egypt

Presenter: Kathryn Jamesen

Mentor: Thomas Walker

Many political studies widely demonstrate that international organizations play a marginal role democratic transition. This study will explore the relationships between international organizations and grassroots efforts in a successful democratic transition of Egypt. Scarce external support limited the prospects of a successful democratic transition after the fall of Mubarak in 2011.

KIRKHOF CENTER 2263

Transitional Justice

Presenter: Quinn Sylow

Mentor: Thomas Walker

When a state transitions to democracy the new government finds itself at a crossroads between prosecution or amnesty for those who committed human rights violations in the old regime. Does the new government prosecute or grant amnesty to human rights violators? This paper focuses on Argentina's decision to prosecute human rights violators in the wake of The Dirty War (1976-1983). Drawing on the work of Katherine Sikkink, I explore how Argentina's decision to prosecute human rights violators fostered democratic norms and promoted a greater respect for human rights.

KIRKHOF CENTER 2270

Underrepresented Identities and Fields Of Study Within Study Abroad: A Case Study

Presenter: Irma Y Ramirez

Mentor: Lisa Perhamus

The inclusive academic options offered by study abroad programs should result in diverse representation abroad. Yet, the proportions of gender, race, and academic fields enrolled in U.S. higher education are not equally reflected in U.S. study abroad participation rates, prompting questions about equitable access. Despite past research, little is known about the relationship between study abroad participation, social identity and academic fields of study. This study uses chi-square goodness of fit tests and post hoc analysis to address the following question: How does Grand Valley State University (GVSU) study abroad participation compare to national data in the context of race, gender, and field of study? Results demonstrate a significant difference between GVSU and U.S. demographic proportions, indicating the importance of gathering and understanding single-institutional participation data to identify and better understand factors that could improve study abroad participation.

Beginning at 12:00 PM

KIRKHOF CENTER 1104

Influence of Urban Green Spaces on Mental Health

Presenter: Alison Stemczynski

Mentor: Carol Griffin

The benefits of utilizing green spaces in urban areas have recently been explored for potential improvements in one's mental health. Green spaces offer opportunities for interacting with nature, and research has shown that time spent in these urban, natural environments is commonly associated with reduced mental fatigue. This paper will address the question: What is the connection between utilization of green spaces and mental health? My research will highlight the main findings of current research as well as present case study results. My research will also describe variables that may affect the extent of influence of green spaces such as community demographics, people's distance to green spaces, and valuable qualities of restorative green spaces. I conclude that green spaces should be promoted for the current and future benefit of our society's mental health.

KIRKHOF CENTER 1142

The Effect of Multi-Sensory Stimulation as a Therapy for Elderly Persons Diagnosed with Late-Stage Dementia

Presenters: Ashley Jackovich, Chelsea Johnson, Alexandra Kuligoski, Alexandra McQuaid, Kati Roberts

Mentor: Teresa Beck

Dementia is an overall term that describes a wide range of symptoms associated with a decline in memory or other thinking skills severe enough to reduce a person's ability to perform everyday activities. Multi-sensory stimulation is a therapy in which at least two of the five senses are stimulated (Auditory, Visual, Tactile, Taste, Olfactory). Its use has been studied to manage dementia-related behavior, improve mood, and increase communication. This presentation will review the empirical evidence from a systematic review of literature for using multi-sensory stimulation as an effective intervention for elderly persons diagnosed with dementia.

KIRKHOF CENTER 2201

Where am I? Error in GPS Positioning

Presenters: Danielle Harris, Nathaniel Orndorf

Mentor: Edward Aboufadel

Most people have a GPS receiver in their car or phone, which receives a signal from many satellites and uses that information to compute the receiver's location. We seek to answer the question, what is the uncertainty of this position? We consider a static situation with five satellites of known position and used the Bancroft Least-Squares Method to compute the expected position of the receiver. Then, given non-uniform, piecewise probability distributions for the distance to the center of the satellites as well as the pseudo-distance to the receiver, we created a Monte Carlo simulation to determine where the receiver has 90% chance to be. This project is part of the 2015 applied mathematics competition sponsored by the Fédération Française des Jeux Mathématiques.

KIRKHOF CENTER 2215

A Remnant Dam's Effects on Stream Geomorphology, Macroinvertebrate Colonization, and Sediment Distribution in Rum Creek, Kent County, MI

Presenter: Jared Sartini

Mentor: Erik Nordman

Rum Creek is a tributary to the Rogue River, whose subwatershed flows into the Grand River watershed slightly north of the Grand Rapids metropolitan area. The study site lies within an approximately 405 meter stretch of Rum Creek flowing through Memorial Park in Rockford, MI. Though the dam is partially broken down, it still acts as a large concrete spillway which inhibits important stream geological, chemical, and biological functions. Three transects above the dam and three below were established along the 405 meter stretch of Rum Creek. At each of the transects, a Wolman pebble count, Surber sampling, and erosion pin studies were conducted to hopefully reveal the effects of the concrete spillway on Rum Creek's natural, ecological processes.

KIRKHOF CENTER 2216

Nutrient Management on a Dairy Farm

Presenter: Misty Brooks

Mentor: Erik Nordman

It can be very difficult for dairy farms to become certified environmentally friendly. Livestock farms often cause excessive amounts of runoff, harming ditches and other surrounding watersheds. Controlling this runoff plays a large role in a farm's environmental status. The goal of this project is to create a manure management plan for a particular farm, giving the amount of manure to be spread in a set value of pounds per acre, based on crop type and expected yields. This value will represent the optimal amount of nutrients for crop uptake while minimizing runoff. Field soils will be tested and cattle diets will be assessed to estimate nutrient contribution. It is expected that the amount of manure being spread currently is too much, and the value shall need to be decreased. This is important on many levels, mainly environmental reasons; also in helping this particular farm become certified environmentally friendly over the next decade.

KIRKHOF CENTER 2263

Perceptions of Officer Use of Force: A Pilot Study Examining Differences in the Public and Police Officer's Perception of Force

Presenter: Cody Longrey

Mentor: Christine Yalda

This pilot study explored whether the same methodological approach could be used to study police and the general public's perception of excessive use of force by officers of the law. The study replicated Barrett, Haberfield, & Walker's (2009) research on whether geographic and educational differences of patrol officers affected their perceptions on use of force. Barrett et. al (2009) created a hypothetical scenario of an officer investigating a crime taking place. Officers participating in the study were asked to explain the level of force that should be used at each stage and explain their justification for that level of force. The current study used the same methods presented to three members of the general public. The findings suggest that these methods could be replicated with the general public. The study has a small sample size, and findings cannot be generalized, but the anecdotal findings suggest that these subjects at least shared officer perceptions of appropriate use of force.

KIRKHOF CENTER 2270

Cat's Cradle: Drawing Movement

Presenter: Kathryn McAllister

Mentor: Nayda Collazo-Llorens

The purpose of this research was to generate a drawing-based project that would develop into a dance performance, exploring connections and entanglements as metaphors for relationships. I worked with two dancers who improvised movements following a set of parameters and guidelines. They had to find a strategy to negotiate the complexities of their relationship while being connected through a series of strings. This research explores the interdisciplinary space between drawing and dance, and its potential in developing new forms and methods of production.

Beginning at 12:30 PM

KIRKHOF CENTER 1104

How Sex and Season Impact American Marten Diet

Presenter: Angela Kujawa

Mentor: Carol Griffin

American martens (*Martes americana*) are lean-bodied generalist predators that commonly specialize on voles. Due to their limited energy reserves and high metabolic demands, martens are very susceptible to variations in food availability. This study seeks to determine how diet preferences of martens may vary with the sex of the animal and the time of year. Scat was collected within the Manistee National Forest in Michigan's Lower Peninsula from 2012 to 2014. Samples were washed and fragments of bone, vegetation and other components removed and identified. If these martens are behaving as true generalists, a change in diet selection should show consumption of prey items as they become more available. It is predicted that females will utilize smaller prey than males if sex is a determining factor of diet preference.

KIRKHOF CENTER 1142

Waves on China's Shores: Understanding the Increased Focus of Korean Wave Marketing in China

Presenter: Ryan Bardusch

Mentor: Yan Liang

China, one of the largest economies in the world and steadily growing larger, has lately seen immense influence from South Korea's so-called "Hallyu," or, "Korean Wave" on its entertainment culture. After seeing increased interests in Korean music from China, many so-called "idol groups," such as EXO-M and UNIQ, have attempted to make focused efforts on promoting in China. Through both compounding on previous research in the field, and evaluating the responses of current fans of both China-focused and Korea-focused idol groups, this work attempts to determine whether a more concerted effort on increasing the availability of Korean-style entertainment in

China has actual impact on the interest of Chinese audiences. By evaluating these results, we can further attempt to understand the limits of the expansion of the Korean Wave, and also help determine the potential steps to increase this interest, availability, and success of the Korean Wave in other locations.

KIRKHOF CENTER 2201

The Gypsy Cry: Granada according to Federico García Lorca

Presenter: Michelle Alderink

Mentor: Zulema Moret

Deep in the heart of Andalucía, Spain, lies the enchanting city of Granada. Characterized by breathtaking sights and a Gypsy-Spanish culture, it's easy to fall in love with this city. Federico García Lorca, a Granadian poet during the 1920's-1930's, demonstrates his passion for Granada in "Poema de la solea", "Poema de la siguiyria gitana", and "Romance de la Guardia Civil espanola". Through reveling in the Gypsy culture that inspired him, Lorca discovered the discrimination this population faced on behalf of society. Believing that remaining silent while burning inside with passion was immoral, he turned this passion into advocacy by speaking out against the persecution faced by the Gypsies of his beloved home. This presentation will analyze how Federico García Lorca expressed, through poetry, his passion for the Gypsy culture and defense of a population society treated unjustly.

KIRKHOF CENTER 2215

Runoff Pollution in Duncan Woods

Presenter: Nathaniel Akey

Mentor: Erik Nordman

Duncan Woods in Grand Haven, Michigan is a plot of land that was donated to the city of Grand Haven with the specific guidelines to keep the wooded area in its natural state. Because of its proximity to the city it is subject to runoff pollution entering due to the impervious surfaces that cover the city. This study was done in order to determine specific areas of the woods that are affected the most by this pollution.

In order to determine areas of pollution, soil samples were taken for 60 random points throughout the woods. These samples were then analyzed for higher salinity by testing conductivity of solution. Higher salinity corresponds to higher pollution.

If areas of pollution are determined, then causes of these pollutants can be determined by location. Once causes of pollution are determined, whether it be impervious surfaces, increases in

automotive traffic, point source pollutants, or others, it can then be analyzed to develop a solution.

KIRKHOF CENTER 2216

Conservation of *Sistrurus catenatus catenatus* (Eastern Massasauga Rattlesnake) at Pierce Cedar Creek Institute

Presenter: Nathan Kudla

Mentor: Erik Nordman

Decline in the population of eastern massasauga rattlesnakes throughout their natural range has increased the need for greater conservation efforts of the species. We have set up a long term mark recapture study through the efforts of Dr. Jennifer Moore and Pierce Cedar Creek Institute. Pierce Cedar Creek Institute has implemented a control of invasive plant species through prescribed burns, herbicide application, and volunteer labor. We have learned that there is an estimated 66 adult eastern massasauga rattlesnakes present at Pierce Cedar Creek Institute with a survival rate of 0.70 for males and 0.65 for females. This data can be used by other land managers to increase the population of eastern massasauga rattlesnakes present on their land and to properly manage or estimate the number of eastern massasauga rattlesnakes present on their land.

KIRKHOF CENTER 2263

Computational Science and Data Analytics in R

Presenter: Adam Terwilliger

Mentors: John Gabrosek, Melissa Tallman

To better understand primate paleontology and more effectively explore unique fossil data, we look to utilize the statistical programming language of R. Making insights on how primate crania evolved is an important topic in primate paleontology. Specifically, there are many open questions as to what factors (*e.g.* diet, brain size, habitat) drove the evolution of new world primate crania. The goal of STA 319 is to develop and showcase skills as a statistical consultant applied to a real world project. We first look to take advantage of interactive learning environments (swirl) and tackle “mini-projects” to demonstrate competency. Next, we look to implement multivariate regressions and permutations tests on 3D skull data, making use of the geomorph package in R. Our main objective is to streamline the data development process into a single software package and lay the foundation for future independent research in computational science and data analytics applied to primate paleontology.

KIRKHOF CENTER 2266

A Statistics Consulting Experience: Analysis of the Perception of Sustainability on Campus

Presenters: Paige Melick, Trisha Zimmerman
Mentors: John Gabrosek, Kimberly Schoetzow

Kimberly Schoetzow, a Graduate Assistant in Grand Valley State University's Office of Sustainability Practices, conducted a survey to examine how GVSU students perceive sustainability on campus. A similar survey is conducted every two years. We analyzed students' opinions on how Grand Valley lives up to their sustainability goals. We will provide our analysis to the department. Further, we will make suggestions to the Sustainability Office on future surveys and programming based on the data we analyzed. We will discuss what we learned from our statistical consulting experience.

KIRKHOF CENTER 2270

The Ghost of *Machismo* in Gabriel García Márquez's "Espantos de agosto"

Presenter: David Gonzalez

Mentor: Mayra Fortes Gonzalez

"Espantos de agosto" is one short story in the collection *Doce cuentos peregrinos* by Gabriel García Márquez. The narrator recounts a ghost encounter during a family vacation. The narrative develops from the city through the Tuscan countryside to a renaissance castle haunted by the ghost of its ancient and matricidal master, Ludovico. In this castle lives an old friend of the narrator. Over lunch, ghost stories are told to much incredulity. In literature, ghosts are a recurring symbol of duality. In "Espantos de agosto" the duality of *machismo* is presented as hidden by lack of discussion such that it strengthens with time, much as a ghost story. This analysis will investigate spatial and temporal symbolism allowing for an allegorical interpretation of the path that the narrator and his wife take from city to castle. This allegory presents the development of their love as one increasingly haunted by the ancient and dualistic ghost of *machismo*.

Beginning at 1:00 PM

KIRKHOF CENTER 1104

Effects of Rainfall Intensity and Volume on Water Quality in the Grand River During the Summers of 2013 and 2014

Presenter: Sarah Czekaj

Mentor: Carol Griffin

A river's water quality can be impacted by both environmental and man-made pollutants such as suspended soil, organic matter and fertilizers. This study looks at water temperature, pH, dissolved oxygen, conductivity, turbidity, and E.coli that were measured at four bridges along the Grand River in Grand Rapids, MI. The purpose of this study is to determine if rainfall intensity and volume had

an effect upon the Grand River's water quality during the summers of 2013 and 2014. I think that rainfall intensity and volume have a substantial impact on the turbidity and E.coli in the river when there is less volume and a slower flow rate present in the river. Based on the data both pH and conductivity remain fairly stable in regard to rainfall intensity and volume, while DO values increase as river volume decreases. Water temperature increases and flow and river volume decrease, for example when there has been minimal rainfall intensity.

KIRKHOF CENTER 2201

The Founders and the Classics: A Diverse Source of Influence on the Founding Generation

Presenter: Matthew Grace

Mentor: Gabriele Gottlieb

In *The Ideological Origins of the American Revolution*, Bernard Bailyn argues that the writings of the classics only acted as "window dressings" for the founding fathers, used only to add color and weight to their speeches and writings. Though not entirely incorrect, the classics had a much more profound impact on the founders than Bailyn suggests. From a young age, the founding generation was instilled with a knowledge of the ancient texts that would form a base from which they would derive lessons in oratory, virtue, writing, and government from. These texts would also serve as a form of language amongst the founders, where they could communicate using a common set of metaphors and shared stories. Most importantly the lessons of ancient Rome and Greece served as a foundation from which the writings of the Enlightenment and English whigs were able to build off of and form the Republican ideology of the revolution.

KIRKHOF CENTER 2215

Enhancing Forest Understory Quality through the Treatment and Removal of Invasive Common Buckthorn

Presenter: Danielle Reynolds

Mentor: Erik Nordman

Common buckthorn is a highly invasive plant located throughout Michigan forests. Its ability to outcompete other vegetation for resources makes it a highly destructive plant that causes these vegetation populations to decline. Multiple efforts have been made to treat and remove buckthorn, but many treatments are expensive and/or hazardous to forest ecosystems. This adaptive management plan was created to discover the most effective and least hazardous way to eliminate buckthorn from the forest of Blandford Nature Center in Grand Rapids, Michigan.

KIRKHOF CENTER 2216

Invasive Plant Species In Huron-Manistee National Forest

Presenter: Jenna Johnson

Mentor: Erik Nordman

Invasive plants in the Huron-Manistee National Forest are rapidly spreading. Due to their aggressive nature invasive plants mature rapidly, outcompete native plants for resources, and have large quantities of produced seeds. These plant species need to be reduced or eliminated to limit their establishment, spread, and impact on the ecosystem. A visual assessment was made of the different invasive species and their establishment within the forest boundaries. This was done by collecting GPS coordinates and abundance of each species. After the data was collected different eradication methods were implemented; cut-stump, herbicide, hand pulling. We learned there are 28 different invasive species on the property, the most abundant are Spotted Knapweed and Garlic Mustard. We expect the species treated with herbicide will be less abundant than the species that were hand pulled. This is important because there needs to be an understanding of how to eliminate these species.

KIRKHOF CENTER 2263

Relatedness of Male Hoary Bats at a Migratory Stopover Site in Northwestern California

Presenter: April Kaneshiro

Mentor: Amy Russell

The social structure and genetic make-up of the hoary bat (*Lasiurus cinereus*) during its fall migration is not well known. Recently, pairs of male hoary bats were observed flying together during the autumn migration. When one member was netted, the other remained in the area and the two would call to each other. This suggests a strong social and a possible genetic bond between the males. To determine whether the males were related, wing tissue samples were collected from 15 pairs and 76 singleton individuals from the migrating population. The relatedness analysis revealed that although the behaviorally interacting pairs were not more related than the general population, there was a wide range of relatedness within the population. There were also 31 pairs of singleton individuals that had a full-sibling or parent-offspring relationship and five pairs that had an identical twin relationship. Our results suggest that migrating through this area is a shared behavior within families.

KIRKHOF CENTER 2266

Climate Change and Tourism Along Australia's Coasts

Presenter: Megan Lamrock

Mentor: Elena Lioubimtseva

As global climate change continues to be a topic of discussion amongst scholars and others around the world, this project focuses on Australia's tourism and how changes due to climate have affected those in the tourism sector along the Northeast coast. Using MAGICC/SCENGEN 5.3, a climate change model developed by the NCAR, I will analyse forecasted future climate change and sea levels for the country. Details on how the region has changed over the past few decades will show the rate of climate change throughout the coast. Scholarly journals and expert reports on the health of the tourism economy of Australia will be discussed. I expect to find that Australia's tourism trade has been affected negatively due to global warming and cooling. This phenomenon is likely to cause further changes in the ocean and coral reef ecosystems, leading to a decline in eco-tourism along Australia's coast.

KIRKHOF CENTER 2270

The Current State of Autism Spectrum Disorder

Presenter: Christine Klingert

Mentor: Sheldon Kopperl

In this presentation, I will discuss my findings from current literature and research about the current state of autism research and the specifics of the Autism Spectrum Disorder (ASD). ASD was recently added to the American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders Fifth Edition (DSM-V) moving the four separate disorders into one category to improve practitioners' ability to more consistently diagnosis affected patients. This change is said to be one of the most significant changes to the DSM and I would like to investigate the potential consequences of this change on the diagnosis, treatment, and understanding of this disorder. I will talk about my findings in regard to how diagnosis will or will not change due to the new definition of ASD, and how this potential change in diagnosis will affect not only individual patients, but society as a whole.

Beginning at 1:30 PM

KIRKHOF CENTER 1104

Evaluating Winter Browsing by White-tailed Deer (*Odocoileus virginianus*) within Duncan Memorial Park

Presenter: Daria Gosztyla

Mentor: Carol Griffin

When white-tailed deer (*Odocoileus virginianus*) populations become locally overabundant, deer

browsing negatively affects tree establishment, survival, and productivity. Sustained browsing pressure may limit the regeneration of tree species favored by deer and may gradually lead to elimination of populations. Losses result in modification of plant community composition and forest structure that indirectly affect wildlife and plant populations. The magnitude of these effects varies extensively based on local deer population size, surrounding land use, and availability of food sources. Effects of deer browsing has become a management concern within Duncan Memorial Park, where the conservation of the native plant community is a primary goal. Browsing by deer may be a major cause of the observed decline in tree regeneration. This study was designed to evaluate the extent of deer browsing within Duncan Memorial Park using deer browsing surveys.

KIRKHOF CENTER 1142

STA 319 Festival Research

Presenters: Mitchell Suing, Erika Todter

Mentors: John Gabrosek, Michael Ricco

For our STA 319 class we are acting as consultants for a professor who is researching variables that increase the likelihood of attendance at a festival. The selected location is Cedarburg, Wisconsin and they hold 4 annual festivals; the Winter Festival, the Strawberry Festival, the Wine and Harvest Festival, and Ocktoberfest. We want to see if attendance at one festival will increase the likelihood that people will return to Cedarburg for another festival. Eventually, the client hopes to use this information for destination marketing purposes. In addition to sharing our results, we plan to provide insight about our consulting experience. We will share any obstacles we faced and how we dealt with them.

KIRKHOF CENTER 2201

Exercise Routines for Better Performance

Presenters: Mariah Boulard, Morgan Patterson

Mentor: John Gabrosek

This semester we have the opportunity to act as statistical consultants for a faculty research project. Dr. Sean Denard, a Grand Valley athletics coach and professor, has been collecting data in hopes of establishing an optimal workout for track and field athletes who throw. More specifically, he would like to know which type, order, weight, and repetitions of exercises will activate the nervous system in such a way to induce the best athletic performance in shot put, discus, hammer, weight, and javelin events. Our main goal for this experience is to play an effective consulting role by determining the best suited and ethical data cleaning and analysis methods through attentive statistical evaluation.

KIRKHOF CENTER 2215

**An Adaptive Management Plan for Modeling Invasive Shrub Species at
Pierce Cedar Creek Institute**

Presenter: Heather Taylor

Mentor: Erik Nordman

In order to fight the spread of invasives, predictive models can be constructed to guide land managers to invasion-prone areas. Forest type, canopy cover, soil properties, past treatment, and the presence of other invasives were investigated as possible predictors for the presence of *Elaeagnus umbellatus*, *Lonicera maakii*, *L. morrowii*, and *L. tatarica*, and *Rosa multiflora* in West Michigan hardwood forests. A logistic regression and a CART model were used to evaluate the power of these possible predictors. Using GIS, the results were interpolated producing a predictive map that reflected the likely locations and possible future spread of invasives. Using threshold conditions established by the CART model, we created a second GIS model and compared it to the predictive model, which further assessed the accuracy of the predictive model. After determining the most effective modeling and treatment strategy, an adaptive management plan was established.

KIRKHOF CENTER 2216

**Adaptive Management Plan for Promoting Monarch Butterfly Habitat in
Backyard Suburban Metro Detroit**

Presenter: Kevin Nietering

Mentor: Erik Nordman

The monarch butterfly (*Danaus plexippus*) is being considered for the Endangered Species List. The decline of their population has been linked to the loss of habitat of their main host plant; the milkweed. I will design an adaptive management plan that will assess current monarch habitat, and suggest improvements. This plan will include planting different varieties of native milkweed, as well as many other nectar producing flowering plants. I anticipate learning that current suburban areas do not support many monarch individuals. My plan will be able to be adapted for others to use in their own unique locations. This project is important because monarch butterflies are appreciated for their ecosystem services and their charismatic appearance.

KIRKHOF CENTER 2263

Metaphors to Live by: What our Political Ideologies Actually Mean

Presenter: William Preston

Mentor: Marshall Battani

The majority of our thought is abstract and the mind uses metaphors to manage non-corporeal issues. Reason is not free from our physical selves, thus we are endowed with a form of embodied cognition. Reason is mostly unconscious and necessarily embodied, thus the social construction and negotiation of meaning must be done through expression of the common collective unconscious (CCU). The CCU elucidates the medium through which enculturation occurs and how culture, morals, and political ideologies exist apart from our conscious conception of them. This underlies the process through which individuals are socialized to political ideologies due to political ideologies having their basis in our conceptions of morality; which is formed through collective expressions of unconscious metaphors. I argue that the formation of political ideologies is done unconsciously, but with conscious reflexive justification, and that political ideologies are truly arguments over morality by way of metaphors.

KIRKHOF CENTER 2266

Using Simulated Microsatellite Loci to Test the Efficacy of Genetic Methods to Detect Population Declines

Presenter: Susan Munster

Mentor: Amy Russell

Accurate and precise estimates of effective population sizes are crucial to making efficacious conservation decisions. Eastern red bats (*Lasiurus borealis*) are experiencing ongoing population losses due to multiple anthropogenic factors. To test the power of genetic studies in detecting recent population declines, simulated microsatellite data sets were created based on the characteristics of eastern red bats and then analyzed using MSVAR. Estimates of current effective population size and ancestral effective population size produced by MSVAR were compared to known parameters. While the MSVAR software yielded highly accurate and precise estimates of ancestral effective population sizes, current effective population size was generally overestimated by an order of magnitude or more. M-ratios and theta also failed to effectively detect population decline. Based on these results, we urge caution in using genetic data as a monitoring tool for populations experiencing recent declines.

KIRKHOF CENTER 2270

The Effects of Foreign Policy in American Elections

Presenter: Drew Nagy

Mentor: Whitt Kilburn

I examine the effects of foreign policy issues on American voters, in particular how voters evaluate candidates based on their foreign policy preferences. Data are collected from the 1992 and 2012 American National Election Studies surveys. I focus on two elections, first the approval of military

strength through defense spending and approval of the Gulf War in the 1992 election, and in 2012 the reserved foreign policy preferences of Obama and Romney. I also provide an overview of the likely influence of foreign policy on voters in the 2016 presidential election.

Beginning at 2:00 PM

KIRKHOF CENTER 1104

The Effect of Climate Change on Baby's Breath Distribution Along Sleeping Bear Dunes National Lakeshore

Presenter: Erin McCabe

Mentor: Carol Griffin

Erin McCabe

A consequence of climate change throughout Michigan's sand dunes is the growing distribution of invasive species. I researched the effect of climate change on the distribution of the invasive, Baby's Breath (*Gypsophilia paniculata*), found in Sleeping Bear Dune National Lake Shore. Baby's Breath competes for habitat, resources, and pollinators with the endangered Pitcher's Thistle (*Cirsium pitcher*). It is projected that climate change will increase winter precipitation rates and temperatures along western Michigan. Research shows that increased precipitation will facilitate the spread of Baby's Breath. Expanded ranges of this invasive species will make containment more difficult for land managers.

KIRKHOF CENTER 1142

Spatial Patterns of Fish Assemblages in Lake Michigan Drowned River Mouths

Presenter: Samantha Morsches

Mentor: Carl Ruetz

Spatial patterns of species similarity in freshwater fish assemblages can be affected by dispersal processes and environmental conditions. We sampled littoral fish assemblages and environmental conditions in 15 drowned river mouths (DRMs) of eastern Lake Michigan using 10-min electrofishing transects ($n=5-6$ per DRM). We captured 3,080 fish representing 45 species across the 15 DRMs. Using nonmetric multidimensional scaling, we found evidence of spatial structure in fish assemblages with the southern DRMs distinct from the others. However, we did not find evidence of a positive correlation between species similarity and distance between each pair of DRMs, contrasting with our original hypothesis that species similarity decreases with distance. A potential explanation for this finding is related to gear selectivity associated with boat electrofishing.

KIRKHOF CENTER 2201

Ready...Set...SET!

Presenter: Nicholas Karavas

Mentor: Feryal Alayont

Published in 1991, Set is a card game consisting of 81 cards varying in four features: color, number, symbol, and shading. Each feature has three options such as red, purple, and green for the three color options. The goal of the game is to obtain three cards, called a *set*, in which for each feature, either all three cards have the same option, or all three cards have three different options. As a player, you want to be quick in finding your sets because the person with the most amount of *sets* at the end of the game is the winner. Will you be fast enough to gain the most amount of *sets*? We will present mathematical models of the game using combinatorial approaches and how to use these models to derive game strategies for winning.

KIRKHOF CENTER 2215

Duncan Woods Understory Vegetation Regeneration Management Plan

Presenter: Nolan Adamski

Mentor: Erik Nordman

Duncan Woods, located in Grand Haven, MI, faces a severe lack of understory vegetation as a result of overbrowsing by white-tailed deer within the park. This is detrimental to the overall quality of the environment and creates an unnatural looking forest. Understory browsing data was collected to determine both vegetation density and browsing pressure within the forest. Management for the regeneration of eastern hemlock, red oak, and American beech species results in a healthier ecosystem by providing habitat and food resources to support wildlife. Having these shade-tolerant species present in the understory ensures that gaps formed in overstory may be filled after a disturbance. This study is an important resource for the involved stakeholders as well as any similar habitat that faces the problem of a depleted understory.

KIRKHOF CENTER 2216

Overall Habitat Management Most Suited for the Number and Quality of White Tail Deer in Middle Lower-Peninsula Michigan

Presenter: Zachary Sompels

Mentor: Erik Nordman

Private hunting anywhere, especially in Michigan, is always striving for mature bucks and more of them. By manipulating and improving the quality of the habitat in the hunted areas as well as controlling the predator population within the immediate area, the hope is to directly effect the

overall White-tailed Deer population in a positive manner with an emphasis on mature bucks. This is to be done through the eradication of invasive plant species, as well as the implementation of food plots, and a cull in the predator population. Knowing the parameters to which you can positively effect mature buck population numbers will be beneficial to anyone looking to strengthen their mature buck numbers across the country.

KIRKHOF CENTER 2263

Graph Theory Modeling of Rook Placements

Presenters: Jacob Adams, Susanna Lange

Mentor: Feryal Alayont

Rook placements can be used to represent matchings between two groups of objects, such as jobs and job applicants. In this talk, we will describe how we can model rook placements as matchings in bipartite graphs and how this model can be generalized to rook polynomials in three and higher dimensions.

KIRKHOF CENTER 2266

***Frankenstein* and “The Labours of Men of Genius”: Science and Medical Ethics in the Early 19th Century**

Presenter: Allison Lemley

Mentor: Carolyn Shapiro Shapin

Mary Shelley’s *Frankenstein*, first published in 1818, used a sprawling network of allusions to contemporary literary and scientific works, which strongly reflected Romantic scientific and literary ideology. *Frankenstein* critiqued prevailing scientific views of the day, such as the materialist and vitalist debates which sought to define life. *Frankenstein* was written and published in a period of scientific transition from “natural philosophy” to modern science during the early 1800s. Shelley referenced scientific works, such as ideas from Humphry Davy and Luigi Galvani, throughout her novel in order to reveal gaps in the development of medical ethics. By portraying this debate in *Frankenstein*, Shelley sought to comment on the rift in the scientific community and focus the debate on ethics.

KIRKHOF CENTER 2270

A Look at Care Givers Safety in a Hospital Setting

Presenters: Allyson O’Connell, Ursula Robinson

Mentor: David Huizen

We are focusing on worker safety in hospitals. Caregivers can experience injury from patient

lifting and moving, slips, falls, trips, and more seriously, needlesticks and infectious disease. Although it is not very well known, hospitals have a higher likelihood of injury than construction and manufacturing. Our presentation will provide detail into training workers on safe practices in the workplace, including procedures. We will also look into cost reduction for hospitals; improvements in patient care, and equipment that can help reduce worker injury. Our project will be beneficial to the healthcare industry because we plan to look into multiple sources like NIOSH, OSHA, CDC, and The Online Journal of Issues in Nursing and combine them for easy access and comparison. This presentation will explore the dangers to workers, the changes that should be made, and the solutions for overall better safety to healthcare workers.

Beginning at 2:30 PM

KIRKHOF CENTER 1104

Climate Change Impact on Federal and State Managed Michigan Highway Tree Species

Presenter: Alexandra Galicki

Mentor: Carol Griffin

Global climate change will alter the environment in many ways. The Environmental Protection Agency estimates a 7-11 degree Fahrenheit raise in temperature to occur around the range of years 2080-2099. Michigan's federal and state highway agencies have different management plans for the trees along their roads. It is important to keep trees alongside the roads to help limit fragmentation, maintain biodiversity and habitat, sequester carbon, as well as maintain aesthetic value. As temperatures increase, aridity and soil acidity will likely increase, which may cause some of the current species planted along both the federally operated Interstate 75, as well as the state operated U.S. 131, less likely to live. The study suggests a new list of wildflowers for both the federal and state highway to plant in the future Michigan climate while determining how successful current species are likely to be in the future.

KIRKHOF CENTER 1142

Physician-Assisted Dying: The Evolution of an Alternative Treatment for Terminally Ill Patients

Presenters: Lonnie Riley, Steven Senglaub II

Mentor: Noor Ghiasvand

End of life options for individuals suffering from incurable ailments have placed care providers in a moral and ethical dilemma for centuries. Caregivers are torn between eliminating the suffering of patients who wish to no longer suffer, and abiding by the Hippocratic Oath. Recently, Physician-

Assisted Dying (PAD) has become more popular with terminally ill patients in some populations. For this reason, PAD has become a topic for debate across all cultures and has gained increased acceptance and legalization in many countries. The purpose of this presentation is to provide key information towards educating the public on alternative treatment options for terminally ill patients. The literature we reviewed was used to create a statistical representation of the acceptance progression and factual evidence to encourage public acceptance. Also, the literature has helped us establish a questionnaire for an upcoming research study aimed towards better understanding Michigan citizens' attitudes regarding PAD.

KIRKHOF CENTER 2201

A Statistical Consulting Experience: Evaluating Geology Topics in Standardized Testing

Presenters: Alison Chapman, Allison Makowski

Mentors: John Gabrosek, Stephen Mattox

The purpose of this project is to look at standardized test scores and recognize areas in geology where students tend to struggle. Dr. Steve Mattox has been collecting data for the past three years from 8 to 10 different schools. This data comprises scores from four separate exams in physical geology that high school geology students take in order to earn college credit. Most colleges want the students to have a 70% passing rate to be able to earn college credit. By identifying specific topics or skills that cause students the greatest difficulty, we can provide teachers with training and other resources to help the students learn better. The findings could be used to encourage students to pursue a degree in geology, which is a field of study where there is a projected shortage of graduates. We will discuss analysis of the data and our role as statistical consultants.

KIRKHOF CENTER 2215

Conservation Plan for the Snuffbox Mussel, an Endangered Species in the Grand River in Michigan

Presenter: Chelsea Cabbage

Mentor: Erik Nordman

The snuffbox mussel was put on the endangered list in 2012. Snuffbox mussels are freshwater mussels that are being threatened by dams, pollution, sedimentation, and nonnative species. The Grand River in Michigan is the area of focus for this research project. The decline in number of snuffbox mussels in the Grand River will continue unless we find ways to protect the river. Snuffbox mussels require a clean swift current for their habitat. By building deep gravel beds snuffbox mussels' riffle habitat will be increased and maintained. The logperch is the host fish for the snuffbox mussel. The snuffbox mussel depends on these fish for dispersal. Conservation of

the logperch fish is a method to use when protecting the snuffbox mussel. Collection of data on population size of snuffbox mussels and logperch fish will have to be done. Providing a research plan for conservation of these snuffbox mussels will benefit the ecosystem as a whole.

KIRKHOF CENTER 2216

Nutrient and Hydrologic Assessment of Lincoln Lake Watershed

Presenter: Adam Chandler

Mentor: Erik Nordman

In 2006, Michigan's Department of Environmental Quality (MDEQ) placed a Total Maximum Daily Load (TMDL) on Lincoln Lake in Kent County, Michigan due to water quality tests showing the presence of elevated levels of E. Coli. These levels did not meet the water quality standards set by MDEQ for total body contact recreation. I will create a management plan to address the degraded water quality and restore total body contact recreation to Lincoln Lake. I will identify the stakeholders and suggest intervention points with best management practices to implement throughout the Lincoln Lake Watershed. By collecting baseline data and establishing a monitoring schedule, I will learn what practices are effective in the watershed for improving the water quality of Lincoln Lake. This is important to the residents of Lincoln Lake because they value total body contact recreation.

KIRKHOF CENTER 2263

Marie Antoinette: At Blame for the Revolution or Victim of Circumstance?

Presenter: Emily Gross

Mentors: Ellen Adams, David Eick

The purpose of this presentation is to explore Marie Antoinette's true contributions to the French Revolution, drawing into question whether she deserves blame for the events or if she just happened to be a victim of adverse circumstance. My study analyzes both negative and sympathetic historical perspectives on Marie's life in order to explore her scandals, such as like The Diamond Necklace Affair, a scheme constructed by fortune hunters that abused the queen's lavish tastes, as well as her commendations, like bravely sealing an alliance between France and Austria through her young marriage. Ultimately, this study favors the sympathetic view since the majority of negative public opinion derived from gossip and futile evidence. Therefore, despite her negative historical image, Marie Antoinette suffered as a victim of circumstance, not deserving the heavy blame for the Revolution.

KIRKHOF CENTER 2266

Guessing Games and Error Correcting Codes

Presenter: Lindsay Czap
Mentor: David Clark

A two-player “guessing game” is a game in which the first participant picks a number from a certain range. Then, the second participant asks only yes-or-no questions in order to guess the number. A technique for minimizing the number of questions uses questions that divide the range of possible choices in half each time. We will prove that the minimum number of necessary questions is directly related to the \log_2 of the number of possible choices. Next, we will introduce guessing games that contain a “lie” or an error. Guessing games with lies are closely linked to error correcting codes, which are codes that allow for us to detect an error in the information that we receive and correct for these errors. We will use basic definitions in coding theory and discuss how error correcting codes will help us to still guess the correct number even if a lie is involved.

KIRKHOF CENTER 2270

Discrete Dynamical Systems

Presenters: Jeremy Kleine Deters, Anthony Pecoraro
Mentor: David Austin

We will be presenting Discrete Dynamical Systems. We will give an overview on different types of discrete dynamical systems (mainly the logistic equation) and the behaviors of their orbits. To understand the behavior of the orbits, we will be discussing the classifications of fixed points (repelling, attracting, and neutral) as well as periodic cycles and bifurcations. We will also be discussing period doubling and how it can eventually lead to chaos in certain discrete dynamical systems.

Beginning at 3:00 PM

KIRKHOF CENTER 1104

The Use of Herbivory Control on Invasive Plant Species: Wege Foundation Natural Area, Lowell, MI.

Presenter: Michael Boike
Mentor: Carol Griffin

The Wege Foundation Natural Area in Lowell, MI. has concerns with multiple invasive species, of which I focused on *Celastrus orbiculatus* (oriental bittersweet) and *Elaeagnus umbellata* (autumn olive). These were selected due to their prevalence at the site, and the amount of damage they cause. The Wege area has a variety of land cover and land cover use (historic and present) that influences the spread of invasives. Incorporating these variables, the study objectives were to: (1)

categorize, quantify, and display invasives on site, (2) determine factors influencing the spread of invasives and to what degree, (3) determine the most effective management plan. Invasives were determined to be most abundant in the southwest corner of the property (historically clearcut). Trails and bordering roads also showed higher densities of invasives. As a result, these components can be displayed and used on GIS-based maps to develop a suitable management plan.

KIRKHOF CENTER 2215

Are Little Brown Bats Ingesting Microcystin through *Hexagenia* Mayflies?

Presenter: Devin Jones

Mentors: Amy Russell, M Woller-Skar

Microcystis aeruginosa is a type of cyanobacteria capable of producing a hepatotoxin called microcystin (MC). As toxic *M. aeruginosa* overwinters in the sediments of lakes, it is consumed by some mayfly larva, such as those of the *Hexagenia* spp., and thus MC bioaccumulates in these insects. Each summer, *Hexagenia* emerge from the lake to reproduce. While individual *Hexagenia* may only live for 48 hours, the emergence of these species can last for several weeks, providing a temporary food source for many terrestrial organisms such as birds and bats. Little brown bats, *Myotis lucifugus*, feed opportunistically on aquatic insects. To test if microcystin is moving from aquatic to terrestrial ecosystems via trophic transfer, we are 1) testing the bat feces for the presence of *Hexagenia* mayflies; and 2) testing the bat livers and feces for microcystin. Pilot data reveal that *M. lucifugus* are not consuming *Hexagenia* mayflies, but MC is present in bat feces.

KIRKHOF CENTER 2216

Adaptive Management Plan for Infected American Beech near Onekama, Michigan

Presenter: Zachary Smith

Mentor: Erik Nordman

Beech bark disease (BBD) has spread into the highly dense American Beech trees on family private property. The disease is causing major degradation of the forest stand. Using GPS, GIS and field inventory collection of infected trees, an adaptive management plan was created to properly manage the trees by methods of salvage, removal and re-planting BBD resistant beech nuts. The expected outcomes include a 40% decrease in BBD infected trees and a healthier forest ecosystem. The positive effects will encourage BBD resistant growth along with viable wildlife habitat and feed in a sustainable upland forest ecosystem. Future management goals include less than 50% of the total beech population to thrive BBD free.

KIRKHOF CENTER 2263

Rook Polynomials of Triangular Boards

Presenters: Jeffrey Miller, Evan Peters, Carl Uzarski

Mentor: Feryal Alayont

Placing rooks on a chess board so that they cannot attack one another provides us a way to match rows with columns. If we place restrictions on these matchings so that the possible matches are allowed only on one triangular half of the board, we find interesting results about the number of possible rook placements. These numbers relate to the famous Stirling numbers of the second kind, which count ways of partitioning a set into non-empty subsets. In this talk, we describe how the number of rook placements on a triangular board relates to the Stirling numbers of the second kind, and generalize this relation to boards in three and higher dimensions.

Beginning at 3:30 PM

KIRKHOF CENTER 1104

Predicting Trap Success of the Northern Bobwhite in Felsenthal National Wildlife Refuge

Presenter: Sarah Studt

Mentor: Carol Griffin

Northern bobwhite (*Colinus virginianus*) populations are on the decline in southern states due to habitat degradation and are currently at risk of becoming endangered. This study has taken call count data and trapping data from the Felsenthal National Wildlife Refuge in southern Arkansas and used statistical analyses to determine if call count alone can be used to predict trapping success. If this is true, call count can be used to set traps so that bobwhites can be captured and radio collared. The ability to track the bobwhite's movement will help determine the home range and aid conservationists in improving their habitat and increasing their population.

KIRKHOF CENTER 2201

Analyzing the Biodiversity Conservation in the Pacaya Samiria National Reserve

Presenters: Kayla Bergel, Kara Ward

Mentor: Terry Trier

As research assistants in the Pacaya Samiria National Reserve in Loreto, Peru we analyzed long-term biodiversity conservation between plants, animals and the needs of the indigenous people of the Cocama tribe. We worked on population control surveys with dolphins, caimans, amphibians,

forest mammals, macaws and several other species of wildlife. We went on multiple surveys each day to measure the abundance of the observed species. Distance based methods were primarily used in collecting our data to estimate the abundance and densities of species on the reserve. The density data was used to look at the impact of recent climate change. The data also relates to the sustainability of hunting and fishing by the people of the Cocama tribe. This experience taught us how research helps determine the impact animals, humans and the environment have on each other.

KIRKHOF CENTER 2215

Investigating Potential Woodlot Overharvest

Presenter: Dominick Remmo

Mentor: Erik Nordman

My goal was to determine whether or not there was evidence of overharvest within a wooded lot owned by a neighboring family. I used the relatively untouched back lot as a baseline comparison to the potentially overharvested front lot area. I then utilized random quadrat sampling over 6 area strips in the front and back lot areas, taking inventories of the trees based on DBH, health (whether dead/downed), and then calculated the density and frequency for comparison. Upon conclusion the compared results of the density and frequency did show that the front lot had a much lower frequency of trees than the back lot, as well as more downed trees. This study was pertinent to giving the stakeholder (the neighboring family) an idea of the current state of the woodlot and what needed to be done to maintain its integrity.

KIRKHOF CENTER 2216

Manistee Private Land Quality Buck Management Plan

Presenter: William Hickman

Mentor: Erik Nordman

Very few large antlered bucks visit my private property, and my goal is increase the number of these deer that enter and remain on the property. I improved the land, including removing pine plantation and adding food plots, as well as planting certain plant/tree species known to attract whitetail deer. Using a tractor, expert knowledge and the help of my family and friends we modified the property to achieve this goal. I learned techniques that worked in achieving this goal, and some that didn't. This is very important to me and my family, as we spend quality time together at my cabin with the over-arching goal of harvesting more mature bucks.

KIRKHOF CENTER 2263

A Statistical Consulting Experience: Determining the Predictive Value of

CHM 115 Grades on CHM 116 Grades

Presenters: Peter Eklund, Kyle Ferguson

Mentors: John Gabrosek, Thomas Pentecost

Dr. Thomas Pentecost wanted to determine the minimum grade required in CHM 115 for the student to reliably pass CHM 116. Using data that Dr. Pentecost collected from over one thousand students who enrolled in both courses over a three year period, we performed multiple linear regression analyses. As Dr. Pentecost's consultants, our main challenge was in designing these analyses: helping him decide which data to include and how to define what it means to "reliably" pass. We will also discuss what we learned about statistical consulting itself.

Beginning at 4:00 PM

KIRKHOF CENTER 1104

Predicted Response of *Achatinella mustelina* to Predator Control

Presenter: Sophie Bennett

Mentor: Carol Griffin

During the late 19th century, 41 species of O'ahu tree snail (*Achatinella spp.*) were identified in the mountain ranges of Hawaii's third largest island. Due to habitat degradation and the introduction of non-native predators, only six or seven species remain. The surviving tree snails were added to the endangered species list in 1981. I used the software, STELLA, to model how captive breeding and predator control will impact the population of *Achatinella mustelina*, the last species of O'ahu tree snail present in the Wai'anae mountain range. I found that if predation by non-native predators continues at its current rate, the snail will be extinct in the wild within decades. To preserve *A. mustelina*, predation by the rosy wolf snail, rats, and chameleons must be reduced drastically. The level of control required may push the boundaries of feasibility, but it may be accomplished through the use of predator exclosures and baited traps.

KIRKHOF CENTER 1142

Reacting to the Past: Complexities in the French Enlightenment

Presenter: Kelsey May

Mentor: David Eick

During the radical mid-1700s, liberties that had never before been considered were brought to the forefront of discussion. French philosophers began to question what information was being handed down to the heavily-regulated masses. In my Honors College Junior Seminar course, we re-enacted the roles of these idealists, discovering again how new and conflicting perspectives

emerged during a time of intense religious and political censorship. My presentation will summarize the historical findings of individuals such as Diderot, Voltaire, Malesherbes, and Graffigny, as well as present the perspective of lesser Enlightenment thinkers, including the working poor.

KIRKHOF CENTER 2216

Increasing Recycling Efforts at Shape Corporation

Presenter: Aliessa Kuhlman

Mentor: Erik Nordman

This project looks at the current state of Shape's recycling efforts through invoice baseline data. Data collection uses the methodology of current principles and efforts of the company to urge improvements. Findings will conclude the degree of implementations needed to push efforts. My presentation will show what a company can do to better their recycling efforts while promoting self-improvement.

Beginning at 4:30 PM

KIRKHOF CENTER 1104

Modeling the Effects of Climate Change on the Habitat and Distribution of the Woodland Jumping Mouse

Presenter: Jessica Siemen

Mentor: Carol Griffin

Climate change has been predicted to increase global temperatures on average 4.3°C in the next 100 years. The upsurge of temperatures will alter biotic and abiotic systems affecting the distribution of vegetation, forest function and habitat suitability. Eco-system changes can be difficult for sensitive species like the woodland jumping mouse (*Napaeozapus insignis*). The loss of preferred habitat and increased fragmentation combined with geographical and physiological restrictions will hinder the connectivity and inherent patterns of the woodland jumping mouse (WJM) populations. Using the high and low temperature predictions, I will create spatial and temporal models for climate change effects pertaining to the WJM habitat and the possible changes in distribution of the WJM in Northern Lower Michigan.

KIRKHOF CENTER 2215

Growing Grand: The GVSU Restoration Plan

Presenter: Youssef Darwich

Mentor: Erik Nordman

Grand Valley State University is emerging as a national leader in sustainable practices. However, rapid growth and development around the university has increased the pressure on the surrounding landscapes to serve multiple functions.

GVSU owns a significant amount of farmland surrounding the university, which has been leased while long term plans are formulated. Yet, historical land use has depreciated natural capital and current use fails to align with GVSU's value of sustainability.

This project provides an adaptive management plan for the restoration of 100 acres of GVSU land by focusing on hydrology, ecology and economics. Hydrological models will present changes in watershed dynamics in response to development. Strategies for obtaining cost effective sources of diverse plant stock will be explored. Potential partnerships and sources of revenue will be identified. Ultimately, this plan hopes to provide a framework for sustainable development at GVSU and beyond.

KIRKHOF CENTER 2263

The Article FEMME in L'Encyclopédie

Presenter: Katie Torkelson

Mentor: David Eick

The *Encyclopédie* was a keystone of the French Enlightenment. Championing equality, critical thinking, and reason, among many other values, the *Encyclopédie* was largely a radical work. However, its article on women (*femme*) is overwhelmingly traditionalist in its views. As the Enlightenment was the birth of many current, widely-held Western values, the hypocrisies in this work have carried on and can be seen today, as we still are plagued with problems of recognizing gender equality. This presentation will focus on highlighting the stark differences between ideals presented in other entries of the *Encyclopédie* and the reality of the role of women in society.

Panel Presentations, Abstracts & Schedule

Beginning at 9:00 AM

MARY IDEMA PEW LIBRARY MULTIPURPOSE ROOM

Digital Insight: Louis de Jaucourt and Citation Strategies in Diderot's *Encyclopédie*, 1751-1772

Presenters: Caitlin McCullough, Scott St Louis, Katie Torkelson

Mentor: David Eick

Caitlin McCullough

Jean leRond d'Alembert, renowned French co-editor of *l'Encyclopédie*, is arguably most famous for his *Discours préliminaire*, the introduction to *l'Encyclopédie*. Although he was the author of one of the literary works, which best exemplified the ideals and values of the Enlightenment, d'Alembert was also a well respected, although often underappreciated mathematician. Unlike his literary works, his mathematics work often lacked clarity and appeared hurried in their presentation and their subsequent publication. In order to understand why his publications were often missing vital information and consequently, why his contributions to mathematics were often overlooked, one must delve into d'Alembert's personal history, his own understanding and perspective of mathematics, and the particularly competitive nature of mathematics at that time, accomplished through secondary source research as well as the analysis of the mathematic articles he contributed to *l'Encyclopédie*.

Scott St Louis

This presentation builds upon the groundbreaking work of Dan Edelstein, Robert Morrissey, and Glenn Roe in the burgeoning field of the digital humanities. By utilizing the search capabilities offered with a digitized version of Diderot's *Encyclopédie*, I find that the carefully designed macroscopic methodology of Edelstein and his colleagues must be tempered by ongoing microscopic analysis of digitized source material. The use of sequence alignment programs and massive online databases can yield important new insights in cultural history, but these findings must be balanced by close reading of documents relevant to the research question(s) at hand.

Katie Torkelson

The *Encyclopédie* was a keystone of the French Enlightenment. Championing equality, critical thinking, and reason, among many other values, the *Encyclopédie* was largely a radical work. However, its article on women (*femme*) is overwhelmingly traditionalist in its views. As the Enlightenment was the birth of many current, widely-held Western values, the hypocrisies in this

work have carried on and can be seen today, as we still are plagued with problems of recognizing gender equality. This presentation will focus on highlighting the stark differences between ideals presented in other entries of the *Encyclopédie* and the reality of the role of women in society.

Beginning at 10:00 AM

MARY IDEMA PEW LIBRARY MULTIPURPOSE ROOM

Mobutu: Our Tyrant

Presenters: Jacob Collaer, Kaylin Klein

Mentor: James Goode

During the Ford administration there were various instances that called for US decision making and intervention abroad. Ranging from Vietnam and East Timor, to the investigation of the CIA and the Church Hearings, the US was actively interacting in world affairs. In the midst of these foreign policy concerns, a useful Tyrant reached power in Zaire. In present day Democratic Republic of Congo, formerly known as Zaire, Mobutu Sese Seko, with CIA help, rose to power. By analyzing the situation prior to his rise during the Johnson presidency, we will show why policy makers believed Mobutu was necessary to the successful implementation of American Foreign Policy. We will also discuss the character of Mobutu and describe the circumstances that affected his choices. Lastly, examining the conclusion of his rule, we will discuss the challenges of using politically questionable characters to achieve US goals.

Beginning at 11:00 AM

MARY IDEMA PEW LIBRARY MULTIPURPOSE ROOM

Television Studies Panel

Presenters: Jordan Boze, Ashleigh Lewis, Taylor Simpson

Mentor: Danielle Leek

Jordan Boze

“Naming Killers: A content analysis comparison of Canadian and American coverage of public violence.” This paper endeavors to look at and compare the way in which Canadian and American television media handle naming perpetrators of public violence.

Ashleigh Lewis

“YouTube and the ‘everyday’ celebrity” endeavors to explore the world of YouTube and how this multifaceted website has created a new celebrity. Through content analysis, the researcher will explain how YouTube has broken down what it means to be normal.

Taylor Simpson

“The Rise in Medical School Applications: What is the influence of medical television shows on undergraduate pre-medical college students?” This secondary research paper offers an insight into the world of Medical Dramas. Specifically how shows like House and Grey’s Anatomy (etc.) have become a source of influence for undergraduate college students in regards to applying for medical school programs. In short, peoples, including college students, are finding TV doctors more relatable and seeing the profession as more attainable, leading to an increase in the average amount of applications received by medical school programs.

Beginning at 12:00 PM

MARY IDEMA PEW LIBRARY MULTIPURPOSE ROOM

Fresh Perspectives on Timeless Works of Spanish Literature

Presenters: Anastasia Boerman, Amber McClain, Lacy Powers

Mentor: Maria Rebeca Castellanos

Anastasia Boerman

Don Juan Tenorio y la penitencia que salva su vida (*Don Juan Tenorio* and The Penitence that Saved His Life)

Don Juan Tenorio by José Zorrilla is a modern take on the Spanish play *El Burlador de Seville y Convidado de Piedra* (*The Trickster of Seville and The Stone Guest*) by Tirso de Molina. The major difference between the two works is that in *The Trickster of Seville*, Don Juan ends up in Hell; in contrast, in *Don Juan Tenorio*, his love, Doña Inés, spends five years in purgatory in order to send both of their souls to Heaven. This paper explores the whirlwind romance between Don Juan and Doña Inés as well as the complexities that come with Don Juan being a “former” rake.

Amber McClain*

La deshumanización de la vida por el dinero/ The Dehumanization of Life Through Money

Miguel de Cervantes presents the complex relationship between Carrizales and Leonora through the rigorous demands money places on their marriage within “El celoso extremeño”. Carrizales manages both his wife and his money with the same tender care, greed and manipulation. As Carrizales demands complete submission of Leonora, she loses her sense of identity and humanization as money proves to be the root of their relationship. The parallels Carrizales draws between his wife and money demonstrate that Leonora cannot be objectivized as capital gain in order to maintain a strong and successful marriage, let alone breath of life.

*This presentation is in Spanish

Lacy Powers*

La Canción del pirata captura el espíritu de Romanticismo (*The Song of the pirate* captures the spirit of Romanticism)

José de Espronceda wrote many poems that captured the essence of romanticism throughout the early nineteenth century. One of Espronceda's most renowned poems, *Canción del pirata* contains many of the characteristics important to the Romantic period. Romanticism was created after a time of oppression and rigidity that was embodied in the period of Neoclassicism. Through the emotional language, the rhythm and repetition, Espronceda creates an anthem for the oppressed. Espronceda uses the life of a pirate as a symbol that exemplifies the themes of liberty, nature and rebellion. It is through these themes, the organization and the language of the poem that Espronceda is able to capture the spirit of Romanticism.

*This presentation is in Spanish

Beginning at 2:30 PM

MARY IDEMA PEW LIBRARY MULTIPURPOSE ROOM

The Many Faces of Enlightenment

Presenters: Micaela Cole, Andrew Newton

Mentors: Ellen Adams, David Eick

Micaela Cole

After freeing themselves from the oppressive British crown and terminating a failed experiment with confederation under the Articles, the Framers were presented with a daunting and complex question: how should a government be constituted in order to best function in accordance with the interests of the people? When studying the making of the constitution, great emphasis is placed upon the debate among the Framers during the constitutional convention— but the philosophical thought behind their arguments is granted less attention, and when it is discussed, John Locke and other English philosophers dominate conversation. The Framers are sometimes called “children of the Enlightenment”. Through a more thorough look at the constitutional thought which influenced the framers, it is clear that the Framers are not only children of English enlightenment thought, but French as well. Montesquieu and Rousseau in particular have provided much of the foundation for american constitutionalism.

Andrew Newton

Too often the Enlightenment is seen as an exclusively male affair, but this is far from correct. Françoise de Graffigny was a woman of the Enlightenment and her novel, Lettres d'une Peruvienne (Letters of a Peruvian Woman) exemplifies the nature and ideals of this movement. By giving voice to the insights she gained as an Enlightenment insider through a fictional outside observer, Graffigny was able to effectively illustrate and emphasize the strengths of the Enlightenment as well as its downfalls and weaknesses. By examining this book I will show the great disparity between the Enlightenment thinkers' professed ideals and their actual practices, and also highlight the way that the women of the Enlightenment viewed the movement as a whole.

Beginning at 4:00 PM

MARY IDEMA PEW LIBRARY MULTIPURPOSE ROOM

Medical Advancements Throughout the Enlightenment

Presenters: Hannah Burt, Emily Konen, Haley Schaner

Mentors: Ellen Adams, David Eick

Hannah Burt

Population in rural France witnessed a decline during the eighteenth century that medical achievements from the Enlightenment helped counteract. Medicine prevents the death of thousands daily and to further understand the body the utilization of cadavers was sought after during the Enlightenment. Not all situations called for the use of cadavers, so stimulators were employed. The Enlightenment pushed for an emphasis towards the pursuit of knowledge and was pursued more than ever heavily benefitting medical education. The history of medical education leading up to the Enlightenment was equally important as the Enlightenment itself. Medicine and medical education during the Enlightenment period had a strong presence in Paris and Oxford, experienced many changes, and was used practically for teaching purposes.

Emily Konen

The Enlightenment was a time that featured discovery through all facets of knowledge. Religion, knowledge for the common people, anatomy, and the furthering of human knowledge of the brain were topics greatly debated during the 18th century. The progression of psychology during this period was great, seeing an influx in differing opinions of the brain's function. There were several views on the foundation of knowledge in the Enlightenment. Treasured philosophers such as Descartes believed knowledge to stem from innate ideas in the brain, whereas John Locke believed knowledge was a product of sensualism, also known as tabula rasa. Today the topics of innate ideas and sensualism are still debated.

Haley Schaner

The Enlightenment was a time of great change in the medical world. Throughout this time, ideas were constantly being developed and improved upon. The Renaissance, however, influenced these improvements by encouraging scientists and doctors to begin to question their knowledge of the human body. This questioning of ideas is evident throughout the medical studies and various art forms of the Renaissance. The Renaissance then influenced doctors and scientists to begin to question the structure and functions of the human body and its response to illness and disease. The Enlightenment allowed for an increase in anatomical knowledge which, in turn, led to advancements in surgical procedures and an expanded understanding of diseases.

Exhibition of Art

9:00 AM - 6:00 PM

Artist Reception 5:00 PM

MARY IDEMA PEW LIBRARY EXHIBITION SPACE 01

Wonder Theatre of the Thumb

Participants attending 5:00 PM - 6:00 PM

Presenter: Marissa Dillon

Mentor: Anthony Thompson

It would take a commuter about five minutes to drive through Caro, Michigan. As you near the heart of downtown you will drive past numerous small businesses. This stretch of locally owned businesses leads to the heart of the small businesses in Caro, The Strand Theater. The Strand was advertised as the “Wonder Theatre of the Thumb” when it first opened. The operator of the Strand, Rick, has owned the theater since 1994. The Strand is at the near center of Caro and remains at the heart of local businesses in a largely blue-collar Midwest town. The lights of The Strand remain as one of the most impressive details of the town of Caro. They give a sense of wonder to the children and families who venture towards this building as both a means of escape and an avenue to discover something unfound. Residents of Caro, have seamlessly become connected through this theater. It’s the simplicity of the place that I admire in a world that is so complicated.

MARY IDEMA PEW LIBRARY EXHIBITION SPACE 02

Library exhibition

Participants attending 5:00 PM - 6:00 PM

Presenter: Anna Bowles

Mentor: Dellas Henke

Anna Bowles

Engravings are presented by the artist.

MARY IDEMA PEW LIBRARY EXHIBITION SPACE 03

The Grand View

Participants attending 5:00 PM - 6:00 PM

Presenter: Kristen Hollingsworth

Mentor: Nathan Abramowski

The purpose of my project is to allow my audience to see the beautiful realm of shapes and colors that I experience. When looking at a particular image, our eyes are affixed to the iconic buildings, structures, and items which we are most accustomed to seeing. Whether we are looking at a car, parking lot, or building, our predisposed conception of seeing the world prevents our vision from perceiving the objects as anything other than what they are. Through the use of repetition in a photographic format, I ask the viewer to examine not these items which their vision parallels, but the geometric and organic shapes and patterns of colors that have been formed as a result of each of the individual details inherent in the image. As we pay attention to these frames of focus, we must never forget to appreciate the way they compliment and supplement one another to formulate a larger picture. It is through these methods that we can examine the world and all its beauty from “The Grand View”.

MARY IDEMA PEW LIBRARY EXHIBITION SPACE 04

“Homemade” Photography Senior Thesis

Participants attending 5:00 PM - 6:00 PM

Presenter: Megan Lendman

Mentor: Anthony Thompson

Creation happens with our hands and also within our hearts. To create with our own hands produces a tangible object while also forwarding our understandings of the world and of ourselves. Experiences also create within ourselves in the form of memories, knowlege, and personal growth. “Homemade” showcases physical and personal creation in a multidimensional photographic exhibit that focuses on individuals and their reflections on how their home made them the people they are today.

MARY IDEMA PEW LIBRARY EXHIBITION SPACE 05

Responsive Web Design

Participants attending 5:00 PM - 6:00 PM

Presenter: Tracey Howell

Mentor: Vinicius Rebello Lima

A responsive website changes depending on the size of the device that is being used. The content stays the same but the layout changes between mobile, tablet devices, laptops and desktops. It is the challenge of a graphic designer to make sense of the content, and figure out how it should respond effectively in each device. The arrangement, look, and the feel of the website depends heavily on the content. In making a responsive website for the band The XX, research was done to find out what sort of identity they have, and how their image is portrayed. The look of their albums, the genre, and the music they make ultimately influenced the design of their website.

MARY IDEMA PEW LIBRARY EXHIBITION SPACE 06

Unseen

Participants attending 5:00 PM - 6:00 PM

Presenter: Kayleigh Gauthier

Mentor: Jill Eggers

In my work, I strive to express the invisible signs of trauma in a way that can be seen, and to create a sort of tension between the figures within the painting, as well as with the viewer. The desire to pursue a specific idea usually comes to me intuitively. It is only once I have worked on the piece and truly engaged, that I discover its purpose and what it is trying to convey. The imagery that I am drawn to typically has an uncomfortable ambiguity: an interaction such as one person grabbing someone's face or body could be read as intimate, or violent. Added ambiguity comes through showing one or both of the subjects as indifferent or placid. The viewer may read the situation as unsettling, but the figures within the painting may not seem to feel that way. This heightens the tension between the viewer and the painting.

MARY IDEMA PEW LIBRARY EXHIBITION SPACE 07

Untitled (Essential Concentration)

Participants attending 5:00 PM - 6:00 PM

Presenter: Krzysztof Lower

Mentor: Paul Wittenbraker

Krzysztof Lower

The new Cosmic order is spatial, spiritual, social, and mystical. It is energized by capitalism, the future, architecture, and dreams. The new Cosmic order situates itself in relationship to global and local construction companies, real estate investment firms, and corporate research and development. The new Cosmic order demands an imaginary that is temporary, provisional, and propositional.

MARY IDEMA PEW LIBRARY EXHIBITION SPACE 08

Biological Glitches

Participants attending 5:00 PM - 6:00 PM

Presenter: Catherine Rader

Mentor: Paul Wittenbraker

This series follows the theme of glitches or corruption of codes in digital or analog data being made in to art. The set of three photos depict glitches in nature, otherwise known as genetic variation. I wanted to explore different dominant and recessive traits found in people. Some examples include

the ability to roll your tongue, earlobe attachment, dimples, cleft chin, finger shape, freckles and so on. The photos show specific differences between my boyfriend and me, our different thumb shape and earlobe attachment. We both share the ability to roll our tongues. I unconsciously seek out the differences in people when I first meet them. I don't really know why, but I have always done it.

MARY IDEMA PEW LIBRARY EXHIBITION SPACE 09

Bridge Street Underwater

Participants attending 5:00 PM - 6:00 PM

Presenter: Katie Pershon

Mentor: Paul Wittenbraker

This work was part of Civic Studio's project "Provisional Flood Club" an inquiry into social connections in the near West Side of Grand Rapids, which is a site of gentrification and a 100 year flood plain. Bridge Street Underwater is a visual exploration of the view of the Bridge Street neighborhood from Civic Studio's space, a former automobile showroom. The views of the water abstractly recreate the 1904 flood, which did cover the street in many of the views in the piece.

The work can be previewed here: <https://vimeo.com/92233413>

MARY IDEMA PEW LIBRARY EXHIBITION SPACE 10

Sister Self Portrait

Participants attending 5:00 PM - 6:00 PM

Presenter: Alyssa Roach

Mentor: Paul Wittenbraker

Alyssa Roach

Media - Digital print on fabric with stitching

Dimensions - 19x24in

Statement - As a fraternal twin, I find myself being curious about the visual similarities and dissimilarities that exists between relatives. Printed on the fabric are two portraits; one of my sister and one of myself. Both the portraits have been folded and stitched together to create one portrait that amplifies both our similarities and our dissimilarities.

MARY IDEMA PEW LIBRARY EXHIBITION SPACE 11

Palpable

Participants attending 5:00 PM - 6:00 PM

Presenter: Hallie Hofman

Mentor: Paul Wittenbraker

This video is about exploring the compelling sensation of touch and how it unifies our senses and ways of understanding our bonds with others. This video allowed me to discover that a blanket filled the lack of a relationship I had with my brother. Touch is a strong sensation that is often used as means of communication through gestures, fabrics, and expressions of affection. And touch is something that shaped me both as a person and an artist.

MARY IDEMA PEW LIBRARY EXHIBITION SPACE 12

Concealment

Participants attending 5:00 PM - 6:00 PM

Presenter: Chelsey Sall

Mentor: Hoon Lee

My ideas originate and stem from the presence of nature and the human body. Each is a form that either conceals or reveals information. More time spent with or researching one leads to a bigger revelation. The human organs along with simple forms in nature lend themselves to be canvases. My work focuses on the transformation of these objects to become beautiful repulsions, desirable articles.

MARY IDEMA PEW LIBRARY EXHIBITION SPACE 13

Evan

Participants attending 5:00 PM - 6:00 PM

Presenter: Emma Hoekstra

Mentor: Renee Zettle-Sterling

This piece, *Evan*, is a reliquary, which is meant to hold a relic, something of religious or sentimental value. This last summer I lost someone very special to me. Inside my reliquary is a single rose that he had given me. For me, this project helped to honor his life and keep safe a single memory of him that I will never forget. On the outside of the reliquary is a metal rose formed out of copper. On the rose petals I set red garnets in silver tubing meant to look like dew. The rose is meant to look alive to signify his life. The inside of the reliquary has a warm, golden glow from the gold leaf overlay on the interior walls. The gold leaf was meant to give the inside a heavenly, precious feeling, and signifies where he is now.

MARY IDEMA PEW LIBRARY EXHIBITION SPACE 14

Pen Cap Reliquary

Participants attending 5:00 PM - 6:00 PM

Presenter: Nick Ciliak

Mentor: Renee Zettle-Sterling

I keep a pen and sketchbook with me at all times. I like to be able to sketch or write notes and ideas wherever I go. One of my favorite pens ran out of ink, so I decided to preserve its memory in a reliquary box. I created a book form and etched scans of my sketchbook on all sides. A paper form on the interior of the box holds the pen cap. The pen cap, which is normally discarded with the empty pen, is now preserved within a representation of the notebook that was written in with the pen. Reflecting on an everyday object has helped me to see beauty and value in the ordinary.

MARY IDEMA PEW LIBRARY EXHIBITION SPACE 15

Silver Necklace with Stones

Participants attending 5:00 PM - 6:00 PM

Presenter: Rikki Paepke

Mentor: Renee Zettle-Sterling

As an artist I'm accustomed to working with my hands, but fabricating with metal is a different type of creation and process, and it has opened up new ways of thinking creatively for me. The Introduction to Jewelry class collaborated with the Geology Club, who provided the cabochons (flat backed stones) for us. The stone I used is called Coprolite, a scientific name for fossilized excrement, specifically dinosaur excrement. Having been part of an extinct animal and buried in the earth for thousands of years, the stone captured my imagination. I was also drawn to the stone because it had a sense of importance, history, and narrative, which lead me to create the flowing organic design seen in my piece. The fabrication of this necklace has been a new, fun, and challenging experience that exposed me to new techniques such as soldering and stone setting. I look forward to taking more jewelry and metalsmithing classes to further my abilities and skill set.

MARY IDEMA PEW LIBRARY EXHIBITION SPACE 16

The Balance of Power

Participants attending 5:00 PM - 6:00 PM

Presenter: Virginia Pisto

Mentors: Jill Eggers, Hoon Lee

My work explores the deeply rooted relationships between ourselves and the vast natural world around us; between the human and non-human animals. By using both clay and oil paint with a careful consideration of form, texture, and color, a narrative object is created that invites quiet reflection by the viewer. The concentrated gaze of the animals created both enchants and interrogates; sparking the natural instinct of curiosity while simultaneously demanding justification

for the creature's compromising position.

MARY IDEMA PEW LIBRARY EXHIBITION SPACE 17

Play and Repetition

Participants attending 5:00 PM - 6:00 PM

Presenter: Sarah Confer

Mentor: Hoon Lee

In the ceramic peices I make, I focus on creating a sense of repetition and chance. By creating spinning tops that are free to be used, the audience is caught between the tension to play and to avoid the fragile object. By repeating the action of spinning, the form of the spinning top is explored, and the circular motion echoes back to the potter's wheel on which it was made. Using ink transforms these objects into writing utensils that record a single moment of play and exploration. Please touch the art.

MARY IDEMA PEW LIBRARY EXHIBITION SPACE 18 - DC

Intertwined

Participants attending 5:00 PM - 6:00 PM

Presenter: Sienna McCone

Mentor: Renee Zettle-Sterling

Casting, a production technique within the metalsmithing department, exemplifies the process of making multiples, generating replicas from a singular form. When coupled with found objects, casting can even act as a unique method for preservation: eradicating the original object in favor of a duplicate. My piece originated from the integration of the involucre of an acorn with a twined vine; I discovered both objects on a walk through the woods, their natural shape and texture attracted my attention. I wanted to not only replicate the forms, but rather incorporate them into a new medium. So I fabricated a ring from the found objects, created a temporary mold, and cast the piece in silver. It is a challenging process, one that can never promise a perfect result.

MARY IDEMA PEW LIBRARY EXHIBITION SPACE 19

The Etiquette of Give and Take

Participants attending 5:00 PM - 6:00 PM

Presenter: Tabitha Gibbs

Mentor: Paul Wittenbraker

The project invited viewers to take one of the prints installed in the space but under the condition that they replace it with something else. This facilitated the creation of a micro gift economy

amongst participants. The prints cycled through a system of exchange through barter, trade and negotiation. For non-participant viewers, it opened up the dialogue on the etiquette of following established rules and how values are socially constructed.

Live Performance

Beginning at 1:00 PM

MARY IDEMA PEW LIBRARY MULTIPURPOSE ROOM

Awash with Color

Presenter: Kelsey May

Mentor: Oindrila Mukherjee

I propose to perform spoken word and oral poetry during my thirty minute session. I have performed my poems in several cities in the U.S. at a number of venues, to audiences as large as 75 people. I have several of these memorized and will work to memorize those that are not. The topics of my poetry are most often examining racial identity, societal structure, and the tension between the two in the context of individual stories. This is why I chose the title “Awash with Color.”

The titles of my pieces include: “Goldilocks,” “Awash with Color,” “Alternative Stories,” “The One who Owns the City,” “I Know About Bruises,” “Release,” and “Street Boy.”

Film / Video

Beginning at 5:00 PM

MARY IDEMA PEW LIBRARY MULTIPURPOSE ROOM

Big Trees - Content Marketing for the Ford Motor Company

Presenters: Atikh Bana, Joseph Buckenmeyer, Richard Iseppi, Ian Kast, Chad Rodgers, Olga Sarayeva, Lindsey VanDenBoom

Mentor: Frank Blossom

This project was a collaboration between students of the advertising and public relations, and film and video departments at Grand Valley State University, to create content for the Ford ‘*Go Further*’ advertising campaign.

The subject of our video is David Milarch, founder of the Archangel Ancient Tree Archive. David and his sons identify the largest and oldest trees of a species and clone them, fighting to preserve their genetics and restore the world’s old-growth forests.

The video was the winning submission in a competition between local colleges, sponsored by Team Detroit - the advertising agency for the Ford Motor Company. In addition to planning, filming, and editing the video, students created and executed a promotion strategy that allowed us to reach the 1,500 view objective in less than two days. The video received more than 5,000 views in just three weeks, reaching a global audience.

Index of Presenters and Mentors

(Sorted by Last Name)

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Abeare, Mackenzie	Student	11:00 a.m.	Henry Hall Atrium 043
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Adams, Ellen	Mentor	4:00 p.m.	MIP Library Multipurpose Room
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Beck, Teresa	Mentor	11:00 a.m.	Kirkhof Center 1142
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Eggers, Jill	Mentor	9:00 a.m.	MIP Library Exhibition Space 16
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Eick, David	Mentor	2:30 p.m.	Kirkhof Center 2263
Eick, David	Mentor	2:30 p.m.	MIP Library Multipurpose Room
Eick, David	Mentor	4:00 p.m.	Kirkhof Center 1142
Eick, David	Mentor	4:00 p.m.	MIP Library Multipurpose Room
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Ferguson, Steven	Student	11:00 a.m.	Henry Hall Atrium 026
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Fleming, Rosa	Student	10:00 a.m.	Kirkhof Center GRR 051
Flores, Alicia	Student	9:00 a.m.	Kirkhof Center GRR 091
Flores, Norma	Mentor	10:30 a.m.	Kirkhof Center 2201
Ford, Molly	Student	10:00 a.m.	Henry Hall Atrium 029
Forman, Kristin	Student	1:00 p.m.	Henry Hall Atrium 061
Fortes Gonzalez, Mayra	Mentor	12:30 p.m.	Kirkhof Center 2270
Fox, Jackson	Mentor	2:00 p.m.	Henry Hall Atrium 075

Foxa, Gabrielle	Student	9:00 a.m.	Henry Hall Atrium 013
Francis, Joel	Student	12:00 p.m.	Kirkhof Center GRR 114
Friedlmeier, Mihaela	Mentor	11:00 a.m.	Kirkhof Center GRR 018
Friedlmeier, Mihaela	Mentor	12:00 p.m.	Kirkhof Center GRR 011
Friedlmeier, Wolfgang	Mentor	9:00 a.m.	Kirkhof Center GRR 097
Friedlmeier, Wolfgang	Mentor	1:00 p.m.	Kirkhof Center GRR 108
Fritzler, Jessica	Student	11:00 a.m.	Henry Hall Atrium 076
Fritzler, Jessica	Student	2:00 p.m.	Kirkhof Center GRR 058
Frostick, Challie	Student	2:00 p.m.	Henry Hall Atrium 037
Fucinari, David	Student	9:00 a.m.	Henry Hall Atrium 103

G

Gabrosek, John	Mentor	1:00 p.m.	Henry Hall Atrium 097
Gabrosek, John	Mentor	9:00 a.m.	Henry Hall Atrium 090
Gabrosek, John	Mentor	10:00 a.m.	Henry Hall Atrium 068
Gabrosek, John	Mentor	12:00 p.m.	Henry Hall Atrium 096
Gabrosek, John	Mentor	10:00 a.m.	Henry Hall Atrium 072
Gabrosek, John	Mentor	9:00 a.m.	Henry Hall Atrium 011
Gabrosek, John	Mentor	9:00 a.m.	Kirkhof Center GRR 033
Gabrosek, John	Mentor	9:00 a.m.	Kirkhof Center GRR 056
Gabrosek, John	Mentor	2:00 p.m.	Henry Hall Atrium 075
Gabrosek, John	Mentor	12:30 p.m.	Kirkhof Center 2266
Gabrosek, John	Mentor	12:30 p.m.	Kirkhof Center 2263
Gabrosek, John	Mentor	1:30 p.m.	Kirkhof Center 2201
Gabrosek, John	Mentor	1:30 p.m.	Kirkhof Center 1142
Gabrosek, John	Mentor	2:30 p.m.	Kirkhof Center 2201
Gabrosek, John	Mentor	3:30 p.m.	Kirkhof Center 2263
Galen, Luke	Mentor	11:00 a.m.	Kirkhof Center GRR 007
Galicki, Alexandra	Student	2:30 p.m.	Kirkhof Center 1104
Gasinski, Emma	Student	12pm; 3pm	Kirkhof Center GRR 075
Gauche, Lindsay	Student	10:00 a.m.	Henry Hall Atrium 102
Gauthier, Kayleigh	Student	9:00 a.m.	MIP Library Exhibition Space 06
Ghiasvand, Noor	Mentor	2:30 p.m.	Kirkhof Center 1142
Gibson, Jack	Student	9:00 a.m.	Kirkhof Center 1104
Gilbert, Timothy	Student	1:00 p.m.	Kirkhof Center GRR 019
Gildner, Brianna	Student	10:00 a.m.	Henry Hall Atrium 072
Gipson, Karen	Mentor	9:00 a.m.	Henry Hall Atrium 074
Gjebic, Julia	Student	9:00 a.m.	Henry Hall Atrium 074
Glass, Stephen	Mentor	9:00 a.m.	Kirkhof Center GRR 026

Glass, Stephen	Mentor	9:00 a.m.	Kirkhof Center GRR 075
Glass, Stephen	Mentor	10:00 a.m.	Henry Hall Atrium 072
Glass, Stephen	Mentor	1:00 p.m.	Kirkhof Center GRR 017
Goncer, Ellyn	Student	9am; 2pm	Kirkhof Center GRR 026
Gonzalez, David	Student	12:30 p.m.	Kirkhof Center 2270
Goode, James	Mentor	9:00 a.m.	Kirkhof Center 2263
Goode, James	Mentor	10:00 a.m.	MIP Library Multipurpose Room
Gormley, Karli	Student	9:00 a.m.	Henry Hall Atrium 107
Gorris, Dane	Student	10:00 a.m.	Kirkhof Center 2215
Gort, Shelby	Student	2:00 p.m.	Henry Hall Atrium 058
Gosztyla, Daria	Student	1:30 p.m.	Kirkhof Center 1104
Gottlieb, Gabriele	Mentor	1:00 p.m.	Kirkhof Center 2201
Grace, Matthew	Student	1:00 p.m.	Kirkhof Center 2201
Graeser, Stephen	Student	9am; 1pm	Henry Hall Atrium 093
Graham, Douglas	Mentor	12:00 p.m.	Henry Hall Atrium 031
Grant, Amanda	Student	9:00 a.m.	Henry Hall Atrium 012
Green, Ian	Student	9am; 12pm	Kirkhof Center GRR 090
Gregory, Kyle	Student	9:00 a.m.	Henry Hall Atrium 104
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	12:00 p.m.	Kirkhof Center 1104
Griffin, Carol	Mentor	12:30 p.m.	Kirkhof Center 1104
Griffin, Carol	Mentor	1:00 p.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
Griffin, Jacob	Student	12:00 p.m.	Kirkhof Center GRR 035
Grose, Joseph	Student	9:00 a.m.	Kirkhof Center 2216
Gross, Emily	Student	2:30 p.m.	Kirkhof Center 2263
Gulgin, Heather	Mentor	9:00 a.m.	Kirkhof Center GRR 120
Gulotty, Eva	Student	10a; 1p; 3p	Henry Hall Atrium 038
Gulotty, Eva	Student	2:00 p.m.	Henry Hall Atrium 033
Guthrie, Amaya	Student	10am; 4pm	Henry Hall Atrium 062

Gyorkos, Amy	Mentor	9:00 a.m.	Kirkhof Center GRR 041
H			
Habel, Michael	Student	1:00 p.m.	Kirkhof Center GRR 053
Hacker, Karena	Student	9:00 a.m.	Henry Hall Atrium 012
Hamilton, Sean	Student	10:00 a.m.	Kirkhof Center GRR 112
Harkness, Erin	Student	10am; 4pm	Henry Hall Atrium 100
Harris, Danielle	Student	11:00 a.m.	Kirkhof Center GRR 061
Harris, Danielle	Student	12:00 p.m.	Kirkhof Center 2201
Hart, Dawn	Mentor	1:00 p.m.	Kirkhof Center GRR 019
Hart, Dawn	Mentor	9:00 a.m.	Henry Hall Atrium 013
Hart, Dawn	Mentor	2:00 p.m.	Henry Hall Atrium 042
Hart, Matthew	Mentor	10:00 a.m.	Henry Hall Atrium 045
Hart, Matthew	Mentor	11:00 a.m.	Henry Hall Atrium 064
Hart, Matthew	Mentor	10:00 a.m.	Henry Hall Atrium 039
Hart, Matthew	Mentor	10:00 a.m.	Henry Hall Atrium 038
Hashemi, Parastoo	Mentor	12:00 p.m.	Henry Hall Atrium 024
Hatzel, Brian	Mentor	3:00 p.m.	Kirkhof Center GRR 043
Haven, Christopher	Mentor	2:00 p.m.	Henry Hall Atrium 089
Hayden, Nolan	Student	9:00 a.m.	Kirkhof Center GRR 109
Hayes, Sarah	Student	3:00 p.m.	Henry Hall Atrium 092
Hecht, Steven	Mentor	9:00 a.m.	Henry Hall Atrium 020
Hefferan, Tara	Mentor	9:00 a.m.	Henry Hall Atrium 036
Heick, Ashley	Student	9:00 a.m.	Kirkhof Center 1142
Heinicke, Ian	Student	12:00 p.m.	Kirkhof Center GRR 032
Henderson-King, Donna	Mentor	11:00 a.m.	Henry Hall Atrium 077
Henke, Dellas	Mentor	9:00 a.m.	MIP Library Exhibition Space 02
Henshaw, Michael	Mentor	9:00 a.m.	Kirkhof Center GRR 016
Hepner, Jeremiah	Student	10:30 a.m.	Kirkhof Center 2216
Herpst, Shelby	Student	11:00 a.m.	Kirkhof Center GRR 018
Herrington, Deborah	Mentor	1:00 p.m.	Henry Hall Atrium 019
Hessler, John	Student	9:00 a.m.	Kirkhof Center GRR 003
Hessler, John	Student	9:00 a.m.	Kirkhof Center GRR 015
Hickman, William	Student	3:30 p.m.	Kirkhof Center 2216
Hickox, Alexandra	Student	9:00 a.m.	Kirkhof Center GRR 120
Hillsamer, Aaron	Student	3:00 p.m.	Kirkhof Center GRR 079
Hindeleh, Firas	Mentor	12:00 p.m.	Kirkhof Center GRR 001
Hintz, Andrew	Student	9:00 a.m.	Henry Hall Atrium 099
Hodge, Kelsey	Student	12:00 p.m.	Kirkhof Center GRR 035

Hodge, Kelsey	Student	2:00 p.m.	Kirkhof Center GRR 045
Hoekstra, Emma	Student	9:00 a.m.	MIP Library Exhibition Space 13
Hofman, Hallie	Student	9:00 a.m.	MIP Library Exhibition Space 11
Hollingsworth, Kristen	Student	9:00 a.m.	MIP Library Exhibition Space 03
Holly, Andrew	Student	9:00 a.m.	Henry Hall Atrium 090
Hoogmoed, Ryan	Student	11:00 a.m.	Kirkhof Center GRR 038
Horr, Kyle	Student	9:00 a.m.	Kirkhof Center GRR 073
Horvath, Chelsea	Student	9:00 a.m.	Kirkhof Center GRR 041
Houghton-Rahrig PhD RN, Lori	Mentor	9:00 a.m.	Kirkhof Center GRR 027
Houghton-Rahrig PhD RN, Lori	Mentor	9:00 a.m.	Henry Hall Atrium 053
Howard, Paige	Student	4:00 p.m.	Henry Hall Atrium 048
Howell, Alivia	Student	9:00 a.m.	Kirkhof Center GRR 056
Howell, Tracey	Student	9:00 a.m.	MIP Library Exhibition Space 05
Huang, Jennifer	Student	9:00 a.m.	Kirkhof Center 1142
Hubbard, Sultan	Student	10am; 4pm	Henry Hall Atrium 062
Hughart, Rachel	Student	2:00 p.m.	Henry Hall Atrium 084
Huizen, David	Mentor	2:00 p.m.	Kirkhof Center 2270
Hunter, Ethan	Student	9:30 a.m.	Kirkhof Center 1142
Hutchinson, Alexis	Student	11:30 a.m.	Kirkhof Center 1142
I			
Iseppi, Richard	Student	5:00 p.m.	MIP Library Multipurpose Room
J			
Jackovich, Ashley	Student	12:00 p.m.	Kirkhof Center 1142
Jackson, Alexes	Student	10am; 4pm	Henry Hall Atrium 062
Jacobs, Brittany	Student	1:00 p.m.	Kirkhof Center GRR 022
Jacquot, Joseph	Mentor	11:00 a.m.	Henry Hall Atrium 040
Jacquot, Joseph	Mentor	1:00 p.m.	Kirkhof Center GRR 053
Jamesen, Kathryn	Student	11:30 a.m.	Kirkhof Center 2259
Janardan, Veena	Student	11:00 a.m.	Henry Hall Atrium 006
Janardan, Veena	Student	10:00 a.m.	Henry Hall Atrium 005
Janecke, Jessica	Student	10:00 a.m.	Henry Hall Atrium 069
Jarman, Sorscha	Student	4:00 p.m.	Henry Hall Atrium 067
Jenkins, Jennifer	Mentor	1:00 p.m.	Henry Hall Atrium 097
Jeroso, Ray Anthony Kim	Student	10:30 a.m.	Kirkhof Center 2263
Joffre, Kevin	Student	10:00 a.m.	Kirkhof Center 2201
Johnson, Chelsea	Student	12:00 p.m.	Kirkhof Center 1142
Johnson, Danielle	Student	11:00 a.m.	Henry Hall Atrium 026
Johnson, Jenna	Student	1:00 p.m.	Kirkhof Center 2216

Johnson, Laura	Student	9:00 a.m.	Kirkhof Center GRR 005
Johnson, Patrick	Mentor	12:00 p.m.	Henry Hall Atrium 096
Johnson, Tessa	Student	1:00 p.m.	Henry Hall Atrium 073
Jones, Devin	Student	3:00 p.m.	Kirkhof Center 2215
Jones, Jessie	Student	10am; 4pm	Henry Hall Atrium 100
Jose, Laurence	Mentor	11:00 a.m.	Kirkhof Center 1104
Junge, Erika	Student	11:00 a.m.	Kirkhof Center 1142

K

Kaba, Fatoumata	Student	10:00 a.m.	Henry Hall Atrium 068
Kamgang, Ronald	Student	1pm; 3pm	Kirkhof Center GRR 066
Kamstra, Kodey	Student	10:00 a.m.	Kirkhof Center GRR 052
Kaneshiro, April	Student	1:00 p.m.	Kirkhof Center 2263
Karavas, Nicholas	Student	2:00 p.m.	Kirkhof Center 2201
Kardol, Sven	Student	9:00 a.m.	Henry Hall Atrium 007
Karlik, Dustin	Student	10:00 a.m.	Kirkhof Center GRR 026
Karlik, Dustin	Student	1:00 p.m.	Kirkhof Center GRR 017
Karpen, Mary	Mentor	9:00 a.m.	Kirkhof Center GRR 090
Karpen, Mary	Mentor	1:00 p.m.	Kirkhof Center GRR 020
Kast, Ian	Student	5:00 p.m.	MIP Library Multipurpose Room
Kastura, Michaela	Student	11:00 a.m.	Kirkhof Center GRR 040
Keenlance, Paul	Mentor	11:00 a.m.	Henry Hall Atrium 040
Kelly, Kristen	Student	9:30 a.m.	Kirkhof Center 1142
Kendziorski, Chelsea	Student	10:00 a.m.	Kirkhof Center 2263
Kenyon, Alena	Student	10:00 a.m.	Kirkhof Center GRR 081
Khoo, Sok Kean	Mentor	2:00 p.m.	Kirkhof Center GRR 107
Khoo, Sok Kean	Mentor	2:00 p.m.	Kirkhof Center GRR 078
Khudhur, Basma	Student	10:00 a.m.	Kirkhof Center GRR 092
Kibbe, Mackenzie	Student	12:00 p.m.	Kirkhof Center GRR 106
Kibbe, Mackenzie	Student	1:00 p.m.	Kirkhof Center GRR 002
Kiewit, Alexander	Student	10am; 2pm	Kirkhof Center GRR 059
Kilburn, Whitt	Mentor	9:30 a.m.	Kirkhof Center 2270
Kilburn, Whitt	Mentor	1:30 p.m.	Kirkhof Center 2270
Kim, YeonHee	Student	10am; 12pm	Henry Hall Atrium 056
King, Sarah	Mentor	9:00 a.m.	Henry Hall Atrium 107
Kiplinger, Megan	Student	10:00 a.m.	Henry Hall Atrium 066
Kishman, Erin	Student	1:00 p.m.	Henry Hall Atrium 044
Klein, Edwin	Student	9:00 a.m.	Henry Hall Atrium 087
Klein, Kaylin	Student	10:00 a.m.	MIP Library Multipurpose Room

Kleine Deters, Jeremy	Student	11:00 a.m.	Kirkhof Center 2201
Kleine Deters, Jeremy	Student	2:30 p.m.	Kirkhof Center 2270
Klingbiel, Jack	Student	10:00 a.m.	Henry Hall Atrium 051
Klingert, Christine	Student	1:00 p.m.	Kirkhof Center 2270
Kneeshaw, Tara	Mentor	11:00 a.m.	Kirkhof Center GRR 049
Knoper, Logan	Student	10:00 a.m.	Kirkhof Center GRR 060
Koerner, Kelly	Student	3:00 p.m.	Henry Hall Atrium 017
Kohler, Mackenzie	Student	11:00 a.m.	Henry Hall Atrium 010
Kohler, Mackenzie	Student	9am; 3pm	Henry Hall Atrium 011
Konen, Emily	Student	4:00 p.m.	MIP Library Multipurpose Room
Kong, Haiying	Mentor	9:00 a.m.	Kirkhof Center 2201
Kopperl, Sheldon	Mentor	1:00 p.m.	Kirkhof Center 2270
Korich, Andrew	Mentor	2:00 p.m.	Henry Hall Atrium 095
Korich, Andrew	Mentor	9:00 a.m.	Henry Hall Atrium 046
Kosak, Talon	Student	2:00 p.m.	Henry Hall Atrium 095
Kosak, Talon	Student	2:00 p.m.	Henry Hall Atrium 080
Kottutt, Jepakoch	Student	9am; 2pm	Henry Hall Atrium 023
Kovacs, Dalila	Mentor	3:00 p.m.	Kirkhof Center GRR 079
Kovacs, Dalila	Mentor	9:00 a.m.	Kirkhof Center GRR 052
Kovacs, Dalila	Mentor	12:00 p.m.	Kirkhof Center GRR 114
Krause, Katelynn	Student	12:00 p.m.	Henry Hall Atrium 054
Krcmar, Maja	Mentor	9:00 a.m.	Henry Hall Atrium 007
Kudla, Nathan	Student	12:30 p.m.	Kirkhof Center 2216
Kudla, Nathan	Student	2:00 p.m.	Henry Hall Atrium 027
Kuhlman, Aliasha	Student	4:00 p.m.	Kirkhof Center 2216
Kujawa, Angela	Student	11:00 a.m.	Henry Hall Atrium 040
Kujawa, Angela	Student	12:30 p.m.	Kirkhof Center 1104
Kulesza, Alyssa	Student	2pm; 4pm	Kirkhof Center GRR 093
Kuligoski, Alexandra	Student	12:00 p.m.	Kirkhof Center 1142
Kurby, Christopher	Mentor	12:00 p.m.	Kirkhof Center GRR 106
Kurjiaka, David	Mentor	9:00 a.m.	Henry Hall Atrium 009
Kurmas, Zachary	Mentor	2:00 p.m.	Kirkhof Center GRR 042
Kurmas, Zachary	Mentor	10:00 a.m.	Henry Hall Atrium 021
Kuzma, Shelby	Student	11:00 a.m.	Henry Hall Atrium 098
Kyle, Barrett	Student	9:00 a.m.	Kirkhof Center GRR 101
L			
LaBar, Hailey	Student	11:00 a.m.	Kirkhof Center GRR 023
LaFave, James	Student	1:00 p.m.	Henry Hall Atrium 061

LaFayette, Gabrielle	Student	10a; 12p; 3p	Kirkhof Center GRR 031
LaMie, Joshua	Student	10:00 a.m.	Henry Hall Atrium 049
Lambertson, Dylan	Student	10:00 a.m.	Henry Hall Atrium 051
Lamrock, Megan	Student	1:00 p.m.	Kirkhof Center 2266
Lane, Erin	Student	11:30 a.m.	Kirkhof Center 1142
Lange, Susanna	Student	2:00 p.m.	Kirkhof Center 2263
Lanier, Gene	Student	1:00 p.m.	Kirkhof Center GRR 095
Lankin, Melissa	Student	10:30 a.m.	Kirkhof Center 1142
Lantz, Andrew	Mentor	2:00 p.m.	Kirkhof Center GRR 055
Lavery, Evan	Student	10am; 2pm	Kirkhof Center GRR 059
Le Mire, Alisha	Student	1:00 p.m.	Henry Hall Atrium 044
Leach, Erin	Student	2pm; 4pm	Kirkhof Center GRR 093
Leahy, Katelin	Student	11:00 a.m.	Kirkhof Center GRR 007
Lee, Diana	Student	9:00 a.m.	Henry Hall Atrium 012
Lee, Hoon	Mentor	9:00 a.m.	MIP Library Exhibition Space 12
Lee, Hoon	Mentor	9:00 a.m.	MIP Library Exhibition Space 17
Lee, Hoon	Mentor	9:00 a.m.	MIP Library Exhibition Space 16
Leek, Danielle	Mentor	11:00 a.m.	MIP Library Multipurpose Room
Leidig, Jonathan	Mentor	9:00 a.m.	Kirkhof Center GRR 069
Leiras, Claudia	Mentor	10:00 a.m.	Kirkhof Center GRR 068
Lemley, Allison	Student	2:00 p.m.	Kirkhof Center 2266
Lendman, Megan	Student	9:00 a.m.	MIP Library Exhibition Space 04
Lenters, Geoffrey	Mentor	10:00 a.m.	Kirkhof Center GRR 112
Leonard, David	Mentor	9:00 a.m.	Kirkhof Center GRR 118
Leppek, Benjamin	Student	9:00 a.m.	Henry Hall Atrium 025
Levin, Adelin	Student	10:00 a.m.	Kirkhof Center 2270
Liang, Yan	Mentor	12:30 p.m.	Kirkhof Center 1142
Linn, David	Mentor	2:00 p.m.	Kirkhof Center GRR 063
Linn, David	Mentor	10:00 a.m.	Kirkhof Center GRR 067
Lioubimtseva, Elena	Mentor	9:30 a.m.	Kirkhof Center 2266
Lioubimtseva, Elena	Mentor	1:00 p.m.	Kirkhof Center 2266
Little, Daltyn	Student	2:00 p.m.	Henry Hall Atrium 004
Lockmiller, Kayla	Student	11:00 a.m.	Kirkhof Center GRR 049
Lockmiller, Kayla	Student	10a; 12p; 3p	Kirkhof Center GRR 031
Lombardo, Michael	Mentor	9:00 a.m.	Henry Hall Atrium 012
Longrey, Cody	Student	12:00 p.m.	Kirkhof Center 2263
Lord, Erica	Student	9:00 a.m.	Henry Hall Atrium 106
Lord, Richard	Mentor	2:00 p.m.	Henry Hall Atrium 070

Lord, Richard	Mentor	9:00 a.m.	Kirkhof Center GRR 119
Lord, Richard	Mentor	2:00 p.m.	Henry Hall Atrium 095
Lord, Richard	Mentor	9:00 a.m.	Henry Hall Atrium 046
Lower, Krzysztof	Student	9:00 a.m.	MIP Library Exhibition Space 07
Lowery, Amanda	Student	9:30 a.m.	Kirkhof Center 2216
Lowery, Amanda	Student	12:00 p.m.	Kirkhof Center GRR 030
Lowis, Ashleigh	Student	11:00 a.m.	MIP Library Multipurpose Room
Lowis, Ashleigh	Student	1:00 p.m.	Kirkhof Center GRR 044
Lown, Deborah	Mentor	10:00 a.m.	Kirkhof Center GRR 094
Luca, Kirk	Student	12:00 p.m.	Kirkhof Center GRR 080
Lucas, Lauren	Student	9:30 a.m.	Kirkhof Center 2215
Lundberg, Paige	Student	12:00 p.m.	Kirkhof Center GRR 041
Lusardi, Lindsey	Student	2:00 p.m.	Kirkhof Center GRR 063
Lustre, Ashley	Student	4:00 p.m.	Henry Hall Atrium 048
Lynn, Jessika	Student	11:00 a.m.	Kirkhof Center GRR 036

M

Ma, Kin	Mentor	1:00 p.m.	Kirkhof Center GRR 022
MacDonald, Neil	Mentor	2:00 p.m.	Henry Hall Atrium 091
Macauley, Beth	Mentor	3:00 p.m.	Henry Hall Atrium 050
Macauley, Beth	Mentor	3:00 p.m.	Henry Hall Atrium 041
Macauley, Emily	Student	3:00 p.m.	Henry Hall Atrium 050
Maddalena, Michael	Student	1:00 p.m.	Kirkhof Center GRR 064
Madden, Gwyn	Mentor	12:00 p.m.	Henry Hall Atrium 052
Madden, Gwyn	Mentor	9:00 a.m.	Kirkhof Center GRR 098
Magirl, Andrew	Student	3:00 p.m.	Kirkhof Center GRR 043
Makowski, Allison	Student	2:30 p.m.	Kirkhof Center 2201
Maouene-Cavin, Josita	Mentor	10:00 a.m.	Henry Hall Atrium 062
Martin, Lee	Student	11:30 a.m.	Kirkhof Center 2215
Masko, Amy	Mentor	10:00 a.m.	Kirkhof Center 2201
Mason, Julia	Mentor	4:00 p.m.	Kirkhof Center GRR 062
Mason, Julia	Mentor	11:00 a.m.	Kirkhof Center 2263
Matchett, Stephen	Mentor	12:00 p.m.	Kirkhof Center GRR 035
Mattox, Stephen	Mentor	2:30 p.m.	Kirkhof Center 2201
May, Christopher	Student	11:00 a.m.	Henry Hall Atrium 098
May, Kelsey	Student	1:00 p.m.	MIP Library Multipurpose Room
May, Kelsey	Student	2:00 p.m.	Henry Hall Atrium 089
May, Kelsey	Student	4:00 p.m.	Kirkhof Center 1142
McAllister, Kathryn	Student	12:00 p.m.	Kirkhof Center 2270

McBane, George	Mentor	10:00 a.m.	Henry Hall Atrium 003
McCabe, Erin	Student	2:00 p.m.	Kirkhof Center 1104
McClain, Amber	Student	12:00 p.m.	MIP Library Multipurpose Room
McCone, Sienna	Student	9:00 a.m.	MIP Library Exhibition Space 18
McCullough, Caitlin	Student	9:00 a.m.	MIP Library Multipurpose Room
McEntire, Molly	Student	4:00 p.m.	Henry Hall Atrium 048
McGuire, Katherine	Student	9am; 12pm	Kirkhof Center GRR 025
McQuaid, Alexandra	Student	12:00 p.m.	Kirkhof Center 1142
Meadows, Austin	Student	9:00 a.m.	Henry Hall Atrium 105
Melick, Paige	Student	12:30 p.m.	Kirkhof Center 2266
Meloche, Chelsea	Student	9:00 a.m.	Henry Hall Atrium 083
Mercado-Idziak, Natosha	Student	9:30 a.m.	Kirkhof Center 2201
Mervyn, Jenna	Student	2:00 p.m.	Henry Hall Atrium 075
Michalec, Devin	Student	10:00 a.m.	Henry Hall Atrium 068
Mico, Hannah	Student	10am; 4pm	Henry Hall Atrium 100
Miller, Jeffrey	Student	3:00 p.m.	Kirkhof Center 2263
Moore, Jennifer	Mentor	12:00 p.m.	Kirkhof Center GRR 080
Moore, Jennifer	Mentor	2:00 p.m.	Henry Hall Atrium 027
Morales, Saray	Student	9:00 a.m.	Henry Hall Atrium 104
Moreno, Teresa	Student	12:00 p.m.	Henry Hall Atrium 052
Moret, Zulema	Mentor	12:30 p.m.	Kirkhof Center 2201
Morgan, Roderick	Mentor	11:00 a.m.	Kirkhof Center GRR 029
Morris, Melissa	Student	12:00 p.m.	Kirkhof Center GRR 030
Morsches, Samantha	Student	2:00 p.m.	Kirkhof Center 1142
Morse, Rachel	Student	10:30 a.m.	Kirkhof Center 1142
Moser, Matthew	Student	3:00 p.m.	Henry Hall Atrium 041
Mukherjee, Oindrila	Mentor	1:00 p.m.	MIP Library Multipurpose Room
Mukhopadhyay, Sayantoni	Student	2:00 p.m.	Kirkhof Center GRR 078
Muller, Leslie	Mentor	12:00 p.m.	Kirkhof Center GRR 030
Munster, Susan	Student	1:30 p.m.	Kirkhof Center 2266
Muscaro, Moriah	Student	9am; 11am	Henry Hall Atrium 009
Muscaro, Moriah	Student	10am; 12pm	Henry Hall Atrium 071

N

Naftaly, Jessica	Student	9:00 a.m.	Kirkhof Center GRR 096
Naftaly, Jessica	Student	10:00 a.m.	Henry Hall Atrium 092
Nagy, Drew	Student	1:30 p.m.	Kirkhof Center 2270
Naheedy, Darby	Student	9:00 a.m.	Henry Hall Atrium 107
Nauta, Kelsie	Student	11:00 a.m.	Henry Hall Atrium 064

Neaton, Kathleen	Student	9:30 a.m.	Kirkhof Center 1142
Nelson, Annastacia	Student	2:00 p.m.	Henry Hall Atrium 055
Newton, Andrew	Student	2:30 p.m.	MIP Library Multipurpose Room
Ngassa, Felix	Mentor	12:00 p.m.	Kirkhof Center GRR 086
Ngassa, Felix	Mentor	1:00 p.m.	Kirkhof Center GRR 113
Nicholson, Benjamin	Student	1pm; 3pm	Kirkhof Center GRR 034
Nietering, Kevin	Student	1:30 p.m.	Kirkhof Center 2216
Niyibizi, Auguste	Student	10am; 2pm	Henry Hall Atrium 039
Nnebedum, Amarachi	Student	10:00 a.m.	Kirkhof Center GRR 081
Nordman, Erik	Mentor	9:00 a.m.	Kirkhof Center 2215
Nordman, Erik	Mentor	9:00 a.m.	Kirkhof Center 2215
Nordman, Erik	Mentor	9:00 a.m.	Kirkhof Center 2216
Nordman, Erik	Mentor	9:30 a.m.	Kirkhof Center 2215
Nordman, Erik	Mentor	10:00 a.m.	Kirkhof Center 2216
Nordman, Erik	Mentor	10:00 a.m.	Kirkhof Center 2215
Nordman, Erik	Mentor	10:30 a.m.	Kirkhof Center 2215
Nordman, Erik	Mentor	10:30 a.m.	Kirkhof Center 2216
Nordman, Erik	Mentor	11:00 a.m.	Kirkhof Center 2215
Nordman, Erik	Mentor	11:00 a.m.	Kirkhof Center 2216
Nordman, Erik	Mentor	11:30 a.m.	Kirkhof Center 2215
Nordman, Erik	Mentor	12:00 p.m.	Kirkhof Center 2215
Nordman, Erik	Mentor	12:00 p.m.	Kirkhof Center 2216
Nordman, Erik	Mentor	12:30 p.m.	Kirkhof Center 2216
Nordman, Erik	Mentor	12:30 p.m.	Kirkhof Center 2215
Nordman, Erik	Mentor	1:00 p.m.	Kirkhof Center 2215
Nordman, Erik	Mentor	1:00 p.m.	Kirkhof Center 2216
Nordman, Erik	Mentor	1:30 p.m.	Kirkhof Center 2216
Nordman, Erik	Mentor	1:30 p.m.	Kirkhof Center 2215
Nordman, Erik	Mentor	2:00 p.m.	Kirkhof Center 2215
Nordman, Erik	Mentor	2:00 p.m.	Kirkhof Center 2216
Nordman, Erik	Mentor	2:30 p.m.	Kirkhof Center 2215
Nordman, Erik	Mentor	2:30 p.m.	Kirkhof Center 2216
Nordman, Erik	Mentor	3:00 p.m.	Kirkhof Center 2216
Nordman, Erik	Mentor	3:30 p.m.	Kirkhof Center 2215
Nordman, Erik	Mentor	3:30 p.m.	Kirkhof Center 2216
Nordman, Erik	Mentor	4:00 p.m.	Kirkhof Center 2216
Nordman, Erik	Mentor	4:30 p.m.	Kirkhof Center 2215
Nsengiyumva, Blaise	Student	12:00 p.m.	Henry Hall Atrium 054

Nunn, Matthew	Student	10:00 a.m.	Henry Hall Atrium 051
O			
O'Connell, Allyson	Student	2:00 p.m.	Kirkhof Center 2270
Ohrling, Nina	Student	10am; 12pm	Kirkhof Center GRR 070
Ong, Billy	Student	10am; 12pm	Henry Hall Atrium 056
Ophoff, Bradley	Student	9:00 a.m.	Kirkhof Center GRR 073
Orchard, Sarah	Student	10:00 a.m.	Kirkhof Center 1104
Orndorf, Nathaniel	Student	12:00 p.m.	Kirkhof Center 2201
Orr, Samantha	Student	11:00 a.m.	Henry Hall Atrium 043
Ostrow, Bruce	Mentor	10:00 a.m.	Henry Hall Atrium 029
Ou, Xinyi	Student	11:00 a.m.	Henry Hall Atrium 086
Owen-DeSchryver, Jamie	Mentor	2:00 p.m.	Kirkhof Center GRR 104

P			
Paepke, Rikki	Student	9:00 a.m.	MIP Library Exhibition Space 15
Paggeot, Jennie	Student	11:30 a.m.	Kirkhof Center 1142
Pandel, Dirk	Mentor	11:00 a.m.	Henry Hall Atrium 016
Park, Ernest	Mentor	12:00 p.m.	Kirkhof Center GRR 037
Pashak, Riley	Student	2:00 p.m.	Henry Hall Atrium 055
Patel, Osman	Mentor	9:00 a.m.	Henry Hall Atrium 099
Patel, Osman	Mentor	11:00 a.m.	Henry Hall Atrium 034
Patel, Osman	Mentor	9:00 a.m.	Henry Hall Atrium 093
Patel, Osman	Mentor	11:00 a.m.	Henry Hall Atrium 098
Patel, Osman	Mentor	10:00 a.m.	Henry Hall Atrium 100
Patterson, Morgan	Student	1:30 p.m.	Kirkhof Center 2201
Pecoraro, Anthony	Student	2:30 p.m.	Kirkhof Center 2270
Pentecost, Thomas	Mentor	12:00 p.m.	Kirkhof Center GRR 082
Pentecost, Thomas	Mentor	3:30 p.m.	Kirkhof Center 2263
Perhamus, Lisa	Mentor	11:30 a.m.	Kirkhof Center 2270
Pershon, Katie	Student	9:00 a.m.	MIP Library Exhibition Space 09
Persoon, James	Mentor	1:00 p.m.	Kirkhof Center GRR 012
Peters, Emily	Student	2:00 p.m.	Kirkhof Center GRR 055
Peters, Evan	Student	11:00 a.m.	Kirkhof Center 2270
Peters, Evan	Student	3:00 p.m.	Kirkhof Center 2263
Peterson, Denise	Student	9am; 1pm	Kirkhof Center GRR 083
Phillips, Maxwell	Student	2:00 p.m.	Kirkhof Center GRR 102
Piccard, Keith	Mentor	9:00 a.m.	Henry Hall Atrium 011
Pickrum, Adam	Student	1:00 p.m.	Henry Hall Atrium 088
Pickrum, Adam	Student	10am; 2pm	Henry Hall Atrium 081

Pike, Jordan	Student	10:00 a.m.	Henry Hall Atrium 102
Pisto, Virginia	Student	9:00 a.m.	MIP Library Exhibition Space 16
Pitcher, Heather	Student	12:00 p.m.	Henry Hall Atrium 052
Pitt, Sarah	Student	2:00 p.m.	Henry Hall Atrium 099
Plant, Anna	Student	11:00 a.m.	Kirkhof Center 2201
Poore, Hannah	Student	2:00 p.m.	Kirkhof Center GRR 104
Potter, Colleen	Student	9:00 a.m.	Henry Hall Atrium 012
Powers, Lacy	Student	12:00 p.m.	MIP Library Multipurpose Room
Powers, Rachel	Mentor	9:00 a.m.	Kirkhof Center GRR 008
Powers, Rachel	Mentor	11:00 a.m.	Kirkhof Center GRR 047
Powers, Rachel	Mentor	11:00 a.m.	Kirkhof Center GRR 038
Powers, Rachel	Mentor	11:00 a.m.	Kirkhof Center 2266
Preston, William	Student	1:30 p.m.	Kirkhof Center 2263
Q			
Quinlan, Josh	Student	1:00 p.m.	Henry Hall Atrium 097
R			
Rabine, Melanie	Mentor	12:00 p.m.	Henry Hall Atrium 096
Rader, Catherine	Student	9:00 a.m.	MIP Library Exhibition Space 08
Ramirez, Irma Y	Student	10:00 a.m.	Henry Hall Atrium 066
Ramirez, Irma Y	Student	11:30 a.m.	Kirkhof Center 2270
Ramirez, Irma Y	Student	1:00 p.m.	Henry Hall Atrium 030
Raymond, Matthew	Student	10am; 4pm	Kirkhof Center GRR 077
Rebello Lima, Vinicius	Mentor	9:00 a.m.	MIP Library Exhibition Space 05
Rebello Lima, Vinicius	Mentor	11:00 a.m.	Kirkhof Center GRR 089
Rediske, Richard	Mentor	9:00 a.m.	Henry Hall Atrium 023
Reed, Ashley	Student	9:00 a.m.	Kirkhof Center GRR 056
Reed, James	Mentor	9:00 a.m.	Kirkhof Center GRR 091
Reiber, Chelsea	Student	11:00 a.m.	Henry Hall Atrium 034
Remick, Tanner	Student	1:00 p.m.	Kirkhof Center GRR 064
Reminga, Katy	Student	9am; 3pm	Kirkhof Center GRR 039
Reminga, Katy	Student	11:00 a.m.	Kirkhof Center GRR 049
Remmo, Dominick	Student	3:30 p.m.	Kirkhof Center 2215
Renkes, Natalie	Student	9am; 3pm	Kirkhof Center GRR 039
Reynolds, Danielle	Student	1:00 p.m.	Kirkhof Center 2215
Reynolds, Ross	Mentor	10:00 a.m.	Henry Hall Atrium 049
Reynolds, Ross	Mentor	10:00 a.m.	Henry Hall Atrium 085
Ricco, Michael	Mentor	1:30 p.m.	Kirkhof Center 1142
Richards, De'Chelle	Student	2:00 p.m.	Kirkhof Center GRR 021

Richiert, Dawn	Mentor	11:00 a.m.	Henry Hall Atrium 035
Riemersma, Peter	Mentor	9:00 a.m.	Kirkhof Center GRR 057
Riemersma, Peter	Mentor	9:00 a.m.	Kirkhof Center GRR 039
Riemersma, Peter	Mentor	10:00 a.m.	Kirkhof Center GRR 059
Riemersma, Peter	Mentor	11:00 a.m.	Kirkhof Center GRR 036
Riemersma, Peter	Mentor	10:00 a.m.	Kirkhof Center GRR 031
Riemersma, Peter	Mentor	10:00 a.m.	Kirkhof Center GRR 060
Rigney, Trevor	Student	9:00 a.m.	Henry Hall Atrium 025
Rigney, Trevor	Student	11:00 a.m.	Kirkhof Center GRR 026
Riley, Lonnie	Student	10:00 a.m.	Kirkhof Center GRR 051
Riley, Lonnie	Student	2:30 p.m.	Kirkhof Center 1142
Riley, Sean	Student	2:00 p.m.	Henry Hall Atrium 080
Ripley, Aaron	Student	9:00 a.m.	Henry Hall Atrium 018
Ripley, Aaron	Student	2:00 p.m.	Kirkhof Center GRR 107
Ritter, Caitlyn	Student	1:00 p.m.	Kirkhof Center GRR 051
Rix, Brandi	Student	10:30 a.m.	Kirkhof Center 1142
Roach, Alyssa	Student	9:00 a.m.	MIP Library Exhibition Space 10
Roberts, Kati	Student	12:00 p.m.	Kirkhof Center 1142
Robertson, Sarah	Student	10:00 a.m.	Kirkhof Center GRR 041
Robinson, Cody	Student	1:00 p.m.	Henry Hall Atrium 002
Robinson, Ursula	Student	2:00 p.m.	Kirkhof Center 2270
Robke, Rhiannon	Student	12:00 p.m.	Henry Hall Atrium 024
Roche, Meagan	Student	10:30 a.m.	Kirkhof Center 2266
Rodgers, Chad	Student	5:00 p.m.	MIP Library Multipurpose Room
Roeters, Rebecca	Student	10:00 a.m.	Kirkhof Center 1142
Rohraff, Dallas	Student	11:00 a.m.	Kirkhof Center GRR 029
Rosenberg, Aaron	Student	10a; 1p; 3p	Henry Hall Atrium 038
Rottier, Aron	Student	10am; 1pm	Kirkhof Center GRR 111
Rowe, Stephen	Mentor	10:00 a.m.	Kirkhof Center 2266
Royer, Christopher	Student	9am; 1pm	Henry Hall Atrium 093
Rozema, Robert	Mentor	11:30 a.m.	Kirkhof Center 2201
Ruetz, Carl	Mentor	2:00 p.m.	Kirkhof Center 1142
Runions, Dylan	Student	10:00 a.m.	Henry Hall Atrium 102
Russa, Mary	Mentor	9:00 a.m.	Kirkhof Center GRR 096
Russell, Amy	Mentor	1:00 p.m.	Kirkhof Center 2263
Russell, Amy	Mentor	1:30 p.m.	Kirkhof Center 2266
Russell, Amy	Mentor	3:00 p.m.	Kirkhof Center 2215
Ruvina, Kristi	Student	9:00 a.m.	Kirkhof Center GRR 109

Ryan, Kristen	Student	11:00 a.m.	Kirkhof Center 2216
Ryskey, Abigail	Student	10am; 12pm	Kirkhof Center GRR 070
S			
Sackleh, Joshua	Student	9am; 2pm	Kirkhof Center GRR 075
Salame, Ali	Student	9:00 a.m.	Henry Hall Atrium 109
Sall, Chelsey	Student	9:00 a.m.	MIP Library Exhibition Space 12
Sarayeva, Olga	Student	5:00 p.m.	MIP Library Multipurpose Room
Sarkissian, Christina	Student	12pm; 3pm	Henry Hall Atrium 031
Sartini, Jared	Student	12:00 p.m.	Kirkhof Center 2215
Sass, Georgette	Mentor	9:00 a.m.	Henry Hall Atrium 109
Schaertel, Stephanie	Mentor	10:00 a.m.	Henry Hall Atrium 003
Schalk, Catlin	Student	10:00 a.m.	Henry Hall Atrium 003
Schaner, Haley	Student	4:00 p.m.	MIP Library Multipurpose Room
Schires, Samantha	Student	1:00 p.m.	Kirkhof Center GRR 108
Schlewitz, Andrew	Mentor	1:00 p.m.	Henry Hall Atrium 002
Schmaltz, Jeremy	Student	9:00 a.m.	Kirkhof Center GRR 052
Schnyders, Harold	Mentor	9:00 a.m.	Kirkhof Center GRR 054
Schnyders, Harold	Mentor	10:00 a.m.	Henry Hall Atrium 049
Schoetzow, Kimberly	Mentor	12:30 p.m.	Kirkhof Center 2266
Schroder, Emma	Student	2:00 p.m.	Kirkhof Center GRR 063
Schroder, Emma	Student	10a; 1p; 3p	Kirkhof Center GRR 067
Schroeder, Laura	Student	10:00 a.m.	Kirkhof Center GRR 009
Schroedter, Lindsey	Student	2:00 p.m.	Kirkhof Center GRR 063
Schroedter, Lindsey	Student	10a; 1p; 3p	Kirkhof Center GRR 067
Schrotenboer, Brian	Student	10am; 2pm	Kirkhof Center GRR 059
Schrotenboer, Brian	Student	4:00 p.m.	Kirkhof Center GRR 077
Schymanski, Jaclyn	Student	11:00 a.m.	Henry Hall Atrium 098
Seck, Birane	Student	11:00 a.m.	Kirkhof Center 2270
Senglaub II, Steven	Student	1:00 p.m.	Kirkhof Center GRR 084
Senglaub II, Steven	Student	11:00 a.m.	Henry Hall Atrium 001
Senglaub II, Steven	Student	2:30 p.m.	Kirkhof Center 1142
Shady, Justin	Student	3:00 p.m.	Henry Hall Atrium 006
Shaffer, Christopher	Mentor	1:00 p.m.	Kirkhof Center GRR 044
Shapiro Shapin, Carolyn	Mentor	2:00 p.m.	Kirkhof Center 2266
Sherman, Ross	Mentor	12:00 p.m.	Henry Hall Atrium 032
Sherman, Ross	Mentor	10:00 a.m.	Henry Hall Atrium 102
Sherman, Ross	Mentor	4:00 p.m.	Henry Hall Atrium 048
Sherman, Ross	Mentor	1:00 p.m.	Henry Hall Atrium 061

Sherman, Ross	Mentor	10:00 a.m.	Henry Hall Atrium 056
Sherman, Ross	Mentor	11:00 a.m.	Henry Hall Atrium 026
Sherman, Ross	Mentor	9:00 a.m.	Henry Hall Atrium 025
Sherman, Ross	Mentor	10:00 a.m.	Kirkhof Center GRR 070
Sherman, Ross	Mentor	11:00 a.m.	Henry Hall Atrium 043
Sherman, Ross	Mentor	9:00 a.m.	Henry Hall Atrium 060
Sherman, Ross	Mentor	2:00 p.m.	Henry Hall Atrium 058
Sherman, Ross	Mentor	1:00 p.m.	Henry Hall Atrium 044
Sherman, Ross	Mentor	1:00 p.m.	Kirkhof Center GRR 095
Sherman, Ross	Mentor	2:00 p.m.	Henry Hall Atrium 055
Sherman, Ross	Mentor	10:00 a.m.	Henry Hall Atrium 051
Sherman, Ross	Mentor	12:00 p.m.	Henry Hall Atrium 054
Shinde, Sapana	Student	2:00 p.m.	Kirkhof Center GRR 107
Siemen, Jessica	Student	4:30 p.m.	Kirkhof Center 1104
Simmons, Alexander	Student	4:00 p.m.	Kirkhof Center GRR 110
Simon, Isaac	Student	9:00 a.m.	Kirkhof Center GRR 003
Simon, Isaac	Student	11:00 a.m.	Kirkhof Center GRR 028
Simon, Isaac	Student	9:00 a.m.	Kirkhof Center GRR 015
Simoni, Marisa	Student	9:00 a.m.	Kirkhof Center GRR 015
Simpson, Taylor	Student	11:00 a.m.	MIP Library Multipurpose Room
Siroonian, Kathryn	Student	11am; 3pm	Kirkhof Center GRR 075
Skinner, Cassandra	Student	10:00 a.m.	Henry Hall Atrium 066
Slachter, Mitchell	Student	9am; 1pm	Kirkhof Center GRR 083
Smith, Joel	Student	10:00 a.m.	Henry Hall Atrium 072
Smith, Katelyn	Student	10:00 a.m.	Kirkhof Center GRR 068
Smith, Kendra	Student	9:00 a.m.	Kirkhof Center 2263
Smith, McKenna	Student	9:30 a.m.	Kirkhof Center 2266
Smith, McKenna	Student	10:00 a.m.	Kirkhof Center GRR 060
Smith, Zachary	Student	3:00 p.m.	Kirkhof Center 2216
Smolen, Kali	Student	9:00 a.m.	Henry Hall Atrium 107
Snyder, Heather	Student	9am; 1pm	Kirkhof Center GRR 085
Sompels, Zachary	Student	2:00 p.m.	Kirkhof Center 2216
Soto, Reynaldo	Student	9:00 a.m.	Henry Hall Atrium 060
Spears, Lydia	Student	11:00 a.m.	Kirkhof Center GRR 036
Spence, Paige	Student	1:pm; 3pm	Kirkhof Center GRR 084
Spruit, Stephanie	Student	1:00 p.m.	Kirkhof Center GRR 108
Spruit, Stephanie	Student	2:00 p.m.	Kirkhof Center GRR 104
Sridhar, Suganthi	Mentor	10:00 a.m.	Kirkhof Center GRR 092

Sridhar, Suganthi	Mentor	11:00 a.m.	Henry Hall Atrium 006
St Louis, Scott	Student	9:00 a.m.	MIP Library Multipurpose Room
Starks, Leah	Student	11:00 a.m.	Kirkhof Center GRR 040
Staves, Mark	Mentor	9:00 a.m.	Kirkhof Center GRR 101
Stemczynski, Alison	Student	12:00 p.m.	Kirkhof Center 1104
Stephenson, Christina	Student	11:00 a.m.	Kirkhof Center GRR 023
Stephenson, Paul	Mentor	11:00 a.m.	Henry Hall Atrium 010
Stevens, Amanda	Student	1:00 p.m.	Kirkhof Center GRR 113
Stevens, Schae	Student	9:00 a.m.	Kirkhof Center 2215
Stewart, Jennifer	Mentor	1:00 p.m.	Henry Hall Atrium 030
Stiemann, Zoe	Student	11:00 a.m.	Kirkhof Center 1142
Stoltenberg, Ashley	Student	11:00 a.m.	Kirkhof Center 2215
Strickler, Timothy	Mentor	11:00 a.m.	Henry Hall Atrium 035
Strowenjans, Melissa	Student	9:00 a.m.	Kirkhof Center GRR 098
Strychar, Kevin	Mentor	1:00 p.m.	Henry Hall Atrium 057
Studt, Sarah	Student	3:30 p.m.	Kirkhof Center 1104
Sugg, Kyle	Student	9:00 a.m.	Kirkhof Center GRR 118
Suing, Mitchell	Student	1:30 p.m.	Kirkhof Center 1142
Swastek, Theresa	Student	10am; 12pm	Henry Hall Atrium 056
Sylow, Quinn	Student	11:30 a.m.	Kirkhof Center 2263
Sylvester, Francis	Mentor	11:00 a.m.	Henry Hall Atrium 014
Sylvester, Francis	Mentor	9:00 a.m.	Henry Hall Atrium 105
Sylvester, Francis	Mentor	9:00 a.m.	Henry Hall Atrium 103
Sylvester, Francis	Mentor	10:00 a.m.	Henry Hall Atrium 005
Sylvester, Francis	Mentor	11:00 a.m.	Kirkhof Center GRR 040
Sylvester, Francis	Mentor	9:00 a.m.	Kirkhof Center GRR 073

T

Tafel, Heather	Mentor	10:00 a.m.	Kirkhof Center 2263
Tallman, Melissa	Mentor	2:00 p.m.	Henry Hall Atrium 084
Tallman, Melissa	Mentor	10:00 a.m.	Henry Hall Atrium 071
Tallman, Melissa	Mentor	1:00 p.m.	Henry Hall Atrium 035
Tallman, Melissa	Mentor	1:00 p.m.	Kirkhof Center GRR 117
Tallman, Melissa	Mentor	12:30 p.m.	Kirkhof Center 2263
Talos, Gabrielle	Student	9am; 1pm	Henry Hall Atrium 036
Tarahomi, Justin	Student	10:00 a.m.	Henry Hall Atrium 045
Tascone, Emily	Student	4:00 p.m.	Kirkhof Center GRR 062
Taylor, Heather	Student	1:30 p.m.	Kirkhof Center 2215
Taylor, Merritt	Mentor	9:00 a.m.	Kirkhof Center GRR 025

Taylor, Merritt	Mentor	2:00 p.m.	Kirkhof Center GRR 102
TerVeen, Jessica	Student	9:00 a.m.	Henry Hall Atrium 090
Terwilliger, Adam	Student	12:30 p.m.	Kirkhof Center 2263
Theisen, Christopher	Student	9am; 1pm	Kirkhof Center GRR 069
Thomas, Derek	Mentor	2:00 p.m.	Kirkhof Center GRR 014
Thompke, Heather	Student	11:00 a.m.	Kirkhof Center GRR 018
Thompson, Anthony	Mentor	9:00 a.m.	MIP Library Exhibition Space 04
Thompson, Anthony	Mentor	9:00 a.m.	MIP Library Exhibition Space 01
Thompson, Cynthia	Mentor	11:00 a.m.	Henry Hall Atrium 035
Thompson, Cynthia	Mentor	2:00 p.m.	Henry Hall Atrium 082
Thornton, Sarah	Student	9:00 a.m.	Henry Hall Atrium 020
Thorpe, Patrick	Mentor	9:00 a.m.	Henry Hall Atrium 012
Thrall, Ana	Student	3:00 p.m.	Henry Hall Atrium 041
Thum, Ryan	Mentor	9:00 a.m.	Henry Hall Atrium 022
Timmer, Christopher	Student	9:00 a.m.	Kirkhof Center GRR 051
Todter, Erika	Student	1:30 p.m.	Kirkhof Center 1142
Torbet, Raymond	Student	9:00 a.m.	Henry Hall Atrium 101
Torkelson, Katie	Student	9:00 a.m.	MIP Library Multipurpose Room
Torkelson, Katie	Student	4:30 p.m.	Kirkhof Center 2263
Tran, Justin	Student	1:00 p.m.	Kirkhof Center GRR 065
Trier, Terry	Mentor	10:30 a.m.	Kirkhof Center 2270
Trier, Terry	Mentor	3:30 p.m.	Kirkhof Center 2201
Tropiano, Hannah	Student	4:00 p.m.	Henry Hall Atrium 067

U

Uhl, Katie	Student	10:00 a.m.	Kirkhof Center GRR 092
Underwood, Kathleen	Mentor	12:00 p.m.	Kirkhof Center GRR 115
Uzarski, Carl	Student	3:00 p.m.	Kirkhof Center 2263

V

Valachovics, Thomas	Student	10a; 12p; 3p	Kirkhof Center GRR 031
Valdez, Glenn	Mentor	10:00 a.m.	Kirkhof Center GRR 071
Valdez, Glenn	Mentor	4:00 p.m.	Henry Hall Atrium 067
Valdez, Glenn	Mentor	3:00 p.m.	Henry Hall Atrium 015
Vallery, Richard	Mentor	11:00 a.m.	Kirkhof Center GRR 061
VanAmberg, Kelsey	Student	11:00 a.m.	Henry Hall Atrium 035
VanDenBoom, Lindsey	Student	5:00 p.m.	MIP Library Multipurpose Room
VanDine, Alison	Student	1:00 p.m.	Henry Hall Atrium 063
VanDuinen, Andrew	Student	10:00 a.m.	Henry Hall Atrium 079
VanWormer, Heather	Mentor	9:00 a.m.	Henry Hall Atrium 108

VandenBosch, Evan	Student	9:00 a.m.	Henry Hall Atrium 101
VandenPlas, Jessica	Mentor	10:00 a.m.	Kirkhof Center GRR 046
Vander Clay, Gage	Student	9:00 a.m.	Henry Hall Atrium 099
VanderKooi, Holly	Student	1:00 p.m.	Henry Hall Atrium 061
VanderMolen, Jordyn	Student	2:00 p.m.	Kirkhof Center GRR 104
VanderMolen, Julia	Mentor	9:00 a.m.	Kirkhof Center GRR 005
VanderMolen, Julia	Mentor	3:00 p.m.	Henry Hall Atrium 017
Vanderlip, Christopher	Student	11am; 2pm	Henry Hall Atrium 065
Vanderweide, Andrew	Student	9:00 a.m.	Kirkhof Center GRR 119
Vavrikova, Marlena	Mentor	9:00 a.m.	Henry Hall Atrium 074
Vegter, Emily	Student	9:00 a.m.	Kirkhof Center GRR 027
Veldman, Sarah	Student	10:00 a.m.	Kirkhof Center GRR 041
Venhuizen, Kathleen	Student	12:00 p.m.	Kirkhof Center GRR 086
Vetter, Breanna	Student	11:30 a.m.	Kirkhof Center 1142
Vetterli, Jamie	Student	1:00 p.m.	Henry Hall Atrium 061
Vink, Chelsea	Student	3:00 p.m.	Henry Hall Atrium 015
Vitale, Sarah	Student	9:00 a.m.	Kirkhof Center GRR 097
Vitale, Serafina	Student	10am; 4pm	Kirkhof Center GRR 046
Vitales-Lanuza, Michael	Student	9am; 1pm	Henry Hall Atrium 036

W

Walker, Alexandria	Student	2:00 p.m.	Henry Hall Atrium 055
Walker, Thomas	Mentor	9:30 a.m.	Kirkhof Center 2216
Walker, Thomas	Mentor	11:30 a.m.	Kirkhof Center 2259
Walker, Thomas	Mentor	11:30 a.m.	Kirkhof Center 2263
Wallace, Adrienne	Mentor	2:00 p.m.	Henry Hall Atrium 004
Wallace, Jay	Student	12:00 p.m.	Henry Hall Atrium 096
Wallar, Bradley	Mentor	1:00 p.m.	Henry Hall Atrium 063
Walquist, Barrett	Student	10:00 a.m.	Kirkhof Center GRR 060
Walters, Timothy	Student	9am; 12pm	Kirkhof Center GRR 057
Wampler, Peter	Mentor	1:00 p.m.	Kirkhof Center GRR 048
Wampler, Peter	Mentor	10:00 a.m.	Kirkhof Center GRR 077
Wampler, Peter	Mentor	9:00 a.m.	Henry Hall Atrium 104
Wampler, Peter	Mentor	11:00 a.m.	Kirkhof Center GRR 116
Wampler, Peter	Mentor	9:00 a.m.	Kirkhof Center GRR 083
Wampler, Peter	Mentor	11:00 a.m.	Kirkhof Center GRR 049
Ward, Brittany	Student	10a; 12p; 3p	Kirkhof Center GRR 031
Ward, Brittany	Student	1:00 p.m.	Henry Hall Atrium 008
Ward, Kara	Student	3:30 p.m.	Kirkhof Center 2201

Weber, John	Mentor	10:00 a.m.	Kirkhof Center GRR 077
Weber, Paul	Student	9:00 a.m.	Henry Hall Atrium 018
Weibel-Swanson, Deana	Mentor	9:00 a.m.	Henry Hall Atrium 036
Weibel-Swanson, Deana	Mentor	10:30 a.m.	Kirkhof Center 2266
Weiss, Thomas	Student	10am; 4pm	Kirkhof Center GRR 046
Wells, Whitney	Student	10:30 a.m.	Kirkhof Center 2270
Wendland, Joel	Mentor	2:00 p.m.	Kirkhof Center GRR 021
Wentworth, Grace	Student	10am; 4pm	Henry Hall Atrium 062
Werner, Josephine	Student	9am; 4pm	Kirkhof Center GRR 008
Wertheimer, Megan	Student	3:00 p.m.	Kirkhof Center GRR 004
Wertheimer, Megan	Student	2:00 p.m.	Henry Hall Atrium 001
Wesche, Kyle	Student	11:00 a.m.	Henry Hall Atrium 026
Westbrook, Laurel	Mentor	9:30 a.m.	Kirkhof Center 2263
Weston, Anne	Student	11:30 a.m.	Kirkhof Center 2201
Whipple, Zachary	Student	1:00 p.m.	Kirkhof Center GRR 095
White, Alec	Student	1:00 p.m.	Henry Hall Atrium 097
Wieckhorst, Matthew	Student	12pm; 3pm	Kirkhof Center GRR 050
Wigger, Adam	Student	10a; 1p; 3p	Henry Hall Atrium 038
Wilcoxson, Alison	Student	9:00 a.m.	Henry Hall Atrium 108
Wilcoxson, Alison	Student	9am; 1pm	Henry Hall Atrium 036
Wilkinson, Steven	Student	1pm; 3pm	Henry Hall Atrium 088
Wilkinson, Steven	Student	10am; 2pm	Henry Hall Atrium 081
Williams, Joseph	Student	9:00 a.m.	Kirkhof Center 2263
Williams, Todd	Mentor	9:00 a.m.	Kirkhof Center GRR 003
Williams, Todd	Mentor	9:00 a.m.	Kirkhof Center GRR 015
Wiltshire, Lauren	Student	9:00 a.m.	Kirkhof Center 2201
Winchell, Kelsey	Student	12:00 p.m.	Kirkhof Center GRR 006
Winchester, Randy	Mentor	1:00 p.m.	Kirkhof Center GRR 024
Winchester, Randy	Mentor	2:00 p.m.	Henry Hall Atrium 033
Winquest, Rachel	Student	11:00 a.m.	Kirkhof Center 1142
Winther, Jennifer	Mentor	3:00 p.m.	Kirkhof Center GRR 105
Wittenbraker, Paul	Mentor	9:00 a.m.	MIP Library Exhibition Space 08
Wittenbraker, Paul	Mentor	9:00 a.m.	MIP Library Exhibition Space 09
Wittenbraker, Paul	Mentor	9:00 a.m.	MIP Library Exhibition Space 11
Wittenbraker, Paul	Mentor	9:00 a.m.	MIP Library Exhibition Space 10
Wittenbraker, Paul	Mentor	9:00 a.m.	MIP Library Exhibition Space 07
Wolfe, Michael	Mentor	9:00 a.m.	Kirkhof Center GRR 003
Wolfe, Michael	Mentor	9:00 a.m.	Kirkhof Center GRR 015

Wolffe, Gregory	Mentor	11:00 a.m.	Henry Hall Atrium 086
Woller-Skar, M	Mentor	9:00 a.m.	Kirkhof Center GRR 085
Woller-Skar, M	Mentor	3:00 p.m.	Kirkhof Center 2215
Wong, Alexander	Student	10a; 1p; 3p	Henry Hall Atrium 038
Woodcock, Theodore	Student	9:30 a.m.	Kirkhof Center 2270
Woodruff, Amanda	Student	1:00 p.m.	Henry Hall Atrium 044
Worm, Thomas	Student	3:00 p.m.	Kirkhof Center GRR 099
Wright, Diane	Mentor	11:30 a.m.	Kirkhof Center 1104
Wyman, Leslie	Student	9am; 1pm	Henry Hall Atrium 093
Wyman, Leslie	Student	11:00 a.m.	Kirkhof Center 2266

X

Xu, Xiaojuan	Mentor	9:30 a.m.	Kirkhof Center 2201
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Y

Yalda, Christine	Mentor	3:00 p.m.	Kirkhof Center GRR 099
Yalda, Christine	Mentor	12:00 p.m.	Kirkhof Center 2263
Yoder, Lauren	Student	11:00 a.m.	Henry Hall Atrium 077
York, Chelsey	Student	9:00 a.m.	Kirkhof Center 1142
Youker, Brandon	Mentor	10:00 a.m.	Kirkhof Center GRR 100
Young, Del	Mentor	10:00 a.m.	Henry Hall Atrium 068

Z

Zaszlavik, Katalin	Mentor	11:00 a.m.	Kirkhof Center GRR 023
Zettle-Sterling, Renee	Mentor	9:00 a.m.	MIP Library Exhibition Space 13
Zettle-Sterling, Renee	Mentor	9:00 a.m.	MIP Library Exhibition Space 18
Zettle-Sterling, Renee	Mentor	9:00 a.m.	MIP Library Exhibition Space 14
Zettle-Sterling, Renee	Mentor	9:00 a.m.	MIP Library Exhibition Space 15
Zhao, Yi	Mentor	9:00 a.m.	Kirkhof Center GRR 074
Zhou, Jordan	Student	10:00 a.m.	Kirkhof Center GRR 072
Zhou, Jordan	Student	10am; 2pm	Henry Hall Atrium 081
Zhou, Jordan	Student	1:00 p.m.	Henry Hall Atrium 088
Zielinski, Alayna	Student	10:00 a.m.	Kirkhof Center GRR 100
Zimmerman, Trisha	Student	12:30 p.m.	Kirkhof Center 2266

Online Schedule Builder

Updated Presentation Information in lieu of Printed Addendum

This book is printed with information current as of mid-February. Changes often occur after the print date, and are reflected online on the Schedule Builder.

To access the Schedule Builder:

1. Go to gvsu.edu/ours/ssd
2. Click on the "Schedule Builder" link
3. Login and follow instructions

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