



Student Scholars Day

4 • 10 • 2013

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SSD Committee

Feryal Alayont	Mathematics
Rebecca Brittian	Student Representative
Callista Cook	Undergraduate Research and Scholarship
Alice Chapman	History
Amanda Cuevas	Frederik Meijer Office of Fellowships
Robert Deaner	Psychology
Andrew Lantz	Chemistry
Susan Mendoza	Undergraduate Research and Scholarship (Director)
Azizur Molla	Anthropology
Melissa Morison	Classics (Chair)
Debbie Morrow	Library
Ross Reynolds	Physics
Michael Scantlebury	Hospitality and Tourism Management
Shelley Sickrey	Undergraduate Research and Scholarship
Suganthi Sridhar	Biomedical Sciences
Richard Vallery	Physics
Patricia Videtich	Geology
Janet Vigna	Biology

Welcome to Student Scholars Day 2013!

It is with great pleasure that we welcome you to celebrate the diversity and excellence of faculty-student collaboration at GVSU. In its 18th 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, Callista Cook, Ellie Fought, Brianna Stelly and Ruby Dockery who made this process manageable and enjoyable. We thank the members of the 2013 SSD committee, Feryal Alayont, Rebecca Brittian, Alice Chapman, Amanda Cuevas, Robert Deaner, Andrew Lantz, Azizur Molla, Debbie Morrow, Ross Reynolds, Michael Scantlebury, Suganthi Sridhar, Richard Vallery, Patricia Videtich, and Janet Vigna, 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 his support of the web registration 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 Elizabeth Uitvlugt for her artistic contributions to this abstract book. Inspiration was one of several pieces submitted in response to a student competition hosted by the Office of Undergraduate Research and Scholarship. Elizabeth'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, Jonathan Gottschall from the Washington & Jefferson College in Pennsylvania. Today is sure to be a day of sharing and celebration.

Susan Mendoza

Director, Undergraduate Research & Scholarship
Center for Scholarly & Creative Excellence

Melissa Morison

Assistant Professor, Classics
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 xx for detailed schedule.

Oral Presentations

Kirkhof Center

9:00 a.m. – 5:30 p.m.

See page xx for detailed schedule.

Panel Presentations

Kirkhof Center 2204

10:00 a.m., 11:00 a.m., 12:00 p.m., 1:00 p.m.

See page xx for detailed schedule.

Live Performances

Kirkhof Center Area 51

11:30 a.m., 1:00 p.m., 2:00 p.m., 4:00 p.m.

See page xxx for detailed schedule.

Keynote Lecture, Jonathan Gottschall

Kirkhof Center, Room 2204

5:30 p.m. Hors d'oeuvres

6:00 p.m. Lecture

Statement from the Cover Artist

Elizabeth Uitvlugt

Inspiration

My piece entitled "Inspiration" is about the relationship Grand Valley has with the surrounding community. As students complete their degrees and start becoming involved in the workplace, there is a transfer of ideas that happens. New perspectives interact with established practices in a way that is enriching to them both. The white cloud shaped patterns emerging from the clock tower represent the ideas coming from Grand Valley and the birds represent the people who are sharing these ideas. In this composition, white signifies both the ideas and where the ideas are being integrated into the community.



Keynote Lecture

Kirkhof Center, Room 2204
6:00 p.m.

The Storytelling Animal: How Stories Make Us Human

Humans live in landscapes of make-believe. We spin fantasies. We devour novels, films, and plays. Drawing on the latest research in neuroscience, psychology, and evolutionary biology, Gottschall tells us what it means to be a storytelling animal. Did you know that the more absorbed you are in a story, the more it changes your behavior? That all children act out the same kinds of stories, whether they grow up in a slum or a suburb? That people who read more fiction are more empathetic?

Of course, our story instinct has a darker side. It makes us vulnerable to conspiracy theories, advertisements, and narratives about ourselves that are more “truthy” than true. National myths can also be terribly dangerous: Hitler’s ambitions were partly fueled by a story.

But as Gottschall shows in this remarkable book, stories can also change the world for the better. Most successful stories are moral—they teach us how to live, whether explicitly or implicitly, and bind us together around common values. We know we are master shapers of story. The Storytelling Animal finally reveals how stories shape us.

Jonathan Gottschall

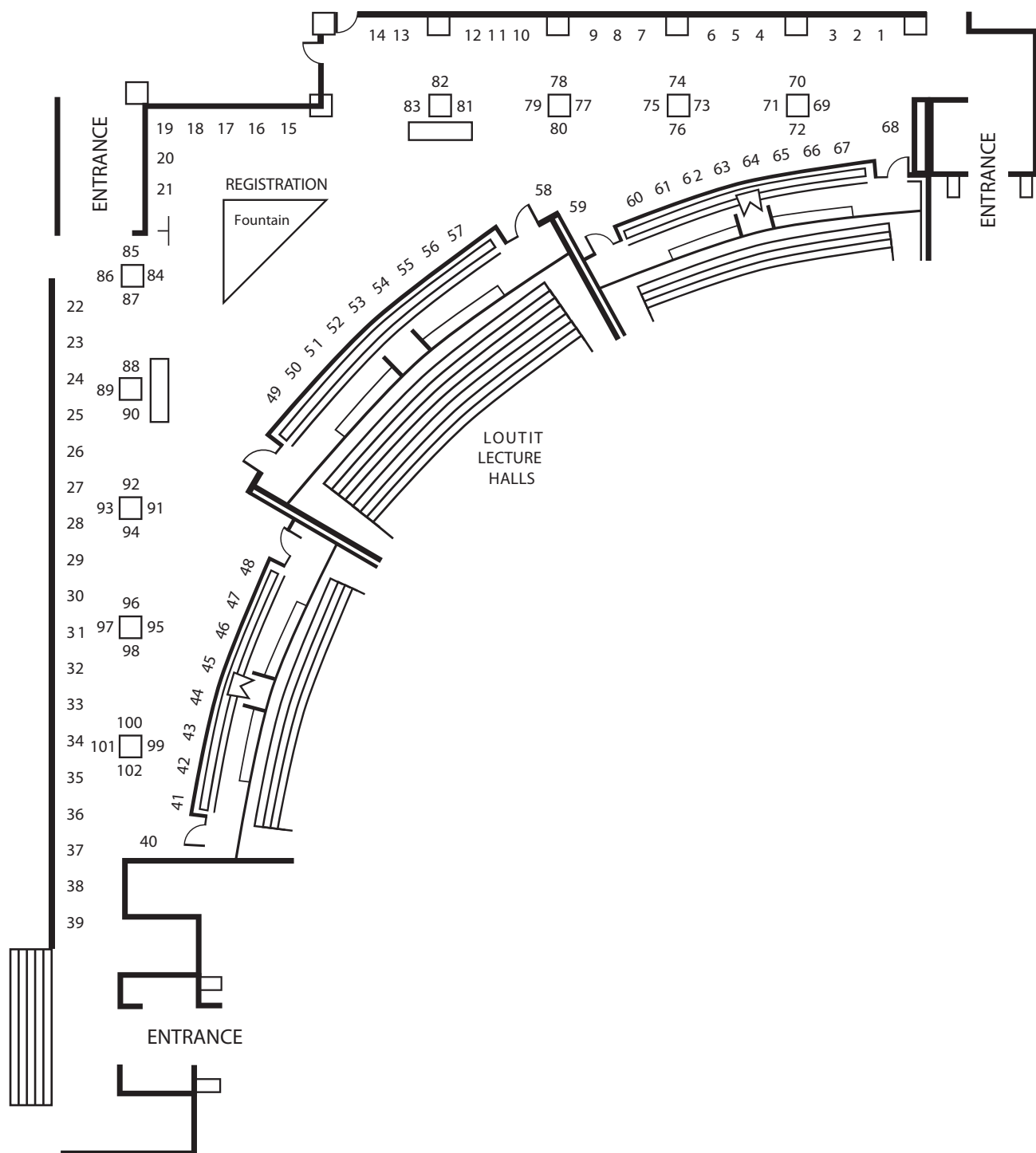
Department of English, Washington & Jefferson College

Jonathan Gottschall writes books at the intersection of science and art. He is a leading figure in a new movement to bridge the divide between the two cultures of the sciences and the humanities. His most recent work, *The Storytelling Animal: How Stories Make Us Human* (a New York Times Editor’s Choice selection), draws on the latest research in neuroscience, psychology and biology to show how storytelling has evolved as a fundamental human instinct. Jonathan teaches in the English Department at Washington & Jefferson College in Pennsylvania and blogs about the mysteries of storytelling at Psychology Today.

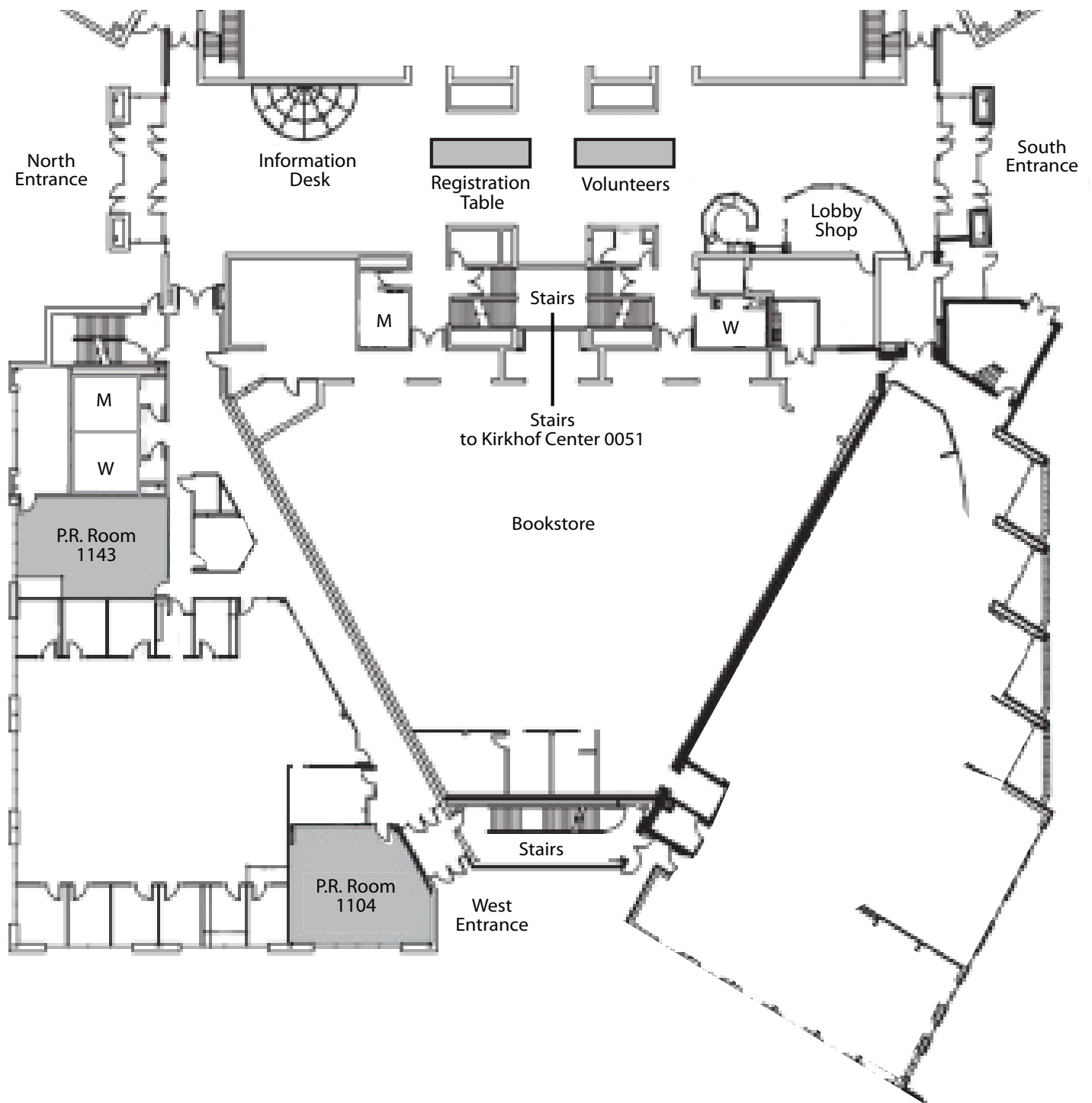
While his Ph.D. is in English, his main dissertation advisor was the prominent evolutionary biologist David Sloan Wilson, and he splits his academic writing between scientific and literary journals. He has also written for *New Scientist*, *The Boston Globe*, *Seed Magazine*, *The Huffington Post*, *NPR* and *BBC Radio*, and the blogs of *The Wall Street Journal* and *Fast Company*. His work has been featured in outlets like *The New York Times*, *Nature*, *Scientific American*, *Oprah Magazine*, *The New Yorker*, *The Atlantic*, and *NPR’s Morning Edition* and *All Things Considered*. Described by Steven Pinker as “a brilliant young scholar, Jonathan is the author or editor of six books, including *The Rape of Troy: Evolution, Violence and the World of Homer* and *Literature, Science, and a New Humanities*. Gottschall lives with his wife and two young daughters in Washington, PA.



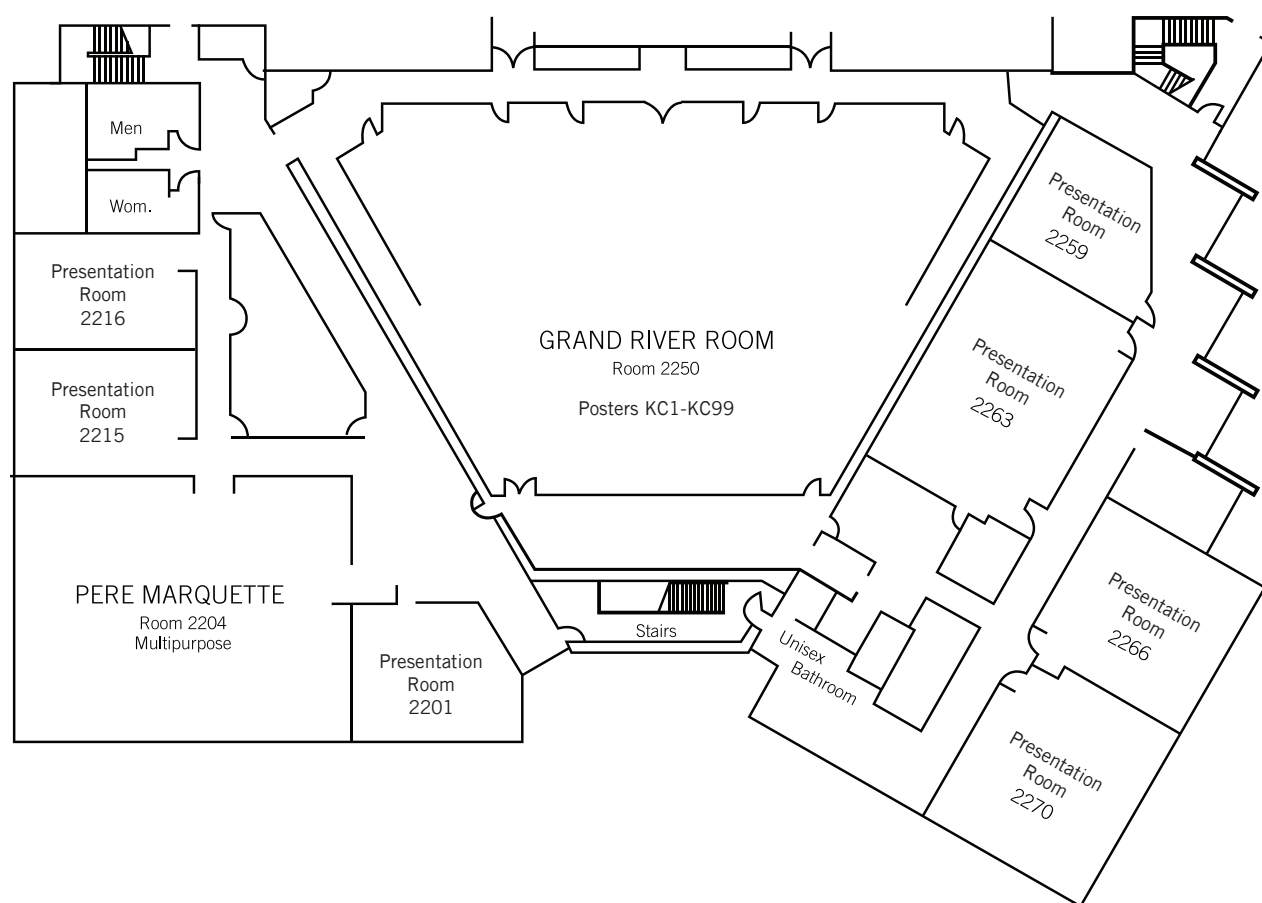
Henry Hall Map



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 Undergraduate Research and Integrative Learning.

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 students, including undergraduate and graduate, 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 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 students, including undergraduate and graduate. Full-time faculty can apply for travel grants that range up to \$400 per student for travel. Grants do not exceed \$1,200.

OURS Undergraduate Grant

The OURS 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're 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 2012 McNair Scholars presenting at this year's SSD include:

Beth Bjorkman, Adam Burl, Thomas Ewing, Karel Lill, Mayra Sanchez, Stephanie Sicard, Shawnkeisha Stoudamire, Malachi Sullivan, and Bridgett Vanderhoof.

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 2012 Student Summer Scholars presenting at this year's SSD include:

Danielle Bradke, Tami Brown, Brittany Cooke, Brianne Docter, Samantha Ellis, Jessica Franks, Danielle Grimm, Anthony Hage, José Jiménez, Kip-Chumba Kaitany, Joshua Lee, Jackie Main, Danielle Maryanski, Michael Peruzzi, Jeremy Peshl, Kira Smith-Butland, Christopher Stretton, Jessica Thoe, Angela Tramontelli, Sarah VanOeveren, and William Waalkes.

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

Academic Conference Fund

The Student Senate, the Provost's Office, and the Center for Scholarly and Creative Excellence have established a fund to support student travel to academic conferences. The Academic Conference Fund (ACF) is available to all students, including non-traditional and graduate students, who may be looking for one time funding to present at an academic conference that is related to their major, minor, and/or professional goals regardless of their affiliation with student organizations.

Undergraduate and graduate students are able to apply for travel grants that range up to \$500 (up to \$750 for international conferences) for conference presenters. The purpose of these grants is to encourage student presentations at academic conferences by offsetting the cost of attendance.

Since January through December of 2012, the Academic Conference Fund aided the following presentations:

Rachel Amity, "Talking the Talk: Linguistic Face Theory in the Writing Center," National Conference of Peer Tutoring in Writing

Patrick Anderson, "Capitalism and the Science of History: Appleby, Marx, and Postmodernism," 2012 Phi Alpha Theta Biennial Convention

Lisa Austin, "Awful Doubt or Faith so Mild: Skepticism and Environmental Morality in Percy Bysshe," Midwest Modern Language Association

David Baisch, "Origin of Great Lakes Brown Trout, *Salmo trutta*: A Phylogeographic Analysis Using mtDNA Sequence Variation," 142nd Annual Meeting of the American Fisheries Society

Claire Banner & Anna Worm, "Profanity, Slang, and Professional Language in the Writing Center," East Central Writing Centers Association

Grayson Barton, "Collegiate Honors Choir Performance," ACDA Central Division Conference

Taylor Barton, "Scene Performance," Kennedy Center American College Theatre Festival Region 3

Paul Belmonte, "Synthesis of Novel Antimicrobial Agents Containing Peptide Bonds," 22nd Annual Argonne Symposium

Jordyn Betz & Lacey Hamilton, "The Role of Textbooks: Does the Course Content or Faculty Member Matter?," Biennial Conference on Chemical Education (BCCE) 2012

Isaac Billings, "Exploring Classifications, Strategies, and Models of Questioning Utilized in Health Care and Potential Applications to the Writing Center," East Central Writing Centers Association

Alicia Blackmer, "Feelings of Punitiveness and Empathy among Inside Out Students," 2012 Academy of Criminal Justice Sciences (ACJS) Annual Meeting: Sustainable Justice

Andrew Borgman, "The Benefits of ePortfolios and Assessment for Student Development," National Council of Teachers of Mathematics (NCTM) Annual Conference 2012

Timothy Botting, "Impacts of Experimental Warming on *Carex aquatilis*-stands in Northern Alaska," International Polar Year (IPY) 2012: From Knowledge to Action

Charlene Bottjier, Christopher Delgado, Mark Lyle, Stephanie Shields, & Micah Stoddard, “Path of Discovery,” National Trumpet Competition

Heather Brown, “Crimes of the Heart Stage Management Prompt Book,” Kennedy Center American College Theatre Festival Region 3

Allison Burke & Sarah Van Oeveren, “Characterization of PkndIn Δ 5, a Derivative Allele of the Delorean Mutation Associated with the Protein Kinase N gene in *Drosophila Melanogaster*,” 53rd Annual *Drosophila* Research Conference

Laura Carlson & Molly Waite, “Behind the Front Desk: The Role of Desk Workers and their Effect on Writing Centers,” East Central Writing Centers Association

Emrie Carlton, “A Series on Dialogue,” 16th Annual Pacific University Undergraduate Philosophy Conference

Yue Chen, “Chinese EFL Students' Perspectives on Writing Instruction,” TESOL International Convention & English Language Expo

Victoria Christensen, “Validation of Measures of Work-to-School Conflict and School-to-Work Conflict,” 84th Midwestern Psychological Association (MPA) Conference

Joe Cox, “Canvas Credeaux, Winston,” Kennedy Center American College Theatre Festival Region 3

Kathryn Crabtree & Heather Gemmen, “Reading in the Digital Age: When Reading and Writing Intersect in the Writing Center,” National Conference of Peer Tutoring in Writing

Jeremy Cusick, “Why don't Dish Die in the Winter? Using 3D Magnetic Models to Visualize Particulate Level Arrangements of Water,” Biennial Conference on Chemical Education (BCCE) 2012

Paula Cynar, Tanya Emalander, & Elizabeth Van Tiflin, “How Do You Role? Future Professionals Tumble On In,” American Alliance for Health, Physical Education, Recreation, & Dance (AAHPERD) Midwest District Centennial Celebration Conference

Paige Darbyshire, Michelle Haapala, & Emily Horvat, “Identity at Risk,” Annual Michigan Art Education Association Conference 2012

Mary Durston & Shambhavi Singh, “Identifying a Regulatory Role for the Tumor Metastasis Suppressor Gene KAI1/CD82 in Metastatic Prostate Cancer Cell Lines,” 2012 American Society of Cell Biology (ASCB) Annual Meeting

Justin Ebert & Nicholas Maodush-Pitzer, “Sustainable Impact: The Challenges of Creating Courses on Food, Food Systems, and Food Justice to Empower Students to Action,” Association for the Advancement of Sustainability in Higher Education (AASHE) 2012: Investing in the Future

Michael Esch, “Some Applications of Bifurcations in Chemistry, Biology and Engineering,” Mathfest 2012

Benjamin Fair, “Epitope Labeling of Histidine Decarboxylase in *Drosophila Melanogaster*,” 53rd Annual *Drosophila* Research Conference

Nicole Fisher, “Cohesion, Coherence, and Collaboration: How Writing Centers Can Aid Students with Stilted Syntax,” East Central Writing Centers Association

Kevin Formsma, "ParabolaX: Learner Engagement with Serious Games," Meaningful Play 2012

Travis Foster, "Bugs and Zebras: How the Zebra Mussel Invasion has Affected Macroinvertebrate Communities in the Muskegon River," Society for Freshwater Science Annual Meeting 2012

Jennifer Furner, "Cold War Containment in Shirley Jackson's 'Flower Garden,'" Society for the Study of American Women Writers (SSAWW) Conference 2012: Citizenship and Belonging

Jennifer Furner, "Lacan's Mirror Stage in Shirley Jackson's 'The Tooth,'" The Louisville Conference on Literature and Culture since 1900

Carlene Gilewski, "Constraints on P-T Conditions during Deformation within the Terrane-Bounding Chunky Gal Mountain Fault, Central Blue Ridge, North Carolina," 2012 Geological Society of America (GSA) Annual Meeting and Exposition

Kelli Gillett, "Protracted Withdrawal from Ethanol and the Enhanced Responsiveness to Mild Stress: Regulation via the Dynorphin/kappa Opioid Receptor System," Society for Neuroscience Annual Meeting: Neuroscience 2012

Lauren Gray, "Exploring Male and Female Inmate Misconduct," 2012 Academy of Criminal Justice Sciences (ACJS) Annual Meeting: Sustainable Justice

Kimberly Greenlees, "The Need (Still) to Offer White Collar Crime Courses in Criminal Justice Curriculum," 2012 Academy of Criminal Justice Sciences (ACJS) Annual Meeting: Sustainable Justice

Joseph Grit, "Can we Improve Research Experiences to Better Address Nature of Science Concepts?," 243rd American Chemical Society (ACS) Spring 2012 National Meeting

Benjamin Hake, "Changes in Vascular Reactivity of Mesenteric Arteries Following Hyperbaric Oxygen Treatment," American Physiological Society Experimental Biology 2012

Robert Harp, "The Use of Student Achievement Data in Special Education Teacher Performance," Council of Administrators of Special Education (CASE) Conference

Amanda Harvey, Aaron Hoxworth, Mary O'Neil, & Jessica Perry, "The Project: Renewing Michigan - One Student at a Time," 13th Annual Lily Conference of College and University Teaching

Brandon Harris, "Evaluating Removal and Mark-Recapture Methods for Estimating Abundance of a Small, Non-Game Fish," 142nd Annual Meeting of the American Fisheries Society

Tamara Hillman, "Study of a Reintroduced American Marten Population using Noninvasive Hair Snares," The Wildlife Society 19th Annual Conference

Jared Homola, "Environmental and Fish Community Influences on Presence of a Microsporidian Parasite in Mottled Sculpin," 142nd Annual Meeting of the American Fisheries Society

Brook Hotchkiss & Erin Quackenbush, "Undergraduate Grantwriting: Fostering the Sustainability of Civic Engagement," 13th Annual Lily Conference of College and University Teaching

Nicole Horne, "Removal Efficacy of Harmful Microbes and Contaminants in Biosand Filter Microcosms," 4th American Society of Microbiology (ASM) Conference on Beneficial Microbes

Gavin Howard, Kathryn Lauer, & Karie McDonald, "The Effect of Room Temperature Storage of Patient Serum Specimens on Troponin T Levels," 2012 American Society for Clinical Laboratory Science-Michigan Annual Meeting and Exhibits

Erica Jones, "Writing Consultant Training: Is It Enough?"

National Conference of Peer Tutoring in Writing

Paul Kiger, "The Benefits of ePortfolios and Assessment for Student Development,"

Las Vegas National Technology & Social Science Conference 2012

Zoe Kilbourne, "Defining the Mechanistic Pathway of the Antibiotic Resistance Enzyme OXA-1 Beta Lactamase," 243rd American Chemical Society (ACS) Spring 2012 National Meeting

Emily Kluck, Joanna McCann, Sarah Pankow, & Drew Theuerkauf, "Robotic-Assisted Sacrocolpopexy: A Retrospective Review of 211 Cases," American Urogynecologic Society (AUGS) 33rd Annual Scientific Meeting

Kelseyann Kremers, "Consistency of Graminoid Response to Warming in Alaskan Yundra,"

International Polar Year (IPY) 2012: From Knowledge to Action

Ahmed Lachheb, "Student & Teacher Perceptions of Ubiquitous Computing,"

SITE 2012 Conference

Skylar Latshaw, "Foucault's Panopticonic Gaze and Cormac McCarthy's The Road (abbreviated),"

American Literature Association: Cormac McCarthy, Ernest Hemmingway and Their Traditions

Skylar Latshaw, "Modified Restraints and Literaty Inhibitions: Writing and Experience in On the Road," The Louisville Conference on Literature and Culture since 1900

Matthew LeaTrea, "Inquiry into Nuclear Decay,"

Biennial Conference on Chemical Education (BCCE) 2012

Joshua Lee, "Screening the Effects of Gene Overexpression on Markers of Neural Progenitor Differentiation in the Developing Chick Spinal Cord," Society for Neuroscience Annual Meeting: Neuroscience 2012

Caitlin Leslie, "Recent Folding, Geomorphic Evolution, and Paleoclimate: Apsheron Peninsula Azerbaijan," 2012 Geological Society of America (GSA) Annual Meeting and Exposition

Jennifer Liebig, "Community Change in Long-term Vegetation Monitoring Sites in Northern Alaska," American Geophysical Union (AGU) Fall Meeting

Jennifer Liebig, "Finding Grouping Schemes to Better Predict Tundra Response to Warming,"

International Polar Year (IPY) 2012: From Knowledge to Action

Krista List-Leinberger, "'Use of Self': Reflexive Practices in Qualitative Inquiry," Eighth International Congress of Qualitative Inquiry

Jaclynn Lubbers, "Meeting Teens Where They Are: The Feasibility of a Cognitive-Behavioral Intervention for Depressed Adolescents in Pediatric Primary Care," Midwest Nursing Research Society

Andrew Lund, "Power, Presages, and Portrayal: Suetonius' Representation of Livia," 92nd Anniversary Meeting of the Classical Association of the Middle West and South (CAMWS) Southern Section

Jill Lynema, "Alteplase: Coagulation Testing Nightmare," American Society for Clinical Laboratory Science (ASCLS) Michigan 2012 Annual Meeting Program

Alynn Martin, "A Comparison of DNA Yields from Different Tissue Types and Storage Media," North American Symposium on Bat Research

Hollie McDonald, "The Role of the Writing Center in Freshmen Preparedness," National Conference of Peer Tutoring in Writing

Ashley Meyers, "In the Attic by Ashley Meyers," 2012 Society for Photographic Education (SPE) National Conference: Intimacy and Voyeurism: The Public/Private Divide in Photography

Jessica Miller & Lindsay Stoyka, "I Demand Euphoria! When Good Isn't Good Enough: Felt Sense in the Writing Center," National Conference of Peer Tutoring in Writing

Meghan Nesheim & Amber Sepsey, "Body Parts and Early-Learned Verbs in Children," 84th Midwestern Psychological Association (MPA) Conference

Marie Orttenburger, "We Can Go All Night: Supporting Students and Fostering Community During the Long Night against Procrastination," National Conference of Peer Tutoring in Writing

Thomas Parker, "Accessorized Therapeutic Game Experiences for Tablets," Meaningful Play 2012

Emily Pradko, "Characteristics of Those with Humeral Fragility Fractures," International Symposium on Osteoporosis

Emily Quiney, "Evaluating Access to Health Care Services for the Medically Underserved Residents of a Small Lakeshore Community in West Michigan," 2012 Midwest Nursing Research Society (MNRS) Research Conference: Innovative Transition Care Models

Douglas Ragan, "Where's My Salt: A Guided Inquiry Activity Looking at Dissolving of Ionic Compounds," Biennial Conference on Chemical Education (BCCE) 2012

Neal Ringerwole, "New Pliocene Paleomagnetic Constraint on Tobago's Rotation History," 2012 Geological Society of America (GSA) Annual Meeting and Exposition

Carol Robinson, "End of Life Simulation of Therapeutic Communication and Care Using Standard Patients and SimMan," 12th Annual International Meeting on Simulation in Healthcare (IMSH)

Mayra Sanchez & Briana Vander Wege, "Emotion Displays in Hispanic- and Euro-American Children's Book," 24th Annual Convention for Association for Psychological Science

Akshay Sarathi, "Indian Ocean Trade: 300 BCE - 300 CE," 2012 Phi Alpha Theta Biennial Convention

Garret Sawyer, "Social Networks as Virtual Outreach: The It Gets Better Project and Experiences of LGBTQ Youth," National Women's Studies Association 2012 Conference: Feminism Unbound: Imagining a Feminist Future

Thomas Schmidt, "Predictive Niche Modeling of Pteridophyte Community Reestablishment in Secondary Forests of Puerto Rico," Michigan Academy of Science, Arts & Letters

Ryan Schoenborn, "A Very Cool Investigation: A Guided Inquiry Lab," Biennial Conference on Chemical Education (BCCE) 2012

Aaron Schultz, "Desire and Attachment: Finding Union with God," Southern Illinois University Edwardsville Undergraduate Philosophy Conference

Jacob Schuuman, "Sensitivity Analysis of the Wnt Pathway," 2012 Joint Mathematics Meetings

Michael Sharp, "Ratings of Prosocial Personality Traits are Contaminated by Religious Stereotype Bias," 2012 Association for Psychological Science (APS) Annual Convention

Kermit Sharp III, “Lie Algebra Change of Basis,” 2012 Joint Mathematics Meetings

Samantha Sheppard & Daniel Veldkamp, “Using Ten Frames to Promote Number Sense,” National Council of Teachers of Mathematics (NCTM) Annual Conference 2012

Meghann Sikora, “Timeliness of Antibiotic Administration on Neurotropic Patients at Risk for Sepsis,” American Academy of Physician Assistants (AAPA) IMPACT 2012 National Conference

Kristen Simon, “The Role of the Textbook for Students in Organic and Analytical Chemistry,” Biennial Conference on Chemical Education (BCCE) 2012

Stephanie Standriff, “Modeling the Melting of Permafrost by Climate Change,” National Science Teacher Association (NSTA) National Conference in Indianapolis

Allyson Stokosa & Anna Urban, “Collegiate Service Learning through International Partnership-GVSU and the Philippines,” Premier Michigan Public Health Conference

Nicole Summers, “The Effects of Culture and Gender on Hispanic-American and European-American Mothers' Conceptions of Child Competence,” 24th Annual Convention for Association for Psychological Science

Neal Swanson, “Juvenile Steelhead in the Muskegon River: Analysis of Larval Drift and Juvenile Diet,” 142nd Annual Meeting of the American Fisheries Society

Jacqueline Taylor, “Predicting the Effects of Land-Use and Climate Change on Michigan Stream Ecosystems,” Society for Freshwater Science Annual Meeting 2012

Lauren Thompson, “What Type of Fish will you catch in Warm Water?” Biennial Conference on Chemical Education (BCCE) 2012

Olvi Tole, “Translational Meta-Analysis Tool for Temporal Gene Expression Profiles,” 24th European Medical Informatics Conference - MIE 2012

Kelley Trisch, “Childhood Memories,” 2012 Society for Photographic Education (SPE) National Conference: Intimacy and Voyeurism: The Public/Private Divide in Photography

Lindsay Tryc, “Facilitating Self-Reflection: The Integration of Photovoice in Graduate Education,” Eighth International Congress of Qualitative Inquiry

Lindsay Tryc, “Inside Out: ePortfolios for Program Assessment,” The Association for the Authentic, Experiential, and Evidence-Based Learning (AAEEBL) Annual Conference: ePortfolios as a Catalyst for Connections: Celebrating the Curious, Creative, and Capable Learner

Beth Vallier, “Structure Determination and Analysis of the Class D Carbapenemase OXA-24 in Complex Imipenem,” 243rd American Chemical Society (ACS) Spring 2012 National Meeting

Daniel Veldkamp & Leah Wischmeyer, “Using Math Games to Motivate Learning and Differentiate Learning,” National Council of Teachers of Mathematics (NCTM) Annual Conference 2012

Amy Ver Wey, “Ratings of Prosocial Personality Traits are Contaminated by Religious Stereotype Bias,” 24th Annual Convention for Association for Psychological Science

Molly Waite & Anna Worm, “The Cursing Consultant: The Role of Profanity in Writing Centers,” National Conference of Peer Tutoring in Writing

Andrew Wernette, "A Great Big Hole in the Ground," Kennedy Center American College Theatre Festival Region 3

Olivia White, "Regioselective Nucleophilic Ring Opening of Aziridines in the Synthesis of T1AM Analogues," 243rd American Chemical Society (ACS) Spring 2012 National Meeting

Alex Wieten, "Movement and Spatial Distribution of Juvenile Lake Sturgeon in Muskegon Lake, Michigan," 142nd Annual Meeting of the American Fisheries Society

Brittney Winters, "Between Innocence and Experience: Marginalization of the 'Other' in 'On the Road,'" The Louisville Conference on Literature and Culture since 1900

Andrew Wisniewski, "A Geopolitical Analysis of the Distribution of American Recovery and Reinvestment Act Funds," Michigan Academy of Science, Arts & Letters

Emily Wisniewski, "Submersive Learning," 13th Annual Lily Conference of College and University Teaching

Huijing Zhu, "Induction of Desiccation Tolerance in Developing Seed of *Phalaenopsis amabilis*: the Role of the Late Embryogenesis Abundant Proteins," American Society of Plant Biologists (ASPB) Annual Meeting: Plant Biology 2012

Holly Zilke, "He/She/Who Cares?: Gender Perception in the Writing Center," East Central Writing Centers Association

Grady Zuiderveen, "A Genetic Analysis of Native and Invasive *Phragmites Australis* along Michigan's West Coast," Botany 2012 - The Next Generation



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Poster Presentations, Abstracts & Schedule

HENRY HALL ATRIUM 1

Genomics in the Classroom: Unraveling the Dot Chromosome of *Drosophila ananassae*

Participant attending from 9:00 a.m. until 10:00 a.m.

Presenters: Katherine Olson, Breanna Haiker, Maxine Wykle, Guillermo Perez-Aragon, Joshua Lorenz, Cody Mittig, Jesse Ensign, Lindsay Corbeill, Adam Wernette, Judith Ingles, Jordan Ramirez, Patrick Schneider, Spencer Batten, Lyndsay Breckenridge

Drosophila Genomics is a course that offers a unique opportunity for students to contribute to a real-time research project, through support of the Genomics Education Partnership (GEP). Through instructional tutorials, students use computer programs to identify and assist in the resolution of DNA sequence inconsistencies, a process known as 'sequence finishing'. The current project focuses on finishing the sequence of the unusually large 4th (dot) chromosome of *D. ananassae*. Once students have completed DNA sequence finishing, each student annotates a large segment of DNA from the *D. biarmipes* dot chromosome. In the process of annotation, students apply their understanding of gene structure to build models of genes in a specific species, using *D. melanogaster* as a reference species. Students gain experience accessing internet databases and use of genome analysis tools in identifying genes. Students' finished work is submitted to the GEP for inclusion in future publications.

Mentor: Martin Burg

HENRY HALL ATRIUM 2

The Effect of Resistance Training on 2K Rowing Performance in High School Rowers

Participants attending from 10:00 a.m. until 11:00 a.m.

Presenter: Lauren Adlof

Rowing requires strength, power, and excellent aerobic and anaerobic endurance. Currently, little research exists regarding strength training practices for the junior level rower. The purpose of this study was to determine the effects of a 5-week resistance training program on 2K rowing test scores in male and female high school rowers. Secondary data analysis examined 2K test scores and 6RM test results pre and post a 5 week weight training program. Significance was set at the $p = .05$ alpha level. The effect of gender on performance scores was also examined. It was hypothesized that male rowers would have more significant improvements in their 2K times. Due to the constraints of testing within the high school rowing season, this research would benefit from being replicated using a longer training timeframe. This research could inform rowing coaches, junior athletes, and the strength and conditioning research community when designing training protocols to improve rowing performance.

Mentor: Amy Crawley

HENRY HALL ATRIUM 3

Religious and Conservative Charitable Giving Reflects Ingroup Preferences

Participants attending from 10:00 a.m. until 11:00 a.m.

Presenters: Peter Norkus, Mike Sharp

In order to determine whether religiosity and conservatism are associated with generalized versus particularistic charitable giving, we offered participants a hypothetical array of charities across several domains. The charitable organizations represented the domains of anti-poverty, medical assistance, and disaster relief. Each participant was asked to distribute a hypothetical fifty dollar sum among four

different charities in each domain. These four separate charities represented Christian versus secular, and local versus international assistance. Regression analyses indicated that religious participants allocate more funds to religious charities. Conservatives show the same preference even controlling for religiosity. This indicates that large portions of charitable giving are based on religious and political ingroup preferences and on shared ideologies.

Mentor: Luke Galen

HENRY HALL ATRIUM 4

A Periodization Program for Collegiate Level Rugby Players

Participants attending from 12:00 p.m. until 1:00 p.m.

Presenters: Shawn Hall, Cory VanAmberg, Nick Thimmesch

Rugby, a hybrid sport, requires an athlete to have the aerobic capacity of a soccer player and the agility, power, and physicality of a football player. A preplanned strength and conditioning regiment that addresses aerobic and muscular endurance, muscular strength, and power is crucial. The purpose of this project was to develop a periodization program that addressed these combined components. While much investigation has been done on concurrent training, the literature is somewhat inconsistent. Research has shown negative returns in adding endurance activities to strength based sports and positive returns when adding resistance training to endurance based sports. It is the authors' belief that through a periodized concurrent training plan the athlete will see increased athletic performance. Limitations include the inconclusive evidence in previous studies. This research should benefit rugby athletes by providing them with a model of combined methods of training for their sport.

Mentor: Amy Crawley

HENRY HALL ATRIUM 5

Plant Biomass to Chemical Feedstock

Participants attending from 10:00 a.m. until 11:00 a.m.

Presenter: Aaron Marshall

Rapid depletion of fossil fuels and increased consumer demands for materials are the driving forces behind scientific work to discover new feedstocks for materials. Cellulose, an abundant carbohydrate comprised of multiple glucose units, has the potential to be converted into fuels or various platform-molecules. However, converting cellulose with high efficiency and low cost is yet to be perfected, and difficulties in using cellulose rise from intramolecular hydrogen bonding. We focused on cellobiose, a two-glucose dimer, because of its solubility in water. We aim to identify the lowest energetic requirements to convert cellobiose into hydrogenated polyols without use of transition metal catalysts like ruthenium or palladium. Results show that aqueous cellobiose is converted to sugar alcohols at 550 psi of hydrogen gas and 200°C. Future work will focus on cellulose conversion, hoping to overcome the solubility issue, and using the increased acidity of near-super critical water.

Mentor: Dalila Kovacs

HENRY HALL ATRIUM 6

Explorations In Sonoluminescence

Participants attending from 10:00 a.m. until 11:00 a.m.

Presenter: Jeremy Peshl

Single Bubble Sonoluminescence (SBSL) is the phenomena by which a bubble is levitated in a liquid

medium and forced to oscillate using sound waves, which can make the bubble collapse violently enough to produce light. Various material parameters affect the light produced by these bubbles. This project provided an alternative methodology for the production of SBSL, as well as for data acquisition. Intensity measurements were obtained using a photomultiplier tube and spectral measurements were obtained using a fiber optic spectrometer. The study focused on the effects of temperature and different liquid compositions on the intensity of the light produced by a SBSL bubble, as well as the spectrum produced by a sonoluminescing bubble. The results may contribute to a better understanding of the effects of these material parameters.

Mentor: Karen Gipson

HENRY HALL ATRIUM 7

Mechanism of Telomerase Inhibition by Novel Non-Nucleosidic Drug Candidates

Participants attending from 11:00 a.m. until 12:00 p.m.

Presenters: Richard Grenn, Amanda O'Brien

Telomerase is a reverse transcriptase enzyme that adds telomeric DNA repeats to the ends of linear chromosomes. In normal somatic cells telomerase activity is very low, which causes the cells to have limited capacity for proliferation. However, many types of cancer cells have the ability to overexpress telomerase enabling them to divide so aggressively. Thus telomerase is an important anti-cancer drug target and designing an effective inhibitor will potentially aid cancer therapy in all telomerase-expressing tumors. Here we present the results of computational modeling of interactions between telomerase TERT domain and several inhibitory drug candidates. On the basis of our protein-ligand docking simulations, domain flexibility and bioinformatics analysis, we propose three different modes of drug binding to telomerase leading to the inhibition of its TERT domain function via distinct mechanisms. Our project will aid and inform further efforts in inhibitor design and optimization.

Mentors: Robert Smart, William Schroeder, Agnieszka Szarecka, Suganthi Sridhar

HENRY HALL ATRIUM 8

Classification of Dolomite Crystals in the Silurian Bisher Formation, Northeastern Kentucky

Participants attending from 3:00 p.m. until 4:00 p.m..

Presenters: Katelynn Braunschneider, Janell Williams, Bradley Morsink, Michelle Poterek

The Silurian Bisher Formation outcrop found at the Herron Hill Road Cut in northern Kentucky is comprised primarily of dolomite, with some intermixed shale and traces of quartz and pyrite. This thin-to-thick bedded formation overlies the Silurian Estill Shale and is overlain by the Devonian Ohio Black Shale. Due to echinoid groups and sedimentary features found within the formation, it has been suggested that the Bisher was likely a tidal flat environment. By conducting point counts on samples taken throughout the formation, we will quantify the shape and size of the dolomite crystals. Initial analysis of thin sections indicates the crystals range in size from 20-200 microns and are planar-euhedral in shape. From the literature we will determine what the texture we observe indicates about the temperature and environment of formation for the dolomite. We will also look to see if crystal characteristics of the Bisher Formation may favor a specific classical model of dolomitization.

Mentor: Patricia Videtich

HENRY HALL ATRIUM 9

The Implementation of New Techniques to Record EKGs in Crayfish and Vascular Reactivity in Porcine Ophthalmic Arteries

Participants attending from 9:00 a.m. until 10:00 a.m.

Presenters: Anthony Sorrentino, Tyler Guinn, Bryan Heystek, Trevor Armstrong

This poster describes new techniques in our lab. The first technique involves recording electrocardiograms in crayfish before and after chronic exposure to nonylphenols. The primary objective of this project is to obtain electrocardiograms from crayfish over time to ascertain the effect of nonylphenol, a potential environmental toxin, on the cardiovascular system. The second technique requires the dissection and isolation of the ophthalmic artery for subsequent mounting in an isolated organ bath. This will allow us to record changes in vascular reactivity of this particular artery in response to pharmacological stimuli. This second experiment is a recent addition to our hyperbaric oxygen experiments.

Mentor: Francis Sylvester

HENRY HALL ATRIUM 10

Comparing Computer Simulation to Interactive Tutorials

Participants attending from 11:00 a.m. until 12:00 p.m..

Presenter: Jake Eerdmans

Three dimensional models and visual simulation technologies are implemented in a college level Astronomy class. The targeted misconceptions deal with the moon's orbit and its phases, along with why we have different seasons. All the students are pre-assessed about particular misconceptions, then split into two groups. One group will engage the lesson using computer simulation exercises, while the other group will be given three dimensional interactive tutorials to build their own self-directed understanding. A mid-test will be issued to the students to get results on how well the two lessons compared.

Mentor: Keith Oliver

HENRY HALL ATRIUM 11

Effects of Self-affirmation on Coping and Motivational Systems

Participants attending from 10:00 a.m. until 11:00 a.m.

Presenters: Jackie Main, Chelsee Herzhaft

Self-affirmation theory proposes that people's beliefs and behaviors are motivated by a desire to view the self as moral, adaptive, and capable. Researchers have found that allowing one to affirm the self reduces defensiveness towards threatening health information and increases intentions to change a health behavior, but few studies have examined why self-affirmation has these effects. In this study, college students were randomly assigned to a self-affirmed condition in which they wrote an essay about their personal values or a non-affirmed condition in which they wrote about a non-personal value. Participants then responded to hypothetical stressful scenarios and completed personality and individual difference measures. We examined the effects of self-affirmation on participants' coping intentions and their motivational states. We further examined whether the effects of self-affirmation were moderated by self-esteem, personality, or optimism.

Mentor: Amanda Dillard

HENRY HALL ATRIUM 12

An Analysis of the "Take the Stairs" Campaign

Participants attending from 2:00 p.m. until 3:00 p.m.

Presenters: Patrick Herta, Stephanie Send

The "Take the Stairs" campaign was launched and completed in the Fall 2012. The purpose of the campaign was to understand the walking and exercise habits of Grand Valley students and faculty. Statistical analysis was required to draw meaning from data collected, and our presentation will focus on the analyses performed and any resulting conclusions.

Mentor: Sango Otieno

HENRY HALL ATRIUM 13

The Seebeck Coefficient of Bismuth

Participants attending from 1:00 p.m. until 2:00 p.m.

Presenters: John Garbini, Ryan Warner, Austen Jousma, Joshua LaMie, Dustin Kirkendall

This experiment was performed to determine the Seebeck Coefficient of a Bi83 cylindrical sample near room temperature (21°C). The Seebeck Coefficient is a measure of an induced voltage across two ends of a given material under a small temperature gradient. This temperature difference causes electric charge carriers in the material to move from the warmer end of the material to the colder side, causing a potential difference. A simple relationship is used to determine the Seebeck Coefficient, $S = \frac{\Delta V}{\Delta T}$, where ΔV is the potential difference between two ends subject to a temperature difference; ΔT is the temperature difference. The ratio of our measured voltage over the temperature difference was positive so this meant that the charge carriers in Bismuth are electrons. Our data shows an average experimental value of 62.2 $\mu\text{V/K}$ which implies that the Seebeck Coefficient of Bismuth is $-62.2 \mu\text{V/K}$ which compares well with the accepted value of $-70 \mu\text{V/K}$.

Mentors: Ross Reynolds, Harold Schnyders

HENRY HALL ATRIUM 14

Measurement of Thermal Properties of Bismuth Using the Harman Method

Participants attending from 10:00 a.m. until 11:00 a.m.

Presenters: Jeremy Peshl, Nathan Gerken, Julia Gjebic

The Harman method (also known as a Z-meter technique) is a well known and established technique for measuring thermoelectric properties of materials, as well as the thermoelectric figure of merit. Involved in these thermoelectric properties is the Seebeck Coefficient, the electrical conductivity, and the thermal conductivity, the latter being a focus of this research along with the thermoelectric figure of merit. The apparatus that was used is loosely based upon a similar apparatus constructed by A.E. Bowley et al., but remains significant due to its ability to easily be reproduced and its inexpensive qualities. The described apparatus uses only direct current to create a temperature gradient across a sample of Bismuth by the means of the Peltier effect. A figure of merit within 7% of expected values was obtained however thermal conductivity determination showed significant error. Details of the experimental apparatus and procedures followed are discussed.

Mentors: Harold Schnyders, Ross Reynolds

HENRY HALL ATRIUM 15

Water birthing - What Is It?

Participants attending from 3:00 p.m. until 4:00 p.m.

Presenter: Heather Kubas

This study examines water birthing and the knowledge women have on this topic. The research relies on an anonymous survey of 10 questions. The expected outcome for this study is that women of childbearing age and young senior college women will not have great knowledge on the topic of water birthing. Over the last 25 years, women have questioned the medicalization of childbirth, through this they have reached out to midwives and doulas. They have also examined other birthing methods; one that is often ignored is water birthing. This study samples two populations, one composed of pregnant women and the other group is made up of college women ages 21-24. Using water during labor and delivery is not a new phenomenon, but there is not much attention focused on water birthing or the advantages to it in the United States.

Mentor: Kathleen Underwood

HENRY HALL ATRIUM 16

Synthesis of Chromene Based Thyronamine Analogues

Participants attending from 2:00 p.m. until 3:00 p.m.

Presenter: Jonathan Lehmann

200 million people worldwide are living with a thyroid hormone imbalance, resulting in abnormal heart rates and metabolic rates. Most treatments for these conditions currently rely on regulating the thyroid hormone (TH) which can take hours or even days to take effect. However, recent discoveries have shown that these same symptoms can be regulated in only minutes by a novel TH metabolite, 3-iodothyronamine (T1AM). T1AM is a potent agonist of the Trace Amine Associated Receptor (TAAR) which is believed to mediate many of these biological effects. To date, many T1AM analogues have been described. Building on these results, we have designed a T1AM analogue with a new molecular scaffold that incorporates key structural features in a conformationally-restricted arrangement. In the laboratory, we have succeeded in synthesizing precursors to these target compounds and are currently optimizing the reactions that will convert them into promising TAAR agonists.

Mentor: Matthew Hart

HENRY HALL ATRIUM 17

Ghana: Gaining Mathematics Experience and Knowledge

Participants attending from 4:00 p.m. until 5:00 p.m.

Presenter: Stacy Georges

My research topic includes personal experiences of my service-learning Study Abroad trip to Ghana, Africa as well as collected research regarding Ghanaian mathematics education with the specific use of manipulatives. The response of elementary (Class One) students at Challenging Heights School in Winneba to the brief implementation of mathematical manipulatives in mathematical instruction is the basis of discussion. Forty-seven Class One students were instructed in the use of one particular type of mathematical manipulatives: Linking Cubes. Based on my observation, their response seemed positive. The addition of mathematical manipulatives at Challenging Heights is then explored, which includes possible pitfalls in implementation. With proper teacher training and knowledge, it is believed that this particular school in Ghana could benefit significantly from supplementary teaching materials in mathematics, such as Linking Cubes.

Mentor: Lisa Kasmer

HENRY HALL ATRIUM 18

The Effects of Methylcholine and Hyperbaric Oxygen Therapy on Porcine Renal Arteries

Participants attending from 9:00 a.m. until 10:00 a.m.

Presenter: Matthew Figlewicz

Nitric oxide is released by blood vessels to mediate vasodilation (i.e. vessel relaxation). Typically, nitric oxide is synthesized by the endothelium of blood vessels in response to various stimuli including acetylcholine or its analog, methylcholine. As a gaseous molecule, nitric oxide diffuses to adjacent vascular smooth muscle cells inducing vasodilation. Hyperbaric oxygen therapy may alter the effects of nitric oxide on the vasculature. The purpose of this study is to determine the effects of hyperbaric oxygen therapy on methylcholine-induced vasodilation in porcine renal arteries. Arteries will be dissected, placed in a hyperbaric chamber for 2 hours, mounted in isolated organ baths, and responses to phenylephrine (a vasoconstrictor) and methylcholine will be recorded. Responses consist of changes in tension as measured by a force transducer. These results will provide insight on the effects of hyperbaric oxygen therapy on a clinically important vascular control mechanism.

Mentor: Francis Sylvester

HENRY HALL ATRIUM 19

Poverty and Urbanization: The 'U' Shape Theory in Michigan

Participants attending from 1:00 p.m. until 2:00 p.m.

Presenter: Kyle Barnhart

The U shape theory explains the distribution of poverty as the population concentration changes when moving along a spectrum from a highly rural area to a highly urban area. The relationship between poverty and urbanization in Michigan will be examined using county level poverty and urbanization data. Poverty data will also be mapped at a more local level to observe specifically how the poverty distribution radiates out from urban centers. The causes and implications of the U shape distribution will also be considered.

Mentor: Jeroen Wagendorp

HENRY HALL ATRIUM 20

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

Participants attending from 2:00 p.m. until 3:00 p.m.

Presenters: Kenton Shaw, Erik Hascall, Eric Armstrong

Ball and pillow structures, sediment masses that form as isolated "pillows" or "balls", are found in the Middle to Late Ordovician Fairview Formation that outcrops near Maysville, Kentucky. The literature suggests these structures are the result of the shaking of sediment by earthquakes. Although most ball and pillow structures are found at the base of sandstones interbedded with mudstone, these structures consist of limestone wackestones and packstones associated with shale. Thin sections from the ball and pillow structures are noticeably different from thin sections of nearby undeformed areas. For example, the ball and pillow structures contain significantly more fossils, including mollusks and corals, than the undeformed areas. Thin sections will be used to visually estimate relative grain packing density and mean grain size. Point counts will be used to quantify the rocks' compositions. This data will help us determine how lithology impacts this type of deformation.

Mentor: Patricia Videtich

HENRY HALL ATRIUM 21

Effect of Cold-Induced Stimulation of Arteriovenous Anastomoses in the Hand on Subsequent Physiological Function and Soccer-Specific Complex Motor Skill Performance

Participants attending from 1:00 p.m. until 2:00 p.m.

Presenters: Raymond Torbet, Rhyan Wozniak

Significance: A rising core body temperature, caused by increasing metabolic load and reduced heat loss capabilities, can be a major factor limiting both physiological function and complex motor skill performance. An intervention that can lower core body temperature may have a positive effect. Hand cooling takes advantage of the arteriovenous anastomoses and venous plexuses, which allow effective and rapid heat dissipation. Purpose: To determine if a 10-min hand-cooling treatment will affect core body temperature, sprint and skill performance. Methods: Subjects completed two 45-min periods of soccer-specific activity intended to simulate a 90-min game. Between periods a 15-min break was given, when participants underwent the 10 min treatment. At the beginning and end of each 45-min period a soccer skill test was performed. Anticipated Results: Hand cooling will effectively dissipate heat, and attenuate the reduction in both sprint and soccer-specific motor skill performance.

Mentor: Ross Sherman

HENRY HALL ATRIUM 23

The Carnegie-Ames-Stanford Approach to Monitoring NPP Production Changes in Southern California from 2000 to 2010

Participants attending from 10:00 a.m. until 11:00 a.m.

Presenters: Diane Panaccio, Matt Rice, Mike Noel, Kris Heisner

Several methods exist to model and monitor the global changes in the Earth's carbon cycle. The CASA Model, designed by scientists from NASA, Stanford University, and the Carnegie Institute, was published in 1993. It has a wide range of applications to analyze and assess the impacts of human and natural activity on world ecosystems. The CASA Model employs the use of various mathematical algorithms and sophisticated geographic technologies to collect and analyze data to calculate the fluctuating variables in carbon sink and uptake in regions around the world. This research study will examine the use of GIS and remote sensing in attempting to relate carbon sequestration of terrestrial NPP to the amount of woody biomass observed via land classification of a ten year time span in Southern California.

Mentor: Wanxiao Sun

HENRY HALL ATRIUM 24

Abundance, Density and Economic Value of the Irapay Palm (*Lepidocaryum tenue*) in Three Topographically Different Areas of the Peruvian Amazon

Participants attending from 9:00 a.m. until 10:00 a.m.

Presenter: Catrina Chambers

The purpose of this study was to examine the density and abundance of the irapay palm (*Lepidocaryum tenue*) in northeastern Peru. *L. tenue* is heavily exploited for use in the construction of roof thatch known as crisneja.

Transects measuring 500 by 10 meters wide were used to conduct censuses of the palms and survey topography. The mean number of usable palm fronds (for thatch) on each adult palm was determined from a random sample of 100 palms in each study area. The economic value of irapay populations in the forest was then calculated based on the mean density of usable palm fronds in each study area. Results indicate that irapay palm distribution varies in density, which may be related to topography.

Irapay was most abundant near a village where it is intensely harvested for sale as roof thatch, but had the lowest number of usable fronds per palm. The economic value of irapay ranged from \$1.20 to \$10.29 per hectare between the three study areas.

Mentor: James Penn

HENRY HALL ATRIUM 25

Exploring How the N152T Mutation in the Class C β^2 -lactamase, AmpC, can Serve as a Substrate Selectivity Switch

Participants attending from 12:00 p.m. until 1:00 p.m.

Presenter: Vincent Baggett

AmpC is a main cause of antibiotic resistance in some types of bacteria. While some active site residues' catalytic roles have been revealed, their contributions to which antibiotic they can inactivate is unknown. Prior work has shown that a mutation of a highly conserved residue in the active site (N152) can result in substrate selectivity changes in similar class C beta-lactamases. The role of the active site residue asparagine-152 (N152) mutated to threonine (T) allowed us to examine the kinetic and structural properties of this mutant with beta-lactam antibiotics. Although the N152T mutation caused a higher K_m with all substrates, N152T exhibits over 150 fold higher k_{cat} against cefotaxime. To investigate the mechanism of the observed change in selectivity, the X-ray crystal structure of AmpC N152T was determined. In comparison to the wild type AmpC structure, small structural active site differences have been associated with the changes in the kinetic values.

Mentor: Brad Wallar

HENRY HALL ATRIUM 26

Factors That Affect Nestling Growth Rates in Tree Swallows

Participants attending from 10:00 a.m. until 11:00 a.m.

Presenters: Dayna Hart, Erika Herbel, Katelyn Nettler, Casimir Tokarski, Megan Briggs, Shadie Emiah

Tree swallows are common aerial insectivores. Nestlings are fed until they fledge 20 days after hatching. From 2008-2012, we examined the effects of brood size and year on nestling growth (head-bill length, mass and wing length) from 430 nestlings in 102 broods when 3, 6, 9 and 12 days old. We measured nestlings at ND12 because nestling size at ND12 predicts size at fledging. Brood sizes ranged from 1-7 nestlings. Head-bill, mass and wing growth rates were all significantly affected by brood size and year. In the most common brood sizes of 4, 5, and 6, head-bill and wing growth rates were significantly affected by brood size, mass was not. Nestling size at ND3 was positively correlated with size at ND12. On ND12, head-bill length, mass and wing length were positively correlated with each other suggesting that brood size affects nestling growth. Nestlings in BS 4-6 were the largest on ND12. Nestling growth rates changed with year suggesting that food availability affects growth.

Mentors: Patrick Thorpe, Michael Lombardo

HENRY HALL ATRIUM 27

Effect of Cold Exposure on the Muscle Metaboreflex During L-tyrosine Supplementation

Participants attending from 1:00 p.m. until 2:00 p.m.

Presenters: Rhyen Wozniak, Raymond Torbet

Significance: The L-tyrosine pool within sympathetic nerve terminals that is available for catecholamine synthesis may limit sympathetic function. After supplementation of L-tyrosine, the sympathetically-

mediated vasoconstriction response during cold exposure was increased in aged skin. Purpose: To investigate oral supplementation of 150 mg/kg of L-tyrosine on the metaboreflex-mediated blood pressure response during passive whole body cooling. Protocol: Subjects performed isometric exercise using a handgrip dynamometer for 2 min at 35% maximal voluntary contraction. Five seconds before exercise ended, a blood pressure cuff was inflated to suprasystolic pressure to trap vasoactive metabolites within the forearm for an additional 3 min. The test was then repeated after whole body cooling to a mean skin temperature of 30.5 C. Anticipated Results: Supplementation of L-tyrosine prior to whole-body cooling will result in an increase in the metaboreflex-mediated blood pressure response.

Mentor: James Lang

HENRY HALL ATRIUM 28

Announcing Roadkill Reporter

Participants attending from 1:00 p.m. until 2:00 p.m.

Presenter: Caleb Gomer

Roadkill Reporter is a mobile app that facilitates crowdsourcing a parasitology project exploring the genetics and distribution of the raccoon roundworm, an intestinal parasite infecting 60-80 percent of raccoons in the Midwest. The basic idea is to get more eyes on the road to help in identifying fresh raccoon roadkill. Reports are transmitted and stored using a Universally Unique Identifier (UUID), ensuring participant anonymity while allowing for subsequent report updates, location refinements and reliability measures of reporters based on cumulative accuracy. A companion app, Roadkill Retriever, helps the project PIs locate and retrieve the carcass for necropsy and subsequent analysis. It accesses reports from our web server, then uses GPS coordinates to filter reports, sort by distance, map, and provide guided navigation. Both Android and iPhone versions are available.

Mentors: Greg Wolffe, Doug Graham

HENRY HALL ATRIUM 29

The Role of the US 1954 Intervention in the Degradation of Guatemala

Participants attending from 2:00 p.m. until 3:00 p.m.

Presenter: Eli Bale

Guatemala is one of the poorest countries in Latin America and is currently plagued with high levels of violence and a degraded level of public safety. This study will attempt to shed light on the question of how the US CIA intervention of 1954 played a role in the deterioration of this country. The US thought it necessary to exercise its role in Latin America by removing the president, Jacobo Arbenz Guzmán, from office by force. Drawing on primary and secondary source material, my presentation will show how this covert operation caused a newly democratizing country to eventually collapse into a thirty-year civil war with catastrophic consequences in terms of public violence.

Mentor: Andrew Schlewitz

HENRY HALL ATRIUM 30

An Analysis of the Effects of Massive Rotating Bodies on Orbits in the Weak Field Limit

Participants attending from 12:00 p.m. until 1:00 p.m.

Presenter: Nathan Tripp

Newtonian theories of gravity fail to describe certain minute but detectable phenomena. The existence of such phenomena spurred the development of improved theories of gravitation, the most popular of

which is general relativity. This project involved mathematical examination of various implications of general relativity, including the perihelion precession of orbits, de Sitter precession, and Lense-Thirring precession. Expressions for these quantities were derived using both the Schwarzschild metric and PPN, parameterized post-Newtonian, formalism involving a single post-Newtonian term.

Mentor: Brett Bolen

HENRY HALL ATRIUM 31

Palm Fiber Use in Artwork Exported from Amazonia: Local Exploitation, Abundance and Spatial Analysis of *Astrocaryum chambira* Near a Community Reserve in Peru

Participants attending from 12:00 p.m. until 1:00 p.m.

Presenter: Elisabeth Cole

The purpose of this study was to determine if *Astrocaryum chambira* palms are being sustainably harvested for fiber used to make artwork in northeastern Peru and what effect the 2012 Amazon flooding had on palm production. Two floodplain harvest areas were inventoried; old river levee fallow that was communally harvested and 18 small swidden-fallow gardens that were individually owned and harvested. The study area was mapped and analyzed with GIS. Statistics for the restinga palms were compared to garden statistics and with previous studies. Findings show that the *A. chambira* in the restinga had a higher density than findings from previous studies and had a significantly higher rate of harvest than the palms in the gardens. Flooding was significantly deeper in the gardens. If the artisans are going to sustain their artwork sales from palm fiber, they will need to reduce harvest rates on restinga palms and move their palm gardens to higher lands to reduce the risk of flood loss.

Mentor: James Penn

HENRY HALL ATRIUM 32

Inconsistent Opinions on the Ethics of Genetic Engineering

Participants attending from 10:00 a.m. until 11:00 a.m.

Presenters: Kelsey VanAmberg, Owen Hurley, Ashton Baker, Hope Johnson, Tom Nieboer

A majority of students indicate that they are familiar with the topic of genetic enhancement and designer babies. Two hundred students at GVSU were randomly surveyed about the ethics surrounding genetic engineering, and opinions varied depending on the use of the technology. They were also asked if they would utilize that genetic technology in their own children. Sixty-four percent of the respondents indicated that they thought the ability to screen embryos to prevent genetic diseases should be available, but only forty-nine percent indicated that they would use the technology in their own children. In contrast, when participants were asked if it is acceptable to be able to choose a child's gender or physical characteristics using genetic technology, only a small percentage agreed, and when asked if they would use these methods on their own children, responses were much more consistent with the answers provided regarding the availability and acceptability of these technologies.

Mentor: Osman Patel

HENRY HALL ATRIUM 33

Periodized Training Program for Beginner Marathon Runners

Participants attending from 11:00 a.m. until 12:00 p.m.

Presenters: Olivia Holwerda, Emily Syfert

Less than 1% of the population can say that they have accomplished a feat of great magnitude that

is both physically and mentally taxing and can span up to 6 hours long. Over the past 20 years, the popularity of marathons has increased and the number of participants has grown to over 500,000. A marathon is an endurance event that consists of running 26.2 miles. Due to the physically taxing nature of the sport, it is crucial that the athletes prepare thoroughly and properly. The purpose of this presentation is to create a periodized training program to safely increase the level of performance of beginner marathon runners. A year-round aerobic and strength training plan was created to enhance performance and prepare these athletes to achieve their goals. Possible limitations include the lack of research on strength and conditioning for amateur marathon runners. This program is designed to benefit beginner marathon runners as they train to complete their first big race.

Mentor: Amy Crawley

HENRY HALL ATRIUM 34

Investigating the Potential of Cellular Focusing and Separation by Capillary Isotachophoresis

Participants attending from 3:00 p.m. until 4:00 p.m.

Presenter: Jared Lamp

Capillary isotachophoresis has long been a useful technique for small molecule separations. This research serves to investigate its potential in the separation of whole cell mixtures. The behaviors of bacterial and fungal species in standard capillary zone electrophoresis are compared to those in isotachophoresis in order to make qualitative assessments. Electrophoretic mobility ranges of different cell species were cataloged and bracketed with ions of higher and lower mobility in isotachophoresis. It is likely that the focusing abilities of isotachophoresis will be able to overcome band broadening caused by heterogeneity in cell cultures and the formation of cellular aggregates. The collected data suggests isotachophoresis may be potentially used in standardized testing of unknown cell cultures.

Mentor: Andrew Lantz

HENRY HALL ATRIUM 35

3 Omega Measurement of Thermal Conductivity of Paraffin

Participants attending from 10:00 a.m. until 11:00 a.m.

Presenters: Jake Eerdmans, Brittany Cooke, Matt Nauta, David Foley, Michael Dykstra

This experiment is a study of the 3 omega method, done by suspending a wire in a sample to measure the thermal conductivity. We also tested various gauges and metal types of wire to see how these affect measurements. Two gauges of copper wire (40 and 28) and one gauge of tungsten wire (38) were used to measure the thermal conductivity of paraffin wax. These individual measurements are compared to the actual measurement of 0.25 W/mK. This experiment was a continuation of previous work and a few changes were made, resulting in slightly more concrete results.

Mentors: Harold Schnyders, Ross Reynolds

HENRY HALL ATRIUM 36

A Survey of Ants (Hymenoptera: Formicidae) in Grand Rapids Parks Representing an Urban Gradient

Participants attending from 2:00 p.m. until 3:00 p.m.

Presenter: Matthew Boot

Ants have been shown to be a useful bioindicator taxon for environmental quality and biodiversity. In order to test sensitivity to environmental quality within urban areas, three parks were surveyed along an urban to rural gradient. A total of 23 ant species representing 14 genera were collected. Species

and genus richness were found to be lowest at urban sites and increased with distance from the urban center. Furthermore, the proportion of both the number of species and number of individuals collected from the subfamily Formicinae at each site was found to be directly related to urban density, while that of subfamily Myrmicinae was inversely related. *L. neoniger* represented 38% of individuals collected and appeared to be locally dominant throughout the region. However, this behavior was most pronounced at the urban site. These results suggest a stable relationship between urban density and ant community structure at a citywide scale.

Mentor: James Dunn

HENRY HALL ATRIUM 37

Analyzing Interactions Between *Candida albicans* and other Microbes

Participants attending from 11:00 a.m. until 12:00 p.m.

Presenter: Andrea Engerson

Candidiasis represents the fourth most frequent nosocomial infection in the US and worldwide. These infections carry unacceptably high morbidity, mortality rates and important economic repercussions. *C. albicans* can grow as yeast cells, pseudohyphae, hyphae or within a biofilm. The ability to form hyphae and biofilms have been fundamentally linked to the disease causing potential of this organism. However, studies have focused on either *C. albicans* in isolation or whilst it alone is infecting a host. Outside of the laboratory *C. albicans* is typically surrounded by, and occupying the host with, other non-related microbes that can be a significant part of the environment *C. albicans* is reacting to. Here we demonstrate the development of a rapid screening technique that can be used to quickly identify and examine interactions between *Candida albicans* and other microbes and demonstrate some of the genes regulated as part of such processes.

Mentor: Derek Thomas

HENRY HALL ATRIUM 38

Changes in Height, Body Weight, and Body Composition in American Football Players from 1942 to 2011

Participants attending from 11:00 a.m. until 12:00 p.m.

Presenter: Anthony Anzell

Documented changes in height (cm) body weight (kg) and body composition (% fat) of college and professional football players from 1942 to 2011. Articles identified from data bases. Data were categorized into groups (college and professional). Player positions were grouped into linemen offensive backs and skilled. Linear regression provided slopes and 95% CI. Unpaired t-tests were used. Significance set at $p < 0.017$. College players in all positions have significantly increased body weight over time (95% CI lineman .338-.900 kg/yr; offensive backs .089-.298 kg/yr; skilled .078-.334 kg/yr). The college linemen showed a significant increase over time for height (95% CI .034-.188 cm/yr) and body composition (.046-.275 %fat/yr). Increases in body weight over time were found for professional lineman (95% CI .098-.756 kg/yr) and offensive backs (95% CI .180-.545 kg/yr). Body weight of all college players and professional linemen and offensive backs have increased during the past 70 years.

Mentor: Jeffrey Potteiger

HENRY HALL ATRIUM 39

Non-Contiguous Pattern Containment in Trees

Participants attending from 11:00 a.m. until 12:00 p.m.

Presenter: Connor Scholten

We will define the containment of a full ordered binary tree within another binary tree in a non-contiguous sense. We then illustrate results regarding the number of non-contiguous containments of a particular i -leaf tree within all j -leaf trees. Also, we will apply generating functions into said results and into the enumeration of containing path trees within binary trees. We then present results, which can be generalized to m -ary trees. We first define what it means for a binary tree to contain another binary tree in a non-contiguous sense. We then enumerate non-contiguous containments of a j -leaf tree within all i -leaf trees. Our main result is that any two j -leaf trees are both contained within all i -leaf trees the same number of times, regardless of their shapes.

Mentor: Gerald Shoultz

HENRY HALL ATRIUM 40

A Periodized Strength and Conditioning Program for a Collegiate Male Sprinter

Participants attending from 1:00 p.m. until 2:00 p.m.

Presenters: Meredith Welsh, Zac Ridgeway

Sprinting is a highly specialized component of track and field. It requires agility, speed, power, high anaerobic capacity, and for the athlete to maintain optimal body composition. The purpose of this study was to design a yearlong periodization training protocol for a male collegiate sprinter. This protocol was designed to improve all of the above-mentioned areas required for this athlete. To create the periodized training protocol, past research from scientific journals were studied extensively. As this periodization model was only designed for college aged male sprinters, generalizing this program to other genders or age groups could prove to be a limitation of this research. College age male sprinters and their coaches should benefit from this study by taking advantage of a well developed model designed to properly train and prepare for their specific event.

Mentor: Amy Crawley

HENRY HALL ATRIUM 41

Populist Rhetoric in South America

Participants attending from 9:00 a.m. until 10:00 a.m.

Presenter: Garrit Hensley

The presidents of Venezuela and Bolivia, Hugo Chavez and Evo Morales, have been very critical of US foreign policy towards their countries, and the Latin American region. Hugo Chavez even once called former President Bush the devil in a 2006 address to the UN. But is their criticism of the US just a populist rhetorical device meant to stir up nationalist support from their peoples, or does it actually reflect actual policy positions that are at odds with US foreign policymakers? Drawing on primary and secondary sources, my poster will illustrate some surprising gaps between populist rhetoric and reality (or, will illustrate the ways Venezuelan and Bolivian foreign policies both match and contradict the anti-US rhetoric of their presidents).

Mentor: Andrew Schlewitz

HENRY HALL ATRIUM 42

Probing the Binding Site in the Antibiotic Resistance Enzyme, AmpC Beta-lactamase

Participants attending from 1:00 p.m. until 2:00 p.m.

Presenter: Brianne Docter

Beta-lactam drugs, such as penicillins and cephalosporins, are widely used to treat bacterial infections, but resistance to these drugs is increasingly becoming a problem. One of the main causes of resistance to these beta-lactam drugs is the bacterial production of beta-lactamase enzymes, such as AmpC. These enzymes are capable of breaking down the drug within their active sites, rendering the antibiotic unable to harm the bacteria. The exact roles that the active site amino acid residues play in the recognition and breakdown of the drug are not fully understood. Here, we investigate the role of the active site residue asparagine-152 (Asn152) in AmpC by mutating it to a glycine, serine, or threonine residue and examining the effect that these mutations have on kinetic and structural properties. Uncovering the specific role of Asn152 in the function of AmpC will be useful in the development of inhibitors to these enzymes in order to combat bacterial resistance.

Mentor: Brad Wallar

HENRY HALL ATRIUM 43

Genetically Modified Organisms: Friend or Foe?

Participants attending from 3:00 p.m. until 4:00 p.m.

Presenters: Ellie Den Braber, Danielle Maryanski, Jacob Borysiak, Michael Esch, Eric Armstrong

The controversy surrounding genetically modified organisms (GMO's) spans many different aspects of life from food production and medicine to environmental uses. One-hundred ninety-four students at Grand Valley participated in an anonymous voluntary survey in which they expressed their opinions about the impacts of GMO's. Because of the broad span of their uses, our survey divided the applications of GMO's into the categories of crops, animal products, the environment, medicine, fuel, research and household products. We also asked the students about the possible impacts of GMO's in their own lives in the areas of personal health, cost, and moral conflicts. Our results show that if the entirety of GMO's is considered, the student body has a neutral attitude towards them. However, there are distinct results showing opinions of positive impacts in medicine, and negative environmental impacts.

Mentor: Osman Patel

HENRY HALL ATRIUM 44

Magnetoresistance of Silver Telluride and Silver Selenide Thin Films

Participants attending from 2:00 p.m. until 3:00 p.m.

Presenter: Mallory Fuhst

Previous studies have found that Ag_2Te and Ag_2Se thin films possess a large positive magnetoresistance. Our preliminary research with these materials suggests that the surface state effects are significant even in bulk and poly crystal forms at room temperature. If this is the case, Ag_2Te and Ag_2Se would be practical materials for commercial applications, particularly thermoelectrics. Therefore, our first goal in researching Ag_2Te and Ag_2Se is to minimize the bulk contributions by reducing the dimensions: we will create thin films on silicon dioxide crystals. Our second goal is to investigate the ability to develop and maintain a tunable Fermi level through modifying the electrochemistry by gating the thin films on silicon. This research will further the understanding of this material and its potential commercial uses.

Mentor: Harold Schnyders

HENRY HALL ATRIUM 45

Development of an Efficient Capillary Isoelectric Focusing Method for Separating Bacteria and Fungi Cells

Participants attending from 1:00 p.m. until 2:00 p.m.

Presenter: Travis Bisson

Identifying and quantifying the bacteria, fungi, or viruses responsible for infectious contamination in food, biological samples, or water sources requires significant time and/or cost for analysis. A quick, efficient, and less expensive means for separating and analyzing complex biological samples for bacteria, fungi, and viruses would be highly beneficial. Capillary electrophoresis (CE) has the potential to be used for such analyses, including capillary isoelectric focusing (CIEF) which can separate analytes by their characteristic isoelectric point (pI). Here, we work to develop an efficient method using CIEF to separate microorganisms in biological samples. CIEF is capable of focusing cells and also measure their pI values by using a pI based calibration curve of molecular zwitterions. This research contributes to the development of a method that could replace current techniques such as growth plate methods and PCR.

Mentor: Andrew Lantz

HENRY HALL ATRIUM 46

A Strength and Conditioning Regiment to Improve Agility, Quickness and Jump Height in Ultimate Frisbee Players

Participants attending from 12:00 p.m. until 1:00 p.m.

Presenters: Krista Whitlock, Elliot Putman

With over 300 college and university teams, Ultimate Frisbee is one of the fastest growing sports in the world. Ultimate combines a backyard game of Frisbee with athletic skills of soccer and football. In order to be successful at Ultimate, an athlete must have well developed agility, speed, hand-eye coordination, and an above average vertical jump. The purpose of this study was to create a conditioning program for an Ultimate player, utilizing the most relevant research for program development. While gameplay and disc-handling skills are important, implementing strength and conditioning exercises may improve a player's overall athletic performance. Due to little research done on conditioning of an Ultimate athlete, strength and conditioning strategies will be adapted from soccer and football training regimens to create a program. With this program, Ultimate athletes should be able to compete at a higher level to increase their overall performance during game play.

Mentor: Amy Crawley

HENRY HALL ATRIUM 47

Pollutant Effects on Neurophysiological Recordings from Sensory And Motor Neurons Of The Crayfish

Participants attending from 12:00 p.m. until 1:00 p.m.

Presenter: William Waalkes

Proper sensory input and motor output relies on constant nervous system activity. We proposed to test the neurological effects of a chemical pollutant on crayfish, *Orconectes propinquus*. Nonylphenol is a chemical used in detergents and pesticides that is commonly concentrated in crayfish, fish, and birds. Crayfish were exposed to 0.20 μ L of nonylphenol for seven days. At the conclusion, crayfish sensory and motor neuron capabilities were tested by allowing crayfish to find food in a Y-maze. Data recorded included percent success finding food, time to find food, time spent motionless, and time spent in the food arm of the Y-maze. In phase two of experiments, primary sensory and motor neurons will be isolated to test changes in membrane potential across axonal membranes. By doing so, we will

elucidate any alterations in neuronal signals due to nonylphenol exposure. For example, a reduction in neuronal signaling would indicate the pollutant directly affects the crayfish nervous system.

Mentor: Dan Bergman

HENRY HALL ATRIUM 48

The Role of Extrinsic Contingency Focus in Consumer Product Preferences

Participants attending from 9:00 a.m. until 10:00 a.m.

Presenter: Mike Sharp

Extrinsic contingency focus (ECF) is a reflection of an individual's tendency to derive self-esteem from meeting socially vs. personally defined standards. Although ECF has already been shown to predict responses to advertising and public service announcements (Arndt et al. 2009; Williams, 2009), the relationship between ECF and preference for consumer products has not been explored. The two studies show that ECF predicts peoples preferences for consumer products. Study 1 shows that ECF is related to preferences for image-oriented characteristics of consumer products, but unrelated to preferences for practical characteristics. In Study 2, ECF is shown to relate to a preference for high-status consumer products, but does not predict preferences for low-status consumer products.

Mentor: Todd Williams

HENRY HALL ATRIUM 49

New Modulators of TAAR1: Meta Linked Ureas

Participants attending from 10:00 a.m. until 11:00 a.m.

Presenter: Jacqueline Williams

A naturally occurring thyroid hormone (TH) metabolite, 3-Iodothyronamine (T1AM), is a fast acting derivative which activates the Trace Amine Associated Receptor (TAAR1). In mice, T1AM exhibits effects opposite of those induced by TH. This presents a novel regulatory mechanism of TH action. Studying this regulatory mechanism may lead to a grater understanding of thyroid hormone biology and has great meedical value. Previously in our lab, a urea derivative of T1AM has been shown to significantly activate TAAR1. This urea contains a para linked aromatic system. The development of new T1AM derivatives will give a better understanding of the structure activity relationship of TAAR1 regulation. To this end, this project focuses on the development of the ureas containing a meta linked aromatic system. This required the synthesis of a key meta diamine that is not commercially available. The results of several synthetic routes to this diamine are described herein.

Mentor: Matthew Hart

HENRY HALL ATRIUM 50

The United States and Women's Political Rights in Latin America

Participants attending from 2:00 p.m. until 3:00 p.m.

Presenter: Carly Durham

Have United States feminist movements sparked increased political rights in Latin American States? In recent decades huge political gains have increased in many Latin American nations, particularly Brazil, Chile and Argentina. Legislation protecting women's rights has expanded, supported by two inter-American rights organizations which promote reforms region wide. Drawing on primary and secondary sources my poster will illustrate the relationship between U.S. and Latin American political rights for women and the influences that exist between continents.

Mentor: Andrew Schlewitz

HENRY HALL ATRIUM 51

Magnetic Phase Transition in the 2-D Ising Model

Participants attending from 11:00 a.m. until 12:00 p.m.

Presenter: Adam Mixer

Using the Ising Model, the phase transition between ferromagnetic and paramagnetic phases of a 2-D square spin lattice are explored. A phase transition into the ferromagnetic phase occurs when the temperature of the system falls below some critical value. The ferromagnetic phase is characterized by a non-zero magnetization on the macroscopic level. Using the Monte Carlo method to obtain system's configurations (i.e., sets of microstates) in thermal equilibrium, we will explore system's macroscopic properties such as magnetization, magnetic susceptibility, and specific heat capacity as functions of temperature. We will evaluate the transition temperature, and discuss how the lattice size affects the results.

Mentor: Maja Krcmar

HENRY HALL ATRIUM 52

Effect of L-tyrosine Supplementation on the Muscle Metaboreflex Response

Participants attending from 3:00 p.m. until 4:00 p.m.

Presenter: Dana Collins

The muscle metaboreflex functions to increase sympathetic activity in response to the generation of vasoactive metabolites from working skeletal muscle. The resulting blood pressure response is dependent on catecholamine synthesis in synaptic nerve terminals. We hypothesize that oral supplementation of L-tyrosine, the primary substrate for catecholamine biosynthesis, will increase or maintain blood pressure response during metaboreflex activation. Subjects will ingest 150mg/kg of tyrosine prior to performing static handgrip exercise for 2 minutes. Before ending exercise, an arm cuff will be inflated to suprasystolic pressure to arrest blood flow to the forearm. Heart rate and blood pressure were measured throughout the procedure. We anticipate that compared to placebo, heart rate and blood pressure will be elevated as a result of tyrosine supplementation. This suggests that tyrosine is limiting the full expression of effector response to sympathetic activation in young adults.

Mentor: James Lang

HENRY HALL ATRIUM 53

Sea Turtle Nesting in Guanacaste, Costa Rica: Effects of Temperature and Sea Level Rise

Participants attending from 12:00 p.m. until 1:00 p.m.

Presenter: Kristen Zemaitis

Climate change is altering sea level in coastal biomes, which will increase about 0.6 m by 2100, detrimentally affecting the quality of sea turtle nesting habitat. I used a World Wildlife Fund protocol to monitor temperature and slope of beach habitat used by nesting green (*Chelonia mydas*), olive ridley (*Lepidochelys olivacea*), leatherback (*Dermochelys coriacea*), and hawksbill (*Eretmochelys*), on San Miguel Beach, Guanacaste, Costa Rica. In July and August, 2012, I measured beach slope with an Abney level and predicted inundation by subtracting 0.6 m from elevation values, resulting in a loss of 3% of the beach area. Beach topography is unstable among nesting seasons. These combined effects will harm sea turtles relative to their body size and timing of nesting. Current beach temperatures support normal sea turtle progress, but if the current trajectory of temperature increase continues, feminizing effects will occur by 2100, and lethal temperatures will be reached subsequently.

Mentor: Jodee Hunt

HENRY HALL ATRIUM 54

The Relationship Between Visual Attention and Event Segmentation in Ongoing Perception

Participants attending from 1:00 p.m. until 2:00 p.m.

Presenters: Steven Mills, Mackenzie Kibbe, Logan Bezy

Event segmentation theory (EST) states that that people break continuous experiences down into discrete units or events. These events are perceived as a partonomic hierarchy with smaller events clustered by larger events. Event segmentation may be influenced by different information based on whether subjects are attending to the higher-level events (i.e., coarse) or lower-level events (i.e., fine). We measured eye movements and segmentation behavior to assess if visual attention changes, across viewings, with the grain at which people segment everyday activities. We found that although participants clearly segmented at different grain sizes effectively - they segmented more often for fine than coarse - their eye movements are highly similar. This suggests that a) eye movements during naturalistic viewing of activity is strongly stimulus driven and b) event models of different grain levels do not differentially control low-level visual attention, but rather the encoding of information.

Mentor: Christopher Kurby

HENRY HALL ATRIUM 55

The Effect of Climate Change on People Living in the Andes Mountain Range

Participants attending from 9:00 a.m. until 10:00 a.m.

Presenter: Gwen Gell

In the Latin American mountain range, the Andes, many people's livelihoods are affected by climate change. This research project focuses on the impacts of climate change on people living in the Central Andes mountain range. Our research includes modeling future climate change scenarios with MAGICC SENGEM 5.3 model, analyzing peer-reviewed literature on ecosystems and cultures native to the Central Andes, and using satellite images to evaluate glacial changes and to understand the relationship between the glaciers and the human population. By combining anthropological evidence and climate change research, evidence shows the effects of changing glaciers, decreased renewable water sources, and other environmental effects on the Central Andean population.

Mentor: Elena Lioubimtseva

HENRY HALL ATRIUM 56

Helping Students Make Healthy Food Choices

Participants attending from 2:00 p.m. until 3:00 p.m.

Presenter: Eric Munson

The goal of this project is to develop an easy-to-use system that allows students to view what food is available at the different locations around campus as well as display the nutritional information in order to promote healthy choices. This system includes a website where each food service location (Connection, Fresh, etc.) can enter what food is available on a given day. This is tied to an Android app that students may use to filter foods by location, name, or nutritional information (fat, calories, carbohydrates, protein). The system is a proof of concept that is designed to show how web apps can help students eat better.

Mentor: Roger Ferguson

HENRY HALL ATRIUM 57

The Appearance of the Muscular Axillary Arch in Three Cadavers.

Participants attending from 9:00 a.m. until 10:00 a.m.

Presenters: Jesse Skok, Lauren Serra, Justin Sedgley, Matthew McRae

The muscular axillary arch (pectorodorsalis muscle) is an uncommon muscle variant that extends from the lateral border of the latissimus dorsi to the pectoralis major muscle tendon, crossing the axillary space (Bergman et al. 1984). This muscle has been reported to appear in 5% to 6% of axillae observed in cadavers. Here, we describe the presence of 4 muscular axillary arches in three cadavers (one cadaver presents the muscle bilaterally). These represent 20% of the axillae in the sample of 10 cadavers, a higher percentage than expected. The muscular axillary arch also is an important variant clinically as the muscle can compress the neurovascular bundle of the axilla (Rizk and Harbaugh 2008).

Mentors: Melissa Tallman, Dawn Richiert, Chris Reed, Tim Strickler

HENRY HALL ATRIUM 58

A Study of Slum Tourism Travel Motivations

Participants attending from 2:00 p.m. until 3:00 p.m.

Presenter: Sara McFarlin

Slum tourism is defined as the organization of tours in cities that are in “a run-down area...characterized by substandard housing and squalor and lacking in tenure security” (United Nations, 2007). As an emerging, niche segment, slum tourism is distinguished from the traditional forms of tourism. This article examines what the tour agency’s objectives are and how they correct the negative connotations of poverty. Research was also conducted to investigate whether slum tourists are primarily driven by mass or moral travel motivations. These findings will help facilitate a discussion of the extent to which poverty can be defined as the main form of observation of slum tourism overall. Citations: Nations, United. Millennium Development Goals Report 2007. Status Report. New York City: United Nations, 2007.

Mentor: Michael Scantlebury

HENRY HALL ATRIUM 59

The Mean Girl, Cliques and Cyber-Bullying: The By-Products of Girls' Inclination towards Relational Aggression

Participants attending from 11:00 a.m. until 12:00 p.m.

Presenter: Elizabeth Kaha

This study seeks to understand the influence of school setting on the prevalence of girls' inclination towards relational aggression. Since the public's discovery of this aggression in the 1980s, further research into this field of study has been merited. The study compares four high schools, urban private and public settings in the West Michigan area, to determine whether the setting assists or inhibits the prevalence of relational aggression among girls. The volunteering participants for the study are age 18 years or older. Upon beginning the anonymous survey, each participant will be asked to define girl-to-girl bullying on a sheet of paper. The definition I have chosen for the participants to use when answering the survey questions will then be presented. The survey will consist of closed-ended questions and one open-ended question. I anticipate that the school setting will possess variables that assist or inhibit the aggression.

Mentor: Kathleen Underwood

HENRY HALL ATRIUM 60

Coordination Exploration, *f*-element Complexation, Extraction and Synthesis of Novel Multidentate Carbamoylmethylphosphine-Oxide Ligands: With Nuclear Waste Remediation Implications

Participants attending from 9:00 a.m. until 10:00 a.m.

Presenter: Hope Sartain

Carbamoylmethylphosphine oxide (CMPO) ligands have been used in industry to complex lanthanides and actinides primarily for the TRUEX nuclear waste remediation process. The anticipated goal is to improve upon current nuclear waste remediation strategies using novel tripodal CMPOs. The research presented in this poster will include the synthesis of multidentate CMPOs, their complexes with and extraction of *f*-elements. Also included is the utilization of CMPOs to computationally explore fundamental *f*-element coordination chemistry.

Mentors: Christopher Lawrence, Shannon Biros

HENRY HALL ATRIUM 61

Data Mining a Hypernetwork of Features of Early-learned Nouns to find Nested and Overlapping Categories of Early Nouns: Comparison With the Binary Network and the Clique Percolation Method

Participants attending from 11:00 a.m. until 12:00 p.m.

Presenters: Kelsey Canada, Abigail Collinge

Former work in the development of semantic networks described the hierarchical information contained in the overlapping features of a binary network of 132 nouns using a method, the clique percolation, to interpret the global organization and the local structures of the network. However, both are limited as they can only yield minimal semantic information such as the degree of connectivity of local structures, whether a link of similarity exist or not between two neighbors or identify cliques with unspecified semantics. To unveil the richness of the semantic organization of this data and the relationships of overlap and containment latent in those structures, and thus to answer categorical questions like what are the semantic features that connect zebra, horse and goat in the animal-like cluster, or what is a more general feature, eats grass or has a tail, we propose to use a different type of representation: hypernetwork and a different formalism: Formal Concept Analysis.

Mentor: Josita Maouene

HENRY HALL ATRIUM 62

Are the Cyclical Lithologies in the Upper Ordovician Fairview Formation in Kentucky Storm Deposits?

Participants attending from 11:00 a.m. until 12:00 p.m.

Presenters: Karl Campbell, Jacqueline Bussey, Joe Klumpstra

The Upper Ordovician Fairview Formation, part of the Cincinnati Arch, spans Kentucky, Ohio, and Indiana. Rock samples collected from northern Kentucky in the winters of 2010 and 2011 indicate cyclical storm deposits in agreement with the literature. We qualitatively classified the samples as ranging from lime mudstone to packstone in a coarsening upward sequence. We have observed an apparent repetition of this sequence indicating cyclical deposition with mudstone beds (low energy) abruptly overlying a coarsening upward sequence (increasing energy). We will also quantify the rock components by point counting seven thin sections using a petrographic microscope. By point counting thin sections we are able to quantify the fossils present, which will help determine the depositional environment. The occurrence of relatively deep-dwelling organisms (brachiopods) mixed with shallow-dwelling organisms (corals) may indicate storm deposition.

Mentor: Patricia Videtich

HENRY HALL ATRIUM 63

Identifying a Regulatory Role for the Tumor Metastasis Suppressor Gene KAI1/CD82 in Metastatic Prostate Cancer Cell Lines

Participants attending from 9:00 a.m. until 10:00 a.m.

Presenter: Shambhavi Singh

KAI1/CD82, a metastasis prostate tumor suppressor gene has been shown to be down-regulated not only in prostate but also many other metastatic cancers. CD82 interacts with proteins and may act as a master regulator of membrane organization at the cell surface but the significance of these associations and CD82's role in metastasis prevention is unclear. By reintroducing CD82 into prostate tumor cells, we have shown CD82 to regulate c-Met activation and focused on identifying the downstream signaling molecules involved. In addition to c-Met we have reason to believe that there may be more proteins regulated by CD82. Microarray studies done on CD82 (+/-), on both tumor and normal prostate cells have identified genes involved in cell cycle, growth, and metastatic suppression being regulated and are currently under investigation. Identifying the proteins regulated by CD82 and deciphering the downstream signaling mechanisms involved in this regulation is the focus of our future studies.

Mentor: Suganthi Sridhar

HENRY HALL ATRIUM 64

Deformation Characteristics and Mechanisms in the Upper Ordovician Point Pleasant Formation, Northern Kentucky

Participants attending from 10:00 a.m. until 11:00 a.m.

Presenters: Christopher Churches, Devin Gerzich, John DeYoung, Matt Raymond

The Upper Ordovician Point Pleasant Formation, located in northern Kentucky, is composed of two deformed biosparite beds, a chaotic layer, and two conglomerate beds. This study targets the Locust Creek Member. The literature indicates that this member is cyclic, with beds composed of basal biosparite overlain by shale and a thick interval of biosparite with folded laminations. Our focus is to quantify the deformation (e.g., twins and pressure solution) displayed by the calcite cement and skeletal grains in thin sections of the folded laminations. We will do this through microscopic analysis using point counts on a subset of samples, which will be selected on the basis of the amount of deformation displayed. We aim to answer two questions: (1) What were the triggering mechanisms and paleogeographic conditions responsible for deformation?, and (2) Is the deformation typical of that produced by waves, sliding and slumping, density inversion, overpressuring, or seismic activity?

Mentor: Patricia Videtich

HENRY HALL ATRIUM 65

Endosymbiotic Microbes and the Evolution of Social Behavior

Participants attending from 1:00 p.m. until 2:00 p.m.

Presenter: Elaine Sheikh

Animals form mutualistic endosymbiotic relationships with microbes. These microbes aid in digestion, supplement nutrients, increase tolerance to environmental stress, enhance host immunity, and increase fecundity. Other specialized symbiotic relationships can facilitate host functions such as bioluminescence or chemosynthetic energy production in gutless hosts. Endosymbiotic microbes specialize to meet their hosts requirements, sometimes resulting in cospeciation or coevolution between the hosts and microbes. The mutualism between hosts and microbes can be either obligate or facultative, and the microbes can be transmitted either vertically or horizontally. Lombardo (2008)

proposed that host species requiring contact with conspecifics to obtain obligate endosymbionts would evolve social behaviors to facilitate microbial transfer between individuals. I reviewed studies published since 2008 review to test that hypothesis. Current data support the hypothesis.

Mentor: Michael Lombardo

HENRY HALL ATRIUM 66

The Appearance of an Aberrant Muscle in the First Dorsal Interosseous Space

Participants attending from 9:00 a.m. until 10:00 a.m.

Presenters: Daniel Tuinstra, Anthony Sorrentino, Aaron Tyner, William Waggener

During the careful dissection of the dorsum of the hand of the cadaver of an eighty-six year old male, a small, round muscle was uncovered that extended from the base of the first metacarpal of the right hand to the proximal portion of the extensor hood of the second digit at the metacarpophalangeal joint. Typically the only musculature to occupy the first interosseous space on the dorsum of the hand is the first dorsal interosseous muscle. Here we describe the unusual presence of this muscle and discuss possible developmental reasons for its appearance.

Mentors: Chris Reed, Melissa Tallman, Tim Strickler, Dawn Richiert

HENRY HALL ATRIUM 67

Investigating the Mechanism of Tup1 Regulation of *Candida albicans* Filamentation

Participants attending from 11:00 a.m. until 12:00 p.m.

Presenter: Elizabeth Stinson

Candidiasis is the fourth most prevalent nosocomial infection both in the US and worldwide. Unfortunately these infections carry unacceptably high morbidity and mortality rates. *C. albicans* is a diploid fungus that has the ability to grow as a blastopore, pseudo-hyphae, and hyphae. The ability to transition between the yeast and hyphal forms appears to be a key virulence trait for *C. albicans*. Tup1 plays a role early in the filamentation process and has been shown to be phosphorylated. It appears this phosphorylation is linked to the regulation of filamentation. Tup1 acts with the DNA binding proteins Nrg1 and Rfg1 as a transcriptional regulator to repress the expression of hyphal specific genes. An His-tagged version of Tup1 was purified using nickel-NTA columns and analyzed using LC MS/MS using CID and ETD to identify sites of phosphorylation. This strain was also used to facilitate Co-IP to define the groups of proteins interacting with Tup1.

Mentor: Derek Thomas

HENRY HALL ATRIUM 68

Origin of Chert Nodules within Dolomite of the Lower Silurian Brassfield Formation, Kentucky

Participants attending from 12:00 p.m. until 1:00 p.m.

Presenters: Christian Vanwyngarden, Kyle Newman, Mitchell Schneider, Katherine Beck

The Lower Silurian Brassfield Formation (BF) is part of the Cincinnati Arch, which spans through northeast Kentucky as well as parts of Tennessee, Ohio, and Illinois. Samples were collected from the BF at an outcrop at the Tollesboro Roadcut, Kentucky. The BF was deposited as limestone and dolomitized after deposition. At this locality, the BF is composed primarily of dolomite, but also contains marine skeletal, pyrite, glauconite, and chert nodules. We will perform point counts (300 points per slide) of three thin sections in order to quantify the dolomite composition by determining percentages of the constituents listed above. Our goal is to determine the order in which the dolomitization and

the formation of chert nodules occurred. Excellent preservation of skeletal remains within chert nodules may indicate the chert formed pre-dolomitization. On the contrary, presence of dolomite rhombs within chert may indicate the nodules formed post-dolomitization.

Mentor: Patricia Videtich

HENRY HALL ATRIUM 69

The Manifestation of Metastatic Melanoma as the Cause of Death in a 64-year-old Male

Participants attending from 12:00 p.m. until 1:00 p.m.

Presenters: Rebekah Burney, Bobbi Botsford, Trevor Armstrong, Trisha Blake

Melanoma is a cancer of the skin that develops in the melanocytes, the cells that produce the protective pigment melanin that gives skin its color tone. The development of melanoma in the skin (cutaneous melanoma) is often the result of exposure to sunlight, and can spread to other parts of the body. This malignancy of melanoma spreads easily through the lymph system to other parts of the body, like the liver, lungs and brain. Melanoma is a common form of cancer and is responsible for 1.5% of cancer deaths in the United States (Palmer et al. 2011). Through the dissection of the body of a 64-year-old male, for whom melanoma was designated as the cause of death, we are able to present the manifestation of malignant melanoma for this instance.

Mentors: Tim Strickler, Melissa Tallman, Chris Reed, Dawn Richiert

HENRY HALL ATRIUM 70

Using DNA Barcoding for Plant Identification in a Longterm Prairie Restoration Study

Participants attending from 4:00 p.m. until 5:00 p.m.

Presenter: Tami Brown

As part of a native plant community restoration study, plants needed to be identified to species to perform Floristic Quality Assessments. At times, identification can be difficult using taxonomic keys because of subtle differences among species. We selected 19 plants that had uncertain identifications to conduct a genetic barcoding study to help identify these specimens. Chloroplast DNA was extracted, amplified to sequence the *rbcL*+*matK* plastid coding regions, and the gene sequences were compared to those of species within the National Center for Biotechnology Information database. Of the specimens sequenced, the genera found included *Carex*, *Lespedeza*, *Panicum*, and *Elymus*. Preliminary results showed that DNA sequencing facilitated plant identification to genus. Compared to traditional taxonomic keys, however, it may be more time consuming and a large degree of uncertainty still remains when trying to identify plants to species using the available information in the public database.

Mentor: Neil MacDonald

HENRY HALL ATRIUM 71

Den Site Characteristics and Kit Survival of American Marten in West Michigan

Participants attending from 11:00 a.m. until 12:00 p.m.

Presenter: Danielle Bradke

American marten (*Martes americana*) were extirpated from Michigan's Lower Peninsula by the early 1900s due to logging and fur trapping. In 1986, 36 marten were reintroduced to the Manistee National Forest (MNF), but the population has not grown as expected. We documented kit survival and identified den sites used by six female marten in the MNF from April through August 2012. Dens

were located with radio telemetry and kits were monitored using remotely triggered cameras. Den site attributes were compared to random sites at the local and landscape levels. We confirmed 28 unique den structures, including cavities in live trees (25), snags (2) and one down log. The mean DBH of den trees was approximately 55cm. Marten utilized dens within red pine stands significantly more than expected based on abundance. Kit survival does not appear to be limiting the population. However, we recommend maintaining large diameter hardwood trees with cavities and red pine stands as a management priority.

Mentors: Paul Keenlance, Joseph Jacquot

HENRY HALL ATRIUM 72

Effects of Aging and Endurance Exercise Training on Adipose Tissue Gene Expression in Rats

Participants attending from 9:00 a.m. until 10:00 a.m.

Presenter: Kyle Wesley

Aging in both humans and rodent models is typically associated with an increase in fat mass while endurance exercise reduces total fat mass. We hypothesize that aging in Fischer-344 rats will cause adaptations in adipose tissue that promote increased fat storage, while endurance exercise training will cause adipose tissue to resist fat deposition. Earlier work identified 19 genes whose expression in adipose tissue appeared to be affected by exercise training in aged rats. This work focuses on one of those genes, DNA binding inhibitor-1 (ID1), which has been shown by others to regulate adipocyte proliferation and differentiation. The goal of this work is to use real-time polymerase chain reaction to verify that exercise training reduces the expression of this gene in aged rats. In addition, we are determining if expression of this gene is affected by aging, and if the effect of exercise training on ID1 gene expression is different between 15 month old, and 27 month old rats.

Mentor: Steven Nizielski

HENRY HALL ATRIUM 73

Health-Related Quality of Life in Persons at Risk for Nonalcoholic Fatty Liver Disease

Participants attending from 11:00 a.m. until 12:00 p.m.

Presenter: Yuka Kutsumi

Obesity-related nonalcoholic fatty liver disease (NAFLD) is a highly prevalent condition that can result in premature death. Although 30-70 million people in the U.S. are estimated to have NAFLD, little is known about the quality of life (QOL) in this population. The purpose of this study was to examine QOL in persons at risk of NAFLD. A secondary analysis of the 2007-2008 National Health and Nutrition Examination Survey was conducted. The CDC's Healthy Days Measure was used to evaluate QOL using metabolic syndrome as a surrogate diagnosis and a calculated fibrosis score to evaluate severity of NAFLD. A total sample of 4886 participants 18 years and older were included in this study. Persons with evidence of hepatitis or alcohol abuse were excluded. Unhealthy physical, mental and activity limited days were evaluated using multiple linear regression. Persons at higher risk of NAFLD and increased severity have poorer QOL than persons at lower risk of NAFLD.

Mentor: Lori Houghton-Rahrig

HENRY HALL ATRIUM 74

Two Mutations Are Necessary to Convert Class D Beta-lactamase Function to Beta-lactam Sensor Function

Participants attending from 10:00 a.m. until 11:00 a.m.

Presenter: Zak Hundley

Class D beta-lactamases and beta-lactam sensors share common topological folds and a similar acylation mechanism. The difference between these proteins lie in Class D beta-lactamases' ability to deacylate the substrate, allowing the them to turn over substrate at an astonishing rate. The beta-lactam sensors on the other hand are unable to complete catalysis. Other studies have implicated specific neutral polar residues play a role in the sensors' inability to deacylate bound substrate. With two key active site mutations to Class D beta-lactamase OXA-24, we caused a dramatic drop in ampicillin hydrolysis, suggesting that these two residues alone may be responsible for the functional difference of these two proteins. X-ray crystallographic analysis reveals that an active site water in OXA-24 is missing in the double mutant, providing a possible explanation for the destabilization of the carboxylsine in beta-lactam sensors.

Mentor: David Leonard

HENRY HALL ATRIUM 75

The Usefulness of SLA in Chem 109

Participants attending from 10:00 a.m. until 11:00 a.m.

Presenters: Craig Van Vliet, Ruth Farnsworth

We will be studying the effectiveness of the Structured Learning Assistance (SLA) program in Chemistry 109 classes. We are grouping students based on their composite ACT scores, as well as ACT scores in math and/or science and comparing SLA to non-SLA students who took CHM 109 to see if there is a significant difference in student performance. We will also talk about what it is like to work as a statistical consultant.

Mentors: Sango Otieno, Karel Swanson

HENRY HALL ATRIUM 76

Freedom Fighters to Peace Corps in Nicaragua from the 1980's - 2000's

Participants attending from 10:00 a.m. until 11:00 a.m.

Presenter: C. Mia Huynh

Drawing on primary and secondary sources, my presentation will describe how the United States has tried to shape Nicaraguan politics through hard power (supporting a guerrilla war against the Nicaraguan regime in the 1980s) and through soft power (supplying Peace Corps volunteers, 1990s to the present). I will suggest that this shift to more soft power has not redressed the damage done by the prior reliance on hard power.

Mentor: Andrew Schlewitz

HENRY HALL ATRIUM 77

Allende and the United States: Examining United States Intervention During Chile's Shift to Socialism

Participants attending from 3:00 p.m. until 4:00 p.m.

Presenter: Katie Rasch

To what extent did the United States government become involved in the campaigns and presidency of

Chilean Salvador Allende and did it play a central role in his eventual downfall? Based on declassified CIA documents as well as Chilean primary and secondary sources, my presentation will argue that if not central, the US government played at least a crucial role in ending a democratic regime, and ushering in a military one. I will focus on the years 1958-1973, from Allende's first bid for the presidency to the infamous 1973 military coup in which he died.

Mentor: Andrew Schlewitz

HENRY HALL ATRIUM 79

PyGASP: Python-based GPU-Accelerated Signal Processing

Participants attending from 1:00 p.m. until 2:00 p.m.

Presenters: Nathan Bowman, Erin Carrier

Computational science is the application of computing technology to evaluate mathematical models in order to solve problems in the scientific disciplines. Many scientific fields are experiencing an explosion of data, with signal processing being a crucial technique for aiding interpretation and for distinguishing meaningful information from noise. This process requires tools that can be easily used by researchers from all branches of science and which are fast enough to manage the enormous amount of data being generated. We have produced such a toolkit: an intuitive, high-performance Python library for facilitating large-scale signal analysis. The library consists of three common signal processing transforms and some filters that can be used for a variety of purposes. Each of the transforms has also been accelerated using General Purpose Graphics Processing Unit (GPGPU) programming, so users with CUDA-capable graphics cards can experience large speedups on big signals.

Mentor: Greg Wolffe

HENRY HALL ATRIUM 80

Comparison of How Textbooks and Lectures Teach Problem Solving in Chemistry

Participants attending from 4:00 p.m. until 5:00 p.m.

Presenters: Skylar Welti, Kayla Maki

A goal of chemistry instruction is to develop students' problem solving abilities and move them from novice toward expert. Students have two resources to learn problem solving, the textbook and the lecture. The purpose of the study is to compare methods of teaching problem solving strategies in various aspects of general and organic chemistry education. Through analysis of worked examples in textbooks and field notes from classroom observations, the methods used to teach problem solving will be identified. These methods will be evaluated for consistency with the literature on how experts solve problems. This poster will present the design and initial results from this study.

Mentor: Thomas Pentecost

HENRY HALL ATRIUM 81

American Idealism or Imperialism? An Analysis of the Panama Canal

Participants attending from 11:00 a.m. until 12:00 p.m.

Presenter: Thomas Wolahan

The construction of the Panama Canal in 1904 was a foreign policy objective on a scale larger than anything the United States had attempted up to this point in history. The monumental obstacles that impeded its production, as well as the outright monetary cost incurred by the United States, makes it evident that huge returns were expected on such a massive investment to make it worthwhile. This

project will analyze the political, economic, and strategic factors behind America's desire to engage in such an undertaking and determine whether or not this enterprise could be ideologically construed as an Imperialist action. Additionally, this project will examine the impact the Panama Canal had in terms of its contribution to the rise of the United States into a regional and global hegemon and resulting consequences.

Mentor: Andrew Schlewitz

HENRY HALL ATRIUM 82

The Maternal Effect Phenotype of *delorean* in *Drosophila melanogaster*

Participants attending from 10:00 a.m. until 11:00 a.m.

Presenter: Sarah VanOeveren

The *delorean* allele is a gain-of-function mutation in *Drosophila melanogaster* that is caused by a transposon insertion in the first intron of the *Protein kinase N (pkn)* gene. It is known that the *pkn* gene in *Drosophila melanogaster* is required in embryonic development during the process of dorsal closure, establishing this kinase as a requirement for developing embryos. The dorsal closure phenotype is rescued when the normal PKN protein is supplied to mutant flies. Here, we study the role of *pkn* in oogenesis. Using the Dominant Female Sterile – Flipase Recombinant Technique (DFS-FRT) germline, homozygous *delorean* clones were generated to quantify the maternal-effect phenotype. We establish *pkn* as a maternal-effect phenotype where females exhibit effective sterility due to a significant reduction in egg production. The eggs produced by *delorean* germline clones are either not fertilizable or if fertilized, generate embryos that fail to complete embryogenesis.

Mentor: Georgette Sass

HENRY HALL ATRIUM 83

A Comparison of Water Quality Parameters Data from the GVSU-AWRI Research and Education Vessels

Participants attending from 1:00 p.m. until 2:00 p.m.

Presenters: Jeremy Flynn, Spencer Brown

Student-collected data on the GVSU Annis Water Resources Institute's two research and education vessels were statistically analyzed for longitudinal trends in water quality parameters. On water quality sampling trips, students collect data on Muskegon Lake, Spring Lake, and Lake Michigan. Observations between years 2006 and 2011 were analyzed to determine any changes in water clarity, color, temperature, dissolved oxygen, turbidity, or pH.

Mentors: Sango Otieno, Janet Vail

HENRY HALL ATRIUM 84

Terror Cimbricus: Section 8 and Civil Segregation

Participants attending from 3:00 p.m. until 4:00 p.m.

Presenter: Jason Escareno

Terror cimbricus was the Latin phrase ancient Romans used to describe the mass panic and state of emergency which followed the approach of the Cimbri tribe in 113 BC. The Cimbrian migration was met with desperate and self-defeating measures by the Roman Republic in order to combat it. While this paper does not treat the particular history of the Cimbrian threat, it does find race relations in America as a terror cimbricus of sorts. From white flight to white return, American cities are battlegrounds of insolvent and myopic public policy attempting to subvert democracy. Further,

urban sprawl and segregation are not spontaneous, as is often assumed, and a close examination of recent national policy will prove that both are structural responses.

Mentor: Jonathan White

HENRY HALL ATRIUM 85

Progress Towards the Synthesis of Novel Urea Derivatives of T1AM

Participants attending from 2:00 p.m. until 3:00 p.m.

Presenter: Alex Zuhl

The thyroid hormone (TH) is excreted by the thyroid gland and plays a pivotal role in organism development and metabolism. Recent research has shown that a metabolite of TH, 3-iodothyronamine (T1AM) is able to evoke biochemical responses in mice, such as hypothermia and cardiac fluctuation in opposition to the effects of TH. T1AM is a known agonist of the trace amine associated receptor (TAAR). Chemical alterations of T1AM may be able to augment these effects and may lead to greater understanding of the role of TAAR in thyroid hormone biology. Specifically, this project examines the incorporation of a urea linkage and altering the substitution pattern on one of the rings of T1AM to an ortho arrangement. Product verification will be done using NMR techniques and HPLC analysis. Once completed, these compounds will be evaluated in cell culture assays using a Hithunter cAMP assay. Progress towards this goal is described herein.

Mentor: Matthew Hart

HENRY HALL ATRIUM 86

Reconstructing the Biogeography of Hawaiian Hoary Bats (*Lasiurus cinereus*)

Participants attending from 10:00 a.m. until 11:00 a.m.

Presenter: Laura Kirby

The Hawaiian hoary bat is a subspecies of the species *Lasiurus cinereus*, which is primarily located in North and South America. The current population in Hawaii most probably descended from the North American population, but now has a great number of morphological differences from that population. This study sought to investigate the genetic relationships between hoary bats from the Hawaiian Islands and hoary bats from mainland North America in order to reconstruct the biogeographic history of this species. Nuclear intron and mitochondrial DNA sequences from the Hawaiian bats and the North American bats were analyzed to estimate effective population sizes, rates of gene flow, and the time of dispersal separating the two populations. These parameters are of critical importance in assessing the conservation status of this unique Hawaiian population, and evaluating the frequency of long-distance dispersal events in populating isolated oceanic islands.

Mentor: Amy Russell

HENRY HALL ATRIUM 87

Dietary Resveratrol Supplements: Do They Mimic the Effects of Endurance Exercise?

Participants attending from 2:00 p.m. until 3:00 p.m.

Presenter: Natalie McQuillan

Resveratrol is a polyphenol whose best dietary sources are red wine, red grapes, and peanuts. It has become a popular dietary supplement because it has been suggested to be responsible for the cardioprotective effects of red wine, and it may also mimic the effects of calorie-restriction to increase longevity. Resveratrol is thought to exert its effects primarily by activating a class of proteins called

sirtuins. These proteins are NAD⁺-dependent deacetylases that potently regulate metabolism and gene expression. A further increase in the popularity of resveratrol supplements occurred following reports that it may also function as an exercise mimetic, inducing some of the same physiological adaptations in skeletal muscle that are observed with endurance exercise training. This review will explore the mechanisms by which resveratrol exerts its cellular effects and critically evaluate the potential for dietary supplementation with resveratrol to function as an exercise mimetic.

Mentor: Steven Nizielski

HENRY HALL ATRIUM 88

U.S. "War On Drugs" Policies

Participants attending from 1:00 p.m. until 2:00 p.m.

Presenter: Ashley Cabral

In recent years the United States' neighbor, Mexico, has suffered many negative effects from the ongoing war on drugs. Although there is plenty of news coverage about the horrors and casualties of the war, not many in the US are informed about the US government's role in effort to stamp out the illicit drug trade through military means. Nor do they know much about Mexican reactions to the US's anti-drug policy. My presentation will not only give an overview of this policy, but also present a range of views by Mexicans regarding this US-led war on drugs. This information can be a great way to inform others about what is going on right below our very own southern border.

Mentor: Andrew Schlewitz

HENRY HALL ATRIUM 89

Kielce: a JavaScript Library to Simplify Creation and Maintenance of Course Web Pages

Participants attending from 12:00 p.m. until 1:00 p.m.

Presenter: Cameron Warner

Putting course content on the web, and keeping it updated, is a tedious process that most instructors dread. Kielce is a JavaScript library that aims to simplify the process by providing a lightweight, client-side technique for moving configurable static content from an HTML document into a separate file where it can more easily and accurately be managed. For example, Kielce makes the process of updating a syllabus each semester easier by collecting the content that changes (e.g., semester name, office hours, exam dates) into a separate file. This file can then be updated accordingly with the majority of the content remaining untouched in the other file. Kielce is also able to load homework questions from a specified file and insert them into the web page that contains the answers. This saves the instructor time and energy because changing a question means only having to edit it in one place, while the answer page is then automatically updated. Example uses will be provided.

Mentor: Zachary Kurmas

HENRY HALL ATRIUM 90

The Effects of Mortality Salience, Need for Structure, and the Choice Environment on Consumers

Participants attending from 10:00 a.m. until 11:00 a.m.

Presenter: Brooke Ward

The current research investigates the relationships between the level of perceived structure in the choice environment, personal need for structure (PNS), and novelty seeking in response to reminders of death. Study 1 assessed whether novelty seeking would increase among mortality salient participants

when they perceived greater structure in the choice environment. Mortality salient individuals who were low in PNS sought more novelty when there was increased structure in the choice environment. Study 2 compared the presence or absence of partitioning on participants desire to seek novelty. Results show that perceived structure of the choice environment was moderated by PNS when mortality salient. Study 3 examines how novelty seeking is moderated by perception of choice environment structure and level of existential anxiety. We predicted when mortality salient, high PNS individuals would decrease variety seeking in their day-to-day decisions.

Mentor: Todd Williams

HENRY HALL ATRIUM 91

A Sports Specific Strength and Conditioning Protocol for Collegiate Ice Hockey Players

Participants attending from 10:00 a.m. until 11:00 a.m.

Presenters: Samantha Baker, Eric Schwab

Collegiate ice hockey is a fast paced, physically grueling game. The requirements of this sport place maximal demands on the players' muscular strength and endurance, which can inevitably affect their game performance. The implementation of a periodized, comprehensive training program designed specifically for the brutal and constant demands of hockey is necessary. The purpose of this presentation is to provide collegiate ice hockey players with the most up to date, evidence based, and sports specific strength and conditioning protocol. Due to the hypothetical approach of this presentation, there are limitations as to the generalizability of this research. This program should benefit collegiate ice hockey players and coaches looking to improve athletic performance while preventing injury through sports specific training regiments.

Mentor: Amy Crawley

HENRY HALL ATRIUM 92

Discovering New Treatments for Children with Neuroblastoma: Investigating the Effects of DFMO on Neuroblastoma Cells In Vitro and In Vivo

Participants attending from 3:00 p.m. until 4:00 p.m.

Presenter: Nick Nicola

Neuroblastoma (NB) is a pediatric cancer that is usually diagnosed in children less than 5 years of age. To identify potential new treatments, our lab at VAI uses genomic data to find genes abnormally expressed in NB such as ornithine decarboxylase (ODC). This gene codes for the enzyme ODC which creates polyamines necessary for cell growth and proliferation. Alpha-Difluoromethylornithine (DFMO) is a drug that inhibits the ODC enzyme. We tested DFMO alone and in combination with other drugs in NB cells using techniques including cell viability assays, western blotting, and in vivo experiments. Cell viability assays use a range of drug concentrations to determine the 50% survival dose (IC50) for a particular cell type identifying those cells resistant or sensitive to a drug. For my project I examined DFMO in combination with other drugs in NB cells using cell viability assays to assess if these drug combinations show synergy. Optimal combinations will then be used in xenograft models.

Mentors: Giselle Sholler, Martin Burg

HENRY HALL ATRIUM 93

Growth and Reproductive Effort of the Sedge Genus *Carex* in Response to Climate Change in Northern Alaska

Participants attending from 1:00 p.m. until 2:00 p.m.

Presenter: Chase Baldwin

The Arctic is changing due to climate change. In order to forecast changes in arctic vegetation, warming experiments were established in Alaska at Barrow in 1994 and Atkasuk in 1996. At both locations the study site consists of 24 control plots and 24 experimental plots. The experimental plots are passively warmed 1-3 degrees Celsius using open top chambers. This study used data collected in the summer of 2012 to analyze the response of the dominant sedge *Carex* to long-term warming at the two wet sites. The measurements made were changes in cover, inflorescence height, and number of inflorescences. We found in response to warming that *Carex* increased in cover and produced larger inflorescences at both sites. These results are consistent with other warming studies conducted across tundra landscapes and suggest that *Carex* will continue to increase growth and reproductive effort and become more dominant with climate change.

Mentor: Robert Hollister

HENRY HALL ATRIUM 94

Ways in Which US Relations with Mexico Affected the Rights of Indigenous Women in Chiapas

Participants attending from 9:00 a.m. until 10:00 a.m.

Presenter: Marina Phillips

In this presentation I will focus on women in the Zapatista movement and discuss how the North American Free Trade Agreement contributed to conditions that led indigenous women to join a cause that has a chance to advance their political and economic equality. Drawing on Mexican and US primary and secondary sources, I will suggest that the human rights policy in the United States has done little since the creation of NAFTA to address their inequality. I will also address what gains indigenous women have made in Mexico.

Mentor: Andrew Schlewitz

HENRY HALL ATRIUM 95

A Look Into the Past: Photo-Physiology of Cyanobacterial Mat Pigments in Alpena, Michigan and Lake Huron Sinkholes

Participants attending from 12:00 p.m. until 1:00 p.m.

Presenter: Elizabeth Sommers

Cyanobacteria were key to oxygenating the atmosphere 2.5 billion years ago (bya). My study examined light harvesting pigments and their response to different light conditions in modern purple cyanobacterial mats that reside in the bottom of the deep, low-light Middle Island sinkhole and the shallow high-light El Cajon springs. Chlorophyll *a*, phycocyanin (PC) and phycoerythrin (PE) were extracted for analysis and pigment ratios were compared between locations. Photosynthetic yield was taken using a Dive-PAM to investigate the photo-physiology of the mats, on location and in the lab. Pigment concentrations from the high-light mats showed decreased pigment concentrations as light intensity increased, while low-light mat pigment concentrations increased with increasing light intensity. Further, PE:PC showed that El Cajon cyanobacteria express more PC, while Middle Island mat express more PE suggesting these modern cyanobacteria actively vary their pigment composition in response to available light.

Mentor: Bopi Biddanda

HENRY HALL ATRIUM 96

Geo-Analysis on Deaths from Cancer in Kent County

Participants attending from 12:00 p.m. until 1:00 p.m.

Presenters: Scott Lacey, Keeley Sadlak

Although death records are kept in Kent County, Michigan, there has been little research looking at the cause of death geographically. This research specifically analyzed the geographic breakdown throughout Kent County of deaths due to cancer using records from the Kent County Health Department. Cancer was further broken down into its types and statistically analyzed for significance while also looking at which demographic features were significant within given types of cancer. These findings could help further programs in the fight against cancer not only in Kent County but also at a national level.

Mentor: Sango Otieno

HENRY HALL ATRIUM 97

Purification of cAR1 Antibody in Dictyostelium discoideum

Participants attending from 12:00 p.m. until 1:00 p.m.

Presenter: Grace Bommarito

Dictyostelium discoideum is an organism that exhibits cell signaling, movement, and development. When starved, these cells secrete cyclic adenosine phosphate (cAMP) to signal nearby cells, increasing expression of the cAMP receptor protein (cAR1). In past BIO 406 classes, an anti-cAR1 antibody was used to detect the receptor protein in these cells; however, western blots showed high background. Our goal was to purify this antibody batch to reduce the background. After initiating expression of cAR1, proteins were extracted and separated on a SDS-PAGE gel. Proteins were visualized on a western blot using the cAR1 antibody (predicted size 44kD). We found that three uses of the antibody was the optimal number of absorptions to reduce non-specific background. However, there was only one band present in both starved and unstarved cells at 120kD, indicating that it was not the cAR1 protein. Ultimately, we concluded that this antibody batch would not be useful for future BIO 406 experiments.

Mentor: Bruce Ostrow

HENRY HALL ATRIUM 98

Freshwater Resources in the Western United States

Participants attending from 4:00 p.m. until 5:00 p.m.

Presenter: Nicole Mater

The purpose of this project is to examine the impacts of global environmental change on freshwater resources in the western United States. We use the model MAGICC/SCENGENS 5.2 to develop future changes in temperature and precipitation. These climate change scenarios are used to estimate future runoff and stream flow in this region. In addition, paleoecological data from the QEN Atlas are used to examine climate variability in the Late Pleistocene and Holocene. We expect the results of this study to confirm our hypothesis that there is increasing drought, causing water supply shortage. There might be less annual rainfall, less snow pack in the mountains, and earlier snow melt. Demand for water is expected to increase, while less water will be available.

Mentor: Elena Lioubimtseva

HENRY HALL ATRIUM 99

Michigan Nonprofit Needs Assessment

Participants attending from 3:00 p.m. until 4:00 p.m.

Presenters: Rachel Gregg, Alaina Clarke

The purpose of this presentation is to report findings from a statewide study of nonprofit professional development conducted in partnership between the Johnson Center for Philanthropy and the School of Public Nonprofit and Health Administration at Grand Valley State University. Undergraduate Mawby Fellows will present data about a survey that was administered to over 1,000 nonprofit organizations in the state of Michigan. The results of the survey will influence programming offered by the Johnson Center for Philanthropy and has the potential to further the work of many philanthropic organizations interested in building nonprofit capacity and supporting nonprofit sustainability.

Mentor: Heather Carpenter

HENRY HALL ATRIUM 100

Contingencies Between Verbs, Body Regions, Directionality and Visuability

Participants attending from 10:00 a.m. until 11:00 a.m.

Presenters: Meghan Nesheim, Trista Witherspoon, Rebecca Notter, Jeremy Christiansen

Previous research has suggested a correlation between early-learned verbs and body regions (HEAD, ARM, and LEG), such that, for example, verbs such as kick, jump, and run are LEG-related verbs (Maouene, Hidaka & Smith, 2009). Another line of research has suggested that verbs also have different degrees of directionality and visuability (Toskos, Hanaia & Hockema, 2004). Such that, for example, the verb obey has a high verticality and the verb find has low visuability. We will connect the two sets of data from these two studies and ask whether the HEAD-related verbs have different directionality and visuability than ARM- or LEG-related verbs. We hypothesize that if body regions matter in verb meanings, then we should find different strengths in correlations between body regions, directionality, and visuability for 88 common verbs. The results will be discussed in terms of the theoretical perspectives of strong, weak, and no embodiment in Language.

Mentors: Sango Otieno, Josita Maouene

HENRY HALL ATRIUM 101

Investigating the Effects of BIBR1532 and Related Analogs on Telomerase Activity in Human Prostate Cancer Cells

Participants attending from 11:00 a.m. until 12:00 p.m.

Presenters: Selina Dorking, Plavita Sharma, Kyle Thaxton

Telomeres are double stranded repeats of DNA sequence that cap the ends of chromosomes and provide genetic stability and immortality to cancer cells. Uncontrolled cellular proliferation of cancer cells is associated with the maintenance of telomeres in DNA. In normal cells, the length of telomeres decrease with each successive cell division. When the length becomes too short the cells cannot divide and become senescent or die. Telomerase is an enzyme which prevents the degradation of telomeres by adding bases to the ends of the telomere. Cancer cells employ this enzyme telomerase to maintain immortality. Synthetic telomerase inhibitor, BIBR1532, has shown growth arrest in tumor cells. In our study, BIBR1532, a mixed-type competitive inhibitor, and its synthetic analogues were tested for proliferative activity. A total of 6 compounds were identified to be highly active against proliferation. Upon these results, current tests are being performed on the telomerase activity.

Mentor: Suganthi Sridhar

HENRY HALL ATRIUM 102

Laser Spectroscopy and Molecular Collisions (Measurement of a Pressure-Broadening Coefficient)

Participants attending from 2:00 p.m. until 3:00 p.m.

Presenters: Stephanie Pierson, Trent Mazer

The widths of IR absorption peaks of a gas are broadened when the pressure is increased, due to molecular collisions. The pressure-broadening coefficient (PBC) is a parameter that describes this broadening. Using a high-resolution, home-built, laser-based absorption spectrometer, we are focusing on the PBC of the 000-301(2) P30 absorption line of carbon dioxide at 6321.2046 wavenumbers, with nitrogen as the colliding gas. An etalon is used to produce fringes for triggering data collection at known wavenumber increments, and a Herriott cell is used to contain the gas, giving a spectroscopic path length of roughly 30 meters after reflections between the mirrors. Recent improvements have been made to our system, including a new soldered circuit board which may reduce electrical noise, and a new pressure gauge, allowing us to take data at higher pressures. Also, the implementation of a new gas mixing method has improved the consistency of our results at these higher pressures.

Mentors: George McBane, Stephanie Schaertel

KIRKHOF CENTER KC1

The Effects of Embryonic Lead Exposure on Avoidance Learning in Male Zebrafish

Participants attending from 10:00 a.m. until 11:00 a.m.

Presenter: Natosha Mercado-Idziak

Lead is widely known to be harmful to humans. In fact, a relationship between early lead exposure and neurobehavioral deficits, including slower reaction times, hyperactivity, and increased inattentive behavior, has been demonstrated by past research. 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 taken care of. The current study utilized an active avoidance conditioning paradigm to explore the neurobehavioral effects of lead exposure on twelve-month-old male zebrafish that were exposed to lead as embryos. As adults, zebrafish were placed in a shuttlebox separated into two compartments with a manually raised divider. On Experimental Day 1, they were trained to associate a light with an electrical shock and to avoid the shock by swimming from the lighted side of the shuttlebox, under the divider, to the dark side. Testing for avoidance learning occurred on Experimental Day 3.

Mentor: Xandra Xu

KIRKHOF CENTER KC2

Sex Differences in Motivation in NCAA Distance Runners

Participants attending from 1:00 p.m. until 2:00 p.m.

Presenter: Eric Saksa

Previous studies indicate that, on average, men are more competitive than women in most sports, including distance running. However, previous studies focused on recreational athletes, not elite ones. We will address this gap in the literature by recruiting several hundred NCAA distance runners to complete online questionnaires regarding their motivation, goals, training, and performance. We predict that male runners will report being more competitive and having a stronger desire to run professionally, whereas female runners will report a stronger interest in starting a non-running career. If these predictions are supported in distance running, a sport where men and women have highly similar professional prospects, it will constitute crucial evidence for the hypothesis that men are more predisposed to achieve in show-off domains such as sports. The show-off hypothesis has important implications for understanding crime, public health, and labor markets.

Mentor: Robert Deaner

KIRKHOF CENTER KC3

Konichiwa America; Japanese War Brides in Michigan

Participants attending from 1:00 p.m. until 2:00 p.m.

Presenter: Jennifer Tompkins

As a result of the Immigration Act of 1924, Asian immigration into the US halted. Anti-immigration, and in particular anti-Japanese, sentiment reached its pinnacle in World War II. However, it was the country's involvement in this war that again opened immigration to Asians. The War Bride Act of 1945 and subsequent legislation was the result of the increasing number of US servicemen's desires to wed Japanese women. Little is known about the Japanese women and their groundbreaking unions. My study focuses on the experiences of Japanese war brides from both World War II and Vietnam. Using methods of oral history, I carried out eight in-depth interviews lasting at least two hours each, and transcribed the tapes. By letting them tell their own stories, my research provides an alternative to the common narrative about Japanese women's submissiveness, subservience, and their sexuality.

Mentor: Kathleen Underwood

KIRKHOF CENTER KC4

Synthesis of Chiral Silanes

Participants attending from 9:00 a.m. until 10:00 a.m.

Presenter: Matt Bailey

Compounds with stereogenic silicon that are chiral can be used in organic synthesis as chiral reagents, as resolving agents, and as chiral polymers. We have examined nucleophilic asymmetric substitution by studying the reaction of a dialkoxy prochiral silane with an organolithium compound in hexanes and ether. These reactions have been shown to produce monosubstituted, chiral silanes in good yield. Specifically, selectivity in the synthesis of a silicon stereocenter from a prochiral dimethoxysilane was investigated. 1-naphthyllithium was prepared by reaction of 1-bromonaphthalene with t-butyllithium and reacted with dimethoxymethylphenylsilane to be studied for stereoselectivity. Methoxymethylnaphthylphenylsilane was synthesized in a 45.1 % yield, and diastereomer excess will be determined by relative peak integrations from NMR data, and independently by GC analysis. We will report on this result and others similar to it in our poster.

Mentor: Randy Winchester

KIRKHOF CENTER KC5

Perceptions of Distressed Identification in Individuals with Disabilities

Participants attending from 2:00 p.m. until 3:00 p.m.

Presenters: Allison Desautels, Samantha VanDriel

Individuals with disabilities may be perceived as experiencing distressed identification, but there have been few experimental investigations comparing perceptions of individuals with disabilities to those without disabilities on variables such as quality of life and subjective well-being. In the present study, we examine whether an individual may be perceived differently depending on whether they are described to have, or not have, a disability and whether they are perceived to be expressing a positive or negative emotion. After reading about an individual that varies these factors, participants will rate the individual on measures of happiness, life satisfaction, and personality. They will also report their preferences for interacting with the individual. This research will further understanding of how people view individuals with disability including how emotional perception may interact with those views.

Mentor: Amanda Dillard

KIRKHOF CENTER KC6

Strength and Conditioning Periodization for American College Football Defensive Players

Participants attending from 12:00 p.m. until 1:00 p.m.

Presenters: Sean Singer, Kelcie Severson

A true, defensive-only player has yet to win college football's most prestigious award, the Heisman Trophy. A periodized, specific strength training and condition program would be essential to attaining the highest level of prestige in collegiate football. Great defensive players must have a combination of strength, speed, power, and the agility to excel. The purpose of this research was to present a periodized strength training and conditioning program for defensive players that would aid them in becoming faster, stronger, quicker, and more powerful, allowing them to become more dominant in changing the momentum of a game. A limitation of this work was that coaches may be apprehensive about trying new training protocols. Nevertheless, if defensive players want the same recognition as offensive players, they must adapt to become more pivotal players that have an impact on the momentum of the game.

Mentor: Amy Crawley

KIRKHOF CENTER KC7

Perception of Political Affiliations from Faces: Part Two

Participants attending from 9:00 a.m. until 10:00 a.m.

Presenters: Kyle Wicklund, Alexandra DeNio

Head-shots of US senators will be presented to GVSU student participants, who will rate the faces on facial and personality characteristics and decide whether each face belongs to a democrat or a republican. Our previous studies found strong inter-rater agreement with regard to how certain characteristics (e.g., warmth) of the faces reveal political identities (e.g., democrats). However, there was no evidence for above-chance accuracy in perceiving political affiliations from faces alone, suggesting that the perception is influenced by participant biases. We predict that the present study will confirm those findings. In the second part of the present study, we will present pairs of photos of each of the senators, with each pair containing one smiling face and one with a serious facial expression. We predict that GVSU students, especially those leaning towards democrats, will perceive smiling faces, regardless of their actual political affiliations, to belong to democrats.

Mentor: Liang Lou

KIRKHOF CENTER KC8

A Web Interface to Search for Similar Temporal Gene Expression Profiles - Implementation and Use.

Participants attending from 12:00 p.m. until 1:00 p.m.

Presenters: Yuka Kutsumi, Mary Ellen Hoinski, Olvi Tole

PURPOSE: Advances in microarray technology have led to highly complex datasets often addressing similar or related biological questions. Molecular biological research is often based on measurements that have been obtained at different points in time. The biologist looks at these values not as individual points, but as a progression over time. Our program (SPOT) helps the researcher find these patterns in large sets of microarray data. **PROCEDURES:** A researcher proceeds through three subsequent steps: first, selection of microarray data of interesting experiments from a public functional genomics data repository, NCBI GEO, second, translating the temporal measurements into time intervals, and third, defining temporal concepts like peaks based on those intervals. **OUTCOME:** We created a software tool using open-source platforms supporting the R statistical

package, PHP, Bioconductor, and Protégé-OWL. The poster focuses on use of the interface and challenges of using public databases.

Mentor: Guenter Tusch

KIRKHOF CENTER KC9

Influence of Glucose and Serum on Connexin 43 Expression in Cultured Mouse Endothelial Cells

Participants attending from 10:00 a.m. until 11:00 a.m.

Presenters: Noah Zucker, David Schachermeyer

The supplier (ATCC) of cultured mouse endothelial cells (bEnd.3) states that those cells should be maintained in a high glucose (10% serum) environment. Previous data gathered from our lab demonstrated that media composition (glucose and serum) impacts the growth rate of these cells. As connexin expression alters cell growth, we were interested in determining whether glucose and serum might alter connexin expression in a way that would affect cell growth. Others have shown that glucose increases endothelial cell connexin 43 expression in vivo. Mouse endothelial cells were grown in mixtures of high (4.5 g/L = 25 mM/L) and low (1 g/L = 5.6 mM/L) glucose with either 10% or 1% serum (fetal bovine FBS). We expect that high glucose and 10% serum, will increase connexin 43 expression which could contribute to the increased growth rate.

Mentor: David Kurjiaka

KIRKHOF CENTER KC10

Understanding Covalent Organic Frameworks Assemblies: A Potential Fuel Storage Devices

Participants attending from 4:00 p.m. until 5:00 p.m.

Presenter: Samantha Ellis

Two-dimensional organic polymers are important materials due to their ability to absorb various gasses including N₂, CO₂, and H₂. Hydrogen absorption in organic polymers is of particular interest to NASA, due to their light-weight nature and high surface area. This project focuses on developing new two-dimensional polymers, which fall into a particular class of compounds called covalent organic frameworks (COFs). However, due to their large molecular size, characterization by traditional methods is difficult if not impossible, and thus the structure of these materials has not been fully elucidated. The long range objective of this project is to expand our knowledge and understanding for how the COF networks are layered which, as a result, will allow us to prepare networks that can store gasses more efficiently.

Mentor: Andrew Korich

KIRKHOF CENTER KC11

Study Design for a Proposed Turtle Research Project

Participants attending from 4:00 p.m. until 5:00 p.m.

Presenters: Christina McGraw, Shana Kelly

Statistical analysis is an important aspect of ecological investigations. We are consulting with a Biology graduate student who is in the study design phase for an Eastern Box Turtle conservation project. Specifically, our client is interested in determining if structural habitat components can predict the movements of these hatchling turtles. Due to cost limitations, the maximum sample size (n=24 turtles) is inflexible. We utilize a mock data set to evaluate potential statistical methods to model the dispersal of hatchling turtles, and provide recommendations to the client.

Mentor: Sango Otieno

KIRKHOF CENTER KC12

Lived Experiences of LGBT Individuals Engaged in Fraternities and Sororities at Grand Valley State University

Participants attending from 12:00 p.m. until 1:00 p.m.

Presenter: Logan Brenk

This study chronicles the lived experiences of ten to twenty members of the lesbian, gay, bisexual, transgender community who are also engaged in the social fraternity and sorority systems at Grand Valley State University. While there is much research done on LGBT collegiate students in regard to their lives in general, little research centers on heteronormative institutions such as residence halls and Greek life; my study addresses this issue. Data was collected through semi-structured interviews lasting an average of an hour and a half and analyzed through the lenses created by D'Augelli's theory of identity development (1994) which addresses matter such as coming out as an LGBT community member and Nadal's theories of microaggressive behaviors (2011, 2012) which deals with covert day-to-day discriminations experienced by the individual. While this study is limited to one university, it is anticipated that it may serve as a model for other institutions of higher education.

Mentor: Kathleen Underwood

KIRKHOF CENTER KC13

The Role and Rationale of Anti-Americanism in Populist Latin American Politics

Participants attending from 9:00 a.m. until 10:00 a.m.

Presenter: Denisha Mosley

This presentation will focus on the role of Anti-Americanism within the populist politics of Latin America. The first hand testimony of such populist leaders as Hugo Chavez, Evo Morales and Rafael Correa and the analyses of those who have studied the impact of Anti-Americanism, populism and nationalism within Latin American politics will be used. Similarities between the studied countries and whether or not the presence of this Anti-American populism can be attributed to any, will also be examined.

Mentor: Andrew Schlewitz

KIRKHOF CENTER KC14

A Low Temperature Thermoelectric Measurement

Participants attending from 12:00 p.m. until 1:00 p.m.

Presenter: Brett Simons

The Seebeck coefficient of a material measures the magnitude of voltage produced when a temperature gradient is created. This project focused on development of a method for measuring thermoelectric data for material samples in a low temperature setting. Temperatures range from 77 K, the boiling point of liquid nitrogen, to approximately 293 K, room temperature. The technique will be used to measure a sample with a well established measurement of the Seebeck coefficient to establish a baseline. The method will then be used to measure a sample of S_2Te which has not been thoroughly researched due to its instability at room temperature. The method involved data collection techniques using LabView software as well as creating an integrated chip template to allow switching between samples easily.

Mentor: Harold Schnyders

KIRKHOF CENTER KC15

Constructing Gender and Sexuality: An Examination of Sex Education Propaganda During World War I and World War II

Participants attending from 1:00 p.m. until 2:00 p.m.

Presenter: Meghan Zyburski

Since the passage of the Comstock Act in 1873, educating the American public about sex and sexuality has been controversial and contested. Until recently, most education about sex focused on disease prevention, with abstinence-only messages providing both sex education and a form of social control of American attitudes toward sexuality and sex. However, during World War I and World War II, the need for sex education increased significantly as men were away at war and venereal disease rates spiked. This project examines more than 20 propaganda posters from World War I and World War II that were aimed at enlisted men and the public to raise awareness about the increasing rates of venereal disease. Using media analysis, the research questions the ways that gender stereotypes were reinforced in both the overt and covert messages about sex and sexuality. This research adds a gendered lens to established body of research and the results show that ideas of gender and sexuality are reinforced

Mentor: Kathleen Underwood

KIRKHOF CENTER KC16

Determining the Origin of a Complex Gutter Cast from the Upper Ordovician Kope Formation, Northern Kentucky

Participants attending from 1:00 p.m. until 2:00 p.m.

Presenter: Caitlin Leslie

An unusual sedimentary structure was collected from the Upper Ordovician Kope Formation in northern Kentucky. This structure, a gutter cast, is interpreted to form on a paleo seafloor that was scoured and infilled during a large storm. This gutter cast has been determined to contain another gutter cast, which we believe is new to the literature. Within the second gutter cast are two features, determined to be cephalopods with their long axes oriented parallel to a hypothesized sea floor current. Thin section analysis indicates that the storm lag deposit of the gutter cast contains brachiopods, enchinoderms, crinoid stems, and trilobite fragments. Oxygen and carbon isotopic data for lime mud ($\delta^{13}\text{C}$, -0.85 to -0.97; Ha^{18}O , -5.82 to -6.01) and calcite cement ($\delta^{13}\text{C}$, 0.42 to 0.75 ; Ha^{18}O -4.93 to -5.95; all data reported in ‰ VPDB) infilling the interparticle porosity formed by the cephalopods indicate two sources of carbon and oxygen with the cement generally less negative in both isotopes than the lime mud.

Mentor: Patricia Videtich

KIRKHOF CENTER KC17

U.S. Involvement in The Dirty War

Participants attending from 3:00 p.m. until 4:00 p.m.

Presenter: Thomas Campolong

Why did the United States government seem to look the other way that it did during the Argentine Dirty War in the 1970s? The Dirty War was a period of state terrorism in Argentina and guerrilla warfare during the 1970s. Victims of the violence included several thousand left-wing activists and militants, including trade unionists, students, journalists, Marxists, Peronist guerrillas and alleged sympathizers. Thousands upon of people disappeared during this time period and the United States government was

aware of this, and even supported the Argentine military government, despite Congress's prohibition on aid to countries with poor human rights records. My presentation will describe this Dirty War, discuss the ways US foreign policy failed to address it, and examine reasons why the US government took this course of action.

Mentor: Andrew Schlewitz

KIRKHOF CENTER KC18

Strength and Conditioning Program for NBA Power Forwards and Centers

Participants attending from 12:00 p.m. until 1:00 p.m.

Presenters: Cory Kelley, Alan Peterson

Throughout the history of the NBA, winning teams have always had a dominant power forward/center. An athlete at this position needs to be extremely skilled at defense, rebounding, and scoring. These attributes are best developed through an intense training regimen that is designed to improve strength, speed, and jumping ability. The purpose of this presentation was to provide a comprehensive training program that would help power forwards and centers be at peak physical performance for competition. Throughout the training protocol, it would be important to evaluate performance will be compared to baseline data to assess the effectiveness of the program. Due to a lack of access to NBA players this training program cannot yet be applied to its designated athletic population. This training regimen strives to inform the way an elite coaching staff trains and prepares their athletes to compete at highest level of basketball.

Mentor: Amy Crawley

KIRKHOF CENTER KC19

Origins of an Invader: Global Phylogeography of Native and Introduced Populations of Eurasian Watermilfoil

Participants attending from 12:00 p.m. until 1:00 p.m.

Presenters: Jeff Pashnick, Danielle Grimm

Identifying the geographic origin(s) of invasive species is valuable for understanding the mechanisms of successful biological invasions. This also helps in designing comparative studies of introduced versus ancestral source populations to identify whether introduced populations have rapidly adapted to new environments during their invasion. Eurasian watermilfoil (*Myriophyllum spicatum* L.) is a widespread invader in North America, and also southern Africa. However, the geographic origin(s) of introduced populations, and whether they have undergone rapid evolutionary change, are unclear. In this presentation, we will present genetic data aimed at identifying the geographic origin(s) of introduced Eurasian watermilfoil in North America and southern Africa. Specifically, we compare ribosomal internal transcribed spacer DNA sequence data (ITS) from populations of watermilfoil collected from introduced populations and throughout the native geographic range in Europe and Asia.

Mentor: Ryan Thum

KIRKHOF CENTER KC20

Impact of Nitrogen on the Environment

Participants attending from 10:00 a.m. until 11:00 a.m.

Presenter: Eric Strong

The objective of our research is investigating changes in climate effect transmission and number of cases of Lyme disease in the northeast area of the United States. With bibliographic research, analysis

of medical statistics, land-use data, climate modeling with MAGICC/SCENGEN 5.3.2 well explore current and future patterns of Lyme disease. Statistical data from: World Health Organization, United States Department of Health & Human Services, and the Center for Disease Control & Prevention will be studied to determine where Lyme disease is most present, how its transmitted, and why its there. With temperature/precipitation data and medical statistics, well investigate if cause-effect relationships exist between climate change and Lyme disease transmission. We expect to test our hypothesis as the increase in the number of cases of Lyme disease in the northeast area of the United States is attributed to temperature increase.

Mentor: Elena Lioubimtseva

KIRKHOF CENTER KC21

Attitudes Held Towards Sex Work and Sex Workers in a College Sample

Participants attending from 11:00 a.m. until 12:00 p.m.

Presenter: Monique Tumbleson

To gauge the environment of college student sex workers at Grand Valley State University, 200 undergraduate students will participate in an online questionnaire that assesses attitudes towards sex work and sex workers. Through utilizing the Attitudes Towards Prostitutes and Prostitution Scale (APPS), this study will assess whether college students view sex work(ers) as either normative or deviant, and whether college students view sex work(ers) as an issue of choice or victimization (Levin and Peled, 2011). This study will expand current knowledge regarding attitudes towards sex work and sex workers within the United States college setting, and further generalize what international research has deemed a global phenomenon of students entering the sex work industry. It is likely that respondents will know a peer who has been, or currently is, involved in sex work. It is also likely that some participants will understand why a peer may choose to be a sex worker while being a student.

Mentor: Kathleen Underwood

KIRKHOF CENTER KC22

Invasive Hybrid Watermilfoils are Sexually Viable: Evidence from Laboratory Crosses and Genetic Analysis of Natural Populations

Participants attending from 9:00 a.m. until 10:00 a.m.

Presenter: Danielle Grimm

The hybrid offspring of invasive Eurasian watermilfoil (*Myriophyllum spicatum*) and native northern watermilfoil (*Myriophyllum sibiricum*) are highly invasive, but little is known about their reproductive biology. Hybrid watermilfoils can reproduce asexually via fragmentation, but sexual viability is unknown. The capacity for sexual reproduction has important implications for the invasive potential and management of hybrid watermilfoils. We investigate whether hybrids are sexually viable using laboratory hybrid crosses and estimate hybrid classes from natural populations with molecular tools. We show that hybrids can produce viable seeds under laboratory conditions and with Amplified Fragment Length Polymorphisms and a Bayesian genetic assignment method we estimate that natural populations contain later generation hybrids. Our study shows hybrids have the ability to reproduce via sexual reproduction, and that later generation hybrids can grow to maturity in natural populations.

Mentor: Ryan Thum

KIRKHOF CENTER KC23

A Periodized Strength and Conditioning Program for a Male Olympic Water Polo Player

Participants attending from 10:00 a.m. until 11:00 a.m.

Presenters: Elisabeth Bradley, Jonathon Tschirhart

Water polo originated in Europe in the late 1800's and first appeared in the Olympics in 1900, but its growth in America is evident by the American women's team winning first place in the 2012 London Olympics. The sport of water polo requires high mental and physical demands. In order to obtain the necessary skills for peak performance, a water polo athlete must participate in a highly structured training program. This project looked at the current research to develop a program to increase speed, agility, endurance and strength to increase the overall performance for an Olympic-level male athlete. Since previous research was observed to construct this workout program, there are limitations to what might specifically be best for the individual. This project was designed to better inform both coaches and athletes on a beneficial means of training for Olympic-level water polo players.

Mentor: Amy Crawley

KIRKHOF CENTER KC24

The Effect of Gene Mutations on Biofilm Formation in *E. Coli*

Participants attending from 12:00 p.m. until 1:00 p.m.

Presenters: Jay Zuidema, Matthew Luce

Escherichia coli, a Gram-negative bacterium is a common commensal found within the gastrointestinal tract of animals. Occasionally this bacterium can acquire additional virulence factors that lead to a variety of gastroenteritis in humans. In either situation, but particularly as a commensal, it is integral that the organism establish itself in the environment. Commonly this is through the formation of biofilms. Previous work was done to determine genes that are important for biofilm synthesis. In this work, researchers identified 110 genes responsible for biofilm formation in an aerobic environment. Our interest is in the impact that low oxygen conditions play in biofilm formation, since this is the common environment *E. coli* is located. Using the Tn5 transposon we are randomly creating mutations within the genome of the bacterium. Utilizing a biofilm formation assay, we will determine the impact on each of these mutations during aerobic and anaerobic conditions.

Mentor: M. Aaron Baxter

KIRKHOF CENTER KC25

A Mathematical Look into Ngorongoro Crater Migration Patterns

Participants attending from 11:00 a.m. until 12:00 p.m.

Presenter: Kirsten Clemans

The Ngorongoro Crater is a concave volcano that has developed into a unique ecosystem differing from the surrounding Serengeti. While animals in the Serengeti migrate great distances to obtain sustenance, the Ngorongoro Crater provides ample food and water supply to animals residing there. Consequently, animals in the crater do not participate in the migratory patterns of their counterparts outside of the crater. Instead, animals have unique migratory patterns within the crater. To study these patterns, resources from scientific studies done in the Ngorongoro Crater and interviews with those who have completed research there have been used. Using the data collected from research on migratory patterns, a mathematical activity book was created for high school students allowing them to analyze the data to learn mathematical concepts. Adding a global context into a math unit helps students see a real-world application and sparks interest in conservation of the globe's unique ecosystems.

Mentor: Lisa Kasmer

KIRKHOF CENTER KC26

Inclusive Transgender Housing in Grand Rapids, MI

Participants attending from 12:00 p.m. until 1:00 p.m.

Presenter: Kayden Robinson

Recently, there has been an increased awareness centered on social justice for gender and sexuality minorities, but much less attention has been focused specifically on the need for safe and inclusive transitional housing/shelters for transgender individuals. The study outlined here examines shelter/transitional housing in Grand Rapids, Michigan. Using content analysis of websites, my study will explore the inclusion statements and the clientele statements of ten randomly selected shelters/transitional housing to determine whether or not each deliberately utilizes gender-specific inclusive or exclusive language. It is argued that if the statements reflect an inclusive gender-non specific language that the shelter/transitional housing will be more open to transgender clientele, and by extension offer a safer environment. This research provides a critical lens to examine the current state of resources available for transgender homeless and the need for a list of safe resources.

Mentor: Kathleen Underwood

KIRKHOF CENTER KC27

Performance of Control Experiments for Hyperbaric Therapy Research

Participants attending from 12:00 p.m. until 1:00 p.m.

Presenters: Kathryn Young, William Waggener, Karina Tavakalyan

Hyperbaric oxygen therapy increases the partial pressure of oxygen in vivo, allowing body tissues to absorb more oxygen. This continuation of an ongoing research project seeks to perform time control experiments to measure the effect of prolonged incubation under normal atmospheric conditions on vascular reactivity. Specifically, porcine pulmonary arteries will be dissected, incubated for 2 hours under normal atmospheric conditions, mounted in isolated organ baths, and responses to potassium chloride, phenylephrine, and nitroprusside will be recorded. Responses consist of changes in tension as generated by the smooth muscle in the arterial wall. We hypothesize that increased ATP production plays a role in the altered vascular reactivity observed in blood vessels following hyperbaric oxygen therapy. An additional control will be to conduct dose response experiments to exogenous ATP. This will lead to a greater understanding of the effects of hyperbaric therapy on the vascular system.

Mentor: Francis Sylvester

KIRKHOF CENTER KC28

Protective Effects of nAChRs by Application of an Allosteric Modulator and nAChR Agonist to Retinal Ganglion Cells

Participants attending from 10:00 a.m. until 11:00 a.m.

Presenters: Jenna Fredrickson, Leah Lyons, Clementina Asamoah, Lindsey Lusardi, Aula Ramo, Alison Tibble, Lindsey Schroedter, Lauren Francis

Retinal ganglion cells (RGCs) are responsible for transmitting visual information from the retina in the eye to the brain's visual centers. Loss of RGCs is the hallmark of glaucoma- a leading cause of blindness worldwide. Nicotinic acetylcholine receptor (nAChR) activation on RGCs provides protection from cell death in several animal models. We studied the protective effects of nAChRs by applying a positive allosteric modulator (PAM) with a selective nAChR agonist to isolated RGCs. PAMs should allow increased survival of RGCs by enhancing activity of nAChRs. We exposed RGCs to various concentrations of agonist and PAM for 3 days. Cell viability was determined by counting live cells

with fluorescence microscope techniques. To determine if the effects seen in isolated RGCs translates to retinal tissue, we have begun culturing retinal explants under similar conditions. PAMs have been used safely at other targets in the brain and could lead to effective glaucoma treatments.

Mentor: David Linn

KIRKHOF CENTER KC29

Technology in the Classroom: Why the

Participants attending from 2:00 p.m. until 3:00 p.m.

Presenter: Kirstie Smith

School systems are experiencing a massive wave of technology integration in education. While many educators and community members support the increasing reliance on technology use in the classroom, misusing such technological devices and programs can be detrimental to student learning. Using Dewey's concept of Experience and Education, this poster argues that it is essential that educators provide an environment for students to have experiences with technology that lead to growth and critical thinking skills built upon from past experiences. I highlight the different ways that technology can be misused in the classroom, causing miseducative experiences (Dewey, 1938) to occur, which hinders growth and often eliminates the need for critical thinking and a deeper understanding of concepts presented.

Mentor: Amy Masko

KIRKHOF CENTER KC30

Where are all the Female Sports Officials?

Participants attending from 11:00 a.m. until 12:00 p.m.

Presenters: Sara Rosenthal, Janet Kaminski

Over the past 40 years since Title IX was approved, women have made significant gains in many areas of sports participation, yet women are virtually absent from officiating. This project questions why there are so few female officials in Major League Baseball, the National Football League and the National Basketball Association, especially since Title IX is celebrating its 40th anniversary. Through a collection of 200 surveys, the study examines the opinions of Grand Valley State University college students on the role of women officiating in such sports organizations. Preliminary research indicates women are highly discriminated against in the role of officiating and primarily allowed into positions of broadcasting. This research adds a significant dimension to our understanding of the glass ceiling for women.

Mentor: Kathleen Underwood

KIRKHOF CENTER KC31

What to Expect When You Read Pregnancy Guides

Participants attending from 1:00 p.m. until 2:00 p.m.

Presenter: Samantha Mikita

Of the dozens of pregnancy guides conveniently available to women, the most popular over the last quarter century is the "What To Expect When You're Expecting" series, which at 597 pages, discusses such topics as pre-conception, the nine months of pregnancy, and finally labor and delivery. Because millions of women use such guides as their primary source, understanding and analyzing the messages received by women is important. This study focuses on the four editions (1984, 1991, 2002, and

2012) of the "What to Expect When You're Expecting" series. These books will be examined with qualitative content analysis to discover possible messages women receive regarding pregnancy choices including the differences of natural compared to medicalized childbirth. Also, by examining each edition, I can analyze how messages change over time. I argue the subject matter in the books focus primarily on medicalized childbirth and how this type is ideal compared to a natural birth.

Mentors: Julia Mason, Kathleen Underwood

KIRKHOF CENTER KC32

Investigation of Novel Fluorescent Boron Complexes

Participants attending from 12:00 p.m. until 1:00 p.m.

Presenters: Donald Klarr, Adam Boyden

β -diketone boron difluoride complexes have shown useful applications as fluorescent probes, photosensitizers, and fluorescing nanoparticles. Our lab has taken this concept and applied it to the formation of β -phosphoryl keto boron difluoride complexes. The synthesis and spectral properties of these complexes will be discussed.

Mentor: Shannon Biros

KIRKHOF CENTER KC34

Periodization Exercise Prescription for Professional Soccer Athletes

Participants attending from 9:00 a.m. until 10:00 a.m.

Presenters: David Germaine, Alexander Roessler, David Grzesek

Soccer is one of the most popular sports in the world and one of the fastest growing in the United States. Soccer is an extremely demanding sport that puts its athletes through rigorous training regimens to prepare them for the long and grueling season. The purpose of this research was to present a periodized exercise training regimen that addresses the areas of endurance, speed, agility, power, and strength, key aspects necessary for professional soccer athletes to be in peak physical form. Research conducted and presented within the macrocycle, show training protocols at different stages over a one-year period. A possible limitation to this study was that each teams training regimen is different and there is wide variability from team to team, and often even player to player. However, current athletes and future professional soccer players can benefit from this research by applying the training regimen to better prepare them for more competitive play.

Mentor: Amy Crawley

KIRKHOF CENTER KC36

Expression Effects of a Cyclic Peptide Library on *hilA* in *Salmonella*

Participants attending from 12:00 p.m. until 1:00 p.m.

Presenters: Matthew Luce, Jay Zuidema

Salmonella Typhimurium is a gram-negative bacterium that produces a self-limiting gastroenteritis in the human small intestine upon ingestion of contaminated food or water. *Salmonella* contains a 40 kb region of DNA known as *Salmonella* Pathogenicity Island 1 (SPI-1), whose expression is controlled via multiple pathways as a result of various environmental signals. When conditions are optimal for invasion, various inducing signals cause the gene coding for the transcriptional activator *HilA* to turn on. This protein in turn activates the transcription of invasion genes located in SPI-1. The expressed SPI-1 proteins force targeted cells to uptake the bacteria through the manipulation of

the epithelial cells cytoskeleton. In collaboration with Brad Jones at the University of Iowa, a plasmid library producing random cyclic peptides has been acquired. Some plasmids which reduce expression of a *hliA::lacZY* reporter in *E. coli* and in *Salmonella Typhimurium* have been identified.

Mentor: M. Aaron Baxter

KIRKHOF CENTER KC37

Work-to-School Facilitation

Participants attending from 12:00 p.m. until 1:00 p.m.

Presenter: Amanda Beaufore

Previous research has shown that individuals who participate in incompatible roles are likely to experience conflict (Markel & Frone, 1998). However, it is also shown that experience in one role can benefit or facilitate an individual in another role (Butler, 2007). Work-to-school facilitation is the idea that having a job helps students in school as well as school helping their work. Participants for this study included 91 students at Grand Valley who were employed at least 15 hours a week or more. Participants self-reported on the beneficial effects of work on their school attitude and performance in addition to the benefits of school on their work attitude and performance. Results suggested that work provides students with social or emotional support in addition to instrumental help. These results are consistent with previous theory and research on work-family facilitation and work-school facilitation.

Mentor: Ellen Shupe

KIRKHOF CENTER KC38

Green Chemistry: Sorbitol to Useful Platform Molecules

Participants attending from 9:00 a.m. until 10:00 a.m.

Presenter: Gerrit Rauch

Conversion of biomass to platform molecules brings hope for a world of limited and diminishing fossil fuels. Hydrogenolysis is a method of cleaving C-C, and C-O bonds, which allows the breakdown of biomass to useful platform molecules. Many biomass refinery procedures involve usage of metal catalysts, and extremely harsh reaction conditions. Biorefinary processes typically start with hydrogenation of cellulose to glucose, followed by hydrogenolysis of glucose to mainly Sorbitol. Sorbitol can undergo numerous subsequent conversions to platform molecules depending on reactions conditions. In search for a greener pathway for Sorbitol conversion, less energy-demanding reactions, less harmful materials, and no catalysts were under investigation. In our experiments, hydrogenolysis of Sorbitol yields xylose as the major product. Research continues into sorbitol conversion, to gain more knowledge about how sugars can be broken down to valuable platform molecules.

Mentor: Dalila Kovacs

KIRKHOF CENTER KC39

Detection of 6xHis Labeled HDC Protein in *Drosophila melanogaster*

Participants attending from 10:00 a.m. until 11:00 a.m.

Presenter: Anthony Hage

Histamine is a neurotransmitter used by photoreceptors in the fruit fly, *Drosophila melanogaster*, and is synthesized by the enzyme histidine decarboxylase (HDC). Previous studies have shown that histamine is localized to the nerve terminals where it is released as a neurotransmitter. If HDC's subcellular location and post-translational processing were better understood, potential regulatory mechanisms,

which lead to histamine synthesis, could be identified. Transgenic flies bearing a functional *Hdc* gene with an internal 6xHIS epitope tag in a specific location were studied. Western blotting and immunocytochemical examination using a penta-HIS antibody did not provide consistent detection of the labeled 6XHIS-HDC protein. However, the site in the HDC protein used is an ideal location for epitope tagging, as it does not disrupt HDC function. Thus, a different epitope, FLAG, was inserted into the Sac1 site and flies bearing the FLAG-HDC-Sac1 transgene are currently being studied.

Mentors: Martin Burg, Debra Burg

KIRKHOF CENTER KC40

A Study of X-Ray Crystallography and the Determination of Atomic Structure

Participants attending from 2:00 p.m. until 3:00 p.m.

Presenter: Matthew Della Pia

The theory of X-Ray crystallography is developed and applied to the determination of crystal structures ranging in size from a small peptide molecule to a modest size protein. Crystallization techniques, data collection, and structural solution methods are discussed as they apply to these compounds. Glucagon, a small organic peptide molecule involved in the body's control of glucose levels, lies at the boundary between the direct methods used on small molecules and the bootstrap phasing methods use on large proteins and viruses. HEW lysozyme is a well-known larger protein molecule which lends itself easily to learning crystallization techniques and is most easily approached using molecular replacement. The structures as well as the details of the methods and programs used to solve them are presented.

Mentor: Ross Reynolds

KIRKHOF CENTER KC41

A Class D Beta-lactamase Clinical Variant with Activity Against Carbapenems, Ceftazidime and Aztreonam

Participants attending from 11:00 a.m. until 12:00 p.m.

Presenter: Kipchumba Kaitany

Like all known class D carbapenemases, OXA-23 cannot bind or hydrolyze the 3rd generation cephalosporin ceftazidime. OXA-146 is an OXA-23 subfamily clinical variant that differs from the parent enzyme by an alanine (A220) duplication in the loop connecting β -strands b5 and b6. We have discovered that this insertion enables OXA-146 to bind and hydrolyze ceftazidime with efficiency comparable to other extended spectrum class D β -lactamases. This enzyme also binds aztreonam, cefotaxime and ampicillin with higher affinity than OXA-23. In this study, we report the crystal structures of both the OXA-23 and OXA-146 enzymes. A comparison of the two structures shows that the extra alanine moves a methionine out of its normal position where it forms a bridge over the top of the active site. The insertion also lengthens the b5-b6 loop, moving its main-chain atoms further away from the active site. A model of ceftazidime bound in the active site shows that these two structural alterations are both likely to relieve steric clashes between the bulky R1 side-chain of ceftazidime and OXA-23.

Mentor: David Leonard

KIRKHOF CENTER KC42

Flabby to Fabulous and Kick Butt Guarantees: Gender Ideologies in Fitness Advertising

Participants attending from 12:00 p.m. until 1:00 p.m.

Presenters: Adam Dreisbach, Shelby Tryon

Language in the media has created a consumer feminism which has problematized women's bodies for decades, and continues to do so now with the addition of the problematization of the male body, a relatively new phenomenon. Fitness advertising is a billion-dollar institution that has the power to spread and legitimize these ideologies. For our study, we analyzed Shake Weight and Shake Weight for Men advertisements with focus on the presentation of masculinity and femininity. Following the poststructuralist feminist approach, with critical discourse analysis, we examined the discursive construction of masculinity and femininity to reveal ideologies in the language of advertisements. Our data include transcripts of two two-minute Shake Weight commercials. Our findings demonstrate that Shake Weight advertisers are using gender ideologies, such as size, strength, and gaze, to sell their products.

Mentor: Kathryn Remlinger

KIRKHOF CENTER KC43

Argument Evaluation as a Function of Reasoning Skill and Belief in an Argument

Participants attending from 2:00 p.m. until 3:00 p.m.

Presenter: Jazzmine Carroll

Our main purpose was to see if people's beliefs predicted their effectiveness at evaluating an argument. We also sought to see if reasoning skills mediate the relationship between beliefs and argument evaluation. Students were prescreened for their beliefs. Only those with strong beliefs were tested. They completed multiple choice tests with questions on the argument topics of TV violence and spanking as punishment. Then students read sentences with an argument claim and a reason. They had to judge whether the reason supported the claim. The questions of the reasoning portion were taken from old LSAT exams. Our results showed that belief in an argument did not affect how well a person could evaluate the validity of a given argument. The results also showed that belief in the argument biased people into accepting it as true even if it was not. With reasoning ability, good reasoners were better able to judge the validity of the arguments but were no more or less biased in responding.

Mentor: Michael Wolfe

KIRKHOF CENTER KC44

Prevalence and Population Dynamics of Raccoon Roundworm in West Michigan: Assessing the Potential of an Emerging Zoonosis

Participants attending from 9:00 a.m. until 10:00 a.m.

Presenter: Christina Sarkissian

Baylisascaris procyonis (a.k.a. raccoon roundworm) is a gastrointestinal nematode parasite of raccoons. *B. procyonis* also infects many other wild and domestic species, wherein the larval stages migrate aggressively through vital organs often causing death. In humans, 50% of infections are fatal. We assessed the prevalence of *B. procyonis* in West Michigan by recovering adult worms from the small intestines of road-killed raccoons. Among the raccoons surveyed so far, prevalence of infection is 67%. Using microsatellites as genetic markers, we also describe preliminary analyses of the population genetic structure of *B. procyonis*, and report on the early stages of our surveillance of the areas dog population. Dogs, along with raccoons, can serve as definitive hosts of *B. procyonis*, which means they

pass infective stages of this parasite in their feces. The degree to which dogs are infected will reflect the potential for zoonotic transmission to humans.

Mentor: Doug Graham

KIRKHOF CENTER KC45

Perception of Social Events

Participants attending from 3:00 p.m. until 4:00 p.m.

Presenter: Wyatt Stahl

Previous research has shown that people break up, or segment, the hierarchy of goals in human behavior into discrete events. The current study expands this literature by investigating how people perceive events in a social context. We were also interested in how variables like grain size (large vs. small events) and type of personality may influence the segmentation of social events. Participants were asked to view short films of two people engaging in everyday activities. While watching the movies, they were asked to indicate the points when one activity ended and another began (i.e., segmenting the movies into events). After each film, the participants were asked to complete a recall task by typing the events that occurred in the film, and last, to complete a personality questionnaire. The movies were coded for changes in nonsocial and social actions of the actor. We found that changes in both social and nonsocial actions significantly predicted event segmentation behavior.

Mentor: Christopher Kurby

KIRKHOF CENTER KC46

Nonreligious Group Factors Versus Religious Belief in Predicting Prosociality

Participants attending from 12:00 p.m. until 1:00 p.m.

Presenters: Alison McNulty, Mike Sharp

Previous research suggests that religious belief is associated prosocial behavior. However, studies have often used measures of belief without separating general group participation or compared group with non-group members. Another major consideration pertains to the group identity of the target of the behavior. Finally, studies of prosociality frequently do not control for demographic and social characteristics. The present study compares members of secular (n=365) and church groups (n=298) located around a major metropolitan area in a southern U.S. state on measures of both in- and outgroup-related prosocial attitudes and behaviors, controlling for these confounding variables. Initial comparison indicated numerous differences between church and secular group members. However, multiple regression controls diminished many of the apparent differences on prosocial outcomes. Religiosity also predicted parochial rather than universal prosocial behaviors.

Mentor: Luke Galen

KIRKHOF CENTER KC47

Microwave Breakdown of N₂ at Sub Atmospheric Pressures

Participants attending from 11:00 a.m. until 12:00 p.m.

Presenter: Joseph Campbell

A strong electric field will ionize gas into plasma; this is called a dielectric breakdown. Dielectric breakdown of molecular nitrogen gas is investigated at radio frequencies in the GHz range. The effective electric field causing this breakdown is modeled by a phenomenological function, and goes as $E_{bd} = C \cdot P^m \cdot (1 + w^2 / (B \cdot P)^2)$ where B is the pressure dependent function describing collision

rate that has units of frequency per Torr, and the power law m is a dimensionless model parameter. Pressures of the molecular nitrogen gas and gap size between the circuit elements are varied while the power of the electric field at breakdown is measured. This will provide information about the relationship between the power law m , and the pressure dependent collision rate B . Previous work shows that the power law and the collision rate function follow an exponential relationship, $me^{(-B)/4}$ by the equation $m^4 = 4 * e^{(-B)}$.

Mentor: Geoff Lenters

KIRKHOF CENTER KC48

A Strength and Conditioning Program for Professional Golfers

Participants attending from 11:00 a.m. until 12:00 p.m.

Presenters: Christopher Werth, Derek Bridges

As the sport of golf continues to intensify, both coaches and athletes are searching for a new edge to surpass the competition. Current research suggests golf performance can be enhanced through the utilization of strength and conditioning programs specifically catered to golf athletes. These adaptations include improving power output and rotational velocity, which in turn increases club head speed. The purpose of this research was to develop a golf specific strength and conditioning regiment, specifically developed to improve golfers' power and flexibility. A caveat of the research was the inability to administer the tests and exercises to existing athletes. Thus, more research is needed to support the positive correlation between power and flexibility with improved golf performance. Golfers and coaches alike can use the presented information to help increase drive distance, as well as range of motion during each swing.

Mentor: Amy Crawley

KIRKHOF CENTER KC49

The Effect of Peripheral and Central Histamine Deficiency on Courtship Behavior in *Drosophila melanogaster*

Participants attending from 2:00 p.m. until 3:00

Presenters: Judith Ingles, Anthony Hage

Histamine is a biogenic amine synthesized from L-histidine via decarboxylation using the enzyme histidine decarboxylase (*HDC*) and is present in photoreceptors and central brain neurons. It has not been possible to separate the function of the histaminergic neurons in the central nervous system (CNS) from that of the peripheral nervous system. An *Hdc* transgene was placed into flies with an *Hdc* mutant background that rescues the *Hdc* mutant phenotype, restoring histamine. Deletions in this *gHdc* transgene have been shown to restore histamine in the PNS but not the CNS, which allows the determination of whether histamine deficiency in the CNS could disrupt a complex behavior, such as courtship. Male and female flies were introduced into a small chamber and observations were recorded as various steps of the courtship process were exhibited. Results show that a lack of histamine disrupts specific components of the normal courtship behavioral repertoire that flies characteristically exhibit.

Mentor: Martin Burg

KIRKHOF CENTER KC50

Progress Towards Regioselective Nucleophilic Ring Openings of Aziridines

Participants attending from 9:00 a.m. until 10:00 a.m.

Presenter: Jeremy Whitmore

Thyroxine (T4), the predominant secretion of the thyroid gland, undergoes deiodination at target tissues to produce the potent agonist triiodothyronine (T3). Recent work has shown that in vivo enzymatic deiodination and decarboxylation of T3 generates the derivative T1AM, a potent agonist of trace amine associated receptors (TAAR). Interestingly, T1AM induces physiological effects opposite of those produced by the T3 and T4 hormones. Elucidation of a regulatory pathway has the potential to establish more comprehensive treatment options for thyroid-related disorders. Our current focus is on the development of conformationally biased analogs of T1AM as regulators of TAAR activity. This project presents the progress towards regioselective nucleophilic ring openings on aziridines using p-methoxy phenol in the synthesis of proposed TAAR1 regulators and describes a parallel computational study seeking to gain a greater understanding of this key transformation.

Mentor: Matthew Hart

KIRKHOF CENTER KC51

Type II MADS-box Genes Isolated from the Gymnosperm Cones of Ephedra and Juniper

Participants attending from 12:00 p.m. until 1:00 p.m.

Presenter: Danielle Maryanski

Type II MADS-box genes determine the organ identity in angiosperm reproductive structures. Current knowledge of Type II MADS-box genes in gymnosperm cones is limited, but it does support the hypothesis that seed plant reproductive structures evolved using a similar genetic toolkit. In this study we focused on isolating and sequencing Type II MADS-box genes from the understudied gymnosperm cones of Ephedra and Juniper. We isolated 11 unique Type II MADS-box gene sequences that belong to four gene lineages. This is the first report of MADS-box genes in Ephedra. Our understanding of the evolutionary history of reproductive structures in gymnosperms and seed plants in general will continue to improve with further work on isolating more sequences and gene expression studies with our increased sampling of gymnosperm Type II MADS-box genes. This knowledge may help determine how cone and flowers are similar at the genetic level and ultimately how flowers evolved from cones.

Mentor: Jennifer Winther

KIRKHOF CENTER KC52

Applications of Computational Methods in Quantum Mechanics

Participants attending from 1:00 p.m. until 2:00 p.m.

Presenter: Jonathon Bednarsky

We will explore applications of computational methods in solving selected quantum mechanical problems. Variational Monte Carlo (MC) will be implemented to find the ground state energy of the electron(s) in hydrogen and helium atoms with interaction potentials based on Coulomb and screened Coulomb interactions. In Variational MC, importance sampling based on the Metropolis algorithm will be used to evaluate relevant integrals. Also, the Numerov method will be used to computationally solve the second order differential equation to find energy levels of the hydrogen atom (ground state as well as excited states).

Mentor: Maja Krcmar

KIRKHOF CENTER KC53

Where is the "Green" in Surface Cleaners?

Participants attending from 2:00 p.m. until 3:00 p.m.

Presenter: Tanner Remick

Surface cleaners are mainly man-made mixture of chemicals. Many of them are advertised on the market as 'green'. What does it mean for a surface cleaner to be 'green'? And, if they are marketed as 'green' does it mean they are prepared following the principles of Green Chemistry or simply are named 'green' because of the appeal the word brings to the consumers? This presentation will give an insight into surface cleaners industry and the connection with the principles of green and sustainable chemistry. Findings regarding the surface cleaners used at GVSU will be presented.

Mentor: Dalila Kovacs

KIRKHOF CENTER KC54

Matter/Antimatter Interactions in Gases

Participants attending from 9:00 a.m. until 10:00 a.m.

Presenter: Jacob Voetberg

Theoretical work on the heavier noble gases, xenon and krypton in particular, has suggested that the temperature dependence of the decay rate of orthopositronium is non-linear in the temperature range being considered. However, there is little experimental data on the heavier noble gases to support the theory. This is in opposition to both the theoretical and experimental work on the lighter noble gases like helium, neon and argon, which have shown a linear dependence with respect to temperature. The goal of this experiment is to investigate the temperature dependence of the decay rate of orthopositronium in xenon gas. We will use a high-pressure gas cell with a positron source inside as the basic setup. Design and construction has been completed on the temperature control system including the temperature controller electronics, the heaters, and the insulated housing for the gas cell. Construction is nearly completed for the gas handling system. We hope to begin taking preliminary data very soon.

Mentor: Richard Vallery

KIRKHOF CENTER KC55

Low Dimension Lie Algebra Dimension Reduction by Modding by the Center

Participants attending from 11:00 a.m. until 12:00 p.m.

Presenter: Nicholas Benthem

We investigate reducing the order of real low dimensional Lie algebras by modding by the center. We find the isomorphism between the reduced algebra and one of the non-decomposable Lie algebras and explain why in certain cases the reduced algebra decomposes.

Mentor: Firas Hindeleh

KIRKHOF CENTER KC56

Characterizing Protein-protein Interactions for Accurate Cell Division in Fission Yeast

Participants attending from 9:00 a.m. until 10:00 a.m.

Presenter: Jessica Thoe

Cell division is a necessary process for growth and development. Fission yeast (*S. pombe*) cells provide

a model system to study polarity and cytokinetic mechanisms because, like human cells, they grow in a bipolar fashion and divide symmetrically through contraction of an acto-myosin ring. Mid1 is a founding protein of the actomyosin ring that helps recruit ring proteins and define the division plane. Without Mid1, there is incomplete, uneven division. The *orb* class of *S. pombe* mutants is classified by the loss of cell polarity and round shape. To study if these polarity defects are related to cytokinetic defects, we have examined interactions between Mid1 and *orb* mutants. These *orb* mutants show more binucleate cells with internal septa, paired configurations, differing localizations of Mid1, and higher protein levels of Mid1. These phenotypes suggest a relationship between cytokinetic defects and the polarity genes, as well as a link between Mid1 and the Orb proteins.

Mentor: Dawn Clifford Hart

KIRKHOF CENTER KC57

The Social Work Meaningful Graduate Relations Center

Participants attending from 10:00 a.m. until 11:00 a.m.

Presenter: Rachel Schafer

The Grand Valley State University School of Social Work (SSW) does an excellent job preparing students to become competent bachelor and master level professionals. However the support from the School of Social Work does not need to end at graduation; the Grand Valley School of Social Work along with alumni relations can provide graduates with many resources to succeed in their professional careers. The purpose of this study is to identify the needs of social work graduates and to identify how the Grand Valley School of Social Work can help meet those needs. Rachel Schafer, student along with Jamie Langlois, associate professor plan to facilitate five faculty focus groups and one alumni focus group. A survey will also be sent out to 2,000+ limited license social workers in the State of Michigan. To meet the alumni needs a proposal has been made to form a Social Work Meaningful Graduate Relations Center on Grand Valley State University's PEW campus.

Mentor: Jamie Langlois

KIRKHOF CENTER KC58

Combatting Cyberloafing in the Workplace: Positive Emotion Intervention

Participants attending from 10:00 a.m. until 11:00 a.m.

Presenter: Reed Bramble

Cyberloafing refers to the use of time originally dedicated to a work-related task to instead check personal e-mails, browse internet applications, etc. This behavior can negatively impact the overall efficiency of an organization. In order to combat the adverse effects of cyberloafing, the current study was proposed. As ego depletion was found to be correlated with cyberloafing behavior, the current study investigated the effects of ego depletion recovery and prevention methods on cyberloafing behavior in college students. I hypothesized that individuals exposed to positive emotion will cyberloaf less than those exposed to neutral emotion. This hypothesis draws from research on ego depletion and positive affect. Using a 2 (positive vs. neutral) X 2 (depleted vs. non-depleted) factorial design, participants attempted to complete a data entry task after being shown a video corresponding to the condition. Cyberloafing activity was measured. Findings and implications are discussed.

Mentor: Ellen Shupe

KIRKHOF CENTER KC59

Reconstruction of Depositional Environments Based on Sedimentary Structures and Biofacies in the Ordovician Kope Formation, Kentucky

Participants attending from 12:00 p.m. until 1:00 p.m.

Presenters: saray morales, Stephen Pratt, Kaitlyn Bertram, Kaitlyn Sterley

The Ordovician Kope Formation in northern Kentucky consists of fossiliferous limestone and shale. The Kope Formation is underlain by the Point Pleasant Formation and overlain by the Fairview Formation. The shale and interbedded limestones in the Kope contain brachiopods, bryozoans, crinoids, trilobites, and mollusks. Sedimentary structures include gutter casts, submarine cemented hard grounds, reworked concretions, and event beds such as distinctive faunal assemblages, taphonomic features, and trace fossils. Using the interbedded limestone and shale layers and event beds other researchers have inferred a progradational succession in what was once part of a tropical, epeiric sea. Skeletals within the Kope suggest specific depositional environments within this epeiric sea. Reconstruction of these depositional environments will be done by point counts of thin sections to quantify the skeletal, and inferences deduced from structures contained within the formation.

Mentor: Patricia Videtich

KIRKHOF CENTER KC60

Individual Differences in Recognition Memory

Participants attending from 10:00 a.m. until 11:00 a.m.

Presenters: Katherine Hammond, Angele Yazbec, Brian Bieganski

Previous research suggests that people make recognition memory judgments on the basis of two kinds of information: they can assess the general familiarity of a stimulus, or they can recollect specific details about having encountered it before. However, there is little consensus on how often recollection is used in recognition. In this study, we addressed this issue from an individual differences perspective. Participants completed tests of working memory, recall, and several types of recognition memory that should rely on recollection to varying degrees (depending on the ambiguity of familiarity information), and for different reasons (i.e., for rejecting or accepting items). We reasoned that, to the extent that recognition judgments depend on recollection, performance on these tasks should correlate with recall and working memory. We report these results and discuss their implications for understanding individual variability in how people make memory decisions.

Mentor: Joel Quamme

KIRKHOF CENTER KC61

Land Cover Classification of Bass River Recreation Area, Ottawa Co., Michigan

Participants attending from 11:00 a.m. until 12:00 p.m.

Presenter: Nicholas Barlow

Bass River Recreation Area is a state recreation area located along the Grand River in Ottawa County, Michigan. Bass River comprises 1,665 acres comprised of open brush land, ponds, man-made lakes and forest. The Michigan Department of Natural Resources (MDNR) manages the area for recreation and wildlife. Currently, there are no existing forest inventory datasets or comprehensive land cover maps. A land cover classification will aid the MDNR in establishing a natural features inventory for Bass River. We will utilize ERDAS Imagine to classify land cover types by combining supervised and unsupervised classification methods from aerial imagery acquired in August 2010 by the National Agriculture Imagery Program. The resulting integrated land cover classification will provide the state

with a current, spatially-explicit inventory of land cover and will assist the MDNR in future management decisions at Bass River Recreation Area.

Mentor: Alexandra Locher

KIRKHOF CENTER KC62

The More Economic Interest There Is in Latin America, the More U.S. Interventionism There Will Be in Latin America

Participants attending from 10:00 a.m. until 11:00 a.m.

Presenter: Veronica Beltran

This presentation will discuss the possible correlation between private U.S. economic interests and U.S. government interventionism in Latin America. My hypothesis is that the larger the economic interest, the greater the U.S. interventionism. I will examine three cases where there was a great deal of U.S. interventionism in the early and mid-20th century--Cuba, Guatemala, and Panama--and describe how the U.S. government used diplomatic and military means to protect the interests of U.S. economic elite who had large stakes in each of these countries.

Mentor: Andrew Schlewitz

KIRKHOF CENTER KC63

The Effects of Sleep Deprivation on BMI and Quality of Health

Participants attending from 2:00 p.m. until 3:00 p.m.

Presenter: Bryanna Cikesh

There are many variables that effect an individual's BMI and quality of health, one of which is sleep deprivation. Sleep deprivation is defined as an average of 7 hours of sleep or less a night. We will examine the association between sleep deprivation, BMI and quality of health in GVSU students. A cross-sectional study will be conducted using surveys to measure sleep deprivation, work hours, academic college, number of credits, class, average number of naps a week, number of hours of sleep at night, self reported height and weight, gender, age and quality of health in GVSU students. For the continuous variables, t-tests will be performed to examine the differences in means by sleep group. For the categorical variables, chi square tests will be performed to examine the frequency of each variable by sleep group. We will report the associations between sleep deprivation, BMI and quality of health in GVSU students extending the limited literature on this topic in college-aged students.

Mentor: Debbie Lown

KIRKHOF CENTER KC64

Suggested approaches to Improving Nutrition Status of College Students

Participants attending from 4:00 p.m. until 5:00 p.m.

Presenter: Marcy Spalsbury

The unhealthy diet of Americans has led to an increase in number of chronic illnesses and obesity. These poor dietary patterns usually originate from early-developed eating habits of young and newly independent adults. In this literature review the health status and eating habits of college students will be discussed, along with the social factors promoting these behaviors; such as location of living, previous parental guidance with nutrition, and meal preparation. Misinformation appears to have the largest impact on the nutrition status of the college student, suggesting that a stronger emphasis on nutritional education and constant and/or direct exposure to nutrition information should be

implemented on campus in order to promote healthier eating habits. This review also provides an analysis of successful collegiate nutrition education programs and suggests approaches to improve the delivery of accurate nutrition information to Grand Valley State University students.

Mentor: Steven Nizielski

KIRKHOF CENTER KC65

Accuracy of Online Recipe Analysis Sites

Participants attending from 9:00 a.m. until 10:00 a.m.

Presenter: Amber Spaans

In the last decade, the obesity epidemic has increased the interest of consumers in calculating the nutrient content of their meals. In response, online tools have arisen including a plethora of internet sites offering complete recipe nutrient analyses. The primary aim of this cross-sectional study is to determine the accuracy of web-based sites that calculate recipe nutritional information as compared to the research software, Nutritionist Pro. To complete the analysis, I will identify five web-based sites that offer nutrition data calculators for custom recipes. Ten recipes will be analyzed using each of the selected nutrition calculators. I will then evaluate accuracy by comparing the results with those computed by Nutritionist Pro. The web-based sites will also be scored based upon ease of use, cost, database adequacy, and other support functions.

Mentor: Debbie Lown

KIRKHOF CENTER KC66

A Scientific Periodization for Amateur Triathletes

Participants attending from 9:00 a.m. until 10:00 a.m.

Presenters: Molly Tyler, Hayley Carter

Triathletes need to specifically target activities focusing on power and endurance to perform well in swimming, cycling, and running. Athletes training for triathlons need to follow a protocol that is specific to their bodies and current performance level. The purpose of this presentation was to design a periodization training schedule that focuses on the athlete and combined effects of triathlon events. Limitations may be seen in a triathlete's training regimen because it is often not designed or adapted to the individual's needs. With the use of available scientific research, a specific program can be developed for the individual triathlete's training season. Amateur participants that follow a program with variability specific to their body will benefit from individualized training, while reducing the risk of injury.

Mentor: Amy Crawley

KIRKHOF CENTER KC67

GVSU Ravines: A Field Guide

Participants attending from 10:00 a.m. until 11:00 a.m.

Presenter: Carly Sills

As members of the Grand Valley State University community, we have a bountiful resource at our disposal in the ravines of the Allendale campus that is being under-utilized. This project was designed to cover many aspects of nature relating to the ravines, and result in a finished product consisting of an easy-to-use field guide that is readily accessible to GVSU students and staff. The book includes sections on the common deciduous trees of the ravines, edible plants, wildlife, bushcraft, and the trail

system on campus. The edible plants section includes not only identifying information for some of the abundant wild edibles to be found, but also information for their preparation and consumption. Both the sections on trees and on wildlife include information for identification as well as fun facts, and the bushcraft section includes a wealth of information about how to survive in the wilderness. The trail map section consists of aerial photos displaying the GPS-mapped trails.

Mentor: Eric Snyder

KIRKHOF CENTER KC 68

Periodized Strength and Conditioning Program for a Male Downhill Skier

Participants attending from 11:00 a.m. until 12:00 p.m.

Presenters: Andrew Coates, Ryan Hooker

Downhill (alpine) skiing incorporates high speeds, sharp turns, and the inherent risk of serious injury. The aim of this presentation was to develop a comprehensive year round training program which generates improved performance on the hill using sport specific exercises that closely mimic those movements used in competition. The program incorporated specific tasks into a periodized strength and conditioning plan which increase speed, agility, strength, endurance, and balance. Limitations of this study arise due to the lack of testing and research on skiers in the current literature. This program incorporates metabolic demands, muscle mechanisms, and injury mechanisms all developed to benefit the downhill athlete by improving overall physical performance and injury prevention.

Mentor: Amy Crawley

KIRKHOF CENTER KC 69

A Multi-Temporal Land Cover Change Analysis of Tropical Forest in Haiti (1973-2010)

Participants attending from 9:00 a.m. until 10:00 a.m.

Presenters: Christopher Churches, Andrew Smith

This study aims to provide accurate quantitative data relating to Tropical Forest land cover change in Haiti. Using Landsat imagery and Geographic Information System (GIS) software, we will produce a multi-temporal land-change profile of Tropical Forest for the past 37 years (1973-2010). Because the study extent covers multiple generations of Landsat Satellites, MSS, TM, and ETM+ imagery will be utilized. Maps will be generated using the following steps: 1) layer stacking of images using satellite equivalent bands; 2) mosaicking of scenes for each chosen date; 3) scene normalization of radiance and reflectance; and 4) supervised classification of Tropical Forest areas. The following questions will be examined: What was the total change in Tropical Forest area during the study extent? What regions of Haiti suffered the greatest loss in Tropical Forest area? Is the amount of deforestation measured consistent with previous studies?

Mentors: Wanxiao Sun, Peter Wampler

KIRKHOF CENTER KC 70

Global Climate Change Effects on Agricultural Production in Eastern Asia

Participants attending from 3:00 p.m. until 4:00 p.m..

Presenter: Geoffrey Kenney

The main objective of this study is to investigate the impacts of climate change on agricultural productivity in East Asia. Our study area includes China, Japan, and Korea. Paleoclimatic data and historical climate records are used to gain understanding of how the past climate variability in East Asia

has shaped the present-day climate and environment. The IPCC AR4 reports, agricultural statistics from the Food and Agriculture Organization, temperature and precipitation data, and remote sensing data are analyzed in order to establish impacts of climatic trends on agricultural crops. In addition, climate change scenarios generated with MAGICC SCENGEN 5.2 climate model and several MMD studies are used to generate climate change and agricultural productivity scenarios for this region. The project tests our hypothesis suggesting that the projected temperature increases would result in the decrease of the amount of agricultural production in East Asia.

Mentor: Elena Lioubimtseva

KIRKHOF CENTER KC 71

Investigation of Multidentate CMPO Compounds for Lanthanide and Actinide Chelation

Participants attending from 12:00 p.m. until 1:00 p.m.

Presenters: Michael Peruzzi, Ben Nicholson, Julie Stoscup

The chelation of lanthanides and actinides is of great importance due to the wide variety of applications such as nuclear waste remediation, MRI contrast agents, and chelation therapy. Three individual carbamoylmethyl phosphine oxide (CMPOs) ligands have been shown to be potent bidentate chelating agents in current nuclear waste remediation processes. Our research group's current interest lies in organizing these ligands on a tripodal cap to increase denticity and take advantage of the chelate effect. By derivatizing these tripodal CMPOs, we hope to increase these chelating agent's selectivity and affinity for f-series elements as well as the variety of their applications. Efforts toward the synthesis of these compounds and their metal complexation will be described.

Mentor: Shannon Biros

KIRKHOF CENTER KC 72

GVSU Students in Favor of Altering the Mosquito Genome to Prevent Disease Transmission

Participants attending from 2:00 p.m. until 3:00 p.m.

Presenters: Dustin Kirkendall, Jordan Straight, Blake Andersen, Jeffrey Wagner

Genetic modification of organisms is commonplace in research laboratories around the world; however, these organisms are strictly monitored and housed in research facilities. Within the last decade, scientists have produced a genetically altered species of mosquitoes to reduce the transmission of dengue fever in third-world countries. Several controlled field tests of these altered mosquitoes have already taken place in the Cayman Islands, Malaysia, and Brazil. We randomly surveyed 200 GVSU students to estimate whether or not the general student population would support genetic modification of mosquitoes in an attempt to reduce the spread of West Nile Virus in Michigan. Seventy three percent of respondents indicated support of research involving modification of the mosquito genome to prevent disease transmission in Michigan. Furthermore, our data indicate that seventy seven percent of students with a strong background in science were in favor of the proposed research.

Mentor: Osman Patel

KIRKHOF CENTER KC 73

Monitoring Migrant Songbirds Along the Lake Michigan Coast

Participants attending from 4:00 p.m. until 5:00 p.m.

Presenter: Jonathan Lautenbach

I surveyed migrant songbirds at two recording stations located along coast of Lake Michigan from

August to October. I wanted to know if the migrant birds avoided flying out over Lake Michigan. To do this I compared the number of birds flying over a station located near the shore and a station 3 miles inland from the coast. No difference was found in the number of birds passing between two stations. I also used weather data to see if there was any correlation between the weather and nights when birds were migrating. I found that birds prefer to fly on nights when the wind is from a favorable direction (in the fall this would be northerly winds) and blowing at low velocities. This correlation with wind suggests that birds do not fly on any nights but that they wait for these nights and this could have implications for management of wind farms in the region.

Mentor: Paul Keenlance

KIRKHOF CENTER KC 74

Demographic Patterns of Feather Damage from Chewing Lice in Tree Swallows

Participants attending from 10:00 a.m. until 11:00 a.m.

Presenters: Amber Olson, Patricia Drake

We examined patterns of feather damage caused by chewing lice in Tree Swallows. We counted the number of louse-chewed holes in the feathers of swallows nesting in west Michigan from 1993-2010 and compared the number of holes found in the feathers of breeding second-year (SY) females, after-hatching year (AHY) females, after-second year (ASY) females, and males. ASY-females had significantly fewer holes than any other breeders. For swallows that returned to breed more than three times, the number of holes was consistent. SY- and AHY-females and their mates did not significantly differ in the number of holes. ASY-females had significantly fewer holes than did their mates. For returning breeders, there were no significant correlations between the number of holes and morphology. In contrast, hole number was negatively correlated with mass and right wing length in males. Collectively, these data suggest little association between damage to feathers by chewing lice and Tree Swallow fitness.

Mentors: Patrick Thorpe, Michael Lombardo

KIRKHOF CENTER KC 75

Why Have US-Cuban Relations Not Improved Since The End Of The Cold War?

Participants attending from 1:00 p.m. until 2:00 p.m.

Presenter: Austin Calloway

United States foreign policy has evolved since the end of Cold War era and there are currently formal diplomatic relations between the US and many former Communist States. The modern US stance on Cuba, however, remains almost as stringent and rigid as it was during the height of the Cold War. There are still no formal diplomatic relations between the US and Cuba, and the US embargo against Cuba limits the flow of capital and people between the two nations. This study will be attempt to explain the hardened stance the US has taken on Cuba by analyzing primary government documents and secondary sources through three unique approaches to international relations. A better understanding of what lead to the deterioration of US-Cuban relations and why they have not improved in a number of decades may help lead toward a path of reconciliation.

Mentor: Andrew Schlewitz

KIRKHOF CENTER KC 76

Evaluating the Success of Wetland Mitigation in the Grand Rapids Area

Participants attending from 2:00 p.m. until 3:00 p.m.

Presenter: Jim Neal

Michigan's wetlands were declining at an alarming rate. Thus, the process of wetland mitigation was introduced to offset this loss. From 2003-2006, a series of mitigated wetlands were installed to compensate for the wetlands removed during the construction of the M6 highway south of Grand Rapids. The objective was to analyze whether these man-made wetlands function the same as natural wetlands in terms of ecological function. We collected macroinvertebrate and plant community data in mitigated and natural wetlands as bioindicators of ecosystem function. We applied this data to indices of biological integrity (IBIs) designed specifically for inland, depressional wetlands. Floristic quality analyses yielded varying results. However, the macroinvertebrate IBI scores for the reference wetlands indicated healthier ecosystems than their mitigated counterparts. These results indicate that plants alone may not be enough to accurately illustrate the system's overall biologic condition.

Mentor: James Dunn

KIRKHOF CENTER KC 77

Antibacterial Activity of GV-1 Chemical Derivatives in the Presence of Human Serum

Participants attending from 9:00 a.m. until 10:00 a.m.

Presenters: Christopher Stretton, Nkrumah Grant

Despite advancements in many areas of human medicine, infectious disease continues to be a major cause of mortality worldwide. Improper and excessive use of antibacterial compounds has led to the rise of resistant species of bacteria like Methicillin Resistant *Staphylococcus aureus* (MRSA). We have discovered a new class of antibiotics that inhibit the growth of Gram-positive bacteria. Upon discovery of inhibition against *S. aureus* and other Gram-positive bacteria, MRSA, VRE, and other resistant strains were tested. Inhibition by the newly developed compounds on the resistant strains was identical to their inhibition levels against non-resistant strains of these species. We have continued to synthesize and test chemical derivatives of our lead compound in an effort to increase their effectiveness. Overall, these results demonstrate that our carboxylic amide compounds are a novel, non-penicillin based antibiotic that could be used to treat MRSA and other Gram-positive infections.

Mentor: Rod Morgan

KIRKHOF CENTER KC 78

Analysis of the Role of Phosphatase 2A Components in *Candida albicans* Hyphal Development

Participants attending from 1:00 p.m. until 2:00 p.m.

Presenter: Elizabeth Sommers

Candida albicans has the ability to form hyphae, which is fundamentally linked to the virulence of this organism. Proteomic and microarray analysis revealed the involvement of the genes *Orf19.1468* and *Orf19.7504* in hypha formation. These two *C. albicans* genes are predicted to encode *Cdc55p* and *Rts3p* respectively, which in *Saccharomyces cerevisiae* are two components of the protein phosphatase 2A complex. A *C. albicans* strain lacking *RTS3* shows no increased sensitivity to rapamycin, but is more sensitive to nourseothricin than a wild-type strain. In our modified *tet-NRG1* strain, hypha formation in embedded conditions is strongly impaired when *NRG1* is over-expressed. However, the absence of *RTS3* restores the ability to filament under embedded growth conditions as does the over expression of *CDC55*. However, the response is different than simple oxygen limitation. We are

now further examining the specific contributions of these two proteins to hyphal development in *C. albicans*.

Mentor: Derek Thomas

KIRKHOF CENTER KC 79

Incidental Emotion and Intuitive Feelings of Risk

Participants attending from 10:00 a.m. until 11:00 a.m.

Presenter: Kelsey George

Research indicates that emotions are essential elements of judgment and decision-making, including risk perception. In the health domain, little research has focused on discrete negative or positive emotions. Research has also been focused on integral emotions or those relating specifically to the decision rather than incidental emotions or those that are contextually unrelated. In this study, we examined whether discrete and incidental emotions of fear, anger, happiness, and surprise influenced peoples health-related risk perceptions of cancer. After an emotion induction task, college students completed a set of risk perception measures. Along with traditional risk perception measures, we included a risk perception measure that has been hypothesized to be more effective than traditional measures. In addition to examining the effects of the different emotions on risk perceptions, we examined whether the magnitude of the effects differed depending on the type of risk perception.

Mentor: Amanda Dillard

KIRKHOF CENTER KC 80

A Pro->Ser Mutation Augments Advanced Generation Cephalosporinase Activity in both the OXA-23 and OXA-24 Beta-Lactamase Subfamilies

Participants attending from 12:00 p.m.. until 1:00 p.m.

Presenter: Joshua Mitchell

OXA-23 and OXA-24 are class D beta-lactamases that hydrolyze carbapenem antibiotics, thus threatening our ability to treat infection. Fortunately, cephalosporins remain as viable treatment, as these enzymes do not hydrolyze these drugs efficiently. We investigated the properties and structures of two clinical variants containing the same Pro->Ser mutation (in the OXA-23 and OXA-24 backgrounds). Steady-state kinetic measurements show that both variants have much higher affinities for cefotaxime, ampicillin and ceftazidime, while maintaining strong activity toward carbapenems. X-ray crystallographic analysis of OXA-24 P227S reveals that the mutation causes a deviation in a surface loop, enlarging the active site. Models of ceftazidime bound to the variant suggest that this deviation provides room for the binding of the oxymino side-chain of that drug. These findings warn of emerging class D beta-lactamases that can provide resistance to carbapenems and cephalosporins.

Mentor: David Leonard

KIRKHOF CENTER KC 81

Recycled Paper: More than Meets the Eye

Participants attending from 11:00 a.m. until 12:00 p.m.

Presenters: Erin Harbour, Kristen Wellman

You did your part: you recycled! But did you ever ask what is happening with the paper after it is collected? Presumably it is returned to the paper mill, processed, and placed on the market again as recycled paper. Is that the only option available for treating waste paper? Every year, 45 million tons

of paper is recycled in the United States. This research provides an insight into the afterlife of that recycled paper, and the possibilities that abound when you treat that waste as a resource; a resource that is able to produce materials and compounds essential for life in the 21st century.

Mentor: Dalila Kovacs

KIRKHOF CENTER KC 82

Screening the Effects of Gene Overexpression on Markers of Neural Progenitor Differentiation in the Developing Chick Spinal Cord

Participants attending from 10:00 a.m. until 11:00 a.m.

Presenter: Joshua Lee

An obstacle in stem cell biology is revealing signaling pathways that drive stem cells to mature into differentiated daughter cells or proliferate into more stem cells (self renewal). Some genes that promote self-renewal also promote some forms of cancer. A subpopulation of cells within solid tumors exhibit stem cell-like properties, including resistance to cell death and exhibiting self-renewal. Reviewing published databases of gene expression profiles for glioblastomas and neural stem cells (NSC), we identified the gene ZSCAN21 is shared in both populations. The sufficiency of ZSCAN21 to promote self-renewal can be monitored using in ovo electroporation of the chick embryonic spinal cord. Immunohistochemistry and anatomical analysis is then used to screen for markers in neurons, glia, and progenitor cells. If ZSCAN21 sufficiently promotes self-renewal, overexpression of the gene should elevate markers for progenitor cells, possibly at the expense of markers for differentiated cells.

Mentor: Merritt Taylor

KIRKHOF CENTER KC 83

The X-ray crystal structure of the *Acinetobacter*-Derived Cephalosporinase, ADC-7, at 1.7 Å

Participants attending from 11:00 a.m. until 12:00 p.m.

Presenter: Alexander Porambo

β -Lactam resistance in *Acinetobacter baumannii* presents one of the greatest challenges to contemporary antimicrobial chemotherapy. The *Acinetobacter*-Derived Cephalosporinases (ADCs) are class C β -lactamases found in *A. baumannii* and other *Acinetobacter* species that are responsible for resistance to penicillins, cephalosporins, and β -lactam- β -lactamase inhibitor combinations. In order to probe the mechanism of substrate turnover, as well as to design novel β -lactam antibiotics, it was important to elucidate the protein structure of an ADC enzyme. Here, we report the successful purification, crystallization, and determination of the crystal structure of ADC-7 at 1.7 Å. This complete structure allows for the critical comparison of the overall structure and active site architecture of ADC-7 with the known cephalosporinase, AmpC. Hopefully, our work will contribute to the development of a structure/function relationship for ADC-7 that will provide insight into bacterial antibiotic resistance.

Mentor: Brad Wallar

KIRKHOF CENTER KC 84

Social Work 348: Professional Development Survey and Analysis

Participants attending from 2:00 p.m. until 3:00 p.m.

Presenters: Duncan Vos, Jared Danbert, Jordan Radvansky

The professional use of self is an essential component of social work education and it has traditionally been taught in the field education setting. The course SW 348: Professional Development in Social

Work Practice was developed to explore the effectiveness of teaching these skills in a classroom setting. In the Fall 2012 semester, the 123 BSW students who completed this course took a survey that asked them to rate their perceived level of professional skills prior to taking the course and their perceived level of professional skills upon completion of the course. The data gathered from this study examines students' responses and discusses the effectiveness of teaching professional use of self in a classroom setting.

Mentors: Shelley Schuurman, Sango Otieno

Oral Presentations, Abstracts & Schedule

BEGINNING AT 9:00 AM

KIRKHOF CENTER 1142

Examining Recreation Trends on the Scenic Pine River, Michigan

Presenter: Nicholas Barlow

The Pine River, located in Manistee County, Michigan, is classified as a National Scenic River and is under the jurisdiction of the Huron-Manistee National Forest Service. The river supports quality opportunities for recreation in a relatively undeveloped, primitive setting. This study will examine river usage rates and the locations of river entry and exit points by analyzing data from the watercraft permits that are required during the summer months. Permit data will also be entered into a spatial database for analysis using ArcGIS software to determine user demographics. I expect to find that over time more permits have been issued which could imply crowding and possible resource degradation. The results will aid the Forest Service in future resource allocation and guide future revisions to the Pine River Management Plan. Through careful management, current and future generations will benefit from the unique characteristics of the Pine River.

Mentor: C. "Griff" Griffin

KIRKHOF CENTER 2201

The Story-Truth of Robert Olen Butler's A Good Scent from a Strange Mountain

Presenter: Michelle Shea

Robert Olen Butler is a Contemporary American author. As such, his novel A Good Scent from a Strange Mountain is a work of fiction that explores the subjective truth in story-telling. Using Tim O'Brien's idea of happening-truth versus story-truth, Brien's Pulitzer Prize winning novel will be explored further.

Mentor: Dr. D. Ihrman

KIRKHOF CENTER 2259

The Impact of Higher Education on Attitudes Toward Sexual Orientation and Gender Identity

Presenter: Mary Spalding

This presentation investigates the impact of higher education on attitudes toward sexual orientation and gender identity. The tools utilized for research include an impartial investigation of evidence, systemic analysis of assumptions, formulation of a hypothesis, synthesis of view-points, and arrival at a conclusion related to outcomes, consequences and implications. The research process for the literature review led to the discovery of how few articles are available with the broad search term of sexual orientation. Thus, the focus was narrowed to homosexuality in the comparison of findings as literature was reviewed. This presentation also includes an anecdotal overview of four key persons who deal directly with the Grand Valley State University (GVSU) lesbian, gay, bi-sexual, transgender and queer (LGBTQ) issues on campus along with the former Mayor of East Grand Rapids who is also a staff member at GVSU. This overview will include their thoughts on the hypothesis statement.

Mentor: Milt Ford

KIRKHOF CENTER 2263

Building Resiliency in Youth at Risk as a Means to Reduce Juvenile Incarceration

Presenter: Molly Johnston

Resiliency is the ability to bounce back or cope in the face of adversity. Youth are identified to be at-risk if they are living in or dealing with an adverse condition, thus youth can be at risk because of any number of things. Statistics indicate that of the 2 million youth who have an incarcerated parent or parents, 70 percent will end up in the corrections system as well. This study examines youth who have a parent or parents incarcerated and how therapeutic recreation programming can provide the protective factors that build resiliency so these youth do not become part of the corrections system themselves.

Mentor: Teresa Beck

BEGINNING AT 9:30 A.M.

KIRKHOF CENTER 1142

Wild Turkey Management Plan

Presenter: Emma Vanacker

Natural Habitat for wild turkey (*Meleagris gallopavo*) is being significantly reduced due to the land being dedicated to agricultural. A 313 acre property, in northern Isabella County, MI, used for agricultural purposes for the last 35 years was examined. The property consist of a large pond surrounded by hardwood forest, lowland swamp, another small woodlot of Oaks and Maples, and agricultural fields of corn, soy beans, wheat, rye and alfalfa hay. The property is bordered on two sides by dirt roads, a rail road track that splits the property into two sections and an adjacent farm to the north, which can affect the movement of the turkey population. I expect to find that the property will be able to hold a substantial population of wild turkey once the management plan is created and a more proper habitat structure is reintroduced. Field data will be collected to determine where the transitions between landscapes are and will create maps that represent the best habitat.

Mentor: C. "Griff" Griffin

KIRKHOF CENTER 2215

Dangerous Writing: The Death of Fear

Presenter: Jason Michalek

In American literature, ideas of genre and the Novel draw into question the direction of literary construction. With electronic texts eliminating the tangibility of paper in the ideas of authors, and the prevalence of textual struggle to portray a post-generic world, the next movement must inevitably face the readers that will keep it alive. Though text has evolved from oral traditions of storytelling, literature must respond to movements of the past. Through works by Amy Hempel and Chuck Palahniuk, and Tom Spanbauer's methods of writing instruction, a new movement reveals the philosophy behind a growing, generic trend. Dangerous Writing reveals the most critical element of reading: the emotions of the reader. In a sensual appeal, the genre addresses the duality of reader's thoughts and feelings. By deconstructing the elements in several works by authors of this movement, a new access to the Novel's readerly appeal is discovered in response to American literary Post-Modernism.

Mentor: Dr. D. Ihrman

KIRKHOF CENTER 2263

Snoezelen: Does Research Support its Effectiveness?

Presenters: Katey Ramthun, Michelle Polanic, Jennifer Van Ryn

Snoezelen, a multi-sensory stimulation method which originated in the Netherlands, has become a commonly used intervention in the United States over the last 15 years. A multi-sensory environment is an environment designed to stimulate the senses through light, sound, touch and smell. Its use has been in multiple settings within health care and education and with different disability groups to manage maladaptive behaviors, promote mood, and increase communication. This study will examine the research that supports therapeutic outcomes of Snoezelen used with older adults with dementia and persons diagnosed with autism.

Mentor: Teresa Beck

KIRKHOF CENTER 2266

Small Group Theory and the Bush Administration's Decision to Invade Iraq (2003)

Presenter: James Manser

On March 19th, 2003 George W. Bush, 43rd President of the United States of America invaded the sovereign nation of Iraq. I seek not to examine the military operation to overthrow the regime of Saddam Hussein, nor will I examine the U.S. occupation of Iraq. Instead, I will analyze the decision making process of the Bush administration to invade Iraq from September 12th 2001 to March 19th 2003. The existing scholarship on this topic tends to focus on the individual and unit level of analysis. I will instead focus on the small group level of analysis, applying theories of groupthink and newgroup syndrometo help dissect the decision making process of President Bush, his closest advisors, and cabinet members. The purpose of this case study is to examine the aforementioned decision by the Bush administration upon the eve of its tenth anniversary, in the hope that current policy makers will recognize the implications of groupthink and newgroup syndrome.

Mentor: Thomas Walker

BEGINNING AT 10:00 A.M.

KIRKHOF CENTER 1142

Management Plan for a Restoration of a Scotch Pine and Hardwood Forest

Presenter: Jacob Kreuzer

The purpose of this project is to create a restoration and management plan for a scotch pine and old hardwood forest in Ottawa County, Michigan. The main goal for the project is to restore the pine forest to a native hardwood forest and control invasive plant growth in the current hardwood forest. Identifying soil types and vegetation composition using the United States Web Soil Survey and Michigan Natural Features Inventory will form the basis of research. I will sample plots, randomly selected for tree, shrub, and sapling identification and create an adequate planting list. I will develop a 20 year restoration plan, starting with an initial selective culling and girdling to promote long term decay, followed by seeding of native plants and biannual monitoring to allow for adaptive management. Multifloral rose control will be done through stem cutting and herbicide application.

Mentor: C. "Griff" Griffin

KIRKHOF CENTER 2201

The Young Lords in Lincoln Park

Presenter: José Jiménez

Throughout the 1950s and 1960s, urban renewal programs forcibly displaced thousands of families from their homes. Chicago's Lincoln Park neighborhood was no exception. Where thriving church congregations, social and political clubs, and family residences once flourished, successive waves of urban renewal and gentrification forcibly displaced most of the Puerto Ricans, Mexicanos, other Latinos, working-class and impoverished families, and their children who had made this place their home. Founded by Mr. José "Cha-Cha" Jiménez in 1968, the Young Lords Organization became one of the premier organizations advocating for international human rights. Much of the work of these organizations remains untold and uncollected. Focusing on the "Young Lords in Lincoln Park" project, this paper explores the hidden stories and contested truthssurrounding the politics of solidarity and self-determination by Latino, African-American, and poor communities in Chicago in the 1960s-1980s and beyond.

Mentor: Melanie Shell-Weiss

KIRKHOF CENTER 2215

Modern Faces: A Glimpse Into the Poetry of Ezra Pound

Presenter: Chelsea Enzweiler

My presentation will be focused on Ezra Pound's two line poem "In a Station of the Metro". I will explore the form of his short poem in addition to the connections readers can make to their own modern lives through this modern poem. "In a Station of the Metro" addresses the experience of being one face amongst a sea of faces in the increasingly modern world. In my presentation, I will explore the symbolism of Pound's poem and the aspects that connect to daily life in 2013, one hundred years after the poem was written.

Mentor: Dr. D. Ihrman

KIRKHOF CENTER 2216

The Ruhr Occupation: An Examination and Assessment of Power

Presenter: Lizzie Heyboer

In January 1923, the French and Belgian armies occupied the Ruhr region in Germany attempting to regain reparations payments from the Germans. While militarily weak, the Germans responded with non-violent resistance and civil disobedience resulting in French withdrawal. Through an in-depth case study of the 1923 Ruhr Occupation expressions of power and the effectiveness of these expressions will be examined. Particular attention will be given to examining the power expressed by the invading forces and the German resistance effort. Furthermore, the role of soft power in the conflict, German passive resistance to the occupation and the role of unions and separatist movements will all be looked at in detail. The implications of this event on world politics as a whole will be examined as well as what lessons can be learned from the occupation.

Mentor: Thomas Walker

KIRKHOF CENTER 2259

Faster-than-light Advancement into Cerenkov Luminescence Imaging

Presenter: Michael Dykstra

Purpose: Cerenkov radiation (CR) is the visible light emission that occurs when a charged particle, such as a β^+ or β^- , exceeds the speed of light in a medium. CR can be detected by an optical imager with appropriate sensitivity. This study is to develop standard protocols for testing the feasibility of optical imagers for Cerenkov Luminescence Imaging (CLI), and then to utilize the protocols to assess if the AMI-1000 is an appropriate device for CLI. Methods: Two positron emitters (^{18}F , ^{64}Cu) were used to investigate the quality of the AMI-1000. Studies included linearity between radiance and radioactivity, spectrum, signal homogeneity across a source of uniform intensity, spatial resolution, and the *in vivo* and *in vitro* correlation between CLI and Positron Emission Tomography (PET). Results: A protocol for testing optical imagers for CLI was successfully developed. Our results in each of these areas demonstrate that the AMI-1000 is a viable optical imager for CLI.

Mentor: Anthony Chang

KIRKHOF CENTER 2263

Community Reintegration of Veterans with Physical Disabilities

Presenters: Stacey Lemieux, Erica Roberts, Kristen Pyles

As of May 2010, over 31,800 U.S. service members have been wounded in Operation Iraqi Freedom (OIF) and Operation Enduring Freedom (OEF). Although the survival rate for service members injured in recent conflicts far exceeds that of previous conflicts, the increase in the number of soldiers surviving is also associated with an increased rate of veterans with severe injuries which include head injuries, burns, and extensive injuries to the limbs caused by improvised explosive devices. This session will explore how community reintegration can be an effective intervention to aid in transitioning and adjusting to civilian life with a physical disability.

Mentor: Teresa Beck

KIRKHOF CENTER 2266

Michigan Sand Prairie Restoration-Est. 2009: Seeding Rates and Plant Community Development

Presenter: Laurel Scholten

The historical oak-pine barren ecosystems of Michigan utilize sand prairie as a primary component. Nearly eliminated across the state, sand prairies restoration efforts have been few. Established in 2009 in the Manistee National Forest, this sand prairie restoration experiment aims to develop and determine practical methods for ecosystem restoration. Specifically, we seek to examine plant community restoration and the influence of variable seeding rates of native plant functional groups (graminoids, early season forbs, late season forbs and legumes). With collected data from 2010, 2011 and 2012 we investigate seeding rate impact on productivity, biodiversity, native and non-native species cover and determine ecologically beneficial and efficient approaches to plant community restoration.

Mentor: Todd Aschenbach

KIRKHOF CENTER 2270

Emerging Treatments in Alzheimer's Disease

Presenter: Abigail Harrelson

Alzheimer's disease is a neurodegenerative disease common in the elderly. Some of the symptoms associated with the disease are deterioration of cognitive functions and loss of memory. These result in lowered ability to perform daily functions. For late-stage patients increased symptoms of dementia, including confusion, personality and speech changes, and eventually an almost vegetative state. It is estimated that in 2050 there will be over 16 million people living with Alzheimers. Due to the large number of people that will be reaching the elderly stage (over 65) in the next few decades, it is important to find an efficient treatment for this disease, since the current therapies do little to help. This presentation will look at emerging treatments in AD. First, it will give background on the disease, its pathology and current treatments. Newer therapies that may open up new treatment pathways will then be the focus.

Mentor: Sheldon Kopperl

BEGINNING AT 10:30 A.M.

KIRKHOF CENTER 1142

Habitat Prediction for Graham's Columbine, a Plant Species Endemic to Uintah County, Utah

Presenter: Katherine Beck

Geobotany describes the relationships of soil, bedrock, and groundwater to plant species occurrence. For exploration geologists, geobotany can be a useful tool to map substrata rich in economically desirable elements and minerals. Geobotany can also be a valuable resource in delineating and predicting habitat for species whose populations are in jeopardy. Graham's columbine (*Aquilegia grahamii*) is endemic to an oil-bearing shale member of the Green River Formation within Uintah County, Utah. Increasing threats of oil development within the Formation and its present listing of critically imperiled make conservation efforts necessary to increase the range of this species. I will map additional suitable habitat for Graham's columbine along outcrops of oil-bearing shale of the Formation in Utah, Colorado, and Wyoming. I expect to find habitat outside Uintah County that would be sufficient for the expansion of Graham's columbine, which would aid in future management of this species.

Mentor: C. "Griff" Griffin

KIRKHOF CENTER 2201

Climate Change and Metapopulation Implications for Species Re/introductions: An Analysis of the American Marten (*Martes americana*) in northern Michigan

Presenter: Josh Green

The American marten (*Martes americana*), utilizes old growth coniferous forests, a habitat containing high levels of coarse woody debris and snags. Extirpated from Michigan in 1911 due to logging, the marten continues to have cultural significance as a clan animal to Native Americans and ecological significance as an indicator of forest health. The Michigan Department of Natural Resources (MDNR) reintroduced the marten into two state forests in the Lower Peninsula during 1984-85. Sleeping Bear Dunes National Lakeshore is now considering reintroducing the American marten. The impact of habitat fragmentation and climate change at the meta-population level must be examined in order to determine the effectiveness of reintroduction and ideal locations for reintroduction. This study will test an existing habitat model and incorporate a climate change prediction for tree species from the United States Forest Service to determine future habitat suitability for marten in northern Michigan.

Mentors: Shaily Menon, Paul Keenlance, Gary Greer

KIRKHOF CENTER 2215

Fighting Fires in Siberia

Presenter: Beth Bjorkman

With a limited number of fire brigades, trucks, and planes and the seemingly limitless area of Siberia to protect, we strive to find the optimal placement of fire-fighting resources. We attempt to minimize the costs of fires, including property damages and eradicating the fires. Operations research, spherical geometry, probability, and coding in Python are key components of determining our solution. This is a project that Smokey the Bear would be proud of!

Mentor: Edward Aboufadel

KIRKHOF CENTER 2216

A Global Perspective on Gender and Sexuality

Presenter: Matthew Harvey

"A Global Perspective on Gender and Sexuality" is an oral presentation designed to explore the origins of modern stereotypical gender and sexual norms, examine how various cultures embody these norms using country/region level case-studies, and to identify the source of societal conflicts regarding gender and sexuality. Through a review of existing scholarly research, it is possible to examine the contentious social debates surrounding gender and sexuality from a global perspective, and why nation-states adopt different political stances on these issues. Religion, globalization, and pop culture have a significant impact on the development of gender and sexual norms around the globe, and by gaining a better understanding of these issues, we can hopefully move towards a future of social equality for women and members of the LGBT community around the world.

Mentor: Gordon Alderink

KIRKHOF CENTER 2259
Regional Extinction Risks of the Eastern Pipistrelle Bat
 Presenter: Alynn Martin

Recent conservation concerns have surfaced for migratory and hibernating bat species in North America. White-nose syndrome (WNS) has resulted in regional population declines in hibernating bat species. Eastern *pipistrelles*, *Perimyotis subflavus*, have experienced mortality rates of 85%. In addition to WNS declines, *P. subflavus* is one of the four migratory bat species predominately affected by wind turbines, accounting for about 25% of turbine mortalities within its geographic range. If *P. subflavus* populations are to remain viable, they must survive both of these conservation threats. Here, we address the following questions: What are the population-specific extirpation risks from WNS and turbine mortality? What rates of decline from WNS and turbines can *P. subflavus* populations sustain? Using genetic data to parameterize migration rates and effective population sizes, we present a range of risk scenarios designed to investigate the limits of population viability in *P. subflavus*.
 Mentor: Amy Russell

KIRKHOF CENTER 2263
Empirical Support for the Effectiveness of Reality Orientation
 Presenters: Valerie Jordan, Loren Duemler, Taylor Johnson

Reality Orientation (RO) is a program to assist persons who are confused in knowing who they are, where they are, why they are there, and when it is. Its aim is to reduce confusion and inappropriate behaviors in persons with dementia. This study will examine the research in terms of empirical evidence of short term and long term outcomes of RO, format of providing RO, and its application to therapeutic recreation.
 Mentor: Teresa Beck

KIRKHOF CENTER 2266
How One Bacterium can Affect the World, in Past and Present: A Review of Yersinia Pestis.
 Presenter: Katherine Olson

The bubonic plague devastated parts of Europe multiple times throughout the Middle Ages, though none so drastically as the Black Death. The Black Death, caused by the bacterium *Yersinia pestis*, took the lives of well over one-third of the population of Europe. The chaos of mass infection and velocity at which it spread changed the European population and how it viewed their society and its practices. This review of the Black Death highlights specific changes in medicine, economics, religion and various cultural aspects of Europe as a result of the Black Death. Furthermore this presentation will address the current issues and concerns surrounding the plague and the possibility of future pandemics.
 Mentor: Sheldon Kopperl

KIRKHOF CENTER 2270
Creative Thinking in Students with Special Needs in an Art Environment
 Presenters: Emily Wolthuis, Kelsey Best, Jaclyn Kwiatkowski

Grand Valley State University Art Education students prepared and taught studio art projects to visiting special needs students of age from 16 to 22 years old. The Fall 2012 project focused on

art-making within the confines of Outer Space. Students created a backdrop of the night sky, and a 3-D planet with a surface environment. Knowledge and research skills were applied through a) preparation of the project, b) problem solving emerging ideas or/and technical challenges, c) inventing new communication strategies, d) collaboration with special needs students. From reflective writing and visual documentation the presentation will share findings of how this non-traditional teaching practice can be applied in a K-8 classroom. It advocates for the power of art and art-making in the development of a student with special needs.

Mentor: Katalin Zaszlavik

BEGINNING AT 11:00 A.M.

KIRKHOF CENTER 1142

The Future of Lake Michigan Charter Fishing Industries

Presenter: Crystal Moenaert

Invasive species create multiple issues within an ecosystem. Disruption of food webs, degradation of habitats, and lower species diversity are just a few examples. The presence of Quagga and Zebra mussels, both invasive species, has contributed to a shift in bottom lake productivity in Lake Michigan. Because of this shift, the important predator-prey relationship between alewife (*Alosa pseudoharengus*) and Chinook salmon (*Oncorhynchus tshawytscha*) has been jeopardized. Alewife is another non-native species; however stable populations of this prey fish are crucial to supporting sustainable harvests of stocked and natural populations of Chinook salmon. The future success of a multi-million dollar sport fishery that has evolved from this predator-prey relationship is now threatened. A literature review of the Lake Michigan ecosystem will help to determine options for the future of charter fishing industries in Lake Michigan.

Mentor: C. "Griff" Griffin

KIRKHOF CENTER 2201

A Comparative National Analysis of Human Rights Conditions

Presenter: Leah Sarnicola

This presentation attempts to answer the question: What factors contribute to current human rights conditions in nation-states? My research analyzes the impact of multiple factors on contemporary human rights conditions around the world. This question is significant and relevant in the 21st century. Although science and technology have greatly improved the living conditions for many, others suffer flagrant human rights abuses every day, even in countries that have signed international human rights treaties. The data for this presentation will come from secondary scholarly sources and the databases of nongovernmental organizations, which I will use to generate an original quantitative analysis of the factors that correlate with human rights conditions. Independent variables such as the literacy rate, economic growth rate, life expectancy, and poverty will be examined.

Mentor: John Constantelos

KIRKHOF CENTER 2215

Group Influences on Inhibition in Decision-Making Contexts

Presenter: Trevor Spoelma

It is recognized that group membership can make people feel safer. If people feel safer in groups, they should be less worried and concerned with negative outcomes. So compared to lone individuals,

group members should feel less need to be inhibited. Thus, we predict groups will be more impulsive, risky, greedy, and less ethical when making decisions. To test this, participants are asked to navigate a moral dilemma either alone or as a dyad. We predict the safety provided by group consensus will lead dyads to choose more often what is recognized as the less ethical action. Participants are also asked to complete a negotiation task, balancing desires to gain rewards with risks of presenting an unfair offer. We predict anonymity will lead group members to be less concerned with how they are perceived, and will present greedier offers. Results will contribute to further understanding how group dynamics can influence psychological processes when making decisions that impact others.

Mentor: Ernest Park

KIRKHOF CENTER 2216

Re-Imagining the Art in the Honors College

Presenter: Riley O'Brien

The physical environment affects how a person thinks; it tells a story; and it creates a mood. On a college campus the physical environment, including the art on the walls, should actively engage students and faculty and inspire fresh ideas and perspectives. A strong narrative linking visual experience with student and faculty values and goals is an important element in this process. My project illustrates one way such a narrative could be developed. I explored how students and faculty in the Honors College respond to their space, and how the art displayed in the building might best reflect and inspire their understanding of what it means to be a member of a community such as the Honors College. My work involved interviewing students, faculty, and staff; cataloguing the art currently on display in the College; and working with the GVSU Art Gallery Collection to create a proposal that re-imagines, as a thought experiment, new possibilities for active engagement with the space.

Mentor: Melissa Morison

KIRKHOF CENTER 2259

Education and Legislation: Female Political Empowerment and the National Consumers League in the Early Progressive Era

Presenter: Scott St. Louis

This presentation will examine the National Consumers League as it empowered women, especially those of higher socioeconomic status, during the first decade of the twentieth century and much of the preceding decade (when several local leagues were established before forming a National League in 1898). These local leagues published lists of retailers that met basic standards for the treatment of employees, especially women and children. The National Consumers League then launched a similar campaign, creating requirements that garment manufacturers had to meet to use the White Label on their products. Not much later, the National League provided its (mostly female) membership with direct opportunities for political participation, including lobbying and preparing arguments for court cases such as *Muller v. Oregon* (1908). These women were surprisingly successful in achieving their goals, considering that they were involved before they could even vote everywhere in the United States.

Mentor: Paul Murphy

KIRKHOF CENTER 2263

INTERNATIONALIZATION OF THERAPEUTIC RECREATION

Presenters: Kendall Wright, Charleen Stempek, Shaina Faber

The profession of therapeutic recreation (TR) has traditionally been a phenomenon just in the United States. In the past 15 years, there have been attempts to develop this profession in other countries. This study will examine two countries, Canada and New Zealand, in terms of the educational preparation for the profession of TR, their attitudes towards and value placed on people with disabilities, and their acceptance of TR as a profession to understand why Therapeutic Recreation is exploding in Canada, but not in New Zealand.

Mentor: Teresa Beck

KIRKHOF CENTER 2266

Mathematical Analysis of Mini-Golf

Presenter: Hannah Anderson

The game of mini-golf raises some interesting mathematical questions. For example, are there any greens in which it is impossible to putt a hole-in-one? Does this fact change when the boundary is required to be a polygon? Are there any greens for which, no matter where the tee is placed, there is some hole placement that makes a hole-in-one impossible? This talk will explore such questions, taking a new look at this familiar game.

Mentor: Jonathan Hodge

KIRKHOF CENTER 2270

Rapid Macroinvertebrate Colonization in a Chronosequence of Constructed Stormwater Retention Wetlands

Presenter: Jessica Franks

Constructing wetlands is a vital tool for increasing the number & extent of wetlands in the U.S., but their ecological effectiveness is variable. Our objective was to evaluate wetlands constructed in 2009 & 2011 to reduce erosion from stormwater runoff & compare them to wetlands constructed in mid-1980. Aquatic macroinvertebrates were sampled throughout May 2012, following rapid bioassessment protocols used by the State of Michigan, while water chemistry parameters were measured bi-weekly throughout the summer. The macroinvertebrate Family richness & diversity were significantly different (p

Mentor: Eric Snyder

BEGINNING AT 11:30 A.M.

KIRKHOF CENTER 1142

Wood Duck Nesting Box Placement at Grand Valley in Allendale, Michigan

Presenter: Rebecca Andrews

In 2009, seven wood duck boxes were placed in the Ravines on the Grand Valley State University property. An additional six boxes are available for placement. Through spatial analysis the most suitable locations for new box placement will be determined. Random tree plots will be established for sampling the number of mature oak trees. The approximate height, size and orientation of any tree cavities found will be recorded. Ideal loafing areas will be based on slow moving, pool forming portions

of the river. The current nesting box locations, plots with high densities of oak trees, cavity trees, and ideal loafing sites will be marked with a GPS and made into shapefiles. Distances will be calculated from ideal loafing sites, oak trees, and natural cavity trees. The ideal location will be away from natural cavities, close to loafing sites and oak tree plots. I expect to find that the ravines lack ample tree cavities, but have prevalent loafing sites and food sources for wood ducks.

Mentor: C. "Griff" Griffin

KIRKHOF CENTER 2201

History of Emotional and Physical Abuse and Parenting

Presenter: Mayra Sanchez Gonzalez

Childhood abuse is a social problem that is associated with many negative outcomes later in life such as an increased risk for suicide attempts, depression, and problems with communication skills. Because physical and emotional abuse are significantly correlated, it is often difficult to determine the impact of the physical versus emotional aspects of the maltreatment. This study explores the extent to which both physical and emotional abuse are associated with parenting attitudes, disciplinary choices, and risk for later abusive parenting. Additionally, this study examines the extent to which deficits in parental empathy that result from abuse may lead to parenting practices that place parents at risk for later abuse perpetration.

Mentor: Mary Russa

KIRKHOF CENTER 2215

Shakespearean Wordplay and the Art of Persuasion: An Analysis of Rhetoric in Act IV, Scene IV of Richard III

Presenter: Joseph Hogan

In the Modern era, an intense reverence for William Shakespeare and his works--a condition sometimes called "Bardolatry"--pervades the academic realm, from high school classrooms to universities. As it manifests itself in the public, an aspect of this condition seems to be an appreciation for and a keen interest in the ways in which Shakespeare manipulates language to the benefit of his characters and his themes. In this essay, I examine that element of the Bard's work in microcosm. Focusing on Act IV, Scene IV of Richard III, I attempt to bring to light the subtleties and nuances of Shakespearean rhetoric and wordplay by examining an argument between King Richard and Queen Elizabeth. Tracking the argument to its end, I aim to explicate how each character uses certain rhetorical devices to gain the upper hand--devices that are, needless to say, thoroughly Shakespearean.

Mentor: Dr. D. Ihrman

KIRKHOF CENTER 2216

Horror Films and Misogyny as a Critique of Western Hegemonic Patriarchy: Lars von Trier

Presenter: Carly Dubiel

Lars von Trier's *Antichrist* is a symbolic descent into insanity that includes violent events and prolific allusions that make it the ideal horror film to be analyzed as emblematic of the genre. Most unsettling about the film is not its gore but the disturbing implications it makes about the human psyche and how it is controlled by hegemonic patriarchy. The given consent that is necessary to hegemony can be traced to the tales of Christian and Jewish tradition. It is what ruled the minds of the people who participate in patriarchy and the mistreatment of women globally. This film's portrayal of She displays

the patriarchal trends in Western civilization and has been labeled as a misogynistic work. Ideas from Gramsci and Nietzsche are important to the central thesis of dissecting *Antichrist* as a testament to the patriarchal trend in horror films. However, the ultimate question perhaps is the purpose of creating a film of this nature. Is this film *art* for provoking these thoughts?

Mentor: Justin Pettibone

KIRKHOF CENTER 2259

The Fixed Points of the Columnar Transposition Cipher

Presenter: Beth Bjorkman

Encrypting a message scrambles it so that it is unreadable to outsiders. A columnar transposition cipher encrypts a message by writing the plaintext across a specific number of columns. Then, one reads down the columns to find the encrypted message. This project investigates the occurrence of characters that do not move when encrypted, and finds a constant time algorithm to determine these characters. We are also interested in maximizing the number of times that a message must be re-encrypted in order for the original text to be found. We look at how the number of columns and length of message affect both of these phenomena.

Mentor: Robert Talbert

KIRKHOF CENTER 2263

Effectiveness of Yoga as a Therapeutic Intervention

Presenters: Brittany Litchfield, Chelsea Gawel

Over the past century, Yoga has become increasingly popular in the United States. Today's yoga goes beyond that of meditation; it encompasses multiple practices which include physical exercise, breath regulation and meditation. It is a practice that promotes the connection of the mind and body and promotes physical, emotional, and psychological health. This study will examine, in a therapeutic recreation setting, the effectiveness of yoga practices with individuals who have had a stroke. Functional outcomes that are explored include balance, mobility, depression and quality of life.

Mentor: Teresa Beck

KIRKHOF CENTER 2266

The Art of the Vote; Analyzing Roll-Call Votes in Congress

Presenter: Zachariah Green

Our government today has a multitude of issues. Problems arising with our government appear to be systemically tied to Congress. It seems to have failed to contribute continued progress and growth to our nation. Determining where these problems exist, and even more importantly how to remedy them in a way that gives us better Congressional representatives, is the goal of this project. Factors that influence roll call voting decisions are the central focus to this study and include: Congressional monetary ties, interest group knowledge, the Presidential and Judiciary influences, legislative importance and Congressional power aspirations, the ethical background of Congressional members, and constituent influences. All of these issues are going to be examined through statistical studies and actual interviews with those in Congressional positions. This way Congressional operations can be analyzed in a more in-depth way, which is vital to actually fix the issues plaguing our Congress today.

Mentor: Norman Kravitz

KIRKHOF CENTER 2270
Silbo Gomero and Whistled Languages
 Presenter: Chris Vanderlip

There are more than thirty whistled languages in the world. These languages often arise in rugged areas where the landscape makes communication both difficult and necessary. In Gomera, an island in the Canaries, the most studied of these languages still survives despite the threat of extinction. It not only survives, but in fact it is thriving, due in part to UNESCO's designation of it as a masterpiece of Intangible Cultural Heritage (ICH), and the work of the government of the Canaries. These whistled languages are being made obsolete with the increasing development of mobile communication and the loss of rural lifestyles, but they are worth preserving: their study has much to teach us about our species' cultural development and our language. This paper represents an inquiry into the history, phonetics and perception of this phenomenon.
 Mentor: Keith Watts

BEGINNING AT 12:00 P.M.

KIRKHOF CENTER 1142
A Forest Management Plan for Ruffed Grouse in Northern Michigan
 Presenter: Connor Wojtowicz

Ruffed grouse are medium-sized birds that predominately live on the ground foraging for berries, seeds, and insects. While often hunted for sport, they are also valued for their physical features and unique non-vocal courtship displays. I will develop a forest management plan for a privately owned site in northern Michigan, measuring DBHs of aspen and evaluating site suitability for ruffed grouse habitat based on understory density, forest stand type, and tree age distribution. While ruffed grouse have been observed on the property, current densities of red pine and undesirable aspen ages make further populating unlikely. Management of the site will be necessary if higher numbers of ruffed grouse are desired. Any data collected from this study will be utilized by the site owners and disseminated when appropriate.
 Mentor: C. "Griff" Griffin

KIRKHOF CENTER 2216
Orators and Empire: Aper's First Speech in Tacitus' *Dialogus De Oratoribus*
 Presenter: Joshua Arnold

Tacitus' *Dialogus de Oratoribus* is a literary reflection upon the rewards and the perils of practicing high-profile forensic rhetoric under the gaze of the emperor at Rome during the second half of the first century CE. One of the interlocutors in the dialogue, Marcus Aper, delivers a speech (Dial. 5-10) espousing the conventional wisdom of his day, that to be an orator is to exercise power and to practice a discipline "richer in advantages" than any other (*ad utilitatem fructuosius*, 5.3). Yet in the larger context of the work and its dramatic setting, Tacitus undermines these sentiments. His Aper, in this speech especially, unwittingly and ironically exemplifies how political realities under an imperial autocracy have degraded oratory as a vocation and a profession. Far from setting up Aper as a straw man, however, Tacitus permits him to make a compelling case, and in so doing offers a demonstration of his own rhetorical skill and versatility.
 Mentor: Charles Pazdernik

KIRKHOF CENTER 2263

Making a Case for Therapeutic Recreation in Special Education

Presenters: Renee Van Y, Stefanie Beaver, Victoria Belcher

The Individual with Disabilities Education Act (IDEA) identifies Therapeutic Recreation (TR) as a "related service" as opposed to a "mandated service." Due to the impact the economy has had on educational funding, providing TR services might be seen as "an extra expense" or "non-essential" to an already tight budget. The bigger question is whether society can afford not to address the social stigma and quality-of-life issues often experienced by persons with disabilities throughout their lifetimes without such services. This study will examine the benefits and outcomes associated with the provision of therapeutic recreation services to students in special education.

Mentor: Teresa Beck

KIRKHOF CENTER 2270

Graph Coloring Algorithm Using CUDA

Presenter: Zach Burnside

Graphs are mathematical entities that can be used to model many real life systems. Graphs consist of nodes (circles) and edges that join those nodes. A classical problem in graph theory is the coloring problem. Given a particular graph, what is the minimum number of colors that are required to color the nodes of the graph if we do not want two nodes that are connected to have the same color? This problem is very difficult (time consuming) to solve. An exact algorithm to solve this problem using Graphical Processing Units (GPUs) will be described. The algorithm will work for small graphs. Performance results for some well-known graphs will be presented.

Mentor: Christian Trefftz

BEGINNING AT 12:30 P.M.

KIRKHOF CENTER 1142

Utilizing Solid Phase Peptide Synthesis Strategies to Produce Peptide Chains for Focal Adhesion Kinase (FAK)

Presenter: Kayla Hurd

The development of anti-cancer drugs is on the rise all around the world. Research is geared at stopping the spread of cancer cells within the body. An enzyme called focal adhesion kinase (FAK) is a non-receptor protein tyrosine kinase located within cells. FAK is designed to help the growth of cells but sometimes things go awry and cell growth can become uncontrolled. The theory that enhanced FAK signaling leads to the growth of cancer cells puts FAK as a target for anti-cancer drug development. The goal of this research is to develop peptide substrates for FAK using solid phase peptide synthesis. Hopefully, the substrates will be specific for FAK and bind efficiently. Once developed, the substrates will be converted to inhibitors, becoming potential anti-cancer therapies. Two peptide chains have been developed and consist of the following amino acid residues: IAYDELKKK and IDYVEWKKK. The synthesis of the two peptides and the FAK assays that will be performed is presented here.

Mentor: Laurie Witucki

KIRKHOF CENTER 2201

The Enumeration of Left Ascending Binary Trees

Presenter: Connor Scholten

We will introduce and define a graph theory structure called left ascending binary trees. We count these trees by the number of vertices and the number of right children. Our main result is a proof of an explicit formula for these trees.

Mentor: Brian Drake

KIRKHOF CENTER 2215

Synthesis of Dipeptide Antimicrobial Agent Analogs on Solid Support

Presenter: Paul Belmonte

Antibiotics, produced naturally by microorganisms, have been used for decades in the battle against pathogenic microbes. Bacterial resistance to antibiotics is an ongoing medical issue throughout the world. In an effort to produce high yielding synthetic bromobenzene-derived antimicrobial agents, a dipeptide analog was built exclusively on solid support. From previous success with a single tyr-analog, a short gly-tyr sequence was synthesized on a Wang Resin, and the rest of the molecule was built on solid support utilizing amide bond synthesis techniques. Kaiser and chloranil tests confirmed the presence of free primary aliphatic and primary aromatic amines, respectively. After cleavage from its support, thin layer chromatography was used to determine the purity of the end product. ¹H NMR spectroscopy was employed to characterize the structure of the molecule. The synthesized compound was assayed for antimicrobial activity using *E. coli* and *S. aureus* bacteria.

Mentor: Laurie Witucki

KIRKHOF CENTER 2216

From Politics to 'Popular': Commercialization of Broadway Musicals and How it Affects the Public Sphere

Presenter: Bridgett Vanderhoof

Wicked became an overnight cultural sensation when it premiered in 2003. The supposed story source was Gregory Maguire's *Wicked: The Life and Times of the Wicked Witch of the West*, a piece brimming with political, social, and religious commentary. The purpose of this piece is to examine the differences between the two Wickedes, and to explain why these differences are affecting the theater's place in the political public sphere, using Jurgen Habermas' and Alan McKee's theories as the basis for my argument.

Mentor: James Bell

KIRKHOF CENTER 2259

Learner Variables in Burmese Refugees

Presenter: Katherine Hammond

The U.S. resettles more refugees than any other country in the world today, over 3 million since 1975 (Office of Refugee Resettlement; 2/11/13). Michigan alone accepted 4,324 refugees from around the world in 2011. Of these, 639 were originally from Burma. Burmese refugees who arrive in West Michigan typically have low literacy levels in their native language, just one factor, or learner variable, that affects their ability to learn English once in the U.S. As English is a key tool in the survival of refugees in America, it is crucial that those who provide English classes as part of a resettlement

service program understand what variables influence English acquisition in their classrooms and how. This study examines the individual learner variables present in an elderly Burmese man and how these will contribute to or hinder his ability to learn English as a resettled refugee in West Michigan.
Mentor: Laura Vander Broek

KIRKHOF CENTER 2263

Therapeutic Outcomes of Animal Assisted Therapy

Presenters: Mercedes Greenland, Abby Rusticus, Caitlin Stoltman, Melanie Van Houten

Interactions with animals are believed to reduce stress, increase communication skills, increase motivation and improve quality of life. For this reason, animals have been used in a variety of healthcare and education settings as a therapeutic intervention. This session will examine Animal Assisted Therapy (AAT) and the empirical research that identifies the therapeutic and functional outcomes for different disability groups

Mentor: Teresa Beck

KIRKHOF CENTER 2266

Pigments and Physiology of Cyanobacterial Mats that are Modern Analogs of Life on Early Earth

Presenter: Michael Snider

Recently discovered submerged sinkholes in Lake Huron are low-oxygen, high-sulfur extreme environments for microbial life. My work investigates the pigments and photophysiology of the cyanobacteria dominated mats present in these sinkholes under in situ and lab studies to understand acclimation to light treatments. Mats were grown in varying light intensities and photosynthetic inhibitors and examined for pigment composition and photosynthetic efficiency using PAM fluorescence to provide insight about light adaptive capabilities and use of oxygenic and anoxygenic photosynthesis. In situ observations show seasonality in photosynthetic efficiency for all sites throughout the year. Lab results indicate a 1-2 day photoacclimation period after which yield stabilizes and increased light intensity treatments result in increased photosynthetic efficiency. Inhibitor studies reveal that DCMU, a photosystem II inhibitor, significantly halted photosystem II activity, while NaH₂S had no effect.

Mentor: Bopi Biddanda

BEGINNING AT 1:00 P.M.

KIRKHOF CENTER 1142

Power and the Gender Binary in Mayra Santos Febres' "Sirena Selena vestida de pena"

Presenter: Taylor Smith

Mayra Santos Febres' "Sirena Selena vestida de pena" tells the story of a young man who finds the possibility of a way out of his life as a homeless transsexual prostitute by way of his special gift: an angelic singing voice. His story of transition into a professional drag performer is marked by moments in which the power differential inherent in the male-female binary comes into play to affect him with regards to his biological or presented gender. Thus, the interactions of the characters are directly influenced by the power structure of the gender binary and the binary is essential to the progression of the plot. In my investigation, I will show how the male-female binary is socially constructed, creating a power differential between men and women and how the protagonist and other drag performers depicted use the manipulation of external gender expression to gain opportunities otherwise not available as homosexual men. Presented in Spanish.

Mentor: Mayra Fortes

KIRKHOF CENTER 2201

Female Truck Drivers: Negotiating Identity in a Male Dominated Environment

Presenter: Stephanie Sicard

This research explores how women negotiate their identities when working in the male dominated field of truck driving. According to the U.S. Bureau of Labor Statistics, of the over three million people who make their living as truck drivers, only six percent are female. Central to the research is identification of the roles women occupy in the trucking industry, how they choose this particular career, and how they confront issues of gender stereotyping. Through a combination of ethnographic approaches including interviews and content analysis, this research explores women truck drivers from several theoretical perspectives including performance theory.

Mentor: Janet Brashler

KIRKHOF CENTER 2215

The Muskegon Lake Observatory: Analyzing Seasonal and Episodic Drivers of Phytoplankton Productivity Using High Resolution Time-Series Data

Presenter: Leon Gereaux

Phytoplankton growth in lakes is regulated by many physical, chemical, and biological drivers, external to and within the system. Advances in automated ecological sensor technologies enable the collection of environmental data, at spatial and temporal scales previously impossible thereby greatly enhancing understanding of complex ecosystem interactions. For this study a lake based observatory with weather and water quality sensors was used to examine seasonal and episodic drivers of phytoplankton productivity in Muskegon Lake over a two year period (2011-2012). Seasonal correlations between algal pigment concentrations and driving variables were calculated. Peak values of chlorophyll a were similar between years, while the peak concentration of phycocyanin was reduced by approximately 50% in 2012. Drought induced decreased nutrient loading and elevated summer wind speeds driving water column instability, contributed to conditions that were less favorable to growth of cyanobacteria.

Mentor: Bopi Biddanda

KIRKHOF CENTER 2216

Race and the Wage Gap based on Sexual Orientation

Presenter: Ryan Meyer

In recent years, debates over same-sex marriage have often overshadowed the economic issues faced by the LGBT community. Despite prevailing stereotypes, many individuals who identify as LGBT live in poverty, which may be attributed to a wage gap based on sexual orientation. Previous research has shown that gay men earn anywhere from 3 to 27% less than similarly-situated heterosexual men, while lesbian women have been found to make more than their heterosexual peers. Recent surveys have found that minorities are slightly more likely to identify as LGBT compared to whites, and previous research only controlled for whether an individual was white. Using data from the American Community Survey, I will conduct a regression analysis to determine if race may be an explanation for the wage gap. Potentially, the findings of the limited prior research may be the result of the influence of race on earnings rather than discrimination based on sexual orientation.

Mentor: Brad Sturgill

KIRKHOF CENTER 2259

International Service Learning: Health Care in Costa Rica

Presenter: Amy Myers

During December of 2012, I had the opportunity to travel to Costa Rica with a group of students to do organized medical volunteer work through an organization called International Service Learning. Upon our arrival, we learned that we would be interviewing patients based on their symptoms, as well as performing physical exams. Two areas were visited, both being outside the city of San Jose. Two doctors from the area accompanied us during our visits and in the clinical setting, in which the doctors gave out medication based on the severity of the medical issue. I had the privilege of interviewing one of the doctors and learned a great amount about the health care system in place in Costa Rica. Besides being a wonderful service opportunity, the trip was an eye opening cultural experience as well.

Mentor: Sheldon Kopperl

KIRKHOF CENTER 2263

Music as a Therapeutic Intervention to Relieve Pain

Presenters: Stephanie Hazel, Tawney Paszkowski, Lindsey Clay, Courtney Bramer

The use of music as a therapeutic agent and as an essential part of healing practices and rituals can be traced back to Ancient Greece where they were the first to use music scientifically and systematically as an intervention. Today, there is a wealth of literature on the impact that music can have on a person's physiological, emotional, social and spiritual well-being. This session will examine the empirical evidence of music as an intervention to relieve and manage acute and chronic pain.

Mentor: Teresa Beck

KIRKHOF CENTER 2266

Individual Contexts Versus Group Contexts

Presenter: Thomas Ewing

Groups are prevalent in life, but little is known about how groups psychologically change individuals. This makes understanding group influences extremely important. Research suggests people prefer groups when feeling uncertain. Since groups provide psychological safety, it is theorized groups can impact member thoughts, actions, and inhibitions accordingly. Thus, we predict an increased preference to be in groups when afraid or uncertain, and people will be less inhibited when in groups versus alone. To test these hypotheses, participants will respond to hypothetical scenarios and answer survey questions designed to measure when groups are preferred and how groups change individuals.

Mentor: Ernest Park

KIRKHOF CENTER 2270

The Reality of Ridley Scott's *Robin Hood*

Presenter: Lindsay Trevethan

This paper examines the historical accuracy of parts of Ridley Scott's *Robin Hood*. Historical films are never completely accurate, but some film makers do a better job than others of incorporating factual elements into their narratives. There are no sources from the 12-13th centuries, which would be contemporary for a Robin Hood figure, but there are later sources, such as ballads and poems from the 15-16th centuries. These provide a glimpse into the past. This study investigates the myth of the

Robin Hood in historical literature, attempting to shed light upon the main characters of the film, examining the storyline behind King Richard's death during the Crusades, and the narrative of King John's reign and events leading to the signing of the Magna Carta. There are many aspects of this film that do not line up exactly with existing historical material, but Ridley Scott's *Robin Hood* weaves this popular literary hero into a convincing historical milieu.

Mentor: Alice Chapman

BEGINNING AT 1:30 P.M.

KIRKHOF CENTER 1142

Signed Consent or _Signed_ Consent? Obstacles in Obtaining Human Subject Approval for Research into Deaf Culture

Presenter: Rylee Mielecki

When working with human subjects, a researcher is first required to obtain permission to conduct research. This process is undertaken so that participants in the study experience minimal harm. Therefore, in order to conduct my research into discrimination against the Deaf in Western Michigan, I had to first receive permission to do so by the Human Subjects Board at Grand Valley. However, during the process, five important issues arose. First, I had to explain the cultural and language differences between the Deaf and mainstream Americans. Second, I had to develop a list of questions. Third, I applied for the wrong level of review. Fourth, I had to discuss the importance of retaining any documentation until the completion of my studies. Lastly, I had to prove that I was able to retain the confidentiality of my informants. Therefore, I hope to demonstrate how I overcame these issues and instruct others on how to avoid them when researching cultures that have not been frequently studied.

Mentor: Deana Weibel

KIRKHOF CENTER 2201

The Earth We Have Forgotten

Presenter: Brittaney O'Brien

The importance of indigenous cultures of our past and present are at times forgotten. We have focused a great deal of energy on finding the right chemical solutions for each medical symptom, and we have overlooked the medicine that is right in front of us, Earth. My research consisted of Mayan and other indigenous herbal medicines as well as the time it took for a plant to be prepared. I studied four scientific journals on herbal medicine and also a novel on the experiences of a senior researcher for the Foundation for Gaian Studies. In this research I found that each herbal plant has a unique story and a plan for preparation. These plants have treated common diseases and are even seen in some cultures today; however, there has not been enough research done on the placebo affects of herbal medicine or the preparation it takes to makes these treatments ready. With more research, we may discover that herbal remedies are the solution to cure incurable diseases of our future.

Mentor: Sheldon Kopperl

KIRKHOF CENTER 2215

Social Networks as Virtual Outreach: The It Gets Better Project and Experiences of LGBTQ Youth

Presenter: Garrett Sawyer

This research focuses on the content of the *It Gets Better Project* and examines the limitations of social media for outreach and diversity. Through audio and visual content analysis, the study explores

themes and messages of the *It Gets Better Project* to develop an empirical understanding of who is contributing and what messages and experience are shared. Preliminary research indicates that predominantly white, educated, 18-40 year olds contributed heavily to the *It Gets Better Project*. In addition, the study examines why such themes as bullying, coming out, and religion are relevant to the *It Gets Better Project*, and analyzes the limitations of social media activism. The methodology for this project is audio and visual content analysis of 250 *It Gets Better Project* on YouTube focusing on demographic and thematic elements of the videos. This project is significant because it highlights strengths of the *It Gets Better Project* as well as providing greater discourse for LGBTQ studies.
Mentor: Kathleen Underwood

KIRKHOF CENTER 2216

The Democratic People's Republic of Korea: A Country Report

Presenter: Katrina Maynes

Within the last seventy years, the Democratic People's Republic of Korea (DPRK) has taken an increasingly controversial position in international affairs. As a result of its growing relevance in world politics, this paper is written in the style of a CIA Country Profile and examines North Korea's modern history, ideological beliefs, and international interactions. From World War II to the present-day Kim Regime, it compiles and assesses Open Source Intelligence (OSI) on North Korean historical foundations, social oppression, interactions with world players, and intelligence and military doctrine. Through an examination of OSI documents and interviews published by North Korean defectors, this country report aims to build a complete portrait of the Democratic Republic of North Korea, as well as to compile a comprehensive analysis of the DPRK's threat to international security.

Mentor: Jonathan White

KIRKHOF CENTER 2259

Historiography, Connection, and Innovation in Renaissance Florence

Presenter: Lynne Pearson

Historians bring fresh perspectives and new ideas to interpretations of the past. Each society evaluates the past based on its own methodologies, information and available technology. People, places, events, and time periods can be interpreted in a multitude of different ways depending on social and political contexts and based on the perceptions of the interpreter. One example of this is the famed art of the Renaissance period, which can be analyzed as a reflection of the goals and desires of those behind the changing political climate. Historians can view the Renaissance as a time period that, while previously thought to be a period devoted strictly to Classical modes and ways of thought, in reality constitutes a more complex era. In addition to Classical influence, even older ideas were utilized by those in power to create the appearance of smooth stability and unbroken tradition, coupled with patrons' and artists' attempts at innovation based on traditional ideas.

Mentor: Alice Chapman

KIRKHOF CENTER 2263

Best Practices of Therapeutic Riding for Persons with Cerebral Palsy

Presenters: Brittany Ouwinga, Kelsey Armstrong, Kayla Klosterman, Melissa Cody, Anna Arzumanova

Supporters of horseback riding interventions indicate that the warmth, shape, and rhythmical, three-dimensional movements of the horse improve flexibility, posture, balance, and mobility of the rider.

Cerebral palsy (CP) is a non-progressive disorder of the areas of the developing brain that control movement and posture. Therefore, an assumption is made that horseback riding as an intervention for persons with CP would improve their posture, balance and mobility. This study will identify the best practices for therapeutic riding and its effectiveness as an intervention for persons with cerebral palsy. Mentor: Teresa Beck

KIRKHOF CENTER 2266

Terence's *Eunuchus Iudaeus*?: Iconography and Identities in Gothic Illuminated Manuscripts

Presenter: Andrew Lund

Poring over an illuminated 15th-century French manuscript of the plays of Terence (BNF lat. 7907A), we are confronted with a most unusual illustrated figure: dressed entirely in yellow, Dorus (the actual eunuch of the *Eunuchus*) wears a pointed, yellow cap ending in a knob. Medieval iconography suggests that Dorus is a Jew. He is depicted wearing the *pileum cornutum* or peaked (literally horned) hat, which despite its name had many stylistic variations, was the most typical headdress used in Christian, northern European art to signify Jewishness. While scholars have questioned whether the *pileum cornutum* always denotes a pejorative characterization, its presence on a eunuch nevertheless raises some interesting questions. Here, I explore the relationship between medieval Jew and eunuch, as well as postulate why the *eunuchus* was depicted as *iudaeus* in this manuscript, using the so-called *Ducal Terence* Bibliothèque de l'Arsenal MS-664; ca. 1400-1500 CE) as a foil.

Mentor: Sigrid Danielson

KIRKHOF CENTER 2270

A Career Guide for Prospective Gladiators

Presenter: Megan Esparsa

Most gladiators were condemned criminals or captives. It is clear, however, that others became gladiators by choice. On one estimate, half of all gladiators in Italy were volunteers by the middle of the first century CE. Efforts to regulate gladiatorial combat by persons of free status attest to the reality of the phenomenon. But what might have influenced a person weighing whether to fight in the arena? Taking into account a range of primary evidence, the paper assesses both the positive inducements, notably, glamor and honor, and the negative consequences, physical, emotional, and social, that would have informed the decision. Such an examination offers insight into the values and paradoxes that inform Roman social history and invites us to consider how individuals might have navigated these complexities. We might describe the result as a kind of "career development guide" for prospective gladiators in the first two centuries CE.

Mentor: Charles Pazdernik

BEGINNING AT 2:00 P.M.

KIRKHOF CENTER 1142

Effect of Agricultural Runoff on Water Quality in the Bass River

Presenter: Anna Daves

This research will examine the impact of different agricultural land uses on water quality in the Bass River, Ottawa County, Michigan. Agricultural land surrounding the Bass River is used to grow both nursery stock and corn. This study will determine whether differences in water quality exist between areas receiving runoff from nurseries compared to areas receiving runoff from corn fields. To determine

water quality, macroinvertebrates, which differ in their sensitivity to water pollution, will be sampled and conductivity will be measured at a site adjacent to nurseries, a site near corn fields, and a forested control site. Conductivity will provide an estimate of the amount of dissolved ions, including fertilizers or pesticides, within the water. Because nursery stock fields exhibit relatively large areas of bare soil between plant rows, erosion is expected to have a significant impact on water quality compared to areas receiving corn runoff.

Mentor: C. "Griff" Griffin

KIRKHOF CENTER 2201

Perception in Geoffrey Chaucer's Wife of Bath

Presenter: Haleigh Vanderstelt

In the *Canterbury Tales*, Geoffrey Chaucer creates the controversial but complex figure of the Wife of Bath. The Wife of Bath can only correctly be analyzed if the reader looks at how she is perceived, how she perceives others and her own moral code. Through Alison's wardrobe, relationships, and ideas about authority, experience and love, the reader may better understand Alison and the contradictions between her *Prologue* and *Tale*. Alison's *Prologue* tells the story of her past marital relationships and her *Tale* recounts the story of one relationship that parallels the fable of the lion painting mentioned in her prologue. An in-depth analysis of the Wife of Bath's perception of herself and others as well as that of the reader, reveals a story of a woman who is developing a pre-feminist outlook that realizes the need for balance in relationships.

Mentor: Diane Wright

KIRKHOF CENTER 2215

Aurelius and McLuhan: A Study in Ancient and Modern Communication Theories

Presenter: Nicholas Macksood

Marcus Aurelius' *Meditations*, written near the end of the Roman emperor's life around 170-180 AD, is considered the first ever private, written journal. His written *meditatio* were the first directed toward his own mind rather than an audience in order to exercise his mind and encourage proper Stoic habits. Nearly two thousand years later, the Canadian philosopher of communication theories Marshall McLuhan posited in his *Understanding Media* that the method of communication itself can introduce a change of scale, pace or pattern into human affairs. However, McLuhan's theory proves timeless when analyzed with the *Meditations*, as Aurelius is aware of the way in which his musings propel a change in his thoughts from off of the page and into his active life. Furthermore, Aurelius' understanding of the command with which the written word yields can be seen in contemporary society with the advent of social media and the methods in which "private" discourse is carried out in a public sphere.

Mentor: Peter Anderson

KIRKHOF CENTER 2216

Stem Cells: Progress in Breast Cancer Research

Presenter: Erin May

The purpose of this presentation is to inform the community about the stem cell therapies and research associated with breast cancer. Breast cancer ranks as the most common form of cancer among women in the United States. It also is the second-leading cause of cancer death among women in the United States. Stem cell research has had major breakthroughs in cancer treatments and therapies in the last

few years worldwide. Through my presentation, I hope that my audience will become informed citizens and realize that stem cell research has great merit.
Mentor: Norman Kravitz

KIRKHOF CENTER 2259

Conceptual Thinking for Artistic Development of Special Needs Students

Presenters: Darrin Gailey, Jessica Cordes, Jose Rodriguez, Megan Jones

Presenters: Jose Rodriguez, Megan Jones, Darrin Gailey, Jessie Cordes GVSU Art Education students prepared and taught studio art projects to visiting special needs students. In Winter 2013 the project focused on three themes: Storytelling, Emotion and Transition. Visiting students completed a worksheet to generate ideas for the projects beforehand and at the time of the visit. During each lesson they learned new art techniques and transferred their plan into a completed art work. The GVSU students applied their knowledge and research skills through a) preparation of the projects, b) creative problem solving, c) collaboration with special needs students, d) action research. From reflective writing and visual documentation the presentation will share findings of how this non-traditional teaching practice can be applied in a K-8 classroom. It advocates for the educational benefit of art and art-making in the development of a student with special needs.

Mentor: Katalin Zaszlavik

KIRKHOF CENTER 2263

Current Status of Therapeutic Recreation Education Accreditation and its Implications for the Profession

Presenter: Ashley Donham

The primary purpose of curricular accreditation is to protect the consumer and to ensure a quality education experience. The first set of competencies for therapeutic recreation curricula was in 1977 with the accreditation program under the National Recreation and Park Association. In addition to the therapeutic recreation competencies, programs also have general recreation coursework that is required. In 2010, a new accreditation program was established, the Committee on the Accreditation of Recreational Therapy Education, with different standards and more of an emphasis on the practice of recreation therapy in health care and human service settings. This study will examine the similarities and differences between the two accreditation programs and the implications for student outcomes and national certification.

Mentor: Teresa Beck

KIRKHOF CENTER 2270

Bio 490 Internship, Great Lakes Zoological Society

Presenter: Catherine Schultz

This presentation describes the internship I spent at the Great Lakes Zoological Society in Ann Arbor, MI. The Great Lakes Zoological Society is a small conservation and rescue center that focuses on educating the community about reptiles and amphibians. Their indoor zoo features a variety of birds and invertebrates as well. The center is also involved with the rehabilitation and rereleasing of endangered native animals, as well as rescue and adoption of surrendered pets that need new homes. In this presentation I illustrate basic reptile and amphibian husbandry, daily duties that I needed to perform, and the medication regimen for animals with intestinal parasites.

Mentor: Terry Trier

BEGINNING AT 2:30 P.M.

KIRKHOF CENTER 1142

Influence of Key Environmental Variables on Fish Abundances in Western Michigan Streams

Presenter: Robert Slick

The primary objective of this research is to find out the relationships between key environmental variables affecting fish species abundance in small streams in Western Michigan. The environmental variables that were collected are water temperature, percent macrophyte cover, substrate composition, amount of woody debris, water conductivity, mean stream depth and mean stream width. The fish species studied are brown trout (*Salmo trutta*), central mudminnow (*Umbra limi*), bluegill (*Lepomis macrochirus*), creek chub (*Semotilus atromaculatus*) and white sucker (*Catostomus commersonii*). The environmental variables were measured along a 150 m stretch at eleven transects. Within each stretch the fish were collected using an electro-backpack fishing technique. I expect to find a correlation between fish species presence and environmental variables present.

Mentor: C. "Griff" Griffin

KIRKHOF CENTER 2215

On The Banks of The Rapids: The Story of Irish Immigrants in West Michigan from 1835 to 1870

Presenter: Valerie Gray

My project is a social history of Irish immigration to Grand Rapids with specific focus on their impact to infrastructure, political contributions and the rise of the furniture industry. Baxter recorded the arrival of the first Irish Immigrants in 1835. By the 1870 US Census, they comprised 11% of the area's population. This project draws on census records, parish documents, furniture company records, public records, and early historical accounts. The Irish who came to Grand Rapids were a mixture of educated and affluent individuals as well as unskilled workers willing to tackle any job. They also worked tirelessly on community building, infrastructure and contributed to the local furniture industry which secured Grand Rapids' economic future in the 19th century. The importance of this study is two-fold: it enriches the history of West Michigan by providing an analysis of Irish immigration to the area, and it increases our understanding of what historians call the lumber frontier.

Mentor: Kathleen Underwood

KIRKHOF CENTER 2216

Bodies of Writing, Bodies in Motion: A Study of Creative Process

Presenter: Ariel Mokdad

This presentation aims to highlight the intersectionality of postmodern poetry and modern dance through the works of Black Mountain alumni: Robert Creeley, Charles Olson, and Merce Cunningham. These artists shared similar beliefs about the creation process of their work and how their work was to be received by audiences. Through techniques such as spontaneous improvisation, energy manipulation, and field composition or organic movement, these artists were able to expand the realm of their art form. The artistic statements of Creeley, Olson, and Cunningham will be used to expose their common creative processes and how it affects creators of today. By examining these techniques, dancer and poet alike will discover new ways to innovatively create work.

Mentor: Carrie Brueck Morris

KIRKHOF CENTER 2259

A Comparison of Dietary Laws in Two World Religions

Presenter: Katherine Hekstra

Dietary restrictions are a major tenet of religions throughout the world. Two of the most well known and widely held are those of Judaism and Islam. The kosher and halal practices will be compared and contrasted to give a deeper understanding of these two traditions. The reasoning for having such dietary restrictions will also be examined by looking at the sacred texts of the religions as well as interpretations of how to uphold the laws. The aim of this presentation is to gain a deeper understanding of these dietary restrictions and how these two religions are similar in this way.

Mentor: Sheldon Kopperl

KIRKHOF CENTER 2263

Horticulture and Its Effectiveness as an Intervention with Persons with Mental Illness

Presenters: Tricia Petiprin, Nicholas Wahl, Andrea Jurries

The use of horticulture as a therapeutic intervention provides a positive and nonthreatening environment for persons with mental illness. Using plants as a medium, persons are encouraged to understand and deal with their emotions and feelings. The purpose of this research is to analyze the benefits of horticulture as an intervention for adults with mental illness. Findings will compare different types of horticulture therapy interventions with mental disorders.

Mentor: Teresa Beck

KIRKHOF CENTER 2270

Generation of Diffraction Gratings Using Photographic Film

Presenter: Brittany Cooke

The properties of light is one of the most interesting and complex topics in physics. For instance, multiple sources of light can interact with each other to create what are known as diffraction patterns - a series of alternating bright and dark spots. These patterns can be produced from a single source of light by use of a diffraction grating, which splits a source of light into multiple sources that can interact with each other. Commercial diffraction gratings are generally made from etched glass. This project determines how well they can be made using an alternative method: photographic film. Photographs of a diffraction grating pattern were taken and developed onto slide film. The slides were tested using a helium-neon laser and factors such as exposure, focal length, and line spacing of the grating were tested for effectiveness. Effective gratings were ones producing a clear diffraction pattern.

Mentor: Richard Vallery

BEGINNING AT 3:00 P.M.

KIRKHOF CENTER 1142

American Martens in the Western Lower Peninsula of Michigan

Presenter: Delaney Cargo

The American marten was extirpated from Michigan in the 1930's, but has since recovered as a result of reintroduction and targeted conservation efforts. Recent studies have indicated that martens cycle through their home range every two weeks. The main objective for my project will be to determine whether two weeks is an adequate amount of time to detect martens in the western Lower Peninsula

and evaluate if false negatives are being reported for martens when, in fact, they are present. I will be collecting data in the field using remote cameras set up in the Manistee National Forest. Ten cameras will be set up and baited in the center of known home ranges and in corresponding random sites. I expect that areas in which radio telemetry have indicated martens to exist will have a higher rate of detection. My secondary objective is to calculate the average amount of time it takes to detect martens within their home range in order to ensure that accurate data is being recorded.

Mentor: C. "Griff" Griffin

KIRKHOF CENTER 2201

Decadal Scale Variability of Oxygen Minimum Zones in the Atlantic and Pacific Oceans

Presenter: Kate Coveney

For the first time, a study documents long-term, large-scale Oxygen Minimum Zone (OMZ) variability since the 1950s based on historical oceanographic data from the World Ocean Atlas 2009 (WOA09). This study provides a baseline to quantify the magnitude of OMZ water volume and area changes in the Atlantic and Pacific Oceans on decadal time scales for 3 DO₂ concentration ranges (≤ 45 , ≤ 61 , and ≤ 90 $\mu\text{mol kg}^{-1}$). Positive linear trends of volume and area superimposed on large decadal-scale fluctuations were observed at all DO₂ thresholds studied except for the ≤ 90 $\mu\text{mol kg}^{-1}$ threshold in the Pacific. Heat content and DO₂ content variability within the OMZ exhibited a high degree of correlation, particularly in the Atlantic at all DO₂ thresholds. Large fluctuations in the extent of OMZ have major biological and socio-economic implications. Additional work is needed to quantify the changes, the ecosystem response scenarios, and the mechanistic role of physical processes including water-mass transport variability.

Mentor: Paul Fishback

KIRKHOF CENTER 2215

Does Reading Make You a Better Writer?

Presenter: Joshua Williams

The advice most often given to young writers -- in order to be a better writer, you have to be a better reader. The intent of this project is to explore that theory, using a combination of psychology, linguistics, and literature. Ultimately, by using such an eclectic range of research, this project hopes to avoid the simple yes or no answer and instead encourage an open discourse about the effects of reading on the writing brain. Further implications include the subjective/objective gauging of good writing, the differences between certain kinds of reading, the effects of technology on both disciplines, and why student writers so often avoid this advice.

Mentor: Dr. D. Ihrman

KIRKHOF CENTER 2216

Flying Fox Bats: Similar Species with Divergent Evolutionary Pathways

Presenter: Susan Munster

Pteropus samoensis and *P. tonganus* (Chiroptera: Pteropodidae) are two species of flying fox bats found on southern Pacific islands, with regions of sympatry in Samoa and Fiji. Both are dietary generalists and have experienced repeated population bottlenecks due to cyclones. We explored the null hypothesis that the two species have experienced parallel evolutionary histories. Using mitochondrial and microsatellite data, we reconstructed their genetic demography. Analyses of the two datasets show

very different patterns within and between Samoa and Fiji. Using coalescent-based ABC analyses, we will illustrate the extent to which the two species have experienced different evolutionary trajectories. This study will address the extent to which similarities in extant populations are generalizable into the past, estimate effective size, spatial limits of both populations, and help to illustrate how two species might arrive at similar traits through quite distinct evolutionary pathways.

Mentor: Amy Russell

KIRKHOF CENTER 2259

Li Qingzhao: Ci Lyrics of Imperial China

Presenter: Kierra Boggs

In imperial China, *quzi ci* poetry (or "lyrics for songs", also known as *ci*) was a style of writing that was a departure from the rigid *shi* poems of earlier times. Love is featured as a most prominent theme in *ci* lyrics, and they were traditionally written from a female perspective. Li Qingzhao (1084-c.1151), considered by many the finest woman author of pre-modern China, is known for her achievements in composing *ci*, with a style that was unique, yet closely adhered to lyrical conventions. Through her lyrics, Li Qingzhao ushered in a new way of artistic expression, one that embraced a distinctly feminine space through an ingenious combination of music and words.

Mentor: Yan Liang

KIRKHOF CENTER 2263

Transitioning Veterans with Mental Health Disorders into the Community

Presenters: Karlee Davis, Michael Arena, Tyler Nietling

Of the nearly 2.5 million veterans who have served, or are serving in Iraq or Afghanistan, nearly fifty percent will face serious mental health issues, including Post Traumatic Stress Disorder (PTSD), depression, or substance abuse. Untreated mental health conditions can lead to other debilitating problems in the veteran community including high rates of unemployment, suicide, homelessness, divorce, and child abuse. This study will examine the role of therapeutic recreation in transitioning veterans back into the community while confronting a mental health diagnosis.

Mentor: Teresa Beck

KIRKHOF CENTER 2266

Extraction and Analysis of Starch Residues Utilizing a Heavy Liquid Technique from Native American

Woodland Ceramics

Presenter: Kayla Hurd

Pottery samples from GVSU archaeological excavations were processed using a heavy liquid method to extract starch grains. The residues will be compared microscopically with modern forms of starch under polarized light. Emily Teall and Dr. Arnold are concurrently analyzing the phytolith extraction of samples. The goal of the research is to identify what foods were being stored and processed. Pottery is from Dr. Brashler's excavations at Prison Farm, a Middle Woodland site (2 sherds, c. 10 BCE - 80 CE), Zemaitis, an Early Late Woodland site (4 sherds, c. 500-700 CE), and South Flats, a Late Woodland site (1 sherd, c. 1400 CE). The analysis of samples from grinding stones from the site of Hibermerdon Tepe, located in southeastern Turkey (c. 2000-1500 BCE) was also conducted for comparative purposes. The extraction of the starches from each sample and the comparison results will be presented here.

Mentors: Janet Brashler, Mark Schwartz, Elizabeth Arnold

KIRKHOF CENTER 2270

Fractal Geometry and its Correlation to the Efficiency of Biological Systems

Presenter: Jonathan Calkins

Fractal geometry is a branch of mathematics that deals with, on a basic level, repeating geometric patterns that scale according to some rule or scaling factor. By observing the many facets of fractal geometry, including fractal dimension and points within fractal sets, we can draw comparisons to real-world phenomena. Fractal geometry appears in nature and biological systems where efficiency is needed, such as the surface area of the brain or lungs, or the branching patterns of leaves on a tree. This report examines the fractal geometry that exists within these biological systems, and how it relates to their overall output and efficiency. We will be gathering our information from print and online sources, from both mathematical and biological perspectives. By this project, we hope to gain a better understanding of the many ways mathematics permeates our universe, and how these correlations help to explain the seemingly infinite complexity of life.

Mentor: Edward Aboufadel

BEGINNING AT 3:30 P.M.

KIRKHOF CENTER 1142

Socio-political and Environmental Implications of the Israeli-Palestinian Water Conflict

Presenter: Mary Haiderer

Palestinians have distinctly different water relations from Israelis due to limited participation in environmental policy, the politics of Zionist occupation, and a de facto shortage due to Israeli diversion of the upper Jordan River. I seek to determine if water can be equitably distributed between its stakeholders, posing the question: Is water scarcity a socio-political construction perpetuated by the politics of Israeli rule, or is there truly not enough water to satisfy demand? I will discuss the uses and policies that allow for this depletion as well as the unequal distribution of the Jordan River resources within the divided Israeli state, focusing on the acute disadvantage faced by Palestinians as they consume amounts determined inadequate by international standards. Israel's water crisis will be scrutinized through environmental, historical, and socio-political lenses to determine the forces of conflict and the possibilities for alleviation.

Mentor: C. "Griff" Griffin

KIRKHOF CENTER 2201

From the African American Oral Tradition to Slam Poetry: Rhetoric and Stylistics

Presenter: Shawnkeisha Stoudamire

Slam poetry is one of African Americans most recent cultural innovations. The artistry of slam poetry is undervalued while its entertainment appeal is overvalued. This research project focuses on selected verbal features of slam poetry and seeks to balance the artistic and entertainment appeal of contemporary slam poetry by demonstrating that its verbal features derive from a linguistic heritage in early forms of Black English vernacular oral storytelling and from performance poetry produced by African Americans in the mid-twentieth century. Sociolinguistics, specifically descriptive linguistics and discourse analysis, will be used as methodologies to isolate and describe artistic and rhetorical features that slam poetry shares with texts in the Black vernacular oral tradition. This research will also answer questions about slam and hopefully produce contemporaries who are better informed of slam poetry's cultural legacy.

Mentor: Veta Tucker

KIRKHOF CENTER 2216

Phytolith Recovery from Native American Woodland Ceramics Utilizing a Heavy Liquid Technique

Presenter: Emily Teall

A pilot study of starch and phytolith recovery techniques was carried out by two students (Kayla Hurd, Emily Teall) and three professors from the Anthropology Department (Elizabeth Arnold, Mark Schwartz, and Janet Brashler). Phytoliths are silica bodies that are deposited in the cells of living plants, and survive their parent plants; phytolith morphology reveals the type of parent plant. Phytolith extraction was carried out on residue removed from pottery sherds. The pottery was collected during GVSU archaeological excavations at a the Middle Woodland site of Prison Farm (2 sherds, c. 10 BCE - 80 CE), the Early Late Woodland site of Zemaitis (4 sherds, c. 500-700 CE), and the Late Woodland site of South Flats (1 sherd, c. 1400 CE). Additional research materials from the site of Hibermerdon Tepe in southeastern Turkey (c. 2000-1500 BCE) were analyzed for comparative purposes. The phytoliths revealed information about subsistence that will be discussed in this presentation.

Mentors: Elizabeth Arnold, Janet Brashler, Mark Schwartz

KIRKHOF CENTER 2263

Dolphin Assisted Therapy: Does it Really Work?

Presenters: Sarah Meyers, Amy Carrabine, Elizabeth James, Ashley Connelly

Dolphin Assisted Therapy (DAT) has become an increasingly popular intervention for children with special needs. Supporters of this therapy indicate that DAT can improve language skills, behavior, cognitive processing, attention, and motivation to learn. However, evidence to support these therapeutic outcomes have been more anecdotal than evidence based. This session will examine the evidence of therapeutic outcomes for persons with special needs.

Mentor: Teresa Beck

BEGINNING AT 4:00 P.M.

KIRKHOF CENTER 1142

Invasive Species in Bass River Recreation Area

Presenter: Ashley Potts

Non-native invasive species have become an increasing problem across the world due to their ability to adapt and out-compete natural species. Invasive species usually provide less wildlife habitat and recreational value for people. This project is located in a small section of the Bass River Recreation Area, Ottawa County, Michigan. Invasive species that are present in the area that will be studied are Multiflora Rose (*Rosa multiflora*), Autumn Olive (*Elaeagnus umbellate*), and Honeysuckle (*Lonicera spp.*). Samples will be collected along approximately 1000 foot transects running north south and 100 feet apart. At every 100 feet along the transect count samples will be taken in a 10m x 10m plot where species and frequency will be recorded. This study is important to understand the composition and distribution within the Bass River Recreation Area to create an effective management plan for non-native invasive species.

Mentor: C. "Griff" Griffin

KIRKHOF CENTER 2201

Comparative Theories of Visual Art and Music: May I Play You a Picture?

Presenter: Karel Lill

Relationships among the visual and aural arts, especially between color and sound, have been postulated by artists and composers for a variety of purposes. Theories which relate the two art forms have been used to translate music into art and vice versa; to educate either musicians or artists about the other art form; and to develop non-representational art that results from the application of musical techniques to colors. How, specifically, can visual art and music be compared? There are various answers to this question. The goal of this study is to develop an understanding of how these theories compare, with the intent of realizing whether or not, or to what degree, visual art and music are related. Looking at how these arts have been compared will shed light on the search for an underlying framework that both of the arts are built upon. This will show how successfully and to what ends music and art can be correlated.

Mentor: Lee Copenhaver

BEGINNING AT 4:30 P.M.

KIRKHOF CENTER 1142

Bald Eagle Habitats Along the Grand River in Ottawa County

Presenter: Megan Harvey

Bald eagles, a species once on the Endangered Species list, have been spotted in areas along the Grand River in Ottawa County, Michigan. It is important that these birds continue to have suitable habitat available to them to keep their population numbers from declining again. The purpose of this study is to determine habitat suitability in privately owned land adjacent to the Grand River. This will provide information on how to manage the land for bald eagles. The study will focus on approximately 30 acres of land. A number of variables listed in a Habitat Suitability Index (HSI) model for bald eagles, such as stem density and ground cover, will be measured and used to determine suitability. These measurements will be surveyed on areas randomly selected within the study area. GIS will be used to map collected data including elevation and proximity to water. The area is currently suitable habitat, as bald eagles already inhabit the area. This study will show the landowners ways to improve the habitat.

Mentor: C. "Griff" Griffin

KIRKHOF CENTER 2266

An Adolescent Sex Offender Treatment Program: Recidivism Rates with Implications on Personality Traits

Presenter: Allison Kosina

In 1988, the Kent County Juvenile Court (Grand Rapids, Michigan) implemented an innovative program for juvenile sex offenders. This program, the Adolescent Sex Offenders Treatment Program (ASOTP) was designed to provide comprehensive treatment services to this population. The presenters will discuss the ASOTP and review current research designed to address issues of sexual offending as it pertains to personality types and recidivism rates. This presentation is designed to assist mental health providers, juvenile court workers and judges in assessing the needs of adolescent sex offenders in order to provide comprehensive treatment services to this population

Mentor: Kathleen Bailey

KIRKHOF CENTER 2270
Multivariate Regression Using Skull Structures
 Presenters: Justin Pierce, Paul Perrin

Inside the human skull are two boney structures called the occipital condyles. As we age, these structures undergo metamorphic changes such as billowing and depression. By measuring these structures at different stages, we can predict the age of an individual. Over 40 pair-wise measurements of each condyle were taken from sampled remains. Using a statistical analysis software a multivariate linear regression model to predict the age of an individual is obtained.
 Mentor: Sango Otieno

BEGINNING AT 5:00 P.M.

KIRKHOF CENTER 1142
Waves of Creativity
 Presenters: Cody-James Scholl, Casey Withers

In fall of 2012 a group of Physical Education majors attended our state conference, Michigan Association for Health, Physical Education, Recreation and Dance(MAHPERD). In addition to attending a variety of professional development sessions, we presented a session entitled "Waves of Creativity". Our focus was on keeping physical education fun and fresh for our students. Now we would like to be a part of SSD and share the process of preparing a session for presentation and talk about the importance of going out and being involved at the professional level. Being a part of this presentation has opened our eyes to the opportunities that are available to us as professional educators. Additionally, it allowed us to make great connections and gather educational resources. These connections and resources will help us as we search for teaching positions.
 Mentor: Ingrid Johnson

KIRKHOF CENTER 2259
The Touchiest Topic in High School: A Textual Analysis of Public High School Policies Regarding Student-to-Student Touch
 Presenter: Adam Burl

Positive experiences with human touch serve a vital role in child and adolescent development. Yet, scholars seldom examine how communication practices contribute to how individuals, including children, experience touch in various contexts. This paper analyzes the way touch is described, articulated, and framed in the student handbooks of public high schools from the state of Michigan. A textual analysis of these texts reveals common themes that shape meanings of touch which extend to broader public discourses about topics such as education, intimacy, and sexuality.
 Mentor: Danielle Leek

Panel Presentations, Abstracts & Schedule

BEGINNING AT 10:00 A.M.

KIRKHOF CENTER 2204

Student Engagement with Classics

Presenters: Abigail DeHart, Andrew Lund, Katie Oyama

Student Engagement with Classics: A Long Journey Home

Abigail DeHart

I am a Classics major, but Homer first came to life for me in a classroom of seven young adults, most of whom were still earning their GEDs. When I first learned of MOOCs, I was thrilled by the idea of making university instruction available to people, regardless of their location or socio-economic status. Yet is wedding technology to a humanities course enough, or is there something special about the face-to-face encounter in the process of learning the humanities? I organized a community Coursera class at the Gerald R. Ford Job Corps Center to explore the issue of student engagement. Together we watched the weekly lectures and then discussed the content afterward. Resources and technology presented real challenges, but the experience of interacting with great works of literature like the *Odyssey* was humanizing for these students. Ideally, universities and innovators would collaborate in delivering high-quality outcomes for audiences who otherwise are not being reached.

Student Engagement with Classics: Promethean Myth and Mythopoeia for Adjudicated Students

Andrew Lund

The power of myth to transcend time and gain new meaning is due to the inherent mutability of myths. The ancient Greeks themselves knew this, and they developed and changed existing myths to (re)make them meaningful and relevant. My project, supported by the OURS Grant, seeks to allow at-risk students to join this conversation. While keeping certain elements of the existing myth but transforming the story to make it meaningful on a personal level, the student gains the power to tell her/his own story. Enrolled in a creative writing course at a day treatment program for court adjudicated youth, the students will be working with myths about the Greek god Prometheus, a trickster god who "embodies the human condition with all its potential for brilliant innovation and for cruel suffering" (Dougherty 2006: 3). Through crafting their own Promethean myth, the students will explore directly the concepts of justice, hubris, and fate. My panel presentation documents the students' engagement.

Student Engagement with Classics: Seneca's *De Otio*, Student Engagement and Academic Success

Katie Oyama

In terms of public life, the Roman term *otium* most often referred to times of political peace. With regards to private life, it evolved to mean withdrawal from public life. Connected with this withdrawal was an expectation that one in *otium* use his time productively. How one spends

one's time in otium is the topic Seneca focuses on in his philosophical work *De Otio*. The advice contained within the work is relevant for a modern college student. Colleges today highly encourage students to participate in campus-related organizations. This means spending time away from the main purpose of college (academics) in a way that often still involves intellectual work and produces a product – time away from academic study is a kind of otium. This study aims to distinguish advice regarding the parameters and limitations of otium, then examine existing student engagement studies in order to discern similarities. The aim is to see if Seneca's advice might help explain or enhance our understanding about the studies' results that tell at which point campus involvement transitions from a beneficial aspect of student life to a detrimental element with regards to a student's academic career.

Mentor: Diane Rayor

BEGINNING AT 11:00 A.M.

KIRKHOF CENTER 2204

History of U.S. Foreign Policy in Southern Africa During the Ford Administration (1975)

Presenters: Walter Klatt, Karol Kuska

What factors govern the foreign policy decisions of our nation? Are the considerations that go into them wholly altruistic or somewhat nefarious, or are they something in between? An examination of the Ford Administration's policies in Southern Africa reveals some of the factors that motivated US policy makers in the 1970s. This presentation will include two case studies, one on the US role in the conflict in Angola and the other on US relations with neighboring Zaire. They will explain how these policies were related and how domestic factors influenced American policy. It will also examine how the shape of current foreign affairs was influenced by the two situations. We expect to impart to the audience an appreciation for the complexities involved in foreign policy decisions that are often not visible to the public at the time.

Mentor: James Goode

BEGINNING AT 1:00 P.M.

KIRKHOF CENTER 2204

The Unhappy Romance of the Three Kingdoms: An In-Depth Look at the Battles, Tactics and Alliances of the Time

Presenters: Kimberly Besaw, James Brien, Nicholas Duckett

The Battle of Red Cliff was a key turning point in Chinese history, and has been represented in many different ways throughout the centuries. To better understand key source text, *The History of the Three Kingdoms*, and the Battle of Red Cliff, it is important to first understand some of these key components: What battle strategies were used? Why exactly did these three kingdoms choose to go to war? How were alliances determined? Our panel will use primary Chinese texts as well as secondary sources to analyze the *History of the Three Kingdoms* and the Battle of Red Cliff. Our panel consists of three presentations addressing some of the more interesting aspects of this decisive period in history. We will be discussing how key alliances were created, territories were claimed, wars were fought, and history was forever changed.

Mentor: Curtis Smith

BEGINNING AT 2:00 P.M.

KIRKHOF CENTER 2204

Hollywood vs. History: An Analysis of the Historicity of Characters in the Battle at Red Cliff

Presenters: Johnson Gao, Nathanael Gendron, Phil Karagoulis, Thomas McSweeney

Method: We will use primary historical and literary sources that mention the Battle of Red Cliff, such as the "Romance of the Three Kingdoms" and the "History of the Three Kingdoms," as well as secondary sources, such as the film "Red Cliff," to analyze the key characters to determine what can be considered fact, and what should be considered fiction. The figures that will be the focus of our research are Zhou Yu, Liu Bei, Cao Cao, and Zhuge Liang. The research will include first-hand translation of the original Chinese texts. Thesis: Although there is reason to believe there is some historical truth to the romanticized telling of the Battle of Red Cliff, we believe that a considerable amount of the information is purely fictional and/or grossly exaggerated when compared to the records of the actual event. Presentations will analyze the evolution of the representation of major figures in the Battle of Red Cliff, examining cultural and social changes represented by these changes.

Mentor: Curtis Smith

Performance Presentations, Abstracts & Schedule

BEGINNING AT 3:00 P.M.

KIRKHOF CENTER AREA 51

Indigo Saxophone Quartet

Presenter: Cameron Miller, Andrea Voulgaris, Lisa Keeney, Matthew Kobberstad

The Indigo Saxophone Quartet was formed in 2010 at Grand Valley State University, comprised of undergraduate students studying with Dr. Jonathan Nichol. The group performed for the NASM Accreditation Concert at GVSU in 2011, and was the first-prize winner of the Sigma Alpha Iota Small Ensemble Competition in 2012. They also performed Revolutionary Etudes for Pulitzer Prize winning composer David Lang during his residency at GVSU in 2012. The members are Andrea Voulgaris, Lisa Keeney, Cameron Miller and Matthew Kobberstad. The Indigo Quartet recently had the opportunity to work with Lang to better understand how to perform the piece. This provided valuable performance insight from the composer when the Indigo Quartet performed

at the 2013 North American Saxophone Alliance conference in March, at Bowling Green State University. Presenting at this conference also provided a great opportunity to premiere a GVSU student composition for students, teachers, and performers.

Mentor: Jonathan Nichol

BEGINNING AT 4:00 P.M.

KIRKHOF CENTER AREA 51

GVSU Grand Sax

Presenter: Cameron Miller

Grand Sax, founded in 2011 at Grand Valley State University, is a student-led performance group inspired by "Supersax", founded by Med Flory in 1972. The focus of the group is performing arrangements of Charlie Parker solos with rhythm section. The group presented their program at the 2013 North American Saxophone Alliance conference on March 2nd at Bowling Green State University. This was an excellent opportunity for the members to perform for their peers and demonstrate their understanding of the performance traditions of American jazz and be-bop. The following tunes are to be performed: Just Friends (1931) Music by John Klenner, Lyrics by Sam Lewis Arr. Med Flory Yardbird Suite (1946) Charlie Parker Arr. Med Flory Moody's Mood for Love (1949) James Moody Arr. Dave Leech Personnel: Cameron Miller, Kevin Bays - Alto saxophone Andrew Christensen, Jake Hewitt - Tenor saxophone Matthew Kobberstad - Baritone saxophone Kaja Lill - Bass Dutcher Snedeker - Piano Joshua Dreyer - Drums

Mentor: Jonathan Nichol

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Alderink, Gordon	Mentor	10:30 a.m.	Kirkhof Center 2216
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Armstrong, Trevor	Student	12:00 p.m.	Henry Hall Atrium 69
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Beck, Teresa	Mentor	1:00 p.m.	Kirkhof Center 2263
Beck, Teresa	Mentor	9:00 a.m.	Kirkhof Center 2263
Beck, Teresa	Mentor	11:00 a.m.	Kirkhof Center 2263
Beck, Teresa	Mentor	9:30 a.m.	Kirkhof Center 2263
Beck, Teresa	Mentor	2:30 p.m.	Kirkhof Center 2263
Beck, Teresa	Mentor	11:30 a.m.	Kirkhof Center 2263
Beck, Teresa	Mentor	10:30 a.m.	Kirkhof Center 2263
Beck, Teresa	Mentor	10:00 a.m.	Kirkhof Center 2263
Beck, Teresa	Mentor	3:00 p.m.	Kirkhof Center 2263
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Chapman, Alice	Mentor	1:00 p.m.	Kirkhof Center 2270
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Cody, Melissa	Student	1:30 p.m.	Kirkhof Center 2263
Cole, Elisabeth	Student	12:00 p.m.	Henry Hall Atrium 31
Collinge, Abigail	Student	11:00 a.m.	Henry Hall Atrium 61
Collins, Dana	Student	3:00 p.m.	Henry Hall Atrium 52
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Constantelos, John	Mentor	11:00 a.m.	Kirkhof Center 2201
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Coveney, Kate	Student	3:00 p.m.	Kirkhof Center 2201
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Deaner, Robert	Mentor	1:00 p.m.	Kirkhof Center KC2
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Della Pia, Matthew	Student	2:00 p.m.	Kirkhof Center KC40
Den Braber, Ellie	Student	3:00 p.m.	Henry Hall Atrium 43
DeNio, Alexandra	Student	9:00 a.m.	Kirkhof Center KC7
Desautels, Allison	Student	2:00 p.m.	Kirkhof Center KC5
DeYoung, John	Student	10:00 a.m.	Henry Hall Atrium 64
Dillard, Amanda	Mentor	2:00 p.m.	Kirkhof Center KC5
Dillard, Amanda	Mentor	10:00 a.m.	Kirkhof Center KC 79
Dillard, Amanda	Mentor	10:00 a.m.	Henry Hall Atrium 11
Docter, Brianne	Student	1:00 p.m.	Henry Hall Atrium 42
Donham, Ashley	Student	2:00 p.m.	Kirkhof Center 2263

Dorking, Selina	Student	11:00 a.m.	Kirkhof Center KC35
Dorking, Selina	Student	11:00 a.m.	Henry Hall Atrium 101
Drake, Brian	Mentor	12:30 p.m.	Kirkhof Center 2201
Drake, Patricia	Student	10:00 a.m.	Kirkhof Center KC 74
Dreisbach, Adam	Student	12:00 p.m.	Kirkhof Center KC42
Dubiel, Carly	Student	11:30 a.m.	Kirkhof Center 2216
Duckett, Nicholas	Student	1:00 p.m.	Kirkhof Center 2204
Duemler, Loren	Student	10:30 a.m.	Kirkhof Center 2263
Dunn, James	Mentor	2:00 p.m.	Kirkhof Center KC 76
Dunn, James	Mentor	2:00 p.m.	Henry Hall Atrium 36
Durham, Carly	Student	2:00 p.m.	Henry Hall Atrium 50
Dykstra, Michael	Student	10:00 a.m.	Kirkhof Center 2259
Dykstra, Michael	Student	10:00 a.m.	Henry Hall Atrium 35
Eerdmans, Jake	Student	10:00 a.m.	Henry Hall Atrium 35
Eerdmans, Jake	Student	11:00 a.m.	Henry Hall Atrium 10
Ellis, Samantha	Student	4:00 p.m.	Kirkhof Center KC10
Emiah, Shadie	Student	10:00 a.m.	Henry Hall Atrium 26
Engerson, Andrea	Student	11:00 a.m.	Henry Hall Atrium 37
Ensign, Jesse	Student	9:00 a.m.	Henry Hall Atrium 1
Enzweiler, Chelsea	Student	10:00 a.m.	Kirkhof Center 2215
Escareno, Jason	Student	3:00 p.m.	Henry Hall Atrium 84
Esch, Michael	Student	3:00 p.m.	Henry Hall Atrium 43
Esparsa, Megan	Student	1:30 p.m.	Kirkhof Center 2270
Ewing, Thomas	Student	1:00 p.m.	Kirkhof Center 2266
Faber, Shaina	Student	11:00 a.m.	Kirkhof Center 2263
Farnsworth, Ruth	Student	10:00 a.m.	Henry Hall Atrium 75
Ferguson, Roger	Mentor	2:00 p.m.	Henry Hall Atrium 56
Figlewicz, Matthew	Student	9:00 a.m.	Henry Hall Atrium 18
Fishback, Paul	Mentor	3:00 p.m.	Kirkhof Center 2201
Flynn, Jeremy	Student	1:00 p.m.	Henry Hall Atrium 83
Foley, David	Student	10:00 a.m.	Henry Hall Atrium 35
Ford, Milt	Mentor	9:00 a.m.	Kirkhof Center 2259
Fortes, Mayra	Mentor	1:00 p.m.	Kirkhof Center 1142
Francis, Lauren	Student	10:00 a.m.	Kirkhof Center KC28
Franks, Jessica	Student	11:00 a.m.	Kirkhof Center 2270
Fredrickson, Jenna	Student	10:00 a.m.	Kirkhof Center KC28
Fuhst, Mallory	Student	2:00 p.m.	Henry Hall Atrium 44
Gailey, Darrin	Student	2:00 p.m.	Kirkhof Center 2259
Galen, Luke	Mentor	12:00 p.m.	Kirkhof Center KC46
Galen, Luke	Mentor	10:00 a.m.	Henry Hall Atrium 3
Gao, Johnson	Student	2:00 p.m.	Kirkhof Center 2204
Garbini, John	Student	1:00 p.m.	Henry Hall Atrium 13
Gawel, Chelsea	Student	11:30 a.m.	Kirkhof Center 2263
Gell, Gwen	Student	9:00 a.m.	Henry Hall Atrium 55
Gendron, Nathanael	Student	2:00 p.m.	Kirkhof Center 2204

George, Kelsey	Student	10:00 a.m.	Kirkhof Center KC 79
Georges, Stacy	Student	4:00 p.m.	Henry Hall Atrium 17
Gereaux, Leon	Student	1:00 p.m.	Kirkhof Center 2215
Gerken, Nathan	Student	10:00 a.m.	Henry Hall Atrium 14
Germaine, David	Student	8:00 a.m.	Kirkhof Center KC34
Gerzich, Devin	Student	10:00 a.m.	Henry Hall Atrium 64
Gipson, Karen	Mentor	10:00 a.m.	Henry Hall Atrium 6
Gjebic, Julia	Student	10:00 a.m.	Henry Hall Atrium 14
Gomer, Caleb	Student	1:00 p.m.	Henry Hall Atrium 28
Goode, James	Mentor	11:00 a.m.	Kirkhof Center 2204
Graham, Doug	Mentor	9:00 a.m.	Kirkhof Center KC44
Graham, Doug	Mentor	1:00 p.m.	Henry Hall Atrium 28
Grant, Nkrumah	Student	9:00 a.m.	Kirkhof Center KC 77
Gray, Valerie	Student	2:30 p.m.	Kirkhof Center 2215
Green, Josh	Student	10:30 a.m.	Kirkhof Center 2201
Green, Zachariah	Student	11:30 a.m.	Kirkhof Center 2266
Greenland, Mercedes	Student	12:30 p.m.	Kirkhof Center 2263
Greer, Gary	Mentor	10:30 a.m.	Kirkhof Center 2201
Gregg, Rachel	Student	3:00 p.m.	Henry Hall Atrium 99
Grenn, Richard	Student	11:00 a.m.	Henry Hall Atrium 7
Griffin, "C. ""Griff""	Mentor	9:30 a.m.	Kirkhof Center 1142
Griffin, "C. ""Griff""	Mentor	2:30 p.m.	Kirkhof Center 1142
Griffin, "C. ""Griff""	Mentor	10:30 a.m.	Kirkhof Center 1142
Griffin, "C. ""Griff""	Mentor	10:00 a.m.	Kirkhof Center 1142
Griffin, "C. ""Griff""	Mentor	3:00 p.m.	Kirkhof Center 1142
Griffin, "C. ""Griff""	Mentor	9:00 a.m.	Kirkhof Center 1142
Griffin, "C. ""Griff""	Mentor	4:30 p.m.	Kirkhof Center 1142
Griffin, "C. ""Griff""	Mentor	11:30 a.m.	Kirkhof Center 1142
Griffin, "C. ""Griff""	Mentor	3:30 p.m.	Kirkhof Center 1142
Griffin, "C. ""Griff""	Mentor	11:00 a.m.	Kirkhof Center 1142
Griffin, "C. ""Griff""	Mentor	12:00 p.m.	Kirkhof Center 1142
Griffin, "C. ""Griff""	Mentor	4:00 p.m.	Kirkhof Center 1142
Griffin, "C. ""Griff""	Mentor	2:00 p.m.	Kirkhof Center 1142
Grimm, Danielle	Student	9:00 a.m.	Kirkhof Center KC22
Grimm, Danielle	Student	12:00 p.m.	Kirkhof Center KC19
Grzesek, David	Student	8:00 a.m.	Kirkhof Center KC34
Guinn, Tyler	Student	9:00 a.m.	Henry Hall Atrium 9
Hage, Anthony	Student	10:00 a.m.	Kirkhof Center KC39
Hage, Anthony	Student	2:00 p.m.	Kirkhof Center KC49
Haiderer, Mary	Student	3:30 p.m.	Kirkhof Center 1142
Haiker, Breanna	Student	9:00 a.m.	Henry Hall Atrium 1
Hall, Shawn	Student	12:00 p.m.	Henry Hall Atrium 4
Hammond, Katherine	Student	12:30 p.m.	Kirkhof Center 2259
Hammond, Katherine	Student	10:00 a.m.	Kirkhof Center KC60
Harbour, Erin	Student	11:00 a.m.	Kirkhof Center KC 81

Harrelson, Abigail	Student	10:00 a.m.	Kirkhof Center 2270
Hart, Dayna	Student	10:00 a.m.	Henry Hall Atrium 26
Hart, Matthew	Mentor	10:00 a.m.	Henry Hall Atrium 49
Hart, Matthew	Mentor	9:00 a.m.	Kirkhof Center KC50
Hart, Matthew	Mentor	2:00 p.m.	Henry Hall Atrium 16
Hart, Matthew	Mentor	2:00 p.m.	Henry Hall Atrium 85
Harvey, Matthew	Student	10:30 a.m.	Kirkhof Center 2216
Harvey, Megan	Student	4:30 p.m.	Kirkhof Center 1142
Hascall, Erik	Student	2:00 p.m.	Henry Hall Atrium 20
Hazel, Stephanie	Student	1:00 p.m.	Kirkhof Center 2263
Heisner, Kris	Student	10:00 a.m.	Henry Hall Atrium 23
Hekstra, Katherine	Student	2:30 p.m.	Kirkhof Center 2259
Hensley, Garrit	Student	9:00 a.m.	Henry Hall Atrium 41
Herbel, Erika	Student	10:00 a.m.	Henry Hall Atrium 26
Herta, Patrick	Student	2:00 p.m.	Henry Hall Atrium 12
Herzhaft, Chelsee	Student	10:00 a.m.	Henry Hall Atrium 11
Heyboer, Lizzie	Student	10:00 a.m.	Kirkhof Center 2216
Heystek, Bryan	Student	9:00 a.m.	Henry Hall Atrium 9
Hindeleh, Firas	Mentor	11:00 a.m.	Kirkhof Center KC55
Hodge, Jonathan	Mentor	11:00 a.m.	Kirkhof Center 2266
Hogan, Joseph	Student	11:30 a.m.	Kirkhof Center 2215
Hoinski, Mary Ellen	Student	12:00 p.m.	Kirkhof Center KC8
Hollister, Robert	Mentor	1:00 p.m.	Henry Hall Atrium 93
Holwerda, Olivia	Student	11:00 a.m.	Henry Hall Atrium 33
Hooker, Ryan	Student	11:00 a.m.	Kirkhof Center KC 68
Houghton-Rahrig, Lori	Mentor	11:00 a.m.	Henry Hall Atrium 73
Hundley, Zak	Student	10:00 a.m.	Henry Hall Atrium 74
Hunt, Jodee	Mentor	12:00 p.m.	Henry Hall Atrium 53
Hurd, Kayla	Student	3:00 p.m.	Kirkhof Center 2266
Hurd, Kayla	Student	12:30 p.m.	Kirkhof Center 1142
Hurley, Owen	Student	10:00 a.m.	Henry Hall Atrium 32
Huynh, C. Mia	Student	10:00 a.m.	Henry Hall Atrium 76
Ihrman, Dr. D.	Mentor	9:00 a.m.	Kirkhof Center 2201
Ihrman, Dr. D.	Mentor	3:00 p.m.	Kirkhof Center 2215
Ihrman, Dr. D.	Mentor	10:00 a.m.	Kirkhof Center 2215
Ihrman, Dr. D.	Mentor	11:30 a.m.	Kirkhof Center 2215
Ihrman, Dr. D.	Mentor	9:30 a.m.	Kirkhof Center 2215
Ingles, Judith	Student	9:00 a.m.	Henry Hall Atrium 1
Ingles, Judith	Student	2:00 p.m.	Kirkhof Center KC49
Jacquot, Joseph	Mentor	9:00 a.m.	Henry Hall Atrium 71
James, Elizabeth	Student	3:30 p.m.	Kirkhof Center 2263
Jimenez, Jose	Student	10:00 a.m.	Kirkhof Center 2201
Johnson, Hope	Student	10:00 a.m.	Henry Hall Atrium 32
Johnson, Ingrid	Mentor	5:00 p.m.	Kirkhof Center 1142
Johnson, Taylor	Student	10:30 a.m.	Kirkhof Center 2263

Johnston, Molly	Student	9:00 a.m.	Kirkhof Center 2263
Jones, Megan	Student	2:00 p.m.	Kirkhof Center 2259
Jordan, Valerie	Student	10:30 a.m.	Kirkhof Center 2263
Jousma, Austen	Student	1:00 p.m.	Henry Hall Atrium 13
Jurries, Andrea	Student	2:30 p.m.	Kirkhof Center 2263
Kaha, Eizabeth	Student	11:00 a.m.	Henry Hall Atrium 59
Kaitany, Kipchumba	Student	11:00 a.m.	Kirkhof Center KC41
Kaminski, Janet	Student	11:00 a.m.	Kirkhof Center KC30
Karagoulis, Phil	Student	2:00 p.m.	Kirkhof Center 2204
Kasmer, Lisa	Mentor	4:00 p.m.	Henry Hall Atrium 17
Kasmer, Lisa	Mentor	11:00 a.m.	Kirkhof Center KC25
Keenlance, Paul	Mentor	4:00 p.m.	Kirkhof Center KC 73
Keenlance, Paul	Mentor	8:00 a.m.	Henry Hall Atrium 71
Keenlance, Paul	Mentor	10:30 a.m.	Kirkhof Center 2201
Kelley, Cory	Student	12:00 p.m.	Kirkhof Center KC18
Kelly, Shana	Student	4:00 p.m.	Kirkhof Center KC11
Keeney, Lisa	Student	3:00 p.m.	Kirkhof Center Area 51
Kenney, Geoffrey	Student	3:00 p.m.	Kirkhof Center KC 70
Kibbe, Mackenzie	Student	1:00 p.m.	Henry Hall Atrium 54
Kirby, Laura	Student	10:00 a.m.	Henry Hall Atrium 86
Kirkendall, Dustin	Student	1:00 p.m.	Henry Hall Atrium 13
Kirkendall, Dustin	Student	2:00 p.m.	Kirkhof Center KC 72
Klarr, Donald	Student	12:00 p.m.	Kirkhof Center KC32
Klatt, Walter	Student	11:00 a.m.	Kirkhof Center 2204
Klosterman, Kayla	Student	1:30 p.m.	Kirkhof Center 2263
Klumpstra, Joe	Student	11:00 a.m.	Henry Hall Atrium 62
Kobberstad, Matthew	Student	3:00 p.m.	Kirkhof Center Area 51
Kopperl, Sheldon	Mentor	2:30 p.m.	Kirkhof Center 2259
Kopperl, Sheldon	Mentor	10:00 a.m.	Kirkhof Center 2270
Kopperl, Sheldon	Mentor	1:00 p.m.	Kirkhof Center 2259
Kopperl, Sheldon	Mentor	10:30 a.m.	Kirkhof Center 2266
Kopperl, Sheldon	Mentor	1:30 p.m.	Kirkhof Center 2201
Korich, Andrew	Mentor	4:00 p.m.	Kirkhof Center KC10
Kosina, Allison	Student	4:30 p.m.	Kirkhof Center 2266
Kovacs, Dalila	Mentor	2:00 p.m.	Kirkhof Center KC53
Kovacs, Dalila	Mentor	8:00 a.m.	Kirkhof Center KC38
Kovacs, Dalila	Mentor	10:00 a.m.	Henry Hall Atrium 5
Kovacs, Dalila	Mentor	11:00 a.m.	Kirkhof Center KC 81
Kravitz, Norman	Mentor	2:00 p.m.	Kirkhof Center 2216
Kravitz, Norman	Mentor	11:30 a.m.	Kirkhof Center 2266
Krcmar, Maja	Mentor	11:00 a.m.	Henry Hall Atrium 51
Krcmar, Maja	Mentor	1:00 p.m.	Kirkhof Center KC52
Kreuzer, Jacob	Student	10:00 a.m.	Kirkhof Center 1142
Kubas, Heather	Student	3:00 p.m.	Henry Hall Atrium 15
Kurby, Christopher	Mentor	1:00 p.m.	Henry Hall Atrium 54

Kurby, Christopher	Mentor	3:00 p.m.	Kirkhof Center KC45
Kurjiaka, David	Mentor	10:00 a.m.	Kirkhof Center KC9
Kurmas, Zachary	Mentor	12:00 p.m.	Henry Hall Atrium 89
Kuska, Karol	Student	11:00 a.m.	Kirkhof Center 2204
Kutsumi, Yuka	Student	11:00 a.m.	Henry Hall Atrium 73
Kutsumi, Yuka	Student	12:00 p.m.	Kirkhof Center KC8
Kwiatkowski, Jaclyn	Student	10:30 a.m.	Kirkhof Center 2270
Lacey, Scott	Student	12:00 p.m.	Henry Hall Atrium 96
LaMie, Joshua	Student	1:00 p.m.	Henry Hall Atrium 13
Lamp, Jared	Student	3:00 p.m.	Henry Hall Atrium 34
Lang, James	Mentor	1:00 p.m.	Henry Hall Atrium 27
Lang, James	Mentor	3:00 p.m.	Henry Hall Atrium 52
Langlois, Jamie	Mentor	10:00 a.m.	Kirkhof Center KC57
Lantz, Andrew	Mentor	1:00 p.m.	Henry Hall Atrium 45
Lantz, Andrew	Mentor	3:00 p.m.	Henry Hall Atrium 34
Lautenbach, Jonathan	Student	4:00 p.m.	Kirkhof Center KC 73
Lawrence, Christopher	Mentor	9:00 a.m.	Henry Hall Atrium 60
Lee, Joshua	Student	10:00 a.m.	Kirkhof Center KC 82
Leek, Danielle	Mentor	5:00 p.m.	Kirkhof Center 2259
Lehmann, Jonathan	Student	2:00 p.m.	Henry Hall Atrium 16
Lemieux, Stacey	Student	10:00 a.m.	Kirkhof Center 2263
Lenters, Geoff	Mentor	11:00 a.m.	Kirkhof Center KC47
Leonard, David	Mentor	11:00 a.m.	Kirkhof Center KC41
Leonard, David	Mentor	12:00 p.m.	Kirkhof Center KC 80
Leonard, David	Mentor	10:00 a.m.	Henry Hall Atrium 74
Leslie, Caitlin	Student	1:00 p.m.	Kirkhof Center KC16
Liang, Yan	Mentor	3:00 p.m.	Kirkhof Center 2259
Lill, Karel	Student	4:00 p.m.	Kirkhof Center 2201
Linn, David	Mentor	10:00 a.m.	Kirkhof Center KC28
Lioubimtseva, Elena	Mentor	3:00 p.m.	Kirkhof Center KC 70
Lioubimtseva, Elena	Mentor	10:00 a.m.	Kirkhof Center KC20
Lioubimtseva, Elena	Mentor	10:00 a.m.	Henry Hall Atrium 78
Lioubimtseva, Elena	Mentor	9:00 a.m.	Henry Hall Atrium 55
Lioubimtseva, Elena	Mentor	10:00 a.m.	Kirkhof Center KC33
Lioubimtseva, Elena	Mentor	4:00 p.m.	Henry Hall Atrium 98
Litchfield, Brittany	Student	11:30 a.m.	Kirkhof Center 2263
Locher, Alexandra	Mentor	11:00 a.m.	Kirkhof Center KC61
Lombardo, Michael	Mentor	1:00 p.m.	Henry Hall Atrium 65
Lombardo, Michael	Mentor	10:00 a.m.	Henry Hall Atrium 26
Lombardo, Michael	Mentor	10:00 a.m.	Kirkhof Center KC 74
Lorenz, Joshua	Student	9:00 a.m.	Henry Hall Atrium 1
Lou, Liang	Mentor	9:00 a.m.	Kirkhof Center KC7
Lown, Debbie	Mentor	2:00 p.m.	Kirkhof Center KC63
Lown, Debbie	Mentor	9:00 a.m.	Kirkhof Center KC65
Luce, Matthew	Student	12:00 p.m.	Kirkhof Center KC36

Luce, Matthew	Student	12:00 p.m.	Kirkhof Center KC24
Lund, Andrew	Student	1:30 p.m.	Kirkhof Center 2266
Lund, Andrew	Student	10:00 a.m.	Kirkhof Center 2204
Lusardi, Lindsey	Student	10:00 a.m.	Kirkhof Center KC28
Lyons, Leah	Student	10:00 a.m.	Kirkhof Center KC28
MacDonald, Neil	Mentor	4:00 p.m.	Henry Hall Atrium 70
Macksood, Nicholas	Student	2:00 p.m.	Kirkhof Center 2215
Main, Jackie	Student	10:00 a.m.	Henry Hall Atrium 11
Maki, Kayla	Student	4:00 p.m.	Henry Hall Atrium 80
Manser, James	Student	9:30 a.m.	Kirkhof Center 2266
Maouene, Josita	Mentor	11:00 a.m.	Henry Hall Atrium 61
Maouene, Josita	Mentor	10:00 a.m.	Henry Hall Atrium 100
Marshall, Aaron	Student	10:00 a.m.	Henry Hall Atrium 5
Martin, Alyn	Student	10:30 a.m.	Kirkhof Center 2259
Maryanski, Danielle	Student	3:00 p.m.	Henry Hall Atrium 43
Maryanski, Danielle	Student	12:00 p.m.	Kirkhof Center KC51
Masko, Amy	Mentor	2:00 p.m.	Kirkhof Center KC29
Mason, Julia	Mentor	1:00 p.m.	Kirkhof Center KC31
Mater, Nicole	Student	4:00 p.m.	Henry Hall Atrium 98
May, Erin	Student	2:00 p.m.	Kirkhof Center 2216
Maynes, Katrina	Student	1:30 p.m.	Kirkhof Center 2216
Mazer, Trent	Student	2:00 p.m.	Henry Hall Atrium 102
McBane, George	Mentor	2:00 p.m.	Henry Hall Atrium 102
McFarlin, Sara	Student	2:00 p.m.	Henry Hall Atrium 58
McGraw, Christina	Student	4:00 p.m.	Kirkhof Center KC11
McNulty, Alison	Student	12:00 p.m.	Kirkhof Center KC46
McQuillan, Natalie	Student	2:00 p.m.	Henry Hall Atrium 87
McRae, Matthew	Student	9:00 a.m.	Henry Hall Atrium 57
McSweeney, Thomas	Student	2:00 p.m.	Kirkhof Center 2204
Menon, Shaily	Mentor	10:30 a.m.	Kirkhof Center 2201
Mercado-Idziak, Natosha	Student	10:00 a.m.	Kirkhof Center KC1
Meyer, Ryan	Student	1:00 p.m.	Kirkhof Center 2216
Meyers, Sarah	Student	3:30 p.m.	Kirkhof Center 2263
Michalek, Jason	Student	9:30 a.m.	Kirkhof Center 2215
Mielecki, Rylee	Student	1:30 p.m.	Kirkhof Center 1142
Mikita, Samantha	Student	1:00 p.m.	Kirkhof Center KC31
Miller, Cameron	Student	4:00 p.m.	Kirkhof Center Area 51
Miller, Cameron	Student	3:00 p.m.	Kirkhof Center Area 51
Mills, Steven	Student	1:00 p.m.	Henry Hall Atrium 54
Mitchell, Joshua	Student	12:00 p.m.	Kirkhof Center KC 80
Mittig, Cody	Student	9:00 a.m.	Henry Hall Atrium 1
Mixter, Adam	Student	11:00 a.m.	Henry Hall Atrium 51
Moenaert, Crystal	Student	11:00 a.m.	Kirkhof Center 1142
Mokdad, Ariel	Student	2:30 p.m.	Kirkhof Center 2216
Morales, Saray	Student	12:00 p.m.	Kirkhof Center KC59

Morgan, Rod	Mentor	9:00 a.m.	Kirkhof Center KC 77
Morison, Melissa	Mentor	11:00 a.m.	Kirkhof Center 2216
Morsink, Bradley	Student	3:00 p.m.	Henry Hall Atrium 8
Mosley, Denisha	Student	9:00 a.m.	Kirkhof Center KC13
Munson, Eric	Student	2:00 p.m.	Henry Hall Atrium 56
Munster, Susan	Student	3:00 p.m.	Kirkhof Center 2216
Murphy, Paul	Mentor	11:00 a.m.	Kirkhof Center 2259
Myers, Amy	Student	1:00 p.m.	Kirkhof Center 2259
Nauta, Matt	Student	10:00 a.m.	Henry Hall Atrium 35
Neal, Jim	Student	2:00 p.m.	Kirkhof Center KC 76
Nesheim, Meghan	Student	10:00 a.m.	Henry Hall Atrium 100
Nettler, Katelyn	Student	10:00 a.m.	Henry Hall Atrium 26
Newman, Kyle	Student	12:00 p.m.	Henry Hall Atrium 68
Nichol, Jonathan	Mentor	3:00 p.m.	Kirkhof Center 0051
Nichol, Jonathan	Mentor	4:00 p.m.	Kirkhof Center 0051
Nicholson, Ben	Student	12:00 p.m.	Kirkhof Center KC 71
Nicola, Nick	Student	3:00 p.m.	Henry Hall Atrium 92
Nieboer, Tom	Student	10:00 a.m.	Henry Hall Atrium 32
Nietling, Tyler	Student	3:00 p.m.	Kirkhof Center 2263
Nizielski, Steven	Mentor	9:00 a.m.	Henry Hall Atrium 72
Nizielski, Steven	Mentor	4:00 p.m.	Kirkhof Center KC64
Nizielski, Steven	Mentor	2:00 p.m.	Henry Hall Atrium 87
Noel, Mike	Student	10:00 a.m.	Henry Hall Atrium 23
Norkus, Peter	Student	10:00 a.m.	Henry Hall Atrium 3
Notter, Rebecca	Student	10:00 a.m.	Henry Hall Atrium 100
O'Brien, Amanda	Student	11:00 a.m.	Henry Hall Atrium 7
O'Brien, Brittaney	Student	1:30 p.m.	Kirkhof Center 2201
O'Brien, Riley	Student	11:00 a.m.	Kirkhof Center 2216
Oliver, Keith	Mentor	11:00 a.m.	Henry Hall Atrium 10
Olson, Amber	Student	10:00 a.m.	Kirkhof Center KC 74
Olson, Katherine	Student	9:00 a.m.	Henry Hall Atrium 1
Olson, Katherine	Student	10:30 a.m.	Kirkhof Center 2266
Ostrow, Bruce	Mentor	12:00 p.m.	Henry Hall Atrium 97
Otieno, Sango	Mentor	2:00 p.m.	Henry Hall Atrium 12
Otieno, Sango	Mentor	12:00 p.m.	Henry Hall Atrium 96
Otieno, Sango	Mentor	2:00 p.m.	Kirkhof Center KC 84
Otieno, Sango	Mentor	1:00 p.m.	Henry Hall Atrium 83
Otieno, Sango	Mentor	10:00 a.m.	Henry Hall Atrium 75
Otieno, Sango	Mentor	10:00 a.m.	Henry Hall Atrium 100
Otieno, Sango	Mentor	4:30 p.m.	Kirkhof Center 2270
Otieno, Sango	Mentor	4:00 p.m.	Kirkhof Center KC11
Ouwinga, Brittany	Student	1:30 p.m.	Kirkhof Center 2263
Oyama, Katie	Student	10:00 a.m.	Kirkhof Center 2204
Panaccio, Diane	Student	10:00 a.m.	Henry Hall Atrium 23
Park, Ernest	Mentor	11:00 a.m.	Kirkhof Center 2215

Park, Ernest	Mentor	1:00 p.m.	Kirkhof Center 2266
Pashnick, Jeff	Student	12:00 p.m.	Kirkhof Center KC19
Paszkowski, Tawney	Student	1:00 p.m.	Kirkhof Center 2263
Patel, Osman	Mentor	10:00 a.m.	Henry Hall Atrium 32
Patel, Osman	Mentor	2:00 p.m.	Kirkhof Center KC 72
Patel, Osman	Mentor	3:00 p.m.	Henry Hall Atrium 43
Pazderni, Charles	Mentor	1:30 p.m.	Kirkhof Center 2270
Pazderni, Charles	Mentor	12:00 p.m.	Kirkhof Center 2216
Pearson, Lynne	Student	1:30 p.m.	Kirkhof Center 2259
Penn, James	Mentor	12:00 p.m.	Henry Hall Atrium 31
Penn, James	Mentor	9:00 a.m.	Henry Hall Atrium 24
Pentecost, Thomas	Mentor	4:00 p.m.	Henry Hall Atrium 80
Perez-Aragon, Guillermo	Student	9:00 a.m.	Henry Hall Atrium 1
Perrin, Paul	Student	4:30 p.m.	Kirkhof Center 2270
Peruzzi, Michael	Student	12:00 p.m.	Kirkhof Center KC 71
Peshl, Jeremy	Student	10:00 a.m.	Henry Hall Atrium 14
Peshl, Jeremy	Student	10:00 a.m.	Henry Hall Atrium 6
Peterson, Alan	Student	12:00 p.m.	Kirkhof Center KC18
Petiprin, Tricia	Student	2:30 p.m.	Kirkhof Center 2263
Pettibone, Justin	Mentor	11:30 a.m.	Kirkhof Center 2216
Phillips, Marina	Student	9:00 a.m.	Henry Hall Atrium 94
Pierce, Justin	Student	4:30 p.m.	Kirkhof Center 2270
Pierson, Stephanie	Student	2:00 p.m.	Henry Hall Atrium 102
Polanic, Michelle	Student	9:30 a.m.	Kirkhof Center 2263
Porambo, Alexander	Student	11:00 a.m.	Kirkhof Center KC 83
Poterek, Michelle	Student	3:00 p.m.	Henry Hall Atrium 8
Potteiger, Jeffrey	Mentor	11:00 a.m.	Henry Hall Atrium 38
Potts, Ashley	Student	4:00 p.m.	Kirkhof Center 1142
Pratt, Stephen	Student	12:00 p.m.	Kirkhof Center KC59
Putman, Elliot	Student	12:00 p.m.	Henry Hall Atrium 46
Pyles, Kristen	Student	10:00 a.m.	Kirkhof Center 2263
Quamme, Joel	Mentor	10:00 a.m.	Kirkhof Center KC60
Radvansky, Jordan	Student	2:00 p.m.	Kirkhof Center KC 84
Ramirez, Jordan	Student	9:00 a.m.	Henry Hall Atrium 1
Ramo, Aula	Student	10:00 a.m.	Kirkhof Center KC28
Ramthun, Katey	Student	9:30 a.m.	Kirkhof Center 2263
Rasch, Katie	Student	3:00 p.m.	Henry Hall Atrium 77
Rauch, Gerrit	Student	8:00 a.m.	Kirkhof Center KC38
Raymond, Matt	Student	10:00 a.m.	Henry Hall Atrium 64
Rayor, Diane	Mentor	10:00 a.m.	Kirkhof Center 2204
Reed, Chris	Mentor	9:00 a.m.	Henry Hall Atrium 57
Reed, Chris	Mentor	9:00 a.m.	Henry Hall Atrium 66
Reed, Chris	Mentor	12:00 p.m.	Henry Hall Atrium 69
Remick, Tanner	Student	2:00 p.m.	Kirkhof Center KC53
Remlinger, Kathryn	Mentor	12:00 p.m.	Kirkhof Center KC42

Reynolds, Ross	Mentor	2:00 p.m.	Kirkhof Center KC40
Reynolds, Ross	Mentor	10:00 a.m.	Henry Hall Atrium 35
Reynolds, Ross	Mentor	10:00 a.m.	Henry Hall Atrium 14
Reynolds, Ross	Mentor	1:00 p.m.	Henry Hall Atrium 13
Rice, Matt	Student	10:00 a.m.	Henry Hall Atrium 23
Richiert, Dawn	Mentor	9:00 a.m.	Henry Hall Atrium 66
Richiert, Dawn	Mentor	9:00 a.m.	Henry Hall Atrium 57
Richiert, Dawn	Mentor	12:00 p.m.	Henry Hall Atrium 69
Ridgeway, Zac	Student	1:00 p.m.	Henry Hall Atrium 40
Roberts, Erica	Student	10:00 a.m.	Kirkhof Center 2263
Robinson, Kayden	Student	12:00 p.m.	Kirkhof Center KC26
Rodriguez, Jose	Student	2:00 p.m.	Kirkhof Center 2259
Roessler, Alexander	Student	9:00 a.m.	Kirkhof Center KC34
Rosenthal, Sara	Student	11:00 a.m.	Kirkhof Center KC30
Ross, Aaron	Student	10:00 a.m.	Henry Hall Atrium 78
Russa, Mary	Mentor	11:30 a.m.	Kirkhof Center 2201
Russell, Amy	Mentor	3:00 p.m.	Kirkhof Center 2216
Russell, Amy	Mentor	10:00 a.m.	Henry Hall Atrium 86
Russell, Amy	Mentor	10:30 a.m.	Kirkhof Center 2259
Rusticus, Abby	Student	12:30 p.m.	Kirkhof Center 2263
Sadlak, Keeley	Student	12:00 p.m.	Henry Hall Atrium 96
Saksa, Eric	Student	1:00 p.m.	Kirkhof Center KC2
Sanchez Gonzalez, Mayra	Student	11:30 a.m.	Kirkhof Center 2201
Sarkissian, Christina	Student	9:00 a.m.	Kirkhof Center KC44
Sarnicola, Leah	Student	11:00 a.m.	Kirkhof Center 2201
Sartain, Hope	Student	9:00 a.m.	Henry Hall Atrium 60
Sass, Georgette	Mentor	10:00 a.m.	Henry Hall Atrium 82
Sawyer, Garrett	Student	1:30 p.m.	Kirkhof Center 2215
Scantlebury, Michael	Mentor	2:00 p.m.	Henry Hall Atrium 58
Schachermeyer, David	Student	10:00 a.m.	Kirkhof Center KC9
Schaertel, Stephanie	Mentor	2:00 p.m.	Henry Hall Atrium 102
Schafer, Rachel	Student	10:00 a.m.	Kirkhof Center KC57
Schlewitz, Andrew	Mentor	9:00 a.m.	Henry Hall Atrium 94
Schlewitz, Andrew	Mentor	9:00 a.m.	Kirkhof Center KC13
Schlewitz, Andrew	Mentor	3:00 p.m.	Kirkhof Center KC17
Schlewitz, Andrew	Mentor	2:00 p.m.	Henry Hall Atrium 29
Schlewitz, Andrew	Mentor	2:00 p.m.	Henry Hall Atrium 50
Schlewitz, Andrew	Mentor	3:00 p.m.	Henry Hall Atrium 77
Schlewitz, Andrew	Mentor	10:00 a.m.	Henry Hall Atrium 76
Schlewitz, Andrew	Mentor	10:00 a.m.	Kirkhof Center KC62
Schlewitz, Andrew	Mentor	1:00 p.m.	Henry Hall Atrium 88
Schlewitz, Andrew	Mentor	1:00 p.m.	Kirkhof Center KC 75
Schlewitz, Andrew	Mentor	9:00 a.m.	Henry Hall Atrium 41
Schlewitz, Andrew	Mentor	11:00 a.m.	Henry Hall Atrium 81
Schneider, Mitchell	Student	12:00 p.m.	Henry Hall Atrium 68

Schneider, Patrick	Student	9:00 a.m.	Henry Hall Atrium 1
Schnyders, Harold	Mentor	2:00 p.m.	Henry Hall Atrium 44
Schnyders, Harold	Mentor	10:00 a.m.	Henry Hall Atrium 14
Schnyders, Harold	Mentor	10:00 a.m.	Henry Hall Atrium 35
Schnyders, Harold	Mentor	12:00 p.m.	Kirkhof Center KC14
Schnyders, Harold	Mentor	1:00 p.m.	Henry Hall Atrium 13
Scholl, Cody-James	Student	5:00 p.m.	Kirkhof Center 1142
Scholten, Connor	Student	12:30 p.m.	Kirkhof Center 2201
Scholten, Connor	Student	11:00 a.m.	Henry Hall Atrium 39
Scholten, Laurel	Student	10:00 a.m.	Kirkhof Center 2266
Schroeder, William	Mentor	11:00 a.m.	Henry Hall Atrium 7
Schroedter, Lindsey	Student	10:00 a.m.	Kirkhof Center KC28
Schultz, Catherine	Student	2:00 p.m.	Kirkhof Center 2270
Schuurman, Shelley	Mentor	2:00 p.m.	Kirkhof Center KC 84
Schwab, Eric	Student	10:00 a.m.	Henry Hall Atrium 91
Schwartz, Mark	Mentor	3:30 p.m.	Kirkhof Center 2216
Schwartz, Mark	Mentor	3:00 p.m.	Kirkhof Center 2266
Sedgley, Justin	Student	9:00 a.m.	Henry Hall Atrium 57
Send, Stephanie	Student	2:00 p.m.	Henry Hall Atrium 12
Serra, Lauren	Student	9:00 a.m.	Henry Hall Atrium 57
Severson, Kelcie	Student	12:00 p.m.	Kirkhof Center KC6
Sharma, Plavita	Student	11:00 a.m.	Kirkhof Center KC35
Sharma, Plavita	Student	11:00 a.m.	Henry Hall Atrium 101
Sharp, Mike	Student	12:00 p.m.	Kirkhof Center KC46
Sharp, Mike	Student	10:00 a.m.	Henry Hall Atrium 3
Sharp, Mike	Student	9:00 a.m.	Henry Hall Atrium 48
Shaw, Kenton	Student	2:00 p.m.	Henry Hall Atrium 20
Shea, Michelle	Student	9:00 a.m.	Kirkhof Center 2201
Sheikh, Elaine	Student	1:00 p.m.	Henry Hall Atrium 65
Shell-Weiss, Melanie	Mentor	10:00 a.m.	Kirkhof Center 2201
Sherman, Ross	Mentor	1:00 p.m.	Henry Hall Atrium 21
Sholler, Giselle	Mentor	3:00 p.m.	Henry Hall Atrium 92
Shoultz, Gerald	Mentor	11:00 a.m.	Henry Hall Atrium 39
Shupe, Ellen	Mentor	12:00 p.m.	Kirkhof Center KC37
Shupe, Ellen	Mentor	10:00 a.m.	Kirkhof Center KC58
Sicard, Stephanie	Student	1:00 p.m.	Kirkhof Center 2201
Sills, Carly	Student	10:00 a.m.	Kirkhof Center KC67
Simons, Brett	Student	12:00 p.m.	Kirkhof Center KC14
Singer, Sean	Student	12:00 p.m.	Kirkhof Center KC6
Singh, Shambhavi	Student	9:00 a.m.	Henry Hall Atrium 63
Skok, Jesse	Student	9:00 a.m.	Henry Hall Atrium 57
Slick, Robert	Student	2:30 p.m.	Kirkhof Center 1142
Smart, Robert	Mentor	11:00 a.m.	Henry Hall Atrium 7
Smith, Andrew	Student	9:00 a.m.	Kirkhof Center KC 69
Smith, Curtis	Mentor	1:00 p.m.	Kirkhof Center 2204

Smith, Curtis	Mentor	2:00 p.m.	Kirkhof Center 2204
Smith, Kirstie	Student	2:00 p.m.	Kirkhof Center KC29
Smith, Taylor	Student	1:00 p.m.	Kirkhof Center 1142
Snider, Michael	Student	12:30 p.m.	Kirkhof Center 2266
Snyder, Eric	Mentor	11:00 a.m.	Kirkhof Center 2270
Snyder, Eric	Mentor	10:00 a.m.	Kirkhof Center KC67
Sommers, Elizabeth	Student	12:00 p.m.	Henry Hall Atrium 95
Sommers, Elizabeth	Student	1:00 p.m.	Kirkhof Center KC 78
Sorrentino, Anthony	Student	9:00 a.m.	Henry Hall Atrium 66
Sorrentino, Anthony	Student	9:00 a.m.	Henry Hall Atrium 9
Spaans, Amber	Student	9:00 a.m.	Kirkhof Center KC65
Spalding, Mary	Student	9:00 a.m.	Kirkhof Center 2259
Spalsbury, Marcy	Student	4:00 p.m.	Kirkhof Center KC64
Spoelma, Trevor	Student	11:00 a.m.	Kirkhof Center 2215
Sridhar, Suganthi	Mentor	11:00 a.m.	Henry Hall Atrium 7
Sridhar, Suganthi	Mentor	11:00 a.m.	Henry Hall Atrium 101
Sridhar, Suganthi	Mentor	11:00 a.m.	Kirkhof Center KC35
Sridhar, Suganthi	Mentor	9:00 a.m.	Henry Hall Atrium 63
St. Louis, Scott	Student	11:00 a.m.	Kirkhof Center 2259
Stahl, Wyatt	Student	3:00 p.m.	Kirkhof Center KC45
Stempek, Charleen	Student	11:00 a.m.	Kirkhof Center 2263
Sterley, Kaitlyn	Student	12:00 p.m.	Kirkhof Center KC59
Stinson, Elizabeth	Student	11:00 a.m.	Henry Hall Atrium 67
Stoltman, Caitlin	Student	12:30 p.m.	Kirkhof Center 2263
Stoscup, Julie	Student	12:00 p.m.	Kirkhof Center KC 71
Stoudamire, Shawnkeisha	Student	3:30 p.m.	Kirkhof Center 2201
Straight, Jordan	Student	2:00 p.m.	Kirkhof Center KC 72
Stretton, Christopher	Student	9:00 a.m.	Kirkhof Center KC 77
Strickler, Tim	Mentor	9:00 a.m.	Henry Hall Atrium 57
Strickler, Tim	Mentor	12:00 p.m.	Henry Hall Atrium 69
Strickler, Tim	Mentor	9:00 a.m.	Henry Hall Atrium 66
Stroh, Justin	Student	10:00 a.m.	Kirkhof Center KC33
Strong, Eric	Student	10:00 a.m.	Kirkhof Center KC20
Sturgill, Brad	Mentor	1:00 p.m.	Kirkhof Center 2216
Sun, Wanxiao	Mentor	9:00 a.m.	Kirkhof Center KC 69
Sun, Wanxiao	Mentor	10:00 a.m.	Henry Hall Atrium 23
Swanson, Karel	Mentor	10:00 a.m.	Henry Hall Atrium 75
Syfert, Emily	Student	11:00 a.m.	Henry Hall Atrium 33
Sylvester, Francis	Mentor	9:00 a.m.	Henry Hall Atrium 18
Sylvester, Francis	Mentor	12:00 p.m.	Kirkhof Center KC27
Sylvester, Francis	Mentor	9:00 a.m.	Henry Hall Atrium 9
Szarecka, Agnieszka	Mentor	11:00 a.m.	Henry Hall Atrium 7
Talbert, Robert	Mentor	11:30 a.m.	Kirkhof Center 2259
Tallman, Melissa	Mentor	12:00 p.m.	Henry Hall Atrium 69
Tallman, Melissa	Mentor	9:00 a.m.	Henry Hall Atrium 66

Tallman, Melissa	Mentor	9:00 a.m.	Henry Hall Atrium 57
Tavakalyan, Karina	Student	12:00 p.m.	Kirkhof Center KC27
Taylor, Merritt	Mentor	10:00 a.m.	Kirkhof Center KC 82
Teall, Emily	Student	3:30 p.m.	Kirkhof Center 2216
Thaxton, Kyle	Student	11:00 a.m.	Henry Hall Atrium 101
Thaxton, Kyle	Student	11:00 a.m.	Kirkhof Center KC35
Thimmesch, Nick	Student	12:00 p.m.	Henry Hall Atrium 4
Thoe, Jessica	Student	9:00 a.m.	Kirkhof Center KC56
Thomas, Derek	Mentor	11:00 a.m.	Henry Hall Atrium 67
Thomas, Derek	Mentor	11:00 a.m.	Henry Hall Atrium 37
Thomas, Derek	Mentor	1:00 p.m.	Kirkhof Center KC 78
Thorpe, Patrick	Mentor	10:00 a.m.	Kirkhof Center KC 74
Thorpe, Patrick	Mentor	10:00 a.m.	Henry Hall Atrium 26
Thum, Ryan	Mentor	12:00 p.m.	Kirkhof Center KC19
Thum, Ryan	Mentor	9:00 a.m.	Kirkhof Center KC22
Tibble, Alison	Student	10:00 a.m.	Kirkhof Center KC28
Tokarski, Casimir	Student	10:00 a.m.	Henry Hall Atrium 26
Tole, Olvi	Student	12:00 p.m.	Kirkhof Center KC8
Tompkins, Jennifer	Student	1:00 p.m.	Kirkhof Center KC3
Torbet, Raymond	Student	1:00 p.m.	Henry Hall Atrium 27
Torbet, Raymond	Student	1:00 p.m.	Henry Hall Atrium 21
Trefftz, Christian	Mentor	12:00 p.m.	Kirkhof Center 2270
Trevethan, Lindsay	Student	1:00 p.m.	Kirkhof Center 2270
Trier, Terry	Mentor	2:00 p.m.	Kirkhof Center 2270
Tripp, Nathan	Student	12:00 p.m.	Henry Hall Atrium 30
Tryon, Shelby	Student	12:00 p.m.	Kirkhof Center KC42
Tschirhart, Jonathon	Student	10:00 a.m.	Kirkhof Center KC23
Tucker, Veta	Mentor	3:30 p.m.	Kirkhof Center 2201
Tuinstra, Daniel	Student	9:00 a.m.	Henry Hall Atrium 66
Tumbleson, Monique	Student	11:00 a.m.	Kirkhof Center KC21
Tusch, Guenter	Mentor	12:00 p.m.	Kirkhof Center KC8
Tyler, Molly	Student	9:00 a.m.	Kirkhof Center KC66
Tyner, Aaron	Student	9:00 a.m.	Henry Hall Atrium 66
Underwood, Kathleen	Mentor	3:00 p.m.	Henry Hall Atrium 15
Underwood, Kathleen	Mentor	2:30 p.m.	Kirkhof Center 2215
Underwood, Kathleen	Mentor	11:00 a.m.	Kirkhof Center KC30
Underwood, Kathleen	Mentor	1:00 p.m.	Kirkhof Center KC31
Underwood, Kathleen	Mentor	12:00 p.m.	Kirkhof Center KC26
Underwood, Kathleen	Mentor	12:00 p.m.	Kirkhof Center KC12
Underwood, Kathleen	Mentor	1:00 p.m.	Kirkhof Center KC15
Underwood, Kathleen	Mentor	1:00 p.m.	Kirkhof Center KC3
Underwood, Kathleen	Mentor	1:30 p.m.	Kirkhof Center 2215
Underwood, Kathleen	Mentor	11:00 a.m.	Kirkhof Center KC21
Underwood, Kathleen	Mentor	11:00 a.m.	Henry Hall Atrium 59
Vail, Janet	Mentor	1:00 p.m.	Henry Hall Atrium 83

Vallery, Richard	Mentor	2:30 p.m.	Kirkhof Center 2270
Vallery, Richard	Mentor	9:00 a.m.	Kirkhof Center KC54
Van Houten, Melanie	Student	12:30 p.m.	Kirkhof Center 2263
Van Ryn, Jennifer	Student	9:30 a.m.	Kirkhof Center 2263
Van Vliet, Craig	Student	10:00 a.m.	Henry Hall Atrium 75
Van Y, Renee	Student	12:00 p.m.	Kirkhof Center 2263
Vanacker, Emma	Student	9:30 a.m.	Kirkhof Center 1142
VanAmberg, Cory	Student	12:00 p.m.	Henry Hall Atrium 4
VanAmberg, Kelsey	Student	10:00 a.m.	Henry Hall Atrium 32
Vander Broek, Laura	Mentor	12:30 p.m.	Kirkhof Center 2259
Vanderhoof, Bridgett	Student	12:30 p.m.	Kirkhof Center 2216
Vanderlip, Chris	Student	11:30 a.m.	Kirkhof Center 2270
Vanderstelt, Haleigh	Student	2:00 p.m.	Kirkhof Center 2201
VanDriel, Samantha	Student	2:00 p.m.	Kirkhof Center KC5
VanOeveren, Sarah	Student	10:00 a.m.	Henry Hall Atrium 82
Vanwyngarden, Christian	Student	12:00 p.m.	Henry Hall Atrium 68
Videtich, Patricia	Mentor	11:00 a.m.	Henry Hall Atrium 62
Videtich, Patricia	Mentor	10:00 a.m.	Henry Hall Atrium 64
Videtich, Patricia	Mentor	12:00 p.m.	Kirkhof Center KC59
Videtich, Patricia	Mentor	2:00 p.m.	Henry Hall Atrium 20
Videtich, Patricia	Mentor	12:00 p.m.	Henry Hall Atrium 68
Videtich, Patricia	Mentor	1:00 p.m.	Kirkhof Center KC16
Videtich, Patricia	Mentor	3:00 p.m.	Henry Hall Atrium 8
Voetberg, Jacob	Student	9:00 a.m.	Kirkhof Center KC54
Voulgaris, Andrea	Student	3:00 p.m.	Kirkhof Center Area 51
Vos, Duncan	Student	2:00 p.m.	Kirkhof Center KC 84
Waalkes, William	Student	12:00 p.m.	Henry Hall Atrium 47
Wagendorp, Jeroen	Mentor	1:00 p.m.	Henry Hall Atrium 19
Waggener, William	Student	9:00 a.m.	Henry Hall Atrium 66
Waggener, William	Student	12:00 p.m.	Kirkhof Center KC27
Wagner, Jeffrey	Student	2:00 p.m.	Kirkhof Center KC 72
Wahl, Nicholas	Student	2:30 p.m.	Kirkhof Center 2263
Walker, Thomas	Mentor	9:30 a.m.	Kirkhof Center 2266
Walker, Thomas	Mentor	10:00 a.m.	Kirkhof Center 2216
Wallar, Brad	Mentor	1:00 p.m.	Henry Hall Atrium 42
Wallar, Brad	Mentor	11:00 a.m.	Kirkhof Center KC 83
Wallar, Brad	Mentor	12:00 p.m.	Henry Hall Atrium 25
Wampler, Peter	Mentor	9:00 a.m.	Kirkhof Center KC 69
Ward, Brooke	Student	10:00 a.m.	Henry Hall Atrium 90
Warner, Cameron	Student	12:00 p.m.	Henry Hall Atrium 89
Warner, Ryan	Student	1:00 p.m.	Henry Hall Atrium 13
Watts, Keith	Mentor	11:30 a.m.	Kirkhof Center 2270
Weibel, Deana	Mentor	1:30 p.m.	Kirkhof Center 1142
Wellman, Kristen	Student	11:00 a.m.	Kirkhof Center KC 81
Welsh, Meredith	Student	1:00 p.m.	Henry Hall Atrium 40

Welti, Skylar	Student	4:00 p.m.	Henry Hall Atrium 80
Wernette, Adam	Student	9:00 a.m.	Henry Hall Atrium 1
Werth, Christopher	Student	11:00 a.m.	Kirkhof Center KC48
Wesley, Kyle	Student	9:00 a.m.	Henry Hall Atrium 72
White, Jonathan	Mentor	3:00 p.m.	Henry Hall Atrium 84
White, Jonathan	Mentor	1:30 p.m.	Kirkhof Center 2216
Whitlock, Krista	Student	12:00 p.m.	Henry Hall Atrium 46
Whitmore, Jeremy	Student	9:00 a.m.	Kirkhof Center KC50
Wicklund, Kyle	Student	9:00 a.m.	Kirkhof Center KC7
Williams, Janell	Student	3:00 p.m.	Henry Hall Atrium 8
Williams, Joshua	Student	3:00 p.m.	Kirkhof Center 2215
Williams, Todd	Mentor	10:00 a.m.	Henry Hall Atrium 90
Williams, Todd	Mentor	9:00 a.m.	Henry Hall Atrium 48
Williams, Jacqueline	Student	10:00 a.m.	Henry Hall Atrium 49
Winchester, Randy	Mentor	9:00 a.m.	Kirkhof Center KC4
Winther, Jennifer	Mentor	12:00 p.m.	Kirkhof Center KC51
Withers, Casey	Student	5:00 p.m.	Kirkhof Center 1142
Witherspoon, Trista	Student	10:00 a.m.	Henry Hall Atrium 100
Witucki, Laurie	Mentor	12:30 p.m.	Kirkhof Center 2215
Witucki, Laurie	Mentor	12:30 p.m.	Kirkhof Center 1142
Wojtowicz, Connor	Student	12:00 p.m.	Kirkhof Center 1142
Wolahan, Thomas	Student	11:00 a.m.	Henry Hall Atrium 81
Wolfe, Michael	Mentor	2:00 p.m.	Kirkhof Center KC43
Wolffe, Greg	Mentor	1:00 p.m.	Henry Hall Atrium 28
Wolffe, Greg	Mentor	1:00 p.m.	Henry Hall Atrium 79
Wolthuis, Emily	Student	10:30 a.m.	Kirkhof Center 2270
Wozniak, Rhyan	Student	1:00 p.m.	Henry Hall Atrium 27
Wozniak, Rhyan	Student	1:00 p.m.	Henry Hall Atrium 21
Wright, Diane	Mentor	2:00 p.m.	Kirkhof Center 2201
Wright, Kendall	Student	11:00 a.m.	Kirkhof Center 2263
Wykle, Maxine	Student	9:00 a.m.	Henry Hall Atrium 1
Xu, Xandra	Mentor	10:00 a.m.	Kirkhof Center KC1
Yazbec, Angele	Student	10:00 a.m.	Kirkhof Center KC60
Young, Kathryn	Student	12:00 p.m.	Kirkhof Center KC27
Zaszlavik, Katalin	Mentor	2:00 p.m.	Kirkhof Center 2259
Zaszlavik, Katalin	Mentor	10:30 a.m.	Kirkhof Center 2270
Zemaitis, Kristen	Student	12:00 p.m.	Henry Hall Atrium 53
Zucker, Noah	Student	10:00 a.m.	Kirkhof Center KC9
Zuhl, Alex	Student	2:00 p.m.	Henry Hall Atrium 85
Zuidema, Jay	Student	12:00 p.m.	Kirkhof Center KC24
Zuidema, Jay	Student	12:00 p.m.	Kirkhof Center KC36
Zyburski, Meghan	Student	1:00 p.m.	Kirkhof Center KC15







Grand Valley State University is an affirmative action, equal opportunity institution. It encourages diversity and provides equal opportunity in education, employment, all of its programs, and the use of its facilities. It is committed to protecting the constitutional and statutory civil rights of persons connected with the university. 2/12
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