

6th Annual Minnesota Conference of
**UNDERGRADUATE SCHOLARLY
and CREATIVE ACTIVITY**
Monday April 3, 2017

**6th Annual Minnesota Conference of Undergraduate Scholarly and
Creative Activity**

**Welcome to the Sixth Annual Minnesota Conference of
Undergraduate Scholarly and Creative Activity**

Minnesota Undergraduate Research Council

Bemidji State University, Mahmoud Al-Odeh
Inver Hills Community College, David Higgins
Metropolitan State University, Jennifer Schultz, Alex Layne and Tammy Durant
Minneapolis Community and Technical College and Renu Kumar
Minnesota State University Moorhead, Oscar Flores
Minnesota State University, Mankato, Karla Lassonde
St Cloud State University, Carrie Barth and Jodi Kuznia
Southwest Minnesota State University, Emily Deaver
Winona State University, Kubilay Gok and Mingrui Zhang
Rochester Community and Technical College, Heather Sklenicka



MINNESOTA STATE UNIVERSITY
MOORHEAD.



It gives me great pleasure to introduce you to the Sixth Annual Undergraduate Scholars Conference, which celebrates undergraduate research at Minnesota State Colleges and Universities. The conference fosters collaboration and partnership as undergraduate students and faculty mentors from nine universities and three community and technical colleges meet in Winona to share projects from a broad range of disciplines.

Our colleges and universities provide students with an extraordinary education that meets their personal and career goals, enhances the quality of life for all Minnesotans, and sustains vibrant communities throughout the state. Hands-on research experience not only enables our students to participate in the process of discovery, it also builds curiosity, creativity, imagination, and teamwork.



This annual conference marks a milestone for students to celebrate and share their discoveries and to celebrate the collaboration among our colleges and universities.

Thank you for participating in the 2017 MN State Undergraduate Scholars Conference.

A handwritten signature in black ink that reads "Steven Rosenstone". The signature is written in a cursive style with a large, stylized initial "S".

Steven Rosenstone

Chancellor, Minnesota State College and Universities



Welcome to the Sixth Annual MN State Undergraduate Scholars Conference. It is a great honor for Winona State University to host this conference. It is our hope that the presence of this event on the campus of WSU will aid in the continued growth and success of undergraduate research throughout MN State.

Winona State University holds, as part of our mission, to be "a community of learners improving our world." This is reflected in our commitment to undergraduate research across the entire campus. This community begins with the collaboration of an undergraduate student and faculty mentors as they work to address issues relevant to their discipline. The community grows through students sharing their work with other students, faculty, and citizens of the Winona area at our annual

Judith Ramaley Celebration of Research and Creative Scholarship, which is now in its 11th year. This year, we have the good fortune to expand this community to other students and faculty within the MN State system! Our hosting the conference will further instill the significance of undergraduate research across our campus and beyond through the exchange of ideas, methods, and views of the many fields of study found across our campuses.

We are proud to host the MN State Undergraduate Scholars Conference and committed to doing our part in making this conference a showcase that demonstrates the value of research to our educational programs.

Sincerely,

A handwritten signature in black ink, appearing to read "S. Olson". The signature is fluid and cursive, with a long, sweeping underline that extends to the right.

Scott R. Olson
President, Winona State University

Acknowledgement

This event would have not been possible without support provided at Winona State University and the administration, staff, and faculty of MN State and our sister institutions. Thanks to President Scott Olson and Provost Pat Rogers for providing financial support and for their commitment to undergraduate research. Ann Durley and Blandine Berthelot, WSU Office for Camps and Conferences, provided all logistical support from registration to campus housing (and everything in between). Stephanie Smidt, Student Union, provided excellent support in helping us identify the best spaces to use for the conference and were tolerant of modifications made along the way. Patricia Malotka and Sarah Delano, Marketing and Communications, designed the conference program, built and maintained the conference website, and we also thank them for the many additions we requested along the way. As always, the staff of Facilities Services provided excellent support setting up the event. We also thank Teaching, Learning, and Technology Services for preparing laptops for student presentations, and Susan McDonnell of Computer Science for providing technical support on-site.

Of course, the conference would not be possible without the students and faculty of the MN State institutions for their commitment to quality education and the initiative to engage research and creative scholarship as part of the educational experience. This includes the members of the MN State Undergraduate Scholar organizing council whose insights and passion for undergraduate research and scholarships have developed and sustained this celebration of our students.

Sincerely,

Heather Sklenicka, Ph.D.
Rochester Community and Technical College

Kubilay Gok, Ph.D. and Mingrui Zhang, Ph. D.
Winona State University



SUNDAY, APRIL 2nd

6:00 p.m. – 8:00 p.m. Check-in for overnight guests
Tau Center, West Campus

MONDAY, APRIL 3rd

7:30 a.m. – 11:00 a.m. Registration
Kryzsko Commons, East Hall

7:30 a.m. – 8:30 a.m. Poster set up, Breakfast
Kryzsko Commons, East Hall

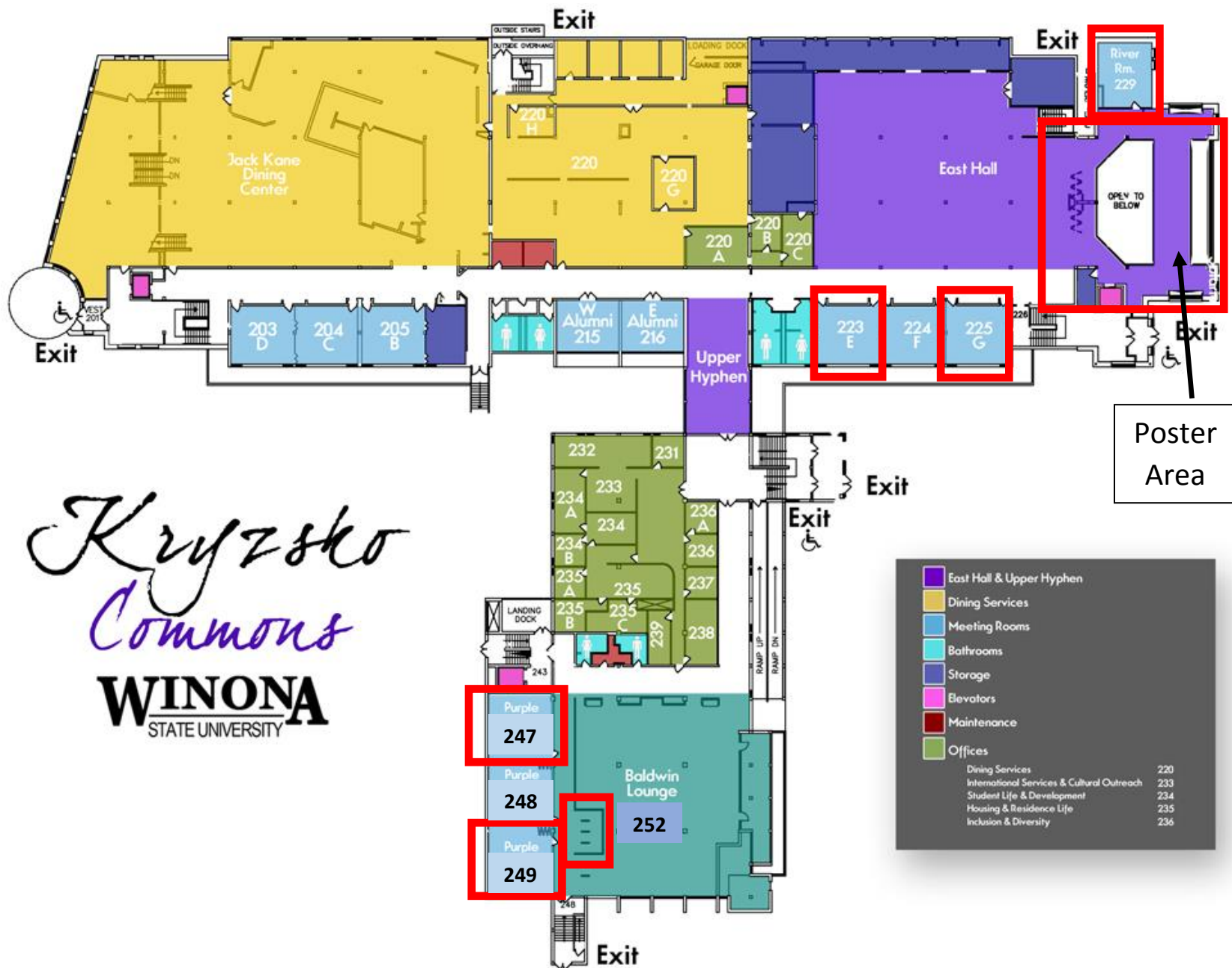
8:30 a.m. – 9:45 a.m. Poster Session I
Kryzsko Commons, East Hall

9:45 a.m. – 12:15 p.m. Oral Session
Rooms 225, 247, 249

12:15 p.m. – 1:00 p.m. Lunch Break
Kryzsko Commons, East Hall

12:45 p.m. – 1:00 p.m. Invitation to the 7th MN State Conference at RCTC

1:00 p.m. – 2:15 p.m. Poster Session II
Kryzsko Commons, East Hall



Poster Area

East Hall & Upper Hyphen	
Dining Services	220
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8:30 – 9:45 a.m. POSTER SESSION I

East Hall

PRESENTATION #3: Alyssa Klenotich

Exploring Vitamin Intake with a Self-As-Doer Intervention

PRESENTATION #8: Bryce Lange

Democracy in the United States

PRESENTATION #11: Cosette Kaster, Tayler Burg and Lindsey Dahlberg

Visionary to Success: J.R. Watkin's Hiring and Performance Management Processes

PRESENTATION #16: Emily Roth

An Improved Method for Vitamin C Titration

PRESENTATION #19: Garrett Wee

Evaluating the Seasonal changes in Lone Tree Lake wetland in North Eastern Lyon County

PRESENTATION #20: Grady Friedges

Group Differences in Performance between Forward Line and Back Line Male Rugby Players

PRESENTATION #21: Grady Friedges, Lauren Mullenbach, Michaela Handke, Kemry Grett, Rylie Klinski and Jonathan St. Peter

How Do You Exercise? Group Differences among College Students' Attitudes towards Exercise and Body Image

PRESENTATION #22: Hok Lam (Rachel) Ou-Yong

Predicting Lung Cancer Treatment Outcomes

PRESENTATION #23: Jennifer Brown, Grady Friedges and Ryan Vargas

Does level of aggression influence athletic performance in men's rugby?

PRESENTATION #28: Katie Scruggs and Ethan Pottebaum

Exploiting Ebola Virus-Like Particles to Develop a Better Vaccine

PRESENTATION #29: Kelly Highum

Online Pornography: Shaping Masculinity in a Post-Industrial World

PRESENTATION #30: Kemry Gett, Grady Friedges, Lauren Mullenbach, Michaela Handke, Rylie Klinski and Jonathan St. Peter

Healthy Lifestyles Among College Undergraduates: Do Healthy Eating Habits Paired with Regular Exercise Reduce the Symptoms of Anxiety?

PRESENTATION #32: Kristian Kennedy

Dihydroxylation of Limonene

PRESENTATION #33: Lauren Mullenbach, Grady Friedges, Michaela Handke, Kemry Gett, Rylie Klinski and Jonathan St. Peter

Exercise and Anxiety Across a College Campus: Does Intensity Matter?

PRESENTATION #34: **Le Tang**

Theorems on p -adic Continued Fractions

PRESENTATION #37: **Madilyn R Schmitz, Amanda Madigan, Nicole Crowson, Nathan L Leonard, Elana Alcala, Victoria R Schwarzinger, Alyssa J Meyer, Mary Soderlund and Jean K Lim**

West-Nile virus replicon particles infect 293T cells expressing DC-SIGNR

PRESENTATION #40: **Mason Fetterer**

Analyzing Twin Cities Public transit as it relates to vehicle ownership choice

PRESENTATION #45: **Michael Holmblad**

Understanding Elliptic Curves in Cryptography

PRESENTATION #47: **Nicole Bean**

Using Total Protein Stain as a Loading Control for Western Blot Analysis of SOD2

9:45 a.m. – 12:15 p.m.

ORAL SESSION

Room 225

Moderator: **Karla Lassonde**

PRESENTATION #2: **Abdiasis Abdilahi, Caitlyn Foley and Jaden Roddick**

Seasonal Variations in the Dorsolateral and Medial Cortex, the Reptilian Hippocampus Homologue

PRESENTATION #5: **Austin Heise**

Cause of Death: United States' Geostrategic Interests in the Horn of Africa, 1991-1995

PRESENTATION #13: **Elena Lacey**

Female Coming of Age in Nazi Germany: Female Youth Education and Motherhood 1933-1945

PRESENTATION #15: **Elizabeth Rossow**

Reflection about One Educator's Experience of Culturally Responsive Instruction of One Child on the Autism Disorder Spectrum

PRESENTATION #26: **Justin Warburton**

A Rubik's Cube Solving Robot

PRESENTATION #46: **Nicholas Meyer**

On The Algebra of Rotations of R^3

PRESENTATION #39: **MaKyla Culpitt**

Silence is Peace: The Clinton Administration and the Rwandan Genocide

Room 247

Moderator: **Heather Sklenicka**

PRESENTATION #1: **Aaron Camacho, Regan Holm and Raeshawn McDuffie**

Indigenous Learning Garden Initiative

PRESENTATION #12: **Dalton Dahle, Laura Oakgrove, Additional Team Members: Lavahn**

Bounkio, Luis Cisneros Pito, Lizette Reilan, Sagal Abdi, Thiab Abuserrieh and Awel Lam

Humans of RCTC: A Service Learning Approach to Intercultural Communication Exploration

PRESENTATION #14: **Elisa Wright**

Optimization of Warfarin Synthesis in the Undergraduate Teaching Laboratory

PRESENTATION #31: **Ker Thao**

Electrochemistry with Household Items

PRESENTATION #35: **Lindsey Wendt and Nicole Pederson**

How BSU Students Utilize Social Media and How Our Campus Can Benefit From This

PRESENTATION #36: **Luis Cisneros Pito, Lizette Reiland, Sagal Abdi, Thiab Abuserrieh and Awel Lam**

Life between Co-Cultures: A Spotlight on RCTC Student Intercultural Communication Experiences

PRESENTATION #44: **Michael Ganzer and Tien Pham**

Design and Validation of a Low Cost High Speed Atomic Force Microscope

Room 249

Moderator: **Emily Deaver**

PRESENTATION #17: **Emma Tomb**

Painting the Revolution: The Mexican Revolution's Transformative Effect on Mexican Painting

PRESENTATION #18: **Gabriela Lara**

Running with the Beast

PRESENTATION #38: **Madison Bowe and Chloe Healy**

An Empirical Analysis of the EEOC and Company Compliance in the Human Resource Field

PRESENTATION #55: **Sarah Ortega, Jennifer Manglos, Risa Muroya and Samantha Fances**

Challenging Rape Culture: FORGE and RE Initiative

PRESENTATION #57: **Sterling Knox**

Grand Reentry

PRESENTATION #59: **Tia Hinz**

Slut Shaming and the Rape Culture

1:00 – 2:15 p.m.

POSTER SESSION II

East Hall

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Developing Hops Extraction Method for Brewing

PRESENTATION #6: Aynura Berdyeva

Isomorphous Replacements and Crystal Structure of $Pb(8-x)Ca_xNa_2(VO_4)_6$ Solid Solutions

PRESENTATION #7: Brennen Godeen

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Escherichia coli (E. coli) Impairment in Minneopa Creek

PRESENTATION #10: Caroline Bang

Gnomons

PRESENTATION #24: Jessica McDonald

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PRESENTATION #25: Justin Hill

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PRESENTATION #27: Kaleab Worku

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PRESENTATION #41: Megan Ford

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Biocompatibility of Hydroxyapatite and Stainless Steel Alloys

PRESENTATION #43: Melissa Jones and Caitlin Flynn

Are Escherichia coli (E. coli) Isolated from Minneopa Creek Developing Resistance to 10 Antibiotics?

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Induced Natriuresis on Spontaneously Hypertensive Female Rats

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Modeling Stratosphere-Troposphere Exchange within Extreme Extratropical Convection

PRESENTATION #50: Ryan Leba

Counteraction of APOBEC3A by SIV Sooty Mangabey Proteins

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Does Experience Predict Success on the Rugby Pitch?

PRESENTATION #52: Rylie Klinski, Grady Friedges, Lauren Mullenbach, Michaela Handeke, Kemry Gett and Jonathan St. Peter

Exercise Motivations of College Students: Shifting Away From Media Influence

PRESENTATION #53: **Samantha Lee and Grady Friedges**

"I work hard, feel good, do well": A Qualitative Analysis of Student Athletes' Perspectives of Academic Achievement

PRESENTATION #54: **Samson Chen**

Complex Analysis Calculator

PRESENTATION #58: **Tate Andrew Colwell**

Stress effect on soybean yield

PRESENTATION #60: **Peter Olson**

Thomas A. Hanson, Faculty Mentor

Financial Literacy, Family Communication, and Privacy Management

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Jenna Kalthoff

Portfolio Investment, Behavioral Biases, and Financial Literacy

PRESENTATION #62

Qin Chen and Wen Zheng

Does higher gender diversity in corporate boards increase financial performance?

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PRESENTATION #1

Aaron Camacho, Regan Holm and Raeshawn McDuffie

Alexander Hines and Tarrell Portman, Faculty Mentor
Inclusion and Diversity Office, Winona State University

Indigenous Learning Garden Initiative

Format: Oral

"The Indigenous Learning Garden Initiative is a student led project through Winona State University's Inclusion and Diversity Office that is attempting to reframe the reproduction of the End of the Trail sculpture by James Earle Fraser featured in the courtyard of our campus. In essence, our initiative is attempting to create a living laboratory and learning space on our campus grounds to appropriately contextualized representations of Indigenous cultures on our campus and educate regarding North American indigenous people. This learning garden will enhance our education at WSU by providing a space to house indigenous knowledge despite currently not having a place to for it within the buildings of our college at this time. This project speaks directly to our university's mission statement, requests by the leadership of our community, as well as addresses the need within our education regarding indigenous peoples of the region and gives WSU a chance to fill the void, the silent narrative of Indian Country.

Our University's name is Winona. It is good to remember this name has been appropriated from the Dakota language. The Dakota word "Wenonah" means first daughter. The first daughter's responsibility is to care for her community, make sure they are protected, and l living in a good way. If this role is not fulfilled, the name will be taken away and given to someone else. This name is a title and holds responsibility. This University has assumed that name and ought to uphold its meaning. This can be done on Winona State University's part by simply acting on its commitment to enhance the intellectual, social, cultural and economic vitality of the people and communities it serves. This commitment can be realized by reframing the End of the Trail sculpture with the implementation of an Indigenous Learning Garden. We are still here."

PRESENTATION #2

Abdiasis Abdilahi, Caitlyn Foley and Jaden Roddick

Rachel Cohen, Faculty Mentor
Department of Biological Sciences, Minnesota State University Mankato

Seasonal Variations in the Dorsolateral and Medial Cortex, the Reptilian Hippocampus Homologue

Format: Oral

The hippocampus is a region of the brain involved in spatial learning and memory and is a site of neural plasticity in the adult brain. In the seasonally breeding green anole lizard, *Anolis carolinensis*, steroid hormones, specifically testosterone (T) and its metabolites, estradiol (E2) and dihydrotestosterone (DHT), have been shown to play a role in seasonal changes to brain morphology. To investigate potential seasonal effects in the lizard homologue of the hippocampus, the dorsolateral cortex (DC) and medial cortex (MC), we examined 1) morphology in breeding (BS) and non-breeding (NBS) males and 2) neuron

addition in BS males treated with various hormones. In experiment 1, we obtained males during the BS and NBS, collected brains, and examined volume in Nissl stained sections. In experiment 2, we gonadectomized BS males and implanted subcutaneous capsules containing T, E2, DHT, or left empty (blank). After hormone implantation, animals were injected with bromodeoxyuridine (BrdU; 50mg/kg) once per day for three days and brains collected after 25 days. Immunohistochemistry for BrdU and HuC/D (a neuronal marker) was performed to determine the number of new neurons (neurogenesis) present in the DC after treatment. Preliminary results for experiment 1 have shown there was no effect of season on the volume of either region, or the total volume ($n=4$; $t_{0.502}$). Additionally, experiment 2 preliminary results suggest that DC, MC and total volume did not differ between T or BI treated breeding males ($n=2$; $t_{0.258}$). More animals are currently being analyzed.

PRESENTATION #3

Alyssa Klenotich

Amanda Brouwer, Faculty Mentor

Department of Psychology, Winona State University

Exploring Vitamin Intake with a Self-As-Doer Intervention

Format: Poster

The self-as-doer identity is an identity that links behavior and self-concept and is associated with increased persistence with physical activity and healthy eating behaviors. However, how the self-as-doer identity intervention affects vitamin intake has not been explored, therefore I examined whether the self-as-doer intervention would induce a positive improvement in Vitamin A and C intake.

Participants were 89 women, 18-53 years old ($M=22.92$, $SD=6.92$) randomly assigned to one of three conditions (i.e., control, nutrition education only, or education and self-as-doer activity). A secondary analysis of 27 of the 89 original women were analyzed. Participants were asked to use a food diary to record their food intake for four days. The food diaries were analyzed before the intervention and one month after the intervention. Two mixed-design, repeated measures ANOVAs were computed.

For Vitamin C there was a main effect of time, $F(1,23)=11.33$, $p=.003$, and only participants in the control group had a significant decrease in Vitamin C consumption between time 1 ($M=93.60$) and time 2 ($M=67.49$, $F(2,23)=.002$). There was not an interaction effect, $F(2,23)=1.67$, $p=.210$, or a main effect for group, $F(2,23)=.78$, $p=.469$. For Vitamin A consumption, there was no main effect for group $F(2,24)=.43$, $p=.658$ or an interaction effect $F(2,24)=.31$, $p=.739$. There was, however, a main effect of time $F(1,24)=5.20$, $p=.032$.

Non-significant results may be because participants could have had an increased awareness of their eating behaviors at time 1, resulting in eating healthier. Over time, their eating behaviors may have returned to normal. For Vitamin C, this same effect could explain the behaviors of the control group. Whereas, the education and self-as-doer intervention group did not change, suggesting that some sort of intervention might promote maintenance of Vitamin C consumption. Results show that the self-as-doer intervention may not be generalizable; future interventions might targeting specific nutrients and vitamins.

PRESENTATION #4

Anh Cong

Brian Groh, Faculty Mentor

Department of Chemistry, Minnesota State University Mankato

Developing Hops Extraction Method for Brewing

Format: Poster

Hops are an essential ingredient in developing a bitterness in flavor and a unique aroma in beer. These characteristics are due to a few important components including bitter acids, essential oils, and polyphenols. These compounds are not found abundantly in hops, however, which complicates the extraction process. This project focuses on developing a method of extraction that can maximize the yield of these desired components from hops. The extraction is carried out using ethanol as a solvent under regulated conditions. A concentrated extract is produced following evaporation of the solvent. Experimental parameters evaluated include duration of extraction time, solvent volume, and the evaporation procedure. Chemical analysis methods including UV-VIS spectrometry, gas chromatography, and gas chromatography-mass spectrometry are used to assess the components present and their quantities in the extracts. Comparison between the data collected from the extracted samples and a standard toluene extraction method is used to verify the efficiency of our process and the quality of the product. This information can potentially lead to the development of an extraction method that results in a commercially viable extract that can benefit the craft brewing industry.

PRESENTATION #5**Austin Heise**

Juandrea Bates, Faculty Mentor

Department of History, Winona State University

Cause of Death: United States' Geostrategic Interests in the Horn of Africa, 1991-1995

Format: Oral

With the increasing interest of United States globalization over the recent decades, scholars have produced numerous works on the topic of US humanitarian intervention in 1990s Somalia. The factors that drove US policy makers to spearhead this effort as well as those contributing to its failure are necessary components to comprehend the subsequent political policy towards the African continent. Despite ample scholarship, the factors that ultimately ushered US withdrawal from Somalia remain unclear, which could have had direct implications on the subsequent Rwandan Genocide years and US humanitarian missions as a whole.

This study directly relates to my military background and builds on several previous works to create a more comprehensive understanding of US intervention in Somalia. I conducted original primary source research at the Columbia University Archives utilizing two collections, totaling over 1,000 documents, on first-hand accounts of the carnage of the Somali civil war and multi-lateral relief efforts between 1980 and 2000. The collections were comprised of United Nations minutes and situational reports and the records of the humanitarian group Human Rights Watch. I hypothesize that Somalia no longer held the geostrategic importance it had during the Cold War, which led the Clinton Administration to abandon the mission. This research will allow me to assess the causes and consequences of withdrawal of US support from Somalia and better understand the effects of humanitarian missions across the globe.

PRESENTATION #6

Aynura Berdyeva

Lyudmyla Stackpool, Faculty Mentor

Department of Chemistry, Minnesota State University Mankato

Isomorphous Replacements and Crystal Structure of $Pb(8-x)Ca_xNa_2(VO_4)_6$ Solid Solutions

Format: Poster

Compounds with the apatite structure and general formula $M_{10}(EO_4)_6(X)_2$, where $M = Ca^{2+}, Sr^{2+}, Ba^{2+}, Eu^{3+}, Na^+$ etc.; $E = P^{5+}, V^{5+}, Si^{4+}, As^{5+}$ etc.; and $X = OH^-, F^-, Cl^-, Br^-, I^-, O^{2-}$ etc. find an application as bioactive, luminescent and laser materials, sensors, solid electrolytes, absorbents and catalysts. Compounds with apatite structure can easily accommodate a great variety of substitutions. Substitutions make not only changes in already existing properties but also cause the emergence of the new ones. Thus, synthesis and study of solid solutions is a way to produce novel functional materials. Among all apatites only Pb-containing compounds retain the apatite structure in which the Y ions are absent in the center of structural channels. Whenever the anions are removed from the channels, the apatite lattice collapses, except for those cases where the M2 sites are occupied by cations having $6s^2$ – lone pair (Pb^{2+}). These stereochemically active lone pairs orient toward the channel and create a negative charge which stabilizes the apatite structure. The solid solutions $Pb(8-x)Ca_xNa_2(VO_4)_6$ were synthesized by the solid-phase method and studied by X-ray powder diffraction and scanning electron microscopy. The substitution of calcium for lead under the scheme: $Pb^{2+} \rightarrow Ca^{2+}$ was accompanied by a decrease of the unit cell parameter c , whereas a change in the parameter was found to be within an error of its determination. Such changes are due to the compression of the structural channel, which occurs as the substitution of lead for calcium takes place.

PRESENTATION #7

Brennen Godeen

Jessica Albers, Faculty Mentor

Department of Human Performance, Minnesota State University Mankato

Jump Rope Study

Format: Poster

Abstract Introduction: Jumping rope is an aerobic activity that is commonly used in a variety of exercise settings. However, the prescription of this exercise lacks accuracy. The purpose of this research study is to further the understanding of the physical activity intensity levels during jump rope intervals. A variable to be measured in this study will include heart rate progression during jump rope intervals. Methods: Recruitment flyers were placed in various locations around the community of Mankato. A health screening waiver was completed. A consent form was then signed and documented. The participant was fitted with a polar heart rate monitor. The participant then laid supine for 10 minutes while resting heart rate was collected. The participant then completed the single under interval test. This set included 3 intervals of jumping single unders for 3 minutes each interval. If the participant could complete 3 double unders in consecutive fashion, they were asked to complete the double under interval set. The double under set includes 3 intervals of jumping double unders for one minute. This set was collected on a later

day. A recovery period of 2 minutes was completed following each jumping interval. During the recovery period, participants were asked to rate the perceived exertion using the Borg scale and their mood using The Feeling Scale. Mistakes made while completing the jump rope interval were recorded. Results and Conclusions: Data is being analyzed and will be included at URC symposium.

PRESENTATION #8

Bryce Lange

Jorgensen, Faculty Mentor
Political Science, Winona State University

Democracy in the United States

Format: Poster

In my research, I am hoping to identify whether or not direct democracy is a viable option in the United States, as opposed to the current republican form of government. There has always been the powerful notion that the American public is incapable of self-rule because of the lack of professional knowledge. However, centralized power in 535 senators and representatives in the U.S. Legislature; that is always filled with the elite of American society, cannot truly represent their constituents because of various inequities. This research could build a better understanding of direct democracy and could potentially change society's view on the subject, or solidify the already commonly held notion. My hypothesis is that the United States has a population that is just as capable of making policy decisions as their elected representatives. The reason being that the prevalence of formal education has an upward trend in the United States (nces.ed.gov). Many opponents to direct democracy argue that the American public is not educated well enough to provide preference stability, effectively communicate their political will, and refrain from impeding on other's rights. In order to determine the practicality of direct democracy, I will be using existing data sets from 1870 to 1979 that display literacy rate and education level by each individual state. What I aim to uncover using these data sets is to determine whether direct democracy could represent the people more accurately than our current republican form of government, in terms of policy choices and the majority of the public's view. I also aim to determine whether the majority of the American public is capable in terms of education and knowledge to make these decisions.

PRESENTATION #9

Caitlin Flynn and Melissa Jones

Beth Proctor, Faculty Mentor
Department of Environmental Science, Minnesota State University Mankato

Escherichia coli (E. coli) Impairment in Minneopa Creek

Format: Poster

The outlet of Lily Lake (2 inflows) and Lake Crystal (1inflow) form the lower Minneopa Creek that flows from the city of Lake Crystal through Minneopa State Park (Park, 162,000 annual visitors) to the Minnesota River. This portion of Minneopa was listed as impaired waters for Escherichia coli (E. coli) in July 2016. The purpose of this research was to determine E. coli levels at several sites including each lake inflows and outlet, the wastewater treatment plant (WWTP) and Park. E. coli levels are reported as number of colonies per 100 mL of water. Most sites are class 2 (E. coli standard 126 April 1-Oct 31). The

Lily Lake outlet and the WWTP are class 7 (E. coli standard 630 May 1 –Oct 31). On November 8 there were 144 and 20 entering and 20 leaving Lily Lake, 10 entering and 0 leaving Lake Crystal, too numerous to count at the WWTP and 180 at the Park. On November 29 there were 100 and 10 entering and 60 leaving Lily Lake, 150 entering and 5 leaving Lake Crystal, 350 at the WWTP and 120 at the Park. These data suggest that the lakes are acting as a buffer (more E. Coli entering the lakes than leaving them) and the WWTP is a potential source of E. coli at the Park. Note the WWTP is not required to disinfect their effluent in the colder months. More monitoring is needed over the warmer months to determine sources of the E. coli impairment.

PRESENTATION #10

Caroline Bang

Dale Buske and Melissa Hanzsek-Brill, Faculty Mentor
Department of Mathematics and Statistics, St. Cloud State University

Gnomons

Format: Poster

Two types of gnomons are presented. The first is a generalization of the golden rectangle by going into higher dimensions. The second is a generalization of the plastic pentagon, another mathematically pleasing object. This generalization fully classifies gnomons for n-gons whose side lengths are in geometric progression. In addition, we can derive the golden ratio and plastic number geometrically by decomposing a square and cube respectively.

PRESENTATION #11

Cosette Kaster, Tayler Burg and Lindsey Dahlberg

Jin Han, Faculty Mentor
Department of Business Administration/ Human Resources, Winona State University

Visionary to Success: J.R. Watkin's Hiring and Performance Management Processes

Format: Poster

Human Resource Management involves creating policies, practices, and systems that best motivate employees to deliver peak performance. Many companies nowadays realize the value of human capital and therefore make efforts to improve their HR functions to create competitive advantage. One of the challenges of HR function is hiring the most qualified employees that will help a company successfully achieve their goals and objectives. The hiring process is usually divided into three-step process: recruitment, the selection process, and final decision. We have found that the length of the hiring process varies from company to company and position to position. The process on average is prolonged nationwide. Moreover, ensuring the right people are hired is only half the battle. Once hired, a company must also enact programs that continue to motivate employees to perform their best. An effective performance management process includes three components: defining performance, motivational aspects, and appraisal and feedback. The performance management process follows the ideology of Douglas McGregor's Theory Y which states that individuals perform better when they are motivated to do so. Through interviews and surveys, we conducted an empirical research at J.R. Watkins to investigate

their hiring process along with the performance management techniques. Our research findings have important implications to companies about how to create a happy and competitive work environment.

PRESENTATION #12

Dalton Dahle, Laura Oakgrove, Additional Team Members: Lavahn Bounkio, Luis Cisneros Pito, Lizette Reilan, Sagal Abdi, Thiab Abuserrieh and Awel Lam

Lori Halverson-Wente, Faculty Mentor

Department of Communication, Rochester Community and Technical College

Humans of RCTC: A Service Learning Approach to Intercultural Communication Exploration

Format: Oral

Intercultural Communication students crafted a service learning project entitled “Humans of RCTC,” mirroring Brandon Stanton’s “Humans of New York” photoblog. Partnering with the Rochester Diversity Council, the group first participated in the Rochester “Human Library” project (or Menneskebiblioteket” as called in its country of origin, Denmark). The Human Library is an international social justice movement that trains community members, hailing from diverse backgrounds, to serve as “books” to be “read” –providing their life stories and experiences through questioning from students. The students, then, interviewed various members of the Rochester Community and Technical College community to highlight the unique stories of RCTC students, faculty, staff, administration and alumni as “Humans of RCTC.” Through this process of service, community and campus mentorship, and reflective learning students applied a variety of theoretical frameworks. This panel will discuss their project, share their results and conclusions. Additionally, photo displays of the project demonstrate the project’s progression. “Never judge a book by its cover” – this oft-quoted cliché is the goal of the “Human Library” movement and the aim of the panelist’s project.

PRESENTATION #13

Elena Lacey

Juandrea Bates, Faculty Mentor

Department of History, Winona State University

Female Coming of Age in Nazi Germany: Female Youth Education and Motherhood 1933-1945

Format: Oral

Adolf Hitler’s reign as Fuehrer of Germany, dramatically transformed German society. While historians have investigated Nazi Germany most research is focused on Hitler himself, the concentration camps, and other atrocities committed, centered mostly on the men of Germany. While thorough research has been done on women, the experience of young girls remains unclear. There is a need to expand the scholarship on this overlooked group and their path taken to adulthood. This paper investigates the path a young girl would have taken growing up in the Nazi regime from 1933-1945. It analyzes various youth groups and education mandated for a young girl. It also explores how that attributed the success or failure of the cult of motherhood that the Nazi regime tried to cultivate in young women and girls from a very early age. This study examines a wide array of primary sources including German education standards, a handbook from the major youth group, the Bund Deutscher Mädel, and reflections by members of these groups, and some scientific studies to assess the success of the indoctrination these girls underwent. This paper argues

that schools and youth groups attempted to integrate motherhood into the foundation of girl's identity with the hopes that would carry into adolescence. Some girls accepted parts of this identity, while they rejected others.

PRESENTATION #14

Elisa Wright

Heather Sklenicka, Faculty Mentor

Department of Science, Rochester Community and Technical College

Optimization of Warfarin Synthesis in the Undergraduate Teaching Laboratory

Format: Oral

The synthesis of warfarin has been used in the second semester organic chemistry class at Rochester Community and Technical College. It is an example of an asymmetric synthesis which will allow students to analyze their samples by optical rotation. Students have had difficulty with obtaining enough product for characterization. To address this issue, three reactions of varying quantities were prepared and different methods of purification tested. The melting point, IR spectrum, and optical rotation of the product was obtained when possible. Results will be presented.

PRESENTATION #15

Elizabeth Rossow

Elizabeth Sandell, Faculty Mentor

Department of Educational Studies: Elementary and Early Childhood, Minnesota State University Mankato

Reflection about One Educator's Experience of Culturally Responsive Instruction of One Child on the Autism Disorder Spectrum

Format: Oral

The role of the teacher of a student with Autism Spectrum Disorder (ASD) is like that of a cross-cultural interpreter: someone who is able to translate the expectations of the non-autistic environment to the student with ASD (Mesibov & Shea 2009). The purpose of this project was to explore the implications of cultural responsiveness of general education teachers and how it affects students with ASD. The source of the data was a journal kept by a teacher in a classroom in Minnesota. The study included a literature review about the culturally responsive teaching of classroom teachers, special education teachers, and other school staff members. Data analysis found themes related to instruction, child response, educator response, or consequences or results. The research project provides information about how general education teachers can be more culturally responsive and improve communication to support students with ASD.

PRESENTATION #16

Emily Roth

Heather Sklenicka, Faculty Mentor

Department of Science, Rochester Community and Technical College

An Improved Method for Vitamin C Titration

Format: Poster

In general chemistry II, students are assigned to create an experiment using either antacid analysis or vitamin C analysis. The vitamin C analysis required students to titrate DCPIP formula into a dissolved vitamin C solution, until the solution becomes clear. This signals to the student that the vitamin C is neutralized. A drawback to this procedure, is that the students are required to use visual analysis to determine the endpoint. Further complications arise, when the vitamin C solution turns clear, yet the solution is not at equilibrium, and will turn back to blue after several seconds. In order to improve this method, participants could use a redox probe, and rely less on a visual test and instead use a more substantial method of finding the equilibrium. The goal of this project is to determine if the redox probe is appropriate for this reaction and optimize the settings. Comparison with the visual method for endpoint determination will be discussed along with the ability of the probe to allow facile titration of colored sample.

PRESENTATION #17

Emma Tomb

Juandrea Bates, Faculty Mentor
Department of History, Winona State University

Painting the Revolution: The Mexican Revolution's Transformative Effect on Mexican Painting

Format: Oral

The Mexican Revolution, which effectively ended the dictatorship of Porfirio Díaz starting in 1910, had many long-term effects on Mexican society. While much research has been done on this time period, most of it is in regards to the political, military, and social aspects of the revolution. There is an understanding that the revolution brought about profound changes in cultural production, but there is a lack of work done on visual art through these decades. There is a need to expand the scholarship on this aspect of visual culture in order to understand deeper Mexican societal trends as well as the connection between revolution and art.

This paper explores Mexican paintings before, during, and after the Mexican Revolution, focusing specifically on the art of Juan Courdero, Jose Maria Jara, Diego Rivera and Frida Kahlo. It analyzes the context in which the artists were educated, as well as the intended demographic the art was created for in all three periods. It also considers the dramatic changes in class relations brought by the revolution and how painting reflected such transformation. This paper argues that before the Mexican Revolution, art was created in a classic European style, only for the upper classes of Mexico, in order to mimic the Spanish heritage of the colonized country. While after the revolution of the lower class Mexican natives, art took on a nationalist aesthetic, and became a celebration of Mexican culture to be consumed by the greater population of the country.

PRESENTATION #18

Gabriela Lara

Season Ellison, Faculty Mentor
Creative Performance, Bemidji State University

Running with the Beast

Format: Oral

Running a marathon can be a grueling, inspiring, and life changing experience. For some, marathon running is a test of willpower and physical strength. For others, marathon running is what gets them up in the morning. Whatever the reason for running, a runner's first marathon is monumental and will forever be ingrained in their minds and slow beating hearts. This piece delves into the mind of one marathon runner and explores the motivation that powered her to run, the obstacles she had to overcome, the self-determination formed, the life lessons learned, and the joys of completing a 26.2-mile race.

PRESENTATION #19

Garrett Wee

Emily Deaver, Faculty Mentor
Environmental Science Program, Southwest Minnesota State University

Evaluating the Seasonal changes in Lone Tree Lake wetland in North Eastern Lyon County

Format: Poster

Wetlands are valuable ecosystems that provide habitat for a wide variety of organisms and provide an important transition from land to water. Lone Tree Lake is a large, Type 3 shallow marsh located just north of Cottonwood in Lyon County, Minnesota. From September 2 through October 22, 2016 water quality (pH, alkalinity, nitrate, phosphate, dissolved oxygen) was measured using LaMotte Test kits. Water temperature, water depth and total number of species of biota were also recorded. Lone Tree Lake was heavily influenced by agriculture revealing a spike in nitrate levels up to 5 ppm and alkalinity jumping to 264 mg/L as CaCO₃ on October 9th, which correlated with harvest activity. Despite this, 62 bird species as well as many invertebrates, plants and animals were found and remained abundant throughout the study.

PRESENTATION #20

Grady Friedges

Trisha Karr, Faculty Mentor
Department of Psychology, Winona State University

Group Differences in Performance between Forward Line and Back Line Male Rugby Players

Format: Poster

Rugby is currently the fastest growing sport in the United States, yet little research has been conducted regarding the psychology of the sport itself, group differences between players, and inter-team dynamics. This study focused on the Winona State University Men's Rugby team, consisting of 26 members, 18-22 years of age. It was hypothesized that the back line would have significantly less penalties than the forward line. A mixed between-within analysis of variance was used to evaluate differences in penalties

and mistakes between the forward and back lines over the course of three matches. Results approached significance over all three matches and that by the 3rd match, the back line players had significantly less penalties than the forward line. It is important for coaches to understand the differences between the two lines of players in order to maximize success, both when training and during matches. Future research should examine differences in demographic and personality traits between types of players in relation to performance.

PRESENTATION #21

Grady Friedges, Lauren Mullenbach, Michaela Handke, Kemry Grett, Rylie Klinski and Jonathan St. Peter

Trisha Karr, Faculty Mentor

Department of Psychology, Winona State University

How Do You Exercise? Group Differences among College Students' Attitudes towards Exercise and Body Image

Format: Poster

The current study set out to examine attitudes towards exercise and body image, specifically group differences towards attractiveness. It was hypothesized that students who preferred to work out with others would feel greater pressure from friends, family, and the media. 213 college students from a small Midwestern college were given an array surveys to fill out using paper and pencil. Multiple Independent samples T-tests were used to examine group differences through the IBM, SPSS software, version 23. Significant findings included that participants who preferred cardio had less of an internalized focus on muscularity, participants who preferred to exercise alone internalized greater pressure from the media, and participants who held some form of athletic membership had a higher internalized drive to achieve a muscular physique. Further research should include examining the relationship between preferences to exercise alone and types of exercise.

PRESENTATION #22

Hok Lam (Rachel) Ou-Yong

Mingrui Zhang, Faculty Mentor

Department of Computer Science, Winona State University

Predicting Lung Cancer Treatment Outcomes

Format: Poster

My research involves the redesign of the web-based Lung Cancer Treatment Outcomes Prediction Tool (LCTOPT). The current application was developed ten years ago and has been in active use at Mayo Clinic since then. It integrates R statistical package in Java environment, which introduced unnecessary software maintenance overhead. To simplify the design, a Java version of Cox Proportional Hazard model has been developed to compute the survival rate of patients. The Java implementation is used in the new design to calculate the survival rate based on patient information and treatments and present the survival curves. Patient information are collected and inserted into medical database. The extensive markup language is used to create a self-structured data form. This approach avoids a large number of csv files

needed during the presentations of Cox survival curves. A responsive design approach was taken in the redesign of user interfaces to allow the displays of survival curves on different mobile devices.

PRESENTATION #23

Jennifer Brown, Grady Friedges and Ryan Vargas

Trisha Karr, Faculty Mentor
Department of Psychology, Winona State University

Does level of aggression influence athletic performance in men's rugby?

Format: Poster

Aggression has the potential to cause changes in behavior. Rugby is an intense, aggressive, full contact sport. Can levels of aggression affect athletic performance? It was hypothesized that players with higher aggression scores will commit more penalties and mistakes than those with lower aggression scores. The current study looked at levels of aggression and the effects on sport performance in number of penalties and mistakes committed. Subjects included 26 male rugby players from Winona State University. 88.5% of subjects were Caucasian, and 38.5% self-reported having no prior rugby playing experience at baseline. A mixed between-within subjects ANOVA was conducted to compare groups on high and low aggression scores across three rugby matches. Results revealed no significant difference in the number of mistakes recorded over three time points or between groups. Findings indicate that the number of penalties committed significantly decreased between the first and the third match regardless of aggression level. Implications of the study suggest that factors other than aggression relate to the frequency of mistakes and penalties in rugby.

PRESENTATION #24

Jessica McDonald

Alan Srock, Faculty Mentor
Department of Atmospheric and Hydrologic Sciences, St. Cloud State University

Insights into Predicting Tornado Development Using NEWS-e Vorticity Forecasts

Format: Poster

This project seeks to determine if the low-level vorticity forecasts generated by the National Severe Storms Laboratory Experimental Warn-on-Forecast System for ensembles (NEWS-e) offer clues for predicting tornadic activity. The vast amount of data produced by NEWS-e requires filtering to provide meaningful results that can be used in forecast decision-making. Here, the authors create a "storm object" filter and apply it to forecasts provided by NEWS-e for six (6) different severe weather events from 2016. Candidate storm objects must exceed a maximum relative vorticity of 0.006 s^{-1} and a mean updraft speed of 5 m s^{-1} . They are classified as tornadic if any part of the storm object is within 30 km of a SPC tornado report. The vertical profiles of vorticity in each storm object reveal consistent mid-level vorticity maxima that vary little in height and strength across all storm objects. Any low-level vorticity maxima exhibited by the storm objects have much greater structural variability. Analysis of these features shows that the low-level maxima in tornadic storm objects are slightly lower and stronger than those in non-tornadic objects. At storm-scale, the profiles that contain low-level vorticity maxima in tornadic storm objects tend

to be grouped together in a cohesive manner, whereas the profiles containing these maxima in non-tornadic storm objects are infrequent and randomly distributed. It is hoped that this study will provide information on how to best utilize the NEWS-e vorticity forecasts for short-term tornado prediction.

PRESENTATION #25

Justin Hill

Emily Deaver, Faculty Mentor

Environmental Science Program, Southwest Minnesota State University

Seasonal Changes in the Biota and Water Quality at Black Rush Lake WPA

Format: Poster

Wetlands are highly productive ecosystems that are defined by having saturated soils or shallow water along with organisms adapted to hydric conditions. A seasonal study was conducted to document changes at Black Rush Lake WPA, a type 4 Deep Marsh located 8 miles southwest of Marshall, MN. LaMotte test kits were used to measure water quality weekly from August 31st to October 19th, 2016. Observations and identification of biota in the wetland were also recorded weekly. Dissolved oxygen increased as water temperature decreased. Alkalinity, pH, and water depth showed slight fluctuations while nitrate, phosphate and turbidity exhibited little to no variation. Twelve taxa of aquatic invertebrates, 32 species of birds, and 33 species of plants were recorded throughout the study. Narrow-leaved Cattail (*Typha angustifolia*) and Soft-Stem Bulrush (*Schoenoplectus tabernaemontani*) were the dominant vegetation. Results indicate that this wetland is a very diverse ecosystem with minor changes in water quality during the fall season.

PRESENTATION #26

Justin Warburton

Jason Schultz, Faculty Mentor

Computer Science, Bemidji State University

A Rubik's Cube Solving Robot

Format: Oral

A Rubik's cube is a 3x3x3 puzzle cube where by spinning the faces you move the little cubes around the puzzle until you've either solved it or scrambled it even more. It's a puzzle that has stumped people for decades, and I made a robot that solves one for me. Building a robot is a challenging task that is made easier by using LEGO Mindstorms. The Mindstorms kits have easy to assemble parts that clip together. This ease of use mixed with the wide array of available parts means you're only limited by your imagination when it comes to making something with the kits. Building a robot capable of solving a Rubik's cube is a relatively simple task. The hard part comes with the programming of it. The LEGO Mindstorms kits use a simplified programming language and because of that I'm limited in what I can and cannot do with it.

PRESENTATION #27

Kaleab Worku

Tirthankar Ghosh and Yi Zheng, Faculty Mentor

Computer Science and Information Technology, and Department of Electrical and Computer Engineering,
Saint Cloud State University

Performance Evaluation of Multi-hop WirelessHART Network on a Real-life Testbed

Format: Poster

Wireless HART network has been widely used for reliable information transfer from sensors and a control center in industrial monitoring applications. It uses a multi-hopping approach to extend the coverage distance and collect information from multiple sensors. The project investigates how WirelessHART network protocol stacks are implemented, and how multi-hopping can be used to transfer data in the network. An experimental testbed was deployed on campus and the network performance was evaluated by setting up multihop communications. Stability, latency and reliability were used to measure the performance of the network. The project has been funded by a grant from Emerson Process Management. The project also includes interdisciplinary senior design projects with electrical engineering students including a custom embedded system that integrated Wireless HART components.

PRESENTATION #28**Katie Scruggs and Ethan Pottebaum**

Osvaldo Martinez, Faculty Mentor

Department of Biology, Winona State University

Exploiting Ebola Virus-Like Particles to Develop a Better Vaccine

Format: Poster

Ebola virus (EBOV), a filovirus family member, is a highly pathogenic virus that causes Ebola hemorrhagic fever resulting in documented mortality rates in humans as high as 50%. Currently, the basic EBOV virus-like particle (VLP) vaccine contains the Ebola virus (EBOV) matrix VP40 and attachment glycoprotein (GP). VLPs are morphologically and biochemically similar to parental virus, yet because they lack a genome and cannot replicate, are safe enough to be used as vaccines. We hypothesize that addition of a constitutively active retinoic acid-inducible gene 1 (RIG-I) would enhance the ability of the vaccine to induce interferon-dependent immune functions yielding an improved vaccine. Expression of EBOV VP40 in 293T cells induces the spontaneous production of VLPs into the media supernatant and if expressed with EBOV GP, will produce VLPs studded with the attachment GP. Recombinant chimeric constitutively active (ca)RIG-I-VP40 matrix and a nonfunctional mutant L58A (mu)RIG-I-VP40 matrix genes were constructed to produce VLPs containing constitutively active and nonfunctional RIG-I. Supernatant from 293Ts transfected with caRIG-I-VP40, muRIG-I-VP40 or VP40 along with GP expression plasmids were tested for the presence of VLPs. Western blotting of purified VLPs confirmed the presence of RIG-I in caRIG-I-VP40 and muRIG-I-VP40, but not VP40 containing VLPs. Monocyte-like and PMA-differentiated macrophage-like THP-1 Dual cells were treated with nothing, VP40+GP, caRIG-I-VP40+GP and muRIG-I-VP40+GP VLPs as well as LPS control and tested for induction of NF-kappaB or interferon signaling. CaRIG-I containing, but not muRIG-I containing VLPs induced interferon signaling from macrophages, but not monocytes. Future studies will be required to determine caRIG-I containing VLP vaccine efficacy.

PRESENTATION #29

Kelly Highum

Rafael Narvaez, Faculty Mentor
Department of Sociology, Winona State University

Online Pornography: Shaping Masculinity in a Post-Industrial World

Format: Poster

This paper examines the normalization of pornography in American society, particularly as a consequence of post-industrial capitalism. I focus on the mainstream pornographic industry and on the systematic commodification, objectification, and stereotypical displays of men, women, racial minorities, and sexual minorities. I examine the ways in which this pornographic consumerist culture affect how individuals think, feel, and experience sexual attraction and romantic love. I argue that the modern pornography industry contributes to create a culture that necessitates conformity to hypertraditional gender narratives. Critical examinations of pornographic narratives that inherently promote and normalize the embodiment of hegemonic masculinity have been scarce in literature. The success of the mainstream pornography industry within the new media calls for new critical examinations of human desire, normalization of gender roles, and human behavior within the context of a postmodern neoliberal capitalism.

PRESENTATION #30

Kemry Gett, Grady Friedges, Lauren Mullenbach, Michaela Handke, Rylie Klinski and Jonathan St. Peter

Trisha Karr, Faculty Mentor
Department of Psychology, Winona State University

Healthy Lifestyles Among College Undergraduates: Do Healthy Eating Habits Paired with Regular Exercise Reduce the Symptoms of Anxiety?

Format: Poster

College students are often put into stress inducing situations during their schooling. Exercise and healthy eating habits have both been shown to reduce symptoms of anxiety. The primary goal of the present study was to assess the relationship between exercise, eating habits and anxiety in Winona State University undergraduates. A sample of (N=26) Winona State male and female undergraduates first finished paper and pencil surveys, and then completed three, 30-minute exercise sessions on a treadmill in the Integrated Wellness Complex on campus. It was hypothesized that a healthy lifestyle – exercising frequently and eating a balanced diet – would decrease anxiety levels in college undergraduates. College students were categorized based on their fruit and vegetable intake as high or low. Mixed between-within subjects tests were conducted to analyze group differences in mean level of anxiety, pre and post-workout session. Results show that all participants reported a reduction in anxiety post-workout, regardless of eating habits. This indicates that exercise is beneficial for anxiety reduction among college students, whether or not the student has healthy eating habits.

PRESENTATION #31

Ker Thao

Heather Sklenicka, Faculty Mentor
Department of Chemistry, Rochester Community and Technical College

Electrochemistry with Household Items

Format: Oral

As chemistry advances and reaches the vast community in the higher education world, we as students struggle with grasping its step-child: Electrochemistry. What really happens when chemical and metals are grouped together? This study is about introducing college students to the basics of electrochemistry and relating it to everyday household items; in hopes to conduct enough electricity to possibly power a LED bulb for a couple minutes. In order to understand this study, voltage testing of basic chemistry lab solution, varies metals, the model 152 Mult-Echem Half Cell Module and the configuration of standard cell potential for each solution was taken. Multi half-cells was tested and used to create enough voltage to power a LED bulb. After determining the research data, household to solutions will be tested to see if it is able to produce enough voltage to conduct electricity.

PRESENTATION #32

Kristian Kennedy

Heather Sklenicka, Faculty Mentor
Department of Science, Rochester Community and Technical College

Dihydroxylation of Limonene

Format: Poster

Currently, RCTC students in Organic Chemistry 2128 perform a dihydroxylation lab on cyclohexene. To make this lab more interesting, cyclohexene was replaced with limonene, a natural compound found in lemons. Using limonene creates a more interesting lab because its source found in everyday life and the compound has more double bonds, making it an improved starting material. The goal of this project is to compare the products synthesized using the three methods of dihydroxylation (Woodward, potassium permanganate, and oxone) and the thin layer chromatography (TLC) process. The reaction process was completed using the cyclohexene which produced one or two products for each method. Then the lemon peels were steam distilled, in order to obtain the Limonene. The limonene was then used in place of the cyclohexene, in order to establish the efficacy. After collecting the limonene, the student ran the dihydroxylation reactions (and TLC process) using the same three methods- the Woodward, oxone, and potassium permanganate. Additionally, the results also showed that the oxone method provided the most products of all three methods which was contrary to the hypothesis and past students' results. Progress towards purification and structural determination will be presented.

PRESENTATION #33

Lauren Mullenbach, Grady Friedges, Michaela Handke, Kemry Gett, Rylie Klinski and Jonathan St. Peter

Trisha Karr, Faculty Mentor
Department of Psychology, Winona State University

Exercise and Anxiety Across a College Campus: Does Intensity Matter?

Format: Poster

College students are habitually exposed to possible anxiety situations. Exercise has been shown to reduce symptoms of anxiety. The primary aim of this study was to objectively assess the relationship between exercise intensity and levels of anxiety in college undergraduates. A sample of (N=26) Winona State University male and female undergraduates completed paper and pencil surveys and finished three, 30-minute exercise sessions on a treadmill in the Integrated Wellness Complex located on campus. It was hypothesized that exercise intensity would reduce anxiety levels in college undergraduates. College students were categorized by exercise intensity level as high or low based on actigraph data points. Paired Samples T-Tests were conducted to examine group differences in mean level pre-workout anxiety and post-workout anxiety across the exercise sessions. Results show that all participants reported a reduction in anxiety post-workout, regardless of exercise intensity. Implications of this study indicate that any level of exercise is beneficial for anxiety reduction among college students. Furthermore, exercise in general may be beneficial for college students to manage anxiety.

PRESENTATION #34

Le Tang

Eric Errthum, Faculty Mentor

Department of Mathematics and Statistics, Winona State University

Theorems on p-adic Continued Fractions

Format: Poster

One of the major results for continued fractions is the Stern-Stolz Theorem that relates the divergence of the continued fraction to the convergence of the associated series. In this presentation, we review the geometric approach by Beardon and Short who re-proved the Stern-Stolz Theorem (and other important convergence theorems for continued fractions) by treating continued fractions as a sequence of Möbius transformations on the complex plane. Then these methods are extended to prove the analogous theorem in the complete p-adic field \mathbb{C}_p .

PRESENTATION #35

Lindsey Wendt and Nicole Pederson

Halbana Tarmizi, Faculty Mentor

Business Administration, Bemidji State University

How BSU Students Utilize Social Media and How Our Campus Can Benefit From This

Format: Oral

As social media has become part of our life, studying how BSU students use social media could help the university in serving their students in a better way by utilizing various social media platforms. In this study, the use of social media among BSU students will be explored. The use of different platforms of social media including Facebook, Twitter, Snapchat, Instagram, and LinkedIn will be assessed. Surveys will be conducted among BSU students from a variety of backgrounds. The surveys will be made up of open-ended and closed-ended questions. These questions will cover, among others, the use of various

social media platforms, time spent on a daily basis, and perception on connecting on social media within the university community. In addition, we will be looking at ways the university could benefit from social media use by students. Creative ideas and best practices from other institutions will be discussed, including how well those ideas and best practices could be applied to Bemidji State, based on the survey data we collect. An example of this would be an "Emergency Notification" as implemented at the University of Minnesota.

PRESENTATION #36

Luis Cisneros Pito, Lizette Reiland, Sagal Abdi, Thiab Abuserrieh and Awel Lam

Lori Halverson-Wente, Faculty Mentor

Communication Department, Rochester Community and Technical College

Life between Co-Cultures: A Spotlight on RCTC Student Intercultural Communication Experiences

Format: Oral

"I was the one who missed high school so I could go to the immigration office and translate for my father" "I am not sure who I am: I am an American, but what about the Somali heritage I hold?" ... "I have come to understand the delicate balance my Latin Collectivist culture and the American Individualist culture play in my life."

This oral presentation highlights the experiences of Rochester Community and Technical College students who have experienced "growing up between cultures." Unique dialectical tensions arise between dominant and co-cultures, especially when one experiences this in their own home. From linguistic challenges, balancing high context and low context cultural norms, to unique role-development, first generation Americans, immigrants and others seen as "newcomers" develop intercultural communication competency. Each panelist will share their experience, the intercultural communication theories they explored and offer advice for others who seek to bridge life's experiences between cultures.

PRESENTATION #37

Madilyn R Schmitz, Amanda Madigan, Nicole Crowson, Nathan L Leonard, Elana Alcala, Victoria R Schwarzingler, Alyssa J Meyer, Mary Soderlund and Jean K Lim

Osvaldo Martinez, Faculty Mentor

Department of Biology, Winona State University

West-Nile virus replicon particles infect 293T cells expressing DC-SIGNR

Format: Poster

West-Nile virus (WNV) is an arthropod-borne virus that is frequently transmitted to humans through the bite of an infected mosquito. Less than one percent of cases result in a serious neurological illness such as meningitis or encephalitis. To investigate WNV tropism we have established several 293T stable cell lines expressing DC-SIGNR or DC-SIGN. Previous studies have suggested that WNV infection efficiency is enhanced by expression of DC-SIGNR, but not DC-SIGN on target cells. We demonstrate high levels of DC-SIGNR expression in selected 293T cells. Replication incompetent virus replicon particles (VRPs) are used to safely and conveniently study viral entry. Successful VRP entry into target cells transfers a mutated incomplete viral genome containing the GFP gene which is expressed from the

infected cells. Infections assays using WNV (NY99) VRPs as well as a variant of WNV (NY99) which contains the beta-lactamase enzyme, show significant infection in DC-SIGNR expressing, but not control cells that do not express DC-SIGNR. The establishment of this entry assay system will allow us to safely study virus tropism.

PRESENTATION #38

Madison Bowe and Chloe Healy

Jing Han, Faculty Mentor

Department of Human Resources, Winona State University

An Empirical Analysis of the EEOC and Company Compliance in the Human Resource Field

Format: Oral

The human resources department plays a key role within an organization and is considered to be a crucial component in assisting a company to meet and exceed their goals and objectives. Many of the HR practices such as recruitment, personnel selection, compensation, and training and development, need to comply with the existing laws and regulations. In our study, we focus on the role of human resources in the area of legal compliance and more specifically the Equal Employment Opportunity Commission (EEOC). Noe, Hollenbeck, Gerhart, & Wright (2015) describe the EEOC as the government commission to ensure that all individuals have an equal opportunity for employment, regardless of race, color, religion, sex, age, disability, or national origin. We will analyze and discuss a selection of laws enforced by the EEOC. Based on their importance in the human resources field, Title VII, Americans with Disabilities Act (ADA), and Age Discrimination in Employment Act (ADEA) have been selected for analysis. Moreover, we conducted in person interviews with HR professionals working at Express Employment Professionals and Winona Agency. The ways companies apply the laws and regulations in their work environments are investigated and compared across employers. Our findings have several important implications to companies how to develop their HR policies and system in order to comply with the Equal Employment Opportunity Commission.

PRESENTATION #39

MaKyla Culpitt

Juandrea Bates, Faculty Mentor

History & Legal Studies Department, Winona State University

Silence is Peace: The Clinton Administration and the Rwandan Genocide

Format: Oral

The Holocaust is one of the most researched historical tragedies of the twentieth century, however it is not the only massacre to have taken place. Due to the overwhelming coverage of the Holocaust, other tragedies, such as Rwanda in 1994, have not received the scholarly attention that they deserve. The purpose of this research is to add to the existing, but limited, scholarship on the Rwandan Genocide. To add to this scholarship this research investigates how U.S. newspaper coverage of Rwanda from April 1st 1994 to July 17th 1994 affected the Clinton Administrations intervention policy concerning Rwanda. By examining Rwanda's history, the United States governments response to previous genocides, and

national newspapers in the United States this investigation gives Rwandans the a that they were denied in 1994.

Through investigation, this research has concluded that the Clinton Administration was able to circumvent intervention largely because of a restrained, and at times entirely absent, media narrative. Newspaper coverage of Rwanda was either lacking or downplayed the violence that was taking place producing both uninformed and misinformed U.S. citizens, resulting in the Clinton Administration not being morally challenged to intervene by the public.

By examining the devastating outcomes that can result from the complex relationship between media, public opinion and government, this research has given the Rwandan Genocide the scholarly attention that it deserves by adding to the existing, but inadequate, scholarship.

PRESENTATION #40

Mason Fetterer

Jeffrey Ueland, Faculty Mentor
Geography, Bemidji State University

Analyzing Twin Cities Public transit as it relates to vehicle ownership choice

Format: Poster

The distribution of households with no vehicles by choice is a very important factor in determining effectiveness of transit. By focusing on areas of higher than median income, issues of poverty may have less influence as a reason for not owning a vehicle. To this end, this study will test if there is a correlation between the average distance from transit stops and the number of households that have no vehicles by choice. This analysis will examine its findings in light of smart growth policies at they relate to reducing automobile dependency. The data used in the project will include census block group level vehicles per household, average distance from transit stops in the twin cities metro area, and median income data. The hypothesis that will be tested is to examine if there is a correlation between readily accessible transit and households that are more likely to have no vehicle by choice. The areas that are well served will be mapped out to determine locations of successful transit based smart growth.

PRESENTATION #41

Megan Ford

Timothy Secott, Faculty Mentor
Department of Biological Sciences, Minnesota State University Mankato

Characterization of Brewer's Yeast Strains by Carbon Source Utilization and Flow Cytometry

Format: Poster

Different types of beers are brewed not only due to variations in the malts and the hops but also as a result of the yeast strains that are involved. With brewers handling so many strains of yeast, there is the possibility of cross contamination which would interfere with the consistency of the product. The purpose of this study was to see if we could establish/distinguish among the strains what biochemical profiles they have with respect to carbon source utilization and what physical properties such as size and surface texture they have so that these may be employed as baseline tools to be used later to see if strains remains

pure or if they have become contaminated. Data was measured using BIOLOG plates, which contain 95 unique carbon sources, coupled with flow cytometry to get indirect measurement of size and surface properties or aggregations. Analysis of preliminary BIOLOG and flow cytometry data indicate that while the English ale and Irish ale yeasts could not be distinguished from one another, California common yeast revealed BIOLOG and flow cytometry profiles distinct from the other two strains. Additional work will be needed in order to identify traits that will differentiate between the English ale and Irish ale yeasts.

PRESENTATION #42

Mehedi Hasan and Clenten Ndonwie

Michael Bentley and Kuldeep Agarwal, Faculty Mentor

Department of Biological Sciences, Department of Automotive Engineering Technology, Minnesota State University Mankato

Biocompatibility of Hydroxyapatite and Stainless Steel Alloys

Format: Poster

The biomaterial used in medical implantable devices must sufficiently integrate within biological tissue and be biocompatible. One such metal is stainless steel. Hydroxyapatite (HA), a major and essential component of normal bone and teeth, is often used for coating metal implants to initiate infiltration. In the present study, our focus is on the biocompatibility of a mixture alloy of stainless steel and hydroxyapatite, fabricated by using a three-dimensional printer. To test the biocompatibility of the fabricated metal implant in vivo, one millimeter-sized metal pieces of high and low HA ratio mixture alloys were inserted on rat skulls through a small incision on the back made using a sterilized implantation surgery. After one month, the metal pieces were removed and observed under scanning electron microscopy to determine the degree of infiltrated bone and connective tissue. The surrounding connective tissues were also examined for inflammation and other tissue damages. The result showed that, the metal alloys were encapsulated by dense connective tissue continuous with dermis and periosteum without having any signs of inflammation or rejection. Furthermore, connective tissue infiltrated into spaces within alloy, between and around the spheres of stainless steel, to form a dense matrix of cellular and fibrous material throughout the implant. Our findings will help improve medical device alloys for hip, femur and other implants.

PRESENTATION #43

Melissa Jones and Caitlin Flynn

Beth Proctor, Faculty Mentor

Department of Environmental Science, Minnesota State University Mankato

Are Escherichia coli (E. coli) Isolated from Minneopa Creek Developing Resistance to 10 Antibiotics?

Format: Poster

E. coli is a pathogenic indicator for water contamination by manure. Many antibiotics are used as additives in livestock feed and are important human medicines. The purpose of this research was to determine if E. coli collected from multiple sites along Minneopa Creek are sensitive, developing resistance, or resistant to 10 antibiotics (Amoxicillin/Clavulanic Acid, Cefotaxime, Ciprofloxacin, Erythromycin, Gentamicin, Lincomycin, Neomycin, Oxytetracycline, Rifampin, and Tetracycline). All antibiotics are used to treat E. coli, except Lincomycin, which was included as a negative control.

Antibiotic resistance was measured on samples collected on November 8 and November 29, 2016 using the Kirby-Bauer disk diffusion assay. On both dates, E. coli colonies tested were sensitive to Gentamicin and Ciprofloxacin. All but one colony tested were sensitive to Cefotaxime, Tetracycline and Oxytetracycline. Eleven out of 13 colonies tested November 8 were sensitive to Rifampin, but 19 out of 22 colonies tested November 29 were resistant and 2 were developing resistance. Four out of 12 colonies tested November 8 were developing resistance to Amoxicillin/Clavulanic Acid and 16 out of 22 colonies tested November 29 were completely resistant and 2 were developing resistance to it. Eight out of 12 colonies tested November 8 were developing resistance to Neomycin and 7 out of 22 colonies tested November 29 were developing resistance to it. Out of 12 colonies on November 8, 6 were developing resistance and two were resistant to Erythromycin and on November 29, 15 out of 20 colonies were developing resistance and 4 were resistant to it.

PRESENTATION #44

Michael Ganzer and Tien Pham

Robert Sleezer, Faculty Mentor

Department of Integrated Engineering, Minnesota State University Mankato

Design and Validation of a Low Cost High Speed Atomic Force Microscope

Format: Oral

The Atomic Force Microscope (AFM) is an important tool for characterization at the nanoscale. They operate by rastering an atomically sharp needle attached to a flexible cantilever across a surface while using an optical lever to measure the tip sample interaction. A control loop is used to keep the tip sample interaction constant. The output of the control loop is used to determine the topography of the surface. Unfortunately, the complex optical and control systems in an AFM make them both expensive and slow. Fortunately, DVD Optical Pickup Units (OPUs) are designed to measure and compensate for wobble in DVD disks to maintain laser focus at the nanoscale with a high bandwidth. Because DVD players are high volume consumer electronics these OPUs are widely available and optimized for both cost and performance. However, interfacing with an OPU is a difficult task because the documentation available for it was scarce and, at times, inaccurate. With further research and experimentation, the authors were able to reverse engineer aspects of OPU that were poorly documented and design a circuit to power a KSS-213C OPU. Additionally, circuits were designed to collect distance data from the KSS-213C. A test structure was designed to demonstrate the capability of the KSS-213C to make nanoscale measurements. The precision of the KSS-213C was measured and is reported.

PRESENTATION #45

Michael Holmblad

Joyati Debnath, Faculty Mentor

Department of Mathematics, Winona State University

Understanding Elliptic Curves in Cryptography

Format: Poster

Elliptic Curve Cryptography is one of two major forms of public key cryptography. Between it and RSA, Elliptic Curve is much faster and more secure. It also has a trapdoor that as of right now is not vulnerable

to sub-exponential attacks. Understanding Elliptic Curve Cryptography is no trivial matter. The learning curve is very steep and sharp. However, by using concepts from Abstract Algebra, basic Number Theory, and Calculus we may be able to understand Elliptic Curve Cryptography from a mathematical standpoint. Elliptic curves themselves are not trivial, but together we will try to understand how they work and how to use them in cryptography. The poster will help give a general sense of elliptic curves, elliptic curve cryptography algorithms, and how elliptic curve cryptography is in the field of security at its current state.

PRESENTATION #46

Nicholas Meyer

Joyati Debnath, Faculty Mentor
Department of Mathematics, Winona State University

On The Algebra of Rotations of R^3

Format: Oral

The need to represent rotations of objects in 3-D Euclidean space arises daily in many fields: animation, computer vision, and physics, to name a few. Ever since Euler first described his eponymous angles, without giving a general method for constructing them, mathematicians have longed for a better system to describe rotations. In 1843, William Rowan Hamilton had an epiphany whilst walking across Brougham Bridge in Dublin with his wife. Therein he inscribed the laws defining the quaternions, forever changing the face of rotations. The quaternions, when limited to having unit norm, form a group under multiplication which is isomorphic to $SU(2,C)$. This presentation will discuss the interplay between these two groups and will clarify the use of quaternions to represent rotations. We will also follow the lead of Altmann and delve into the relationship between $SU(2,C)$ and $SO(3,R)$.

PRESENTATION #47

Nicole Bean

Theresa Salerno, Faculty Mentor
Department of Chemistry, Minnesota State University Mankato

Using Total Protein Stain as a Loading Control for Western Blot Analysis of SOD2

Format: Poster

A deficiency in the antioxidant enzyme Superoxide Dismutase (SOD), more specifically the SOD2 isoform, can lead to an increase in oxidative stress resulting from hyperglycemia. Most of this previous work has been focused on total SOD enzymatic activity, not specific isoform expression, and most of the studies have used diabetic models rather than dietary studies. In this study rats were fed diets supplemented with sucrose and two other sweeteners, Stevia and saccharin. SOD2 expression was measured at the protein level using the Western blot technique. The initial objective of this project was to establish a proper normalization for SOD2 relative quantitation using the Western blot technique and an IR labeled secondary antibody. The Revert Total Protein Stain has been tested as a loading control with a Sigma Prestige antibody for SOD2. By comparing different protein levels on the blot, we have established a linear range for the detection of both total protein and the SOD 2 protein target and have optimized the technique as a successful quantitation tool for SOD2 protein relative expression. The technique will now be applied to measure SOD2 protein expression in the control and experimental kidney samples. This will

first involve homogenization and extraction with a RIPA buffer followed by centrifugation and the quantitation by the BCA assay so that all protein samples are analyzed in the linear range of detection for the target and total protein.

PRESENTATION #48

Okhumhekho Kassim

Penny Knoblich, Faculty Mentor

Department Biological Sciences, Minnesota State University Mankato

Induced Natriuresis on Spontaneously Hypertensive Female Rats

Format: Poster

Hypertension (high-blood pressure) can lead to several health issues. Blood pressure is strongly influenced by blood volume, which is related to sodium and water retention by the kidneys. The kidneys excrete extra sodium and water when blood pressure is raised, a process called pressure natriuresis. Regular exercise reduces blood pressure and stimulates the release of a chemical called endothelin (ET). Endothelin has three forms and it binds to two different receptors, ETA and ETB, both found in the kidneys. Elimination of the ET-1 receptors in the kidney collecting duct prevents the normal pressure natriuresis response. Prior studies in this laboratory found that exercised female Spontaneously Hypertensive Rats (SHR) exhibited an increase in pressure natriuresis and had a greater number of endothelin receptors in the kidneys. Further understanding of exercise, endothelin, pressure natriuresis, and blood pressure could lead to better treatments for hypertension. Investigation of the role of endothelin in the exercise-induced improvement in pressure natriuresis was carried using an ETA receptor blocker. Female SHRs were assigned to an exercised group, which ran voluntarily from 4 to 12 weeks of age, or a sedentary group. At 12 weeks of age, the rats were anesthetized and given either the ETA blocker or the vehicle control. After catheterization of the carotid artery and jugular vein, a baseline urine sample was collected. Afterwards, arterial blood pressure was raised by ligating three abdominal arteries. Four additional urine samples were collected at the higher blood pressure, analyzed for sodium and water content, and compared between groups.

PRESENTATION #49

Russell Manser and Daniel Phoenix

Cameron R. Homeyer, Faculty Mentor

Department of Atmospheric & Hydrologic Sciences, Saint Cloud State University; School of Meteorology, University of Oklahoma

Modeling Stratosphere-Troposphere Exchange within Extreme Extratropical Convection

Format: Poster

Stratosphere-troposphere exchange via extreme extratropical convection has implications for climate change and is not well understood. In situ trace gas observations in convection from aircraft are limited due to hazards associated with turbulence near the core of a storm. Modeling allows us to examine the processes responsible for irreversible transport of gases into the stratosphere on the convective scale. Previous studies have examined if numerical models can represent the physical characteristics of tropopause-penetrating convection. Here, we test the ability of the ARW-WRF model to simulate the

physical aspects of a real case of extreme extratropical convection that injected cloud particles into the stratosphere. We find that the model resolves storm structure sufficiently, but initiates convection in a different geographical location than that observed, a common limitation of convective-scale modeling. Despite the incorrect location, we proceed to examine the representation of trace gas transport in the upper troposphere and lower stratosphere within the same case of convection using ARW-WRF coupled with chemistry. Model output shows evidence of irreversible transport of tropospheric air to the stratosphere. Tropospheric pollutants, such as carbon monoxide or CO, are limited to altitudes 1 to 2 km above the tropopause, while transport of water vapor is found up to 5 km above the tropopause.

PRESENTATION #50

Ryan Leba

Allison Land, Faculty Mentor

Department of Biological Sciences, Minnesota State University Mankato

Counteraction of APOBEC3A by SIV Sooty Mangabey Proteins

Format: Poster

The APOBEC3 protein family is best known for its lentiviral restriction capabilities. These proteins counteract lentiviruses such as HIV by causing lethal mutagenesis. In order for these lentiviruses to survive they need a protein to counteract the APOBEC3s. A series of proteins known as VPX and VPR are encoded by the related lentivirus SIVsmm, which infects sooty mangabeys. These proteins have recently been shown to possibly degrade APOBEC3A. Understanding a mechanism that neutralizes APOBEC3A is important because APOBEC3A and APOBEC3B have recently been implicated in oncogenesis, with one report even suggesting that APOBEC3 mutagenesis is second only to aging in terms of contribution to cancer mutagenesis. I hypothesize that with increasing levels of VPR and VPX we will see dwindling levels of APOBEC3A due to degradation mediated by the SIV proteins. To test our hypothesis VPR/VPX will be individually transfected into 293T cells, and after 48 hours, the cells will be lysed and A3A will be detected by immunoblot to assess VPR/VPX mediated degradation. If these proteins are unable to mediate degradation of APOBEC3A, we will expand our survey to other SIV strains. We are confident that we will identify a protein that is effectively able to neutralize APOBEC3A, and furthermore provide knowledge that may lead to more effective treatments for cancer patients by counteracting mutagenesis and tumor evolution.

PRESENTATION #51

Ryan Vargas, Grady Friedges and Jennifer Brown

Trisha Karr, Faculty Mentor

Department of Psychology, Winona State University

Does Experience Predict Success on the Rugby Pitch?

Format: Poster

Rugby is the fastest growing sport in America, and at the college level there's a wide range of experience on each team. This study revolved around 26 rugby players from Winona State and examined how their cognitions influenced their match-day performance. The subjects were all males, 18-22 years of age, mostly Caucasian, and ranged from zero to seven years of rugby experience. It was hypothesized that the

experienced players would have more mistakes and penalties than the players with no experience. Data was collected over three matches where performance was self-evaluated and evaluated by the researchers through match film. From the film, researchers were able to track penalties and mistakes for each player. Before the study began, researchers individually watched the same match to establish inter-rater reliability. With the data collected, researchers conducted mixed between-within analyses of variance to examine the differences of having some or no experience and mistakes and penalties across three matches. After the testing, it was found that penalties significantly decreased over the three matches, but no significance was found between the two groups. As for mistakes, no significant differences were found across matches or between groups. Being able to coach players with different levels of experience is hard enough as it is, but how each player thinks is another variable that coaches have to juggle. Knowing how each player thinks will help coaches and teammates to be a more cohesive unit, and can change a program around.

PRESENTATION #52

Rylie Klinski, Grady Friedges, Lauren Mullenbach, Michaela Handeke, Kemry Gett and Jonathan St. Peter

Trisha Karr, Faculty Mentor

Department of Psychology, Winona State University

Exercise Motivations of College Students: Shifting Away From Media Influence

Format: Poster

Limited prior studies have found that college females tend to be motivated by social and cultural cues such as the media and their peers. The purpose of this study was to find out what is motivating college students in the Midwest to exercise. The researchers hypothesized that college males are more motivated by intrinsic factors than females. In addition, college females are hypothesized to be more socially/culturally motivated to exercise than males. This study consisted of 27 college students (9 males and 18 females) ranging in age from 18-25. The students completed the following surveys: demographic form, EMI-2, and SATAQ. Data was analyzed using independent samples T-tests to test for group differences on exercise motivations. The researchers found that social recognition in males was significantly higher than in females. When comparing sexes, weight loss and competition motivators were approaching statistical significance. Enjoyment was the most frequent motivator overall. The data suggests that college students are becoming more focused on leading a healthy lifestyle than worrying about how they look. This may also mean that the media is having less and less of a hold on our young adult population in the United States.

PRESENTATION #53

Samantha Lee and Grady Friedges

Amanda. M. Brouwer and John C. Johanson, Faculty Mentor

Department of Psychology, Winona State University

"I work hard, feel good, do well": A Qualitative Analysis of Student Athletes' Perspectives of Academic Achievement

Format: Poster

Student athletes attain good grades to evaluate what they have learned for personal purposes while others do so in order to achieve another goal, such as their desired career. It is theorized that there are inherent group differences between athletes and non-athletes in terms of academic experiences. Therefore, the aim of the study was to better understand student athletes' perspectives of academic achievement.

A semi-structured interview was used to conduct 12 focus groups of male (n = 6) and female (n = 6) athletic teams. Data were analyzed by using Consensual Qualitative Research methodology.

The perspective of academic achievement differs among athletes, some saw the purpose of grades as a form of self-assessment (e.g., personal representation, grades represented self-knowledge), whereas others viewed it as an external evaluation (grades have a tangible outcome). Results also demonstrate that athletes discussed their academics through shared classroom experiences with their teammates and they talked about both good and bad grades. They also discussed how they would use such communication to support one another and that often the coach would be a source of communication about grades, whether to congratulate them on good grades or encourage them to do better. When discussing grades, athletes also discussed how they responded to encouragement to do better with either passive or active responses. Overall, student athletes perceive grades as having either an internal or external purpose. They also value communication from their teammates and coaches and are more likely to respond actively when encouraged by teammates rather than parents or professors. As such, it may be useful for those working with student athletes to stress the importance of student network support for grade improvement and share such information with incoming freshmen.

PRESENTATION #54

Samson Chen

Dan Kaiser, ShuShuang Man and Mr. Kouros Mortezaipoor, Faculty Mentor
Computer Science Program Southwest Minnesota State University

Complex Analysis Calculator

Format: Poster

Computer automation is an applied area of computer science that is prolific in the processes of automating tedious and error-prone actions. In the vast and broad field of mathematics, regardless of the level and difficulty, there exist special theorems that allow a mathematician find unique properties of equations. For example, in the specified field of complex analysis, special properties like the polarity and the residue of a complex variable can be found by applying the Theorem of Poles and Cauchy's Residue Theorem. Since these special properties must adhere to rigid criteria, computer programs like a digital calculator can be created to automate this process. I will introduce the problem of building this calculator by parsing the input variables and designing algorithmic processes to find special properties of the tokenized inputs.

PRESENTATION #55

Sarah Ortega, Jennifer Manglos, Risa Muroya and Samantha Fances

Tamara Berg and MaryJo Klinker, Faculty Mentor
Women's, Gender, and Sexuality Studies, Winona State University

Challenging Rape Culture: FORGE and RE Initiative

Format: Oral

In 2015 a Climate Survey was sent to students via email, 19.9% of students stated they had experience some form of unwanted sexual experience. In 2016, this number rose up to 21.5% of the students that completed the survey. It shows that sexual assault is an prevalent epidemic on college campuses around the country, and Winona State lines up with national average of 1 in 5 students. Through the collective anti rape efforts of campus activists we will examine rape culture and the issue of campus sexual assault. We will analyze the challenges we face as activists through student run clubs, RE Initiative and Forge. RE stands for “recognizing equality.” This training focuses on responding to gender-based violence, which is an all-encompassing term meaning: rape, sexual assault, sexual harassment, stalking, dating and domestic violence, appropriately while redefining campus culture. Through education this program aims to reduce incidents at this university. FORGE, Fighting for Our Rights and Gender Equality, is a feminist campus club dedicated to creating campus events that create awareness and advance women's rights and social equality. We create a safe space to speak out about gender issues on campus and we act as a leadership group for the Women's, Gender, and Sexuality Studies program. There is a prevalent issue of sexual assault within the higher education system and these types of programs have been shown to be effective in preventing gender-based violence from occurring.

PRESENTATION #57

Sterling Knox

George McConnell, Faculty Mentor
Interdisciplinary Studies, Bemidji State University

Grand Reentry

Format: Oral

In recent years the term Mass Incarceration has become an area of great concern and has landed the U.S. the award for the highest incarcerated population. The U.S. also maintains a national recidivism rate of 67%, 30% of which were re-convicted of a new crime. This rate becomes inflated on tribal lands reaching upwards to 80% nationally with some individual reservations above 90%. The challenges unique to tribal reentry do not fit the research mold resulting in a lack of resources, preparation, and community involvement which is key to successful reentry. In recognition of this crisis, this presentation serves to explore the reentry process, its programs and what changes can be made to increase the chances of success for tribal re-entrants.

PRESENTATION #58

Tate Andrew Colwell

Lee French, Faculty Mentor
Agronomy Program, Southwest Minnesota State University

Stress effect on soybean yield

Format: Poster

The research conducted was to determine the yield reduction on soybeans due to early season defoliation. Field trials were conducted in the months of May through November 2016, to determine the artificial effects of weather, and insect defoliation on the soybean plant. Plant vigor and yield rates were measured throughout the growing season. To simulate defoliation, 75% of the newest trifoliolate were removed at

various stages of growth. The experiment consisted of a control group along with the growth stages of V2, V4, and R1. My hypothesis was that in the early stages of growth, yield would be reduced due to the simulated defoliation on the soybean plant. In my results, I had found that defoliation at these various stages of growth had no result in yield loss, and plant vigor in comparison to the control group.

PRESENTATION #59

Tia Hinz

Jay Passa, Faculty Mentor
Health Education, Bemidji State University

Slut Shaming and the Rape Culture

Format: Oral

Rape culture is something that emerges in our everyday life and very few dare to challenge this norm. Rape Culture is so drenched into our social norms that most of us do not even notice it -most of the time. As a sexual assault prevention peer educator on campus, I have found that it is up to all of us to help prevent sexual assault? and support the victims. I believe a great place to start is debunking the rape culture and challenging the norm.

PRESENTATION #60

Peter Olson

Thomas A. Hanson, Faculty Mentor
Paseka School of Business, Minnesota State University Moorhead

Financial Literacy, Family Communication, and Privacy Management

Format: Poster

Financial literacy affects a wide range of behavior, including credit card debt, mortgage terms, stock market participation, and overall retirement planning. Therefore, understanding methods to improve financial literacy is vital for improving personal financial outcomes. However, efforts to increase financial literacy through education have exhibited mixed results, which suggests that additional factors merit exploration for their impact on financial literacy. This study explores theories of family communication patterns as possible predictive variables of financial literacy. First, the study hypothesizes that the conversation-conformity continuum of the Revised Family Communication Pattern survey will be related to financial literacy, specifically that families with a conversation orientation will be more likely to have imparted practical financial knowledge. Second, the study considers the privacy orientation of the students, as defined by Communication Privacy Management (CPM) Theory. CPM explores the notion of privacy with an ownership metaphor of boundaries, linkages, and permeability. The authors adapt existing scales for use with financial topics, and this cross-disciplinary work emphasizes the relationships between financial decisions and communication studies. We argue that lower privacy boundaries will further encourage conversation and information-sharing that correlate with financial literacy. The research is conducted through an online survey administered to a volunteer sample of college students. The purpose of the research is to discover additional variables that correlate

with financial literacy. Conversations within the family and personal privacy boundaries regarding financial matters provide important direct experience with financial matters that should be considered in designing financial literacy programs.

PRESENTATION #61

Jenna Kalthoff

Thomas A. Hanson, Faculty Mentor

Paseka School of Business, Minnesota State University Moorhead

Portfolio Investment, Behavioral Biases, and Financial Literacy

Format: Poster

Behavioral finance combines insights from psychology with financial theory to explain anomalies and departures from expected behavior in traditional equilibrium theories. In particular, investors might exhibit naïve diversification in portfolio selection by allocating funds evenly across available assets, a disposition effect in which investors hold losing positions longer than winning positions, and/or loss aversion in which investors strive to avoid losses without appropriately valuing gains. Financial education might help overcome these behavioral tendencies and improve financial decision-making. This research examines the relationship between financial literacy and investor behavior regarding behavioral biases by analyzing results of a survey of college students, who answered questions on a range of financial topics. The Consumer Financial Literacy Survey by the National Foundation for Credit Counseling was used to measure financial literacy, and all respondents completed various investment tasks that required financial decisions regarding portfolio diversification in a fictional market. Higher levels of financial literacy generally attenuate the effect of all three biases in the financial allocation task. Therefore, financial decisions are improved by increased financial literacy. Specifically, the more financially literate a student is, the more likely the student will be to avoid behavioral finance errors due to the allocation effect, the disposition effect, and loss aversion. Overall, this study demonstrates the relationship between financial literacy and behavioral finance in an investment portfolio setting. Demonstrating the value of financial literacy could encourage further education and training, as well as spark conversations and practice that improve financial outcomes.

PRESENTATION #62

Qin Chen and Wen Zheng

Eduardo Pablo, Faculty Mentor

Paseka School of Business, Minnesota State University Moorhead

Does higher gender diversity in corporate boards increase financial performance?

Format: Poster

As the importance of gender diversity has increased in management, a higher proportion of female directors is common in corporate boards. The purpose of this research is to review the literature associated to the effect that females have on financial performance as members of the board of directors. Most of the recent studies only focus on large public firms based in developed countries, there is not much attention on the role that female directors have on the financial performance of firms in developing countries. We however review recent articles from different countries, and analyze the information we gather from these articles. Some authors believe there is a positive relationship between gender diversity and financial performance (i.e. Hillman, 2015). However, some studies have found evidence related to female directors having a negative influence on financial performance (i.e. Adams & Ferreira, 2009). There are also some studies that found no statistical relationship between female involvement in the board of directors and financial performance (i.e. Carter et al, 2010).