Eastern Oregon University

# Spring Symposium 2026


Wednesday, May 20th
Online at eou.edu/symposium

# EOU Spring Symposium 2026

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# Keynote Presentation

## 9:00 AM - 9:50 AM McKenzie Theater

**Livestream:** https://youtube.com/live/Ec8wDls-6TE?feature=share

**Welcome:** EOU President Kelly Ryan

**Presenter:** Nerita Juda

### “Will Someone Think of the Children?: Meeting Early Childcare Needs in Union County”

**Faculty Sponsor:** Daniel Costie

**Abstract:** Access to affordable, reliable childcare is a key driver of workforce participation, family stability, and local economic health, yet rural communities often face persistent shortages and structural barriers. In 2025, Union County conducted a countywide survey of households with children ages 0–5 to better understand early childhood care needs and their intersection with employment, income, and community well-being. This presentation highlights the findings of the survey, focusing primarily on the extent to which inaccessible or unaffordable childcare prevents employable adults from participating in the workforce. In addition, recommendations will be offered to guide policy advocacy and provide local knowledge to local employers and providers regarding the nuanced childcare needs of Union County's workforce.

# Demonstrations and Performances

## 10:00 AM to 11:00 AM McKenzie Theater

**45th Parallel Arranging Team with Jakob Graffunder, Tristan Eggert, and Diego Jones Bedolla: "45th Parallel Student Performance"**

**Faculty Sponsor: Greg Johnson**

**Abstract:** This presentation features original jazz arrangements by Jakob Graffunder, Diego Jones Bedolla, and Tristan Eggert, performed by Eastern Oregon University's premier jazz ensemble, The 45th Parallel. The program highlights the creative and technical processes involved in adapting and reimagining existing musical works for a contemporary small-ensemble setting. Each arranger brings a distinct stylistic approach, drawing on influences ranging from traditional swing and bebop to modern jazz idioms. Through these arrangements, the ensemble explores how harmony, form, rhythm, and orchestration can be reshaped to create fresh musical interpretations while preserving the character of the source material. The performance also emphasizes collaboration, demonstrating how arrangers and performers work together to refine musical ideas in rehearsal and bring them to life in a live setting. By combining performance with insight into the arranging process, this presentation offers a practical perspective on jazz as both an interpretive and creative art form, showcasing the evolving role of student musicians as composers, arrangers, and performers.

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## 12:00 PM - 1:00 PM Loso 123

**Choral Methods Class with Hannah Brown, Laylah Lucas, McKenzie Jonas, Jakob Graffunder, and Jillian Newman: "Spring Choral Concert"**

**Faculty Sponsor:** Peter Wordelman

**Abstract:** A choral presentation by the EOU Chamber Choir and student conductors. The students have learned these pieces, rehearsed them with the choir and will be conducting them for the performance. The performance will represent music from Indonesia, South Africa, Kenya, and the United States.

# Demonstrations and Performances

## 1:00 PM - 2:00 PM Zabel 102

**Abel Anaya, Davon Dunajski, Henry Hoelscher, Zen Califf, Jadelynn Harris, Curran Stolk, and Jeremiah Wright: "The Resurrection of Film at EOU"**
**Faculty Sponsor:** Kevin Roy
**Abstract:** At the Altar of God - Music Video We took one of the singles from Davon's newest record and made a film utilizing a light provided by Aputure lighting. The project aims to explore contrast and single source lighting. Miles of blue - Short Film A three-minute silent short film written, filmed and edited by students in the inaugural FILM 366: Cinematography course offered at EOU in the Fall of 2025. This film explores themes of loss, memories, and finding the hope to move forward, while exhibiting best practices in student filmmaking. Moping Around - Short Film Robbie has one hell of a night as he struggling with a recent break up and his own addictive vices. This small project was written and directed by Abel Anaya.

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**Levi Pringle and Levi Danz: "Orbito Because TicTacToe is overrated"**
**Faculty Sponsor:** Amy Yielding
**Abstract:** In this demonstration we describe and demonstrate the rules and gameplay of the board game Orbito. We introduce notation and concepts we developed in researching the game at EOU. Lastly we will show the proofs, results, and statistics discovered to better understand potential winning strategies for Orbito.
*Game will be running near poster presentations.

# OTP Posters

## 10:10 AM - 10:40 AM Simmons Gallery

**Faculty Sponsor:** Tawnya Lubbes

### Baker High School (Teacher: Rachel Balza)

**Sage Baker:** “Anxiety and Depression: How do They Affect Adolescents in High School?”
**Kaitlyn Dixon:** “Snapchat Effects: Ages 12-17”
**Elissa Nilsen:** “The Impact of COVID-19 School Shutdowns Among Elementary Students”
**William O’Connell:** “How Positive Student-Teacher Relationships Impact Students”

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### La Grande High School (Teacher: Elizabeth Becker)

**Peyton Daggett:** “The Effects of Dyslexia on Student Success in School”
**EnJie Fan:** “The Impact of Dating Violence on High School Students”
**Oliver Ganung:** “Supporting Non-Verbal Students: Improving Access and Inclusion in Schools”
**Paylan Hampton:** “Promoting Inclusion, Belonging, and Equity for Students of Color in Schools”
**Kiera Hibbert:** “The Role of Movement in Supporting Students with ADHD”
**Shayla King:** “Mental Health, Brain Development, and the Educational Experiences of Students in Poverty”
**Delaney Klinger:** “Economic Barriers to Extracurricular Participation for Low-Income Students”
**Hanna McCarty:** “The Impact of Vaping on the Health of High School Students”
**Lindsay Nelson:** “Improving Student Mental Health: Suicide Prevention and Social Emotional Learning in Schools”
**Madison Seavert:** “The Effects of Stress and Mental Health on Student Success in School”

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### Umatilla High School (Teacher: Chris Early)

**Estrella Valencia:** “The Exploration of the Effects of Substance Abuse on Adolescents”
**Cecillia Lopez:** “The Analysis of Artificial Intelligence Within Education”
**Jack Ricardo:** “The Impact of Foster Care on Educational Outcomes”

# OTP Posters

## 10:40 AM - 11:10 AM Simmons Gallery

**Faculty Sponsor:** Tawnya Lubbes

### Pilot Rock High School (Teacher: Kyndra Nelson)

**Gabriel Endersby:** “Dyslexia Screening”
**Coley Gibbs:** “Chronic Absenteeism”
**Renee Stairs:** “AI in Schools”
**Hailey Thieme:** “Teacher Shortage Leading to Uncertified Educators”
**Kaija Warren:** “AI in Schools”

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### McLoughlin High School (Teacher: Marianne Smith)

**Miah Cisneros:** “What is an Effective and Appropriate Consequence for Absences or Tardiness in High School?”
**Marshall Koch:** “Do the Pros Outweigh the Cons for Allowing Underage Vaping?”
**Samantha Lozano:** “How are Funding Changes Affecting Minority Student Access to Academic Resources?”
**Zoey Watts:** “What is the Impact of Excluding Disabled Students From Core Experiences in Elementary Education?”

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### Ontario High School (Teacher: Rodney Williams)

**Amaya Hawkinson:** “Teacher Bias Towards Students in High School”
**Eduardo Ramirez Perez:** “Visual Arts can be Used in Every Subject Area.”
**Yolibet Lemus Madera:** “Educational Challenges Faced by High School Girls”
**Jayda Rodriguez:** “How Mental Health Affects High School Students”
**Ana Madera Navarrete:** “Why Teachers Should Get Higher Salaries”
**Angela Victoria Corona:** “Artificial Intelligence in Schools”
**Gissell Alejandro:** “The Benefits and Challenges Placed on Collegiate Athletes”

# OTP Posters

## 11:10 AM - 11:40 AM Simmons Gallery

**Faculty Sponsor:** Tawnya Lubbes

### Pendleton High School (Teacher: Nicole Stewart)

**Lauren Anderson:** “Covid’s Impact on Learning”
**Boone Carlson:** “The Impact of Lighting on Learning”
**Kacey Cooper:** “How Does AI Impact Student Learning?”
**Hailey Erickson:** “Is Sex Education Working?”
**Brianna Medrano:** “Do Students Perform Better When They Feel Emotionally Supported by Their Teachers?”
**Madelyn O'Grady:** “Does The Schedule Impact Student Engagement?”
**Meliah Phynon:** “Motivation for Higher Education”
**Nataly Ponce Palomera:** “How Mental Health Impacts Student Learning”
**Madelyne Roberts:** “Parental Impact on Student Involvement”
**Jaylene Rodriguez-Garcia:** “What Are the Effects of Caffeinated Beverages on Children and Adolescents?”
**Annaliese Somnis:** “Should Teacher Evaluations be Reevaluated?”
**Flora Thatcher-Naegeli:** “Does Flexible Seating Improve Student Engagement?”
**Emma Ware:** “Why is Character Education Important?”
**TJ Williams:** “Lack of Funding and Representation in Secondary Schools”

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### Wallowa High School (Teacher: Kelsey Layton)

**Christina Jones:** “Post Traumatic Stress Disorder: Awareness, Recognition, and Effects in the Classroom to Accommodate and Maximize Student Learning”
**Aaron Brainard:** “Incorporating Sensory-Friendly Practices in Education to Enhance Learning for Students with Sensory Processing Disorders”

# Poster Presentations

## 10:15 AM - 11:15 AM Loso Hall Lobby

**Hunter Blake: "Enhancing Student Engagement in Livestock Nutrition through Reflective Pedagogy and Real-World Applications"**

**Faculty Sponsor:** Jimmy Zamora

**Abstract:** This instructional unit examined the principles of livestock nutrition within a rural secondary Agriculture/CTE setting, focusing on how different life stages and nutritional requirements influence animal health and management. Using a reflective action research framework, the project utilized a five-lesson sequence incorporating both qualitative and quantitative methodologies, including formative pre-assessments, interactive whiteboard activities, and hands-on laboratory investigations. These methods were designed to measure students' ability to identify essential nutrients, calculate feed rations, and analyze nutritional disorders. The unit culminated in a summative "Nutritional Disease Experts" research project where students conducted independent research and presented prevention protocols. Results indicated that 72.7% of students achieved mastery on the final assessment, with high-performing students demonstrating advanced critical thinking during class discussions and collaborative tasks. Despite attendance challenges due to regional sports and school activities, the integration of Universal Design for Learning (UDL) principles—such as guided notes and visual aids—significantly supported student engagement and content retention. This study highlights the value of intentional, scaffolded instruction in helping students bridge the gap between scientific theory and real-world agricultural application.

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**Addie Banks, Chase Bugni, and Florin Fulmer: "Baseline Data on American Kestrels and Raptor Communities in Northeastern Oregon"**

**Faculty Sponsor:** Dr. Laura Mahrt

**Abstract:** American Kestrel (Falco sparverius) populations have been declining throughout North America over the past several decades. One of the smallest raptors, they can fall prey to predators such as larger raptors, snakes, and domestic cats. Body conditions and presence of Kestrels at the start of breeding season is an important metric for monitoring the health of an ecosystem, allowing us to predict reproductive success as well as long-term survival. Field methods include live trapping and banding of Kestrels, along with morphometric measurements to evaluate body condition. In parallel, systematic raptor surveys are conducted to quantify species presence and relative abundance across the study area. To date, three American Kestrels have been caught, banded, and assessed, providing an initial baseline on body condition. Ongoing raptor surveys have yielded consistent observations of multiple species, contributing to a growing dataset on raptor diversity and activity in the region. As the project continues and sample sizes increase, our intent is to provide a clearer picture of body condition variation in Kestrels and raptor community dynamics in northeastern Oregon. This project contributes to regional conservation efforts by generating baseline data for a species of concern.

# Poster Presentations

## 10:15 AM - 11:15 AM Loso Hall Lobby

**Alara Campbell and Caden George: "Ligand complexes of cytochromes P460"**

**Faculty Sponsor:** Colin Andrew

**Abstract:** Cytochromes P460 (cyts P460) are bacterial ligand-binding heme enzymes that catalyze the oxidation of hydroxylamine (NH2OH) to nitric oxide (NO) and/or nitrous oxide (N2O) gas (possibly to mitigate NH2OH toxicity within the nitrification pathway). This activity contributes to the loss of fixed nitrogen to the atmosphere, with consequences for agriculture, wastewater treatment, and atmospheric pollution. All cyts P460 contain a novel lysine-porphyrin crosslink that is essential for catalytic activity, and which leads to unusual optical absorbance features. Here we report UV-vis spectra and ligand binding data for a variety of cyt P460 complexes with small molecules. Trends in spectroscopic parameters and ligand binding affinities are discussed in the context of the heme active site environments.

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**Irene Griswold: "Challenges in Human Health and Pharmaceuticals in Extended Space Exploration"**

**Faculty Sponsor:** Colby Heideman

**Abstract:** The safety and efficacy of pharmaceuticals are critical in space, especially as human space exploration extends beyond low-Earth orbit to long-duration missions such as the Moon and Mars. The challenges posed by the space environment, including microgravity, ionizing radiation, and confinement, can impact both human physiology and drug stability. Some bodily changes that occur are altered fluid distribution, immune response, and bone density, which can influence the absorption, distribution, and metabolism of the pharmaceuticals. The pharmaceuticals themselves can also be chemically and physically impacted by the spaceflight conditions to often results in reduced stability and shortened shelf life. The current resupply strategies on the International Space Station are not feasible for deep space missions, requiring alternative approaches. This review examines existing research on pharmaceutical instability, crew member health risks, and mission limitations while highlighting emerging solutions such as on-site drug synthesis, developing packaging systems, targeted drug delivery technologies, and innovations, including plant-based pharmaceutical production. Addressing these challenges is essential for the development of medical systems capable of supporting astronaut health during extended space travel.

# Poster Presentations

## 10:15 AM - 11:15 AM Loso Hall Lobby

**Casey Helwig and Emma Burlingame: "How Prototypical Leaders Shape "Us and Them": Entitativity, Dehumanization, and Extremism in Political Groups"**

**Faculty Sponsor:** Olivia Kuljian

**Abstract:** Leaders who exemplify essential group traits (i.e., prototypical leaders) define group identity and shape intergroup contexts (van Knippenberg, 2011). Moreover, prototypical leaders increase group entitativity (i.e., group cohesion), which shapes group perceptions and relations. Members who view their ingroup as high (vs. low) in entitativity tend to derogate and express prejudice toward outgroup members (Effron & Knowles, 2015), thus influencing the group to adopt more extremist positions. This work explores the consequences of prototypical leadership and group entitativity on extreme prejudice: dehumanization. We predicted perceived prototypical leadership would heighten members' perception of ingroup entitativity and increase the dehumanization of outgroup members. We recruited 436 participants through Prolific one week before the 2024 US presidential election. Participants completed measures of political ingroup leader prototypicality, ingroup entitativity, and subtle dehumanization of the political outgroup. Results provide evidence for group entitativity as a significant partial mediator between leader prototypicality and outgroup dehumanization. Increased leader prototypicality related to increased ingroup entitativity, and increased entitativity related to increased outgroup dehumanization. The findings suggest that viewing influential leaders as prototypical not only increases followers' perceptions of ingroup entitativity but also contributes to increased outgroup dehumanization, which has implications for increased prejudice, conflict, violence, and extremism.

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**Nora Roscoe and Kaleah Hines: "Evaluating an Awareness Campaign for Youth Substance Use in Union County"**

**Faculty Sponsor:** Kelly McNeil

**Abstract:** A Community Readiness Assessment was conducted to determine Union County's level of readiness to address the issue of adolescent substance use. The findings concluded that Union County ranked particularly low in the dimension Knowledge of the Issue, indicating a need for improved data transparency surrounding the prevalence of youth substance use and what substances are being used. The purpose of the study was to evaluate a community- based intervention aimed at increasing awareness and knowledge of current substance use statistics among Union County youth. An awareness campaign presenting current substance use statistics specific to Union County youth was developed using data from the 2024 Union County Student Health Survey and in partnership with the EOU Marketing Department. The campaign was disseminated through multiple community channels, including local news outlets and organizations social media platforms with the goal of improving data transparency and raising awareness of the issue. Program effectiveness was evaluated through a brief survey attached to the distributed material, assessing whether the program improves accurate knowledge and results in engagement with prevention efforts. Results of this study contribute to conclusions regarding whether improving data transparency enhances community understanding and engagement in adolescent substance use prevention efforts.

# Poster Presentations

## 10:15 AM - 11:15 AM Loso Hall Lobby

**Megan Scharf:** **"An Exploratory Analysis of the Effects of Automation and the Cost of Labor on Farm Revenue"**

**Faculty Sponsor:** Michael Fakutiju

**Abstract:** This exploratory study examines the economic impact of automation adoption on farm-level revenue within U.S. agriculture. As agricultural systems evolve, producers face increasing pressure to allocate labor and capital efficiently to remain competitive and sustainable. This research tests the hypothesis that the implementation of automation technologies positively influences farm revenue, while greater reliance on manual labor is associated with lower economic performance. Using state-level data across five years, gathered from the United States Department of Agriculture (USDA), the analysis explores proxy measures for automation adoption, such as machinery investment, to evaluate their relationship with output and financial outcomes. Econometric methods are employed to identify trends and quantify the effects of technological adoption across varying farm sizes and production types. The findings aim to provide insight into how automation reshapes resource allocation decisions and economic viability in modern agriculture. This study contributes to a growing body of literature on agricultural innovation by offering empirical evidence to inform producers, policymakers, and agribusiness stakeholders. Ultimately, the results highlight the importance of strategic technology adoption in enhancing efficiency, reducing labor dependency, and supporting long-term agricultural profitability.

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**Cutter Tanaka, Brooke Snyder, and Cole Jorgensen:** **"Effects of Post-Exercise Recovery Modalities on Blood Glucose Kinetics"**

**Faculty Sponsor:** Kyle Pfaffenbach

**Abstract:** Athletes commonly use heat or cold after exercise in an effort to improve recovery, yet the metabolic effects of these recovery strategies remain unclear. In particular, little is known about how post-exercise temperature-based recovery methods may influence blood glucose kinetics after consumption of a recovery drink. This study will investigate the effects of post-exercise recovery modalities on blood glucose kinetics following ingestion of a 3:1 carbohydrate-to-protein recovery drink. Healthy, physically active college-aged adults will complete a repeated-measures protocol involving three recovery conditions: seated room-temperature recovery (control), infrared sauna exposure, and cold-water immersion. Each session will begin with a 30-minute treadmill run at approximately 70% of age-predicted maximum heart rate, followed by the assigned recovery condition. Blood glucose will be measured in the fasted state, immediately after recovery, and at regular intervals after consumption of a standardized recovery drink until levels return to baseline. The primary objective is to determine whether recovery modality influences the magnitude and time course of post-exercise blood glucose response. This study may provide insight into how nutritional and temperature-based recovery strategies interact, with practical relevance for athletes, coaches, and practitioners.

# Poster Presentations

## 11:15 AM - 12:15 PM Loso Hall Lobby

**Teagen De Forest: "Chemical Warfare In The 20th Century"**

**Faculty Sponsor:** Tracey Hanshew

**Abstract:** The employment of chemical substances in waging war has proved detrimental to the health of not just the warring military on both sides, but to the members of the civilian public as well. Not only has this problem led to severe health challenges, but it has also greatly harmed not just the warring nations but the environment as well. The chemical substances were deliberately produced through different means, such as aerial and ground-level spraying, to ensure their full potential was realized in their employment in the waging of war. The outcome of their employment in waging war proved to be detrimental to the health of those on the front line of the war, a factor that has otherwise ensured environmental decline in the long run, an issue that has continued to affect the public long after the conflict came to an end. The use of Chemical warfare did not show its true potential until World War I. The First World War showed everyone a new level of warfare, on a technical, controversial and devastating level. The chemicals used have inflicted multiple generations in an unfortunate way, such as birth defects, mass deforestation, and long-term health effects on both sides.

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**Moyra Dorzab: "Making Fractions Meaningful for Multilingual Learners"**

**Faculty Sponsor:** Karyn Gomez

**Abstract:** This project examined a fraction unit implemented in a third-grade summer school classroom that incorporated both third- and fourth-grade Oregon state standards. The purpose was to strengthen students' conceptual understanding of fractions, particularly among multilingual learners. The class included 15–25 students daily, with six identified English Language Learners, though most students spoke Spanish as their first language. Instruction focused on visual models, explicit vocabulary development, and guided practice to support both content and language learning. Student understanding was measured using pre- and post-assessments. Results showed overall growth in fraction comprehension, with most students demonstrating 10–20% improvement, though some showed minimal or negative change. One student demonstrated a 40% increase. These results suggest that combining visual supports with targeted language instruction can improve mathematical understanding for diverse learners. This project highlights the importance of integrating language and content instruction to support equitable outcomes in elementary math classrooms.

# Poster Presentations

## 11:15 AM - 12:15 PM Loso Hall Lobby

**Brooke Glaser: "Policy Implications of NASA Earth Observation Data in U.S. Agricultural Decision-Making"**

**Faculty Sponsor:** Elaine Swanson

**Abstract:** NASA Earth observation data, particularly from the Landsat program, play a critical role in supporting agricultural decision-making and addressing global food security challenges. This review demonstrates how Landsat's long-term, open-access data enables scientists, policymakers, and agricultural producers to monitor land use, assess crop health, and respond to environmental change using tools such as the Normalized Difference Vegetation Index (NDVI). It highlights the importance of U.S. policy in shaping the accessibility and continuity of Landsat data, with key legislation expanding public access and enabling widespread application. Advances in Landsat technology continue to improve the usefulness of satellite data for real-world agricultural and environmental applications. The review also shows how initiatives such as NASA Harvest, NASA Acres, and FEWS Net use satellite data to improve food security and agricultural resilience. A case study of drought in the Karamoja region of Uganda demonstrates how Landsat-derived NDVI data supports crop monitoring and informs timely interventions. Overall, this review shows that the integration of satellite technology and supportive policy frameworks is essential for translating Earth observation data into actionable insights and strengthening agricultural systems.

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**Marcus Judd and Curran Stolk: "Community Readiness Assessment for Adolescent Substance Use in Union County"**

**Faculty Sponsor:** Kelly McNeil

**Abstract:** Union County teens exhibit higher rates of Alcohol (21.2%), Marijuana (10.6%), and Nicotine (17.9%) use than Oregon state averages. The purpose of this study was to assess community readiness to address teen substance use in Union County. The Community Readiness Model (CRM), developed by the Tri-Ethnic Center at Colorado State University, was used to assess Union County's readiness stage regarding teen substance use. After approval by the EOU IRB, 14 interviews were conducted with community leaders who regularly interact with teens. Interviews were recorded, transcribed, and scored using the anchored rating scale by at least 2-3 separate individuals to determine which of the 9 stages of readiness Union County was in. The average score across the six dimensions was: Community Efforts (Preplanning, 4.47), Knowledge of Efforts (Vague Awareness, 3.53), Leadership (Preparation, 5.05), Community Climate (Preplanning, 4.02), Knowledge of Issue (Preplanning, 4), and Resources (Vague Awareness, 3.65). The mean of these scores determines the stage of readiness for Union County (Preplanning, 4.12). Results from the study enable the development of substance use interventions based on the stage of community readiness specific to Union County.

# Poster Presentations

## 11:15 AM - 12:15 PM Loso Hall Lobby

**Sarai Clunie Paul, Editor-in-Chief: "The Eastern Oregon Science and Science Journal: A look at student-run, student research-centered journals in rural Oregon"**

**Faculty Sponsor:** Anthony Stenson

**Abstract:** This presentation highlights the work that goes into the Eastern Oregon Science and Social Science Journals. Two students run publications that showcase undergraduate research at Eastern Oregon University. From the selection of student staff and cover artists to editing and collaboration with student researchers and faculty. The Eastern Oregon Science Journal was founded in 1983 by Dr. Richard Hermens, making it the first student-published undergraduate science journal in the state of Oregon. The Science Journals have been serving Eastern Oregon University since 2015 and are a fantastic way for undergraduates to have their work published and recognized. It also provides valuable mentoring experience with expert faculty advisors in their respective fields, and students are highly encouraged to submit their papers for future publication.

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**Brock White: "Effects of Cognitive Load and Physical Fatigue on Postural Stability During Landing Tasks"**

**Faculty Sponsor:** Jacqueline Morgan

**Abstract:** This study examined the combined effects of cognitive load and physiological fatigue on postural control and landing stability. While prior research demonstrates that cognitive exertion and physical fatigue independently impair neuromuscular control, their interactive effects remain unclear. Participants completed double-leg (DBL), single-leg left (SLL), and single-leg right (SLR) landing tasks under four conditions: control (CON), cognitive (COG), physical (PHYS), and combined cognitive and physical stress (COG-PHYS). Time to stabilization (TTS) and the dynamic postural stability index (DPSI) were used to quantify performance. Results indicated condition-specific alterations in stability. Cognitive load alone increased TTS in DBL landings, while physiological fatigue generally reduced TTS across tasks. Notably, the combined COG-PHYS condition produced the greatest impairment in SLL TTS (3.02 s) and a corresponding increase in SLL DPSI, suggesting a localized effect of dual stress on unilateral stability. Outside of these conditions, dual-task effects were inconsistent and did not uniformly degrade performance. These findings suggest that cognitive demands may increase instability when layered onto physiological fatigue in specific task contexts, particularly unilateral landings. This task-specific effect may help explain elevated injury risk during sport situations requiring rapid decision-making under fatigue and supports further investigation into cognitively demanding assessments under fatigued condition.

# Poster Presentations

## 11:15 AM - 12:15 PM Loso Hall Lobby

**Madelynn Sturm: "The Living Legacy of Native American Boarding Schools"**
**Faculty Sponsor:** Tracey Hanshew
**Abstract:** Beginning in the late nineteenth century, Native American boarding schools became an essential tool of the United States federal assimilation policy. These institutions were designed to remove Indigenous children from their families and communities to suppress Native languages, cultural practices, and kinship systems. While boarding schools are often discussed as a historical phenomenon that ended with the decline of the boarding school system in the mid-twentieth century, their impacts did not end when students returned home. Forced family separation, cultural suppression, and institutional discipline reshaped parenting practices, emotional expression, and identity in ways that continued across generations. By examining boarding schools through the framework of historical and intergenerational trauma, this paper argues that federal Indian policy produced long-term social and cultural consequences that remain visible in Native families and communities today. This paper situates the development of the boarding school system within the 1870s through the early twentieth century, while focusing on the late twentieth and early twenty-first centuries to analyze the intergenerational impacts of these policies.

# Poster Presentations

## 12:15 PM - 1:15 PM Loso Hall Lobby

**Alara Campbell: "Prebiotic Chemistry on Titan: Insights into the Origins of Life"**
**Faculty Sponsor:** Colin Andrew
**Abstract:** Titan, Saturn's largest moon, hosts a chemically rich environment shaped by a dense nitrogen- methane atmosphere, complex organic aerosol production, and dynamic surface processes. These characteristics make Titan one of the most compelling locations in the solar system for investigating prebiotic chemistry, which is the study of how simple molecules evolve into increasingly complex organic compounds capable of supporting life. This study examines current research on Titan's surface and subsurface composition, with a focus on transient melt-pool environments generated by cryovolcanism and meteor impact events. These aqueous, ammonia-rich environments may support multiple prebiotic pathways, including the formation of RNA nucleobases and amino acids, as well as the aggregation of amphiphilic vesicles and formation of HCN-derived co-crystals. Although laboratory simulations demonstrate the plausibility of these reactions under Titan-like conditions, significant uncertainties remain regarding molecular stability, reaction kinetics, and the precise chemical composition of Titan's melt pools. NASA's upcoming Dragonfly mission will directly address these gaps through in-situ sampling and mass spectrometric analysis of organic materials at sites such as the Selk Crater. By integrating existing laboratory studies with mission objectives, this work provides a framework for interpreting Dragonfly's future findings and advancing the understanding of Titan's potential to support prebiotic chemical evolution.

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**Reece Dixon: "Building Power and Governing Capital: Monopolies, Antitrust, and the Making of the Modern American State"**
**Faculty Sponsor:** Tracey Hanshew
**Abstract:** American monopolies, by consolidating capital and controlling national markets, have not only built the U.S. economy but also prompted the development of federal regulatory frameworks and established legal precedents that continue to evolve and shape the balance between corporate power and government regulation. Through an examination of Standard Oil, Alcoa, AT&T, Microsoft, and Google, this paper argues that the history of American monopolies is not merely a story of economic dominance but a recurring struggle that has defined the structure, governance, and evolution of the modern American economy. The results of these antitrust cases left us with many of the modern American appliances and products we enjoy today. As well as providing a foundation for dealing with trusts across all types of industries. Our modern American economy would not be where it is today without the impacts of these antitrust cases. Monopolies have shaped and continue to shape our everyday lives.

# Poster Presentations

## 12:15 PM - 1:15 PM Loso Hall Lobby

**Shawna DeVault: "Horses Don't Solve Problems the Same Way Every Time: Two Puzzles Don't Correlate"**

**Faculty Sponsor:** Zoe Johnson-Ulrich

**Abstract:** Animals frequently have to problem-solve while obtaining food, which may require learning, innovation, and behavioral flexibility. In this study, we used multi-access tasks to assess behavioral flexibility by requiring horses to find new ways to solve a task when previous strategies no longer worked. Although these paradigms have been used in other species, they have not been applied to domestic horses. We tested horses using a multi-access box (MAB) and a novel multi-access spatial problem (MASP). Thirteen horses participated, though not all completed both tasks. Performance was measured as the number of solutions achieved. Results showed substantial individual variation, and performance across tasks was not correlated, suggesting that success in one task did not predict success in the other. These findings suggest that problem-solving in horses may be influenced by motivation, personality, and prior experience.

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**Megan Harris and Aspen Smith: "The Effects of Short-from Brain Rot Content on Attention and Digital Fatigue"**

**Faculty Sponsor:** Anthony Stenson

**Abstract:** Many studies have suggested a connection between short-term content and attentional deficits or decreased executive function, which is a process that is part of attention. Other studies have indicated that prolonged screen usage can cause increased digital fatigue. However, most prior research is correlational, and there is little to no research on the impact of brain rot short-form content on attention and digital fatigue. Brain rot short-form content is short videos that are random, unintelligible, and purposeless. Modality may also be a contributing factor to the effects seen in short-form content usage. Previous research has found that reading, while it increases fatigue, also may have attentional benefits due to the active attention. Watching videos, however, may lead to less fatigue and more difficulty with attending due to passive watching. Participants of this study were placed in a reading condition or a watching condition where they would either watch or read brain rot and non-brain rot content. Attention was tested with the attentional network task (ANT), and digital fatigue was tested with the visual analogue scale to evaluate fatigue severity (VAS-F). Results were run through an ANOVA to see if significant decreases or increases in digital fatigue and attention were present.

# Poster Presentations

## 12:15 PM - 1:15 PM Loso Hall Lobby

**Cole Jorgensen, Cutter Tanaka, and Brooke Snyder: "Effect Of 5-Days Post Exercise Infrared Sauna On Wildland Firefighters Wearing Protective Clothing During Exercise"**

**Faculty Sponsor:** Kyle Pfaffenbach

**Abstract:** Wildland Firefighters (WFF) perform physically demanding work in hot conditions while wearing personal protective equipment (PPE). The National Institute for Occupational Safety and Health reports increased risk for early-season heat-related injury due to lack of heat acclimatization and the burden of PPE. To our knowledge, no studies have examined the effects of moderate exercise combined with post-exercise infrared sauna (IRS) in WFF. The purpose of this study was to measure the impact of 5-days of exercise+IRS on heart rate (HR), blood lactate (BL), and oxygen consumption (VO2) during a standardized sub-max exercise protocol. Female (n=3) and male (n=3) WFF completed treadmill walking (32 minutes at 1.34 m/s, 12% incline) followed by a 1.61 km run (3.35 m/s) under three conditions. Subjects completed trials in PPE (PPE1) and gym clothes (GC), followed by 4-days of moderate exercise and 25 minutes of IRS (60°C), and a final PPE trial (PPE2). HR and VO2 were measured every 4 minutes, and BL every 8 minutes. HR was higher in PPE1 compared to GC and PPE2, with no difference between PPE2 and GC. No differences were observed in VO2 or BL. These findings suggest reduced cardiac strain.

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**Calvin Lewis and Jasper Herio: "Optimizing Measurements and Electrical Resistance in Calcium Magnanese Oxide Perovskites"**

**Faculty Sponsor:** Colby Heideman

**Abstract:** Samples of calcium manganese oxide (CaMnO3) were synthesized utilizing the SOL GEL technique. These samples were prepared by mixing ethylene glycol, citric acid, and water at various ratios, with calcium nitrate and manganese nitrate in different stoichiometric ratios. In the process of creating the pellets, different experimental designs were created to optimize the measurements of physical and electrical properties of the pellets. Using CAD design software, 3D printed tools were created to help in the measurements of electrical conductivity, resistivity, and XRD imaging. All samples were heated in a box furnace, and X-ray diffraction (XRD) was performed between annealing steps to monitor structural changes with heat. Once the final heating step produced a suitable product, the electrical conductivity, resistivity, and Seebeck coefficient of the pellets were measured to explore the influence of the stoichiometric ratios on the electrical properties of the pellets.

# Poster Presentations

## 12:15 PM - 1:15 PM Loso Hall Lobby

**Gretchen Morgan and Lisa MacPherson: "Follow Their Leader: Representative Outgroup Leadership Clarifies Intergroup Contexts and Reduces Self-uncertainty"**

**Faculty Sponsor:** Olivia Kuljian

**Abstract:** As much as we may not want to admit it, rival outgroups help define ingroups and self-identity. Ingroup membership provides clarity about values, behaviors, and worldview, reducing self-uncertainty (Hogg, 2001). However, outgroups also shape identity by providing a basis for comparison, allowing individuals to understand who they are by who they are not, consistent with metacontrast theory (Turner et al., 1987). In intergroup contexts, group leaders communicate group norms and identity to both ingroup and outgroup members (Hogg, 2001; van Knippenberg, 2011). While strong ingroup leaders serve as clear indicators of group identity, less is known about how outgroup leaders influence individuals' understanding of their own group and self. We examined how representative outgroup leadership shapes ingroup definition and self-uncertainty in a survey of partisan groups conducted during the 2024 U.S. presidential election. We hypothesized that outgroup leaders who strongly reflect their group would help define the ingroup and reduce member self-uncertainty. This prediction was supported via a full mediation. Increased outgroup leader prototypicality was associated with lowered ambiguity about ingroup definition, which related to lower reported self-uncertainty. Overall, these findings suggest that clear signals from outgroup leaders can reduce self-uncertainty by defining the intergroup context.

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**Brock White: "Effects of Motorized, Nonmotorized, and Smart Treadmill Running on Energetics, Tibial Impact, and Muscle Activity"**

**Faculty Sponsor:** Jacqueline Morgan

**Abstract:** This preliminary study compared physiological and biomechanical responses to running under three treadmill conditions: a Wahoo motorized treadmill (MT), a Woodway nonmotorized treadmill (NMT), and a Wahoo treadmill with Run Free mode enabled (SMT). Five volunteers familiar with running completed the trials at a fixed pace of 8 min/mile. Data was analyzed over 90 seconds. Outcomes included muscle activity intensity of the rectus femoris, semitendinosus, tibialis anterior, and medial gastrocnemius; tibial impact acceleration; common stride measures; metabolic rate; and energy cost. Compared with MT, NMT produced the largest reduction in tibial impact acceleration but increased metabolic rate and energy cost. SMT also reduced tibial impact acceleration while showing lower metabolic rate and energy cost than MT. SMT additionally showed higher average muscle activity in several muscles, especially rectus femoris, semitendinosus, and tibialis anterior. This suggests NMT may reduce impact at a higher energetic cost, whereas SMT may reduce energetic demand while increasing lower-limb muscle activity. Higher muscle activity in RF, TA, and ST on SMT could indicate greater bracing before and during foot strike. Stride timing variables changed very little across conditions demonstrating the participants maintained a similar overall stride pattern while adapting internally to each treadmill mode.

# Talk Presentations

## 10:30 AM - 11:00 AM Loso 115

**Lisa N. MacPherson: "When Parenting Centers the Parent: Narcissism, Attachment, and Relational Trauma"**

**Faculty Sponsor:** Felicia Kademian-Saini

**Abstract:** This review examines how parents with strong narcissistic traits shape adult attachment and contribute to patterns of relational trauma across generations. Such parenting can create environments that undermine a child's sense of security, increasing dependency, anxiety, and emotional difficulties that persist into adulthood. Eberly Lewis et al. (2023) found that parental narcissism was associated with overinvolved "helicopter" parenting driven by parental anxiety and self-worth concerns, limiting children's independence and secure attachment. Adults with anxious or avoidant attachment styles may also exhibit narcissistic traits, reinforcing these relational patterns over time (Ellina & Parpottas, 2023). Research also suggests trauma can transmit through emotional withdrawal: Spiel, Szymanski, and Bornstein (2023) linked parental trauma histories to dysfunctional detachment in adult children. Meta-analytic evidence further connects overprotective or low-warmth parenting with higher narcissism in children, highlighting the potential for intergenerational cycles (An et al., 2023; dos Reis et al., 2025). Qualitative work reports lasting relational anxiety and emotional distance among adult children of narcissistic or traumatized parents (Lyons et al., 2023). Protective factors such as self-compassion, therapy, and coping skills may help buffer these outcomes (Set, 2021). Greater research attention, particularly cross-cultural and LGBTQIA+ focused, may help inform efforts to break these cycles.

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## 10:30 AM - 11:00 AM Loso 116

**Olivia M. Thornburg: "Optimal Stopping and the Hiring Problem"**

**Faculty Sponsor:** Stephan Tanner

**Abstract:** This research explores the problem of optimal stopping through the lens of job candidate selection. Imagine interviewing candidates ranked 1 to 100 by skill level, where each candidate must be accepted or rejected on the spot, and rejecting any given candidate and returning to the pool has a cost whereas the top candidates will be lost to other companies. The challenge is determining the optimal threshold: when should you stop searching and make an offer? We formalize this as finding G_N, a decision boundary that maximizes the expected quality of the hired candidate across any pool of N applicants. To solve for G_N, we derived a recursive equation and systematically tightened our estimates through induction, expressing our bounds purely in terms of N. This process offered both an upper and a lower bound that together resolve the problem in nearly all cases. The one remaining edge case required a third bound, one that has proven more difficult to establish rigorously due to the oscillating behavior of the underlying function.

# Talk Presentations

## 11:00 AM - 11:30 AM Loso 115

**Quin McLaren: "Gaming the Market"**

**Faculty Sponsor:** Andrew-David Bjork

**Abstract:** This presentation proposes a specific stock trading strategy that is optimized using mathematical game theory and statistics. Rather than viewing the market as purely random, setting up an iterated game between the market and the trader can be beneficial to create strategic decisions based on payoffs, pure strategies, and risk acceptance. The market is modeled as an opposing player whose "moves" are reflected through price changes, while the trader responds with strategies such as buying, selling, or holding positions. This talk will implement the strategy on a particular stock and give the results of the findings.

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## 11:00 AM - 11:30 AM Loso 116

**Payton Talbot: "Demography of the Rufous Hummingbird (Selasphorus Rufus): a quantification of changes in effective population size over time"**

**Faculty Sponsor:** Brian Myers

**Abstract:** Processes such as deforestation, habitat fragmentation, and climate change have dramatically altered ecosystems and disrupted species distributions. Habitat fragmentation in particular can reduce gene flow between populations and alter the balance between interior and edge habitats. While many species decline under these conditions, edge-dependent species may experience expanded habitat ranges, allowing increased exploitation of resources. Partners in Flight hypothesizes rufous (Selasphorus rufus) and Allen's hummingbirds (S. sasin) have experienced recent, drastic population declines of 93% and 77%, respectively, over the last 50 years. However, the population status of Allen's and rufous hummingbird described by Partners in Flight has been questioned (Clark 2017). One reason for this doubt is that these species appear to thrive in additional edge habitats and food subsidies provided by human activity. For example, additional edge habitat is provided by clear-cut forests and campgrounds, while suburban areas provide feeders and ornamental plants as supplemental resources. Here, we incorporate whole-genome data and perform demographic modeling to examine recent changes in effective population size in Allen's and rufous hummingbird. We evaluate three hypotheses for these species: a recent population expansion, a recent population decline, and a null model of no change in population size over the last 50 years.

# Talk Presentations

## 11:30 AM - 12:00 PM Loso 115

**Mary Qazizada: "It's pentagons all the way down!"**

**Faculty Sponsor:** Andrew-David Bjork

**Abstract:** Fractals, self-similar geometric objects, are used to model irregular forms in nature, such as clouds, trees, coastlines, and blood vessels. One way to create fractals is through geometric iterations, where a shape is drawn and a specific rule is applied repeatedly to refine it, or through a mathematical formula. In this presentation, we attempt to create these complex geometric shapes using matrix transformations that are embedded in Iterated Function Systems. As a result, we witness how linear algebra operations can manipulate geometric shapes to create interesting objects such as fractals.

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## 11:30 AM - 12:00 PM Loso 116

**Diego Zuber and Daniel Kropf: "Room 32 Nightlife in La Grande"**

**Faculty Sponsor:** Michael Fakutiju

**Abstract:** This paper investigates the nightlife in La Grande through a students experiment. The period where data was collected was from 2024-2026 on nightlife activities in La Grande. The data sources come from our personal experiment and surveys from students in the community. The hypothesis for our project is: an improved nightlife benefits students. The second hypothesis is: investing in nightlife ventures targeting students is a viable business idea in La Grande. We will be using descriptive statistics to examine our survey findings and then later use regression analysis. Currently, our observations show that Room 32 and other evening events for students show that nightlife benefits students and is a viable investment in La Grande Oregon.

# Talk Presentations

## 12:00 PM - 12:30 PM Loso 115

**Levi Pringle:** **“Running Low On Crayons In Geography Class? No Problem!”**

**Faculty Sponsor:** Andrew-David Bjork

**Abstract:** This presentation will define the four color theorem in graph theory and discuss some history surrounding its solution. At the same time we go through a proof of the five color theorem. We then follow up with discussion of the difficulties and tools that come about when shifting to the four color theorem, including reducibility and discharging.

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## 12:30 PM - 1:00 PM Loso 116

**Luna Dennett:** **“The Entomologist's Journal”**

**Faculty Sponsor:** James Dyer

**Abstract:** Luna Dennett’s work “The Entomologist’s Journal” is a piece blending the artistic with the scientific. The intention behind this project is to utilize the blending of genres as a way to tell a more realistic story about human relationships. This project is the product of a two-term capstone, one term spent researching and the other within the creation process. “The Entomologist’s Journal” takes loose inspiration from poets such as Mary Oliver and Anna Letitia Barbauld in its attempts to mesh the world of poetry and the study of entomology. Through the blending of the creative and the logical, Dennett creates an intriguing, multi-modal story that leaves readers pondering what it means to be in love, what it means to have a relationship, and how we as people can recognize our own flaws. Her presentation will include a discussion about the writing and creation process for this project, a brief reading of select poems from the complete work, and a question-and-answer session where audience members will have the opportunity to talk with the author about her work.

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**2026 Coordinating Committee: Jacqueline Morgan (chair), Tawnya Lubbes, Kevin Roy, Hope Schuermann, and Kevin Walker.**

# Index of Presenters

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