Fall SOURCE
October 15 & 16, 2021
Presented by CWU Office of Undergraduate Research
Funding Opportunities

**Faculty-Student Provost Research Grants**
Deadline: October 20th
Up to $3000 for all applicants for research and scholarship support

**Fall/Winter OUR Grants**
Fall Deadline: November 3rd
Winter Deadline: February 2nd
Research, and Experiential Arts Grants: Up to $750/individual and $1500/groups
Virtual Presentation Grants: Up to $300/individual and $600/groups

Presentation Opportunities

**End of Quarter Poster Sessions**
Faculty may request poster sessions for their classes at the end of Fall and Winter Quarter. Requests must be submitted by November 15th and February 28th.
Sessions will occur during finals week of each quarter.

**SOURCE**
Symposium of University Research and Creative Expression
May 17th – 19th, 2022
May 17th: Westside Campus, 5–8pm
May 18th & 19th: All day events at the SURC
Submit your abstract February 25th – April 8th

Summer Opportunities

May 25: OUR Summer Student Grant Application Deadline
Summer Quarter: Weekly Research Teas & Professional Development

For more information, contact OUR:
our@cwu.edu - 509.963.2646 – Black Hall 225–42

Connect with us thru Facebook, Twitter, and Instagram (@CWUSource) to learn more about our student researchers and other OUR opportunities.
Exploring Optimal Lockdown Policies during the COVID-19 Pandemic - Cameron Bundy
Faculty Mentor: Sooie-Hoe Loke

The Covid-19 virus has had a substantial impact on public and economic health in countries around the world. In order to bolster the economy and maintain human life, continued economic and epidemiological research is vital. Global nations have implemented lockdown policies with the purpose of slowing the spread of the novel corona virus. This research analyzes how lockdown parameters can help control a nation’s fatalities. The study incorporated an SIRD disease model into a minimization function that analyze dynamics that best produce minimal loss of GDP as well as low loss of life during a lockdown. The approach to solving this minimization function is by using a Hamilton-Jacobi-Bellman equation. Once solved the results will be compared to similar studies. The goal in recreating this epidemiological model is to further investigate the outcomes of parameter adjustment within a model that works to minimize fatalities and economic loss in a nation, in hopes of preparing for future disease outbreaks.

A Campus Culture Shift with Neo-Traditional Students at the Forefront of Change - Angela Kyle
Faculty Mentor: Megan McConnell, Alissa Scriven

What is a Neo-Traditional student? Are there specific needs that populations of students have that are not being met at our universities and community colleges? We will be looking at the risk factors that Neo-Traditional students face deterring them from degree completion, and key in on the differences between Neo-Traditional students and Traditional students. Asking the important questions such as why today, amid a global pandemic, administrators need to look more closely at this population of students? The time is now to bring an awareness of the growth and needs of the Neo-Traditional student on campus. This is a call for a cultural shift on campuses to be more inclusive for all students; taking the time to look at your student population and all the diversity that lies within your campus. Ask yourself the question, "are we meeting the needs of all students? Including our adult learners, student parents, and transfer student populations?"
Interactive and Accessible Digital Top Apps for Student Support - Amanda Hopkins, Rachel Bailey-Pentz
Faculty Mentor: Naomi Petersen

This Top Apps for Student Support infographic was developed to bring awareness to CWU students of currently available phone and computer apps that address the needs of those with accessibility needs. For the infographic's development, a variety of apps that increase accessibility in academics or address mental health impairments that contribute to accessibility were researched. Public input was sought from the community and related organizations during the research process. These apps were then sorted into four categories, Mental Health, Task Management, Reading and Writing, and Collaboration, and further curated. The infographic was then created with a QR code to a digital, interactive version that utilizes responsive web design, is screen reader-supported and contains quick links to the apps. The target audience of this infographic are students who may not be aware of innovative new technology that addresses accessibility, especially for those who may not have an official disability designation but may benefit from these supports nonetheless. In addition, the infographic aims to normalize the use of accessibility supporting technology in everyday contexts, especially awareness of screen reader compatibility. Notably, the infographic also contains apps that allow collaboration between those without an impairment to support those with one. This aspect encourages personal responsibility within the community to support the unique needs of others in the community.

12 - 1:30pm

The Monsters Within: An Analysis on Minorities in the Horror Film - Julianna Kropla
Faculty Mentor: M. O'Brien

This poster presentation will present how horror films have portrayed minority groups and their identities during the 1970's-present and how these portrayals have evolved. This presentation will discuss the eleven horror films researched, ranging from supernatural/paranormal, camp, and the slasher sub genre. This variety of sub genres provides the opportunity for this presentation to be explicitly diverse in film and in character. This presentation will contribute a unique perspective by looking at not one, but three minority groups, as well as their intersections, and how their character portrayals have evolved throughout the last 5 decades. The final product of this presentation will be a poster that will guide the audience through the analyzation of these films and their portrayal of minority characters. This will be done by applying feminist theory, queer theory, gender theory, cultural theory, and film theory to discuss how the genre and its characters have evolved in terms of racism, sexism, and homophobia.
Exploring Accessible Practices in the Music Classroom Using Universal Design -
Amanda Christian  
Faculty Mentor: Naomi Petersen

Music is often described as a “universal language”. However, it is not experienced universally. Music education in our public schools is inaccessible for many students for both systematic and pedagogical reasons. This paper analyzes the barriers to access found in the context of music education and explores the possible improvements to accessibility that could be found with the implementation of the principles of Universal Design and Universal Design for Learning in the classroom.

Faculty Mentor: Michael Pease

This study divulges the complexities associated with solar power production facility (SPPF) permitting in Kittitas County as the region undergoes a statewide renewable energy transition. Its purpose is to identify reoccurring areas of permitting conflict that may be amended with further research. Although five SPPFs have been proposed within the county, none have been constructed in full. These projects have each stirred contentions associated with land use rights, regulatory power, market dynamics, and more. By reviewing three Kittitas County case study projects under the popularizing theories of geographical political economy, this research describes the underlying nature of these conflicts. In doing so, it analyzes differing interpretations of prevalent SPPF-regulatory legislation, such as the Kittitas County Code (KCC). Further, SPPF-specific guidance policy instilled by the county in 2018 - KCC S17.16C - is evaluated using the ex-ante efficiency testing parameters developed by Mousmouti (2012). The purpose of this is to establish if permitting conflicts were adequately addressed, and if the legislation effectively achieved its purpose. The results suggest that the SPPF conflict in Kittitas County vocalized spatially bound and scaled interpretations of prevalent policy with a focus in either energy market growth of land use management. Additionally, the Mousmouti (2012) test revealed that many critical regulatory clauses remain undefined for SPPFs, and that some creative co-locational land use outlets have been hindered by KCC S17.16C in favor of traditional land management practices.
**Flexible Synthesis and Site-Selective Functionalization of sp3-rich N-heterocyclic Sulfones** - Claire Borg  
Faculty Mentor: Timonty Beng

N-heterocyclic sulfones are a familiar motif in small-molecule pharmaceuticals, for example Nifurtimox and Artemisone. Our group has previously undertaken the synthesis of N-heterocyclic sulfones using thiodiglycolic anhydride and 1,3 azadienes, but experienced challenges related to chemoselectivity while oxidizing this motif. The current project is instead proposing a cycloaddition approach which uses a sulfone bearing anhydride and a variety of diverse imines to achieve the N-heterocyclic sulfones. With this approach, and increase in reactivity paves the way to creating a diverse library of sp3 rich N-heterocyclic sulfones. This process is cheap, site selective, atom economical, and leads to structural diversity in 3D space.

**Towards the Synthesis of Cyclic 1,3-Azaborines as Potential HIV-1 Protease Inhibitors** - Aleksey Lanin, Jacob Olson, Alexandria Glebe, Kristin Sigurjonsson  
Faculty Mentor: Levente Fabry-Asztalos

Since the discovery of Human Immunodeficiency Virus (HIV-1) amid the early 1980s, humankind endured the inevitable los of 32.7 million lives. HIV-1 attacks the white blood cells of an infected host; hence, the human immune system becomes weak and vulnerable to opportunistic diseases. The major challenge in pharmaceutical development is the increasing resistance of HIV-1 to antiretroviral therapy (ART). HIV-1 protease is a viral protein responsible for cleaving the scissile bond of Phe-Pro residues in Gag-Pol polyprotein substrates. The dual-mode inhibition (competitive and associative of retroviral HIV-1 protease via substrate-mimicking structures is described herein. This work highlights the attempted synthesis of 1,3-azaborines via three distinct approaches.
Functionalized nanoparticles (measuring <100 nm in at least one dimension) have shown promise in several biomedical applications including diagnostics, drug delivery, and photothermal tumor ablation. The size and shape, and the composition of molecules bonded to the nanoparticle’s surface, guide a nanoparticle's interactions with biological systems in a variety of ways. Despite their importance, many of these bio-nano interactions remain a mystery. Of particular importance are the interactions between nanoparticles and serum proteins, chief among them albumin, which in turn influence the nanoparticles’ interactions with cells and tissues. This presentation details work done this summer to support the researcher’s goal of investigating the interactions of mixed-ligand gold nanoparticles with bovine serum albumin (BSA), including the synthesis of approximately 4.5 nanometer gold nanoparticles (AuNPs) functionalized with a mixed monolayer of mercaptoethoxyethoxyethanol (MEEE) and mercaptohexanoic acid (MHA); testing the stability of the nanoparticles in buffered saline containing BSA; and preliminary results from a Bradford protein assay.
Saturday, October 16 - Virtual Sessions

10am: Welcome

10:15 - 10:35am: Skyler Smith Presentation

What Do You Meme? An Analysis of How CWU College Students Use Memes - Skyler Smith, Faculty Mentor: Rodrigo Renteria-Valencia

Memes have become a key part of modern living on the Internet, however, it is still unclear who is creating, sharing and interacting with memes. This study examines meme use in college students at Central Washington University while also examining the definition of a meme within the population. Data is not conclusive in this study, but analysis shows that college students use memes as an important component of private conversations and to reiterate their public identities among many others. On the other hand, meme making is not as prevalent as other usage and is often not recognized as a meme making process. Additionally, participants' meme definitions were fluid and expansive but similar to definitions laid out in current literature.

10:35 - 11:35am: How to get involved with student scholarship, research and creative projects (for students)

11:35 - 11:40am: Break

Saturday schedule continued on next page!
Saturday, October 16 - Virtual Sessions (Cont'd)

11:40am - Noon: Henry Reinhardt Presentation

A Possible Explanation for the Sharp Decrease of Ions in Titan’s Ionosphere: Atmospheric Waves - Henry Reinhardt, Faculty Mentor: Darci Snowden

Titan, the largest of Saturn’s moons, was the target of a series of flybys from NASA’s Cassini mission. We will use the data from the 5th flyby of Cassini (T5), where it went through Titan’s atmosphere and used the Ion and Neutral Mass Spectrometer to measure ionic and neutral particle densities. The data recorded displayed a sharp decrease in densities of ions with short lifetimes, like CH₅⁺, whereas longer lifetime ions did not have this same decrease. One possible explanation of this decrease is that there could be an atmospheric wave propagating to create a situation in which ions will be at densities different than expected. If we can model this decrease, then we can not only explain the data but also have a new way of understanding the waves in Titan’s atmosphere, which will lead towards a deeper understanding of the structure and transport of energy of Titan. To determine what sort of situation could be present on Titan, I created a model that uses photoionization to depict the chemistry of Titan's ionosphere as described by the continuity equation, using the production and loss equations to create a continuously changing interaction between the chemicals. When this photochemical model is complete, a vertically propagating wave will be added to explain the sharp decrease of the ion densities, which the photochemical model does not depict on its own. Once the vertical wave is added to the system, we will be able to explore the effect of different wave parameters to see if we can reproduce the T5 data with this model. Should the model work as hoped, we can then look at the other flybys and analyze that data with this model.

Noon - 12:30pm: Break

12:30 - 1:10pm: Library resources to support student research

1:10 - 1:15pm: Break

1:15 - 2:00pm: Info session on student funding for scholarship opportunities (for all campus)