PROGRAM AND PROCEEDINGS

SYMPOSIUM ON UNIVERSITY RESEARCH AND CREATIVE EXPRESSION

17TH ANNUAL CONFERENCE

CENTRAL WASHINGTON UNIVERSITY
ELLENSBURG, WASHINGTON

MAY 17, 2012

STUDENT UNION AND RECREATION CENTER

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## Program at a Glance – 2012

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<th>Location</th>
<th>Session 1</th>
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<tr>
<td>8:00-8:30</td>
<td>Room 135</td>
<td>OPENING CEREMONY – SURC PIT</td>
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<tr>
<td>8:30-9:50</td>
<td>Room 135</td>
<td>ENGLISH (Jane Austen)</td>
<td>L &amp; J</td>
<td>GEOG &amp; REC &amp; TOURISM</td>
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<tr>
<td>9:50-10</td>
<td>Room 137A</td>
<td>10 MINUTE BREAK</td>
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<td>10:11:20</td>
<td>Room 137B</td>
<td>MANASTASH (Supreme Court Cases)</td>
<td>L &amp; J PANEL</td>
<td>GEOG &amp; GEOL</td>
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<td>11:20-11:40</td>
<td>Room 140</td>
<td>20 MINUTE BREAK</td>
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<td>11:40-1:00</td>
<td>Room 201</td>
<td>ENGLISH</td>
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<td>2:40-4:00</td>
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<td>ENGLISH</td>
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<td>CHEM &amp; PHYSICS</td>
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<tr>
<td>4:00-4:10</td>
<td>Theatre</td>
<td>10 MINUTE BREAK</td>
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<td>4:10-5:30</td>
<td>Upstairs Mezzanine</td>
<td>ENGLISH</td>
<td>BIOLOGY</td>
<td>PHYSICS</td>
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### Poster Session #1 - Topics
- ANTHROPOLOGY
- BIOLOGY
- CHEMISTRY
- MATH

### Poster Session #2 - Topics
- EDUCATION
- IET
- LAW AND JUSTICE
- NEHS
- PESP
- PHYSICS
- PUBLIC POLICY
- REC & TOURISM
- STEP
- WATERS
- WALTER STROM MIDDLE SCHOOL

### Creative Works: Fashion Merchandising

### Poster Session #3 - Topics
- GEOGRAPHY
- GEOLOGICAL SCIENCES
- PRIMATE BEHAVIOR/CHCI
- PSYCHOLOGY
- SOCIOLOGY

### Creative Works: Theatre, Art, IET, PESP
SOURCE 2012

This year, SOURCE celebrates the 17th annual Symposium on University Research and Creative Expression, an event celebrating scholarship at Central Washington University. SOURCE features the solo and collaborative works of CWU students, faculty, and staff members, from a wide range of CWU’s colleges, departments, and programs. These works are being presented through a variety of approaches, including oral presentations, posters, artwork, and performances.

The goals of SOURCE are to:
1. Enhance and promote the discovery-, creativity- and inquiry-based scholarship and entrepreneurial talents of CWU students, faculty, and staff;
2. Commend the diligence and commitment of mentors from secondary and post-secondary educational institutions and industry;
3. Cultivate the next generation of research mentors and professionals; and,
4. Enhance local, regional, and global engagement by building partnerships between higher education, industry, and government.

Once again this year, SOURCE participation continues to grow. In 1996, the original Undergraduate Research Symposium had 23 presentations. This year, there will be 335 presentations: 163 oral presentations, 17 creative expression presentations, 127 poster presentations (including 12 at university centers), 18 creative works presentations, five video presentations, and a fashion show. Additionally, five finalists are presenting at SOURCE as part of the Institute for Innovation and Entrepreneurship's Business Plan Competition.

Forty-three academic units are represented at this year’s symposium: Aerospace Studies; Anthropology and Museum Studies; Art; Biological Sciences; Chemistry; Chimpanzee and Human Communication Institute; Communication; Computer Science; Dance; Douglas Honors College; Education; English; Environmental Studies; Family and Consumer Sciences; Film and Video Studies; Finance and Operations and Supply Chain Management; Geography; Geological Sciences; History; Industrial and Engineering Technology; Information Technology and Administrative Management; Law and Justice; Management; Mathematics; McNair Scholars Program; Music; Nutrition, Exercise and Health Services; Philosophy and Religious Studies; Physical Education, School and Public Health; Physics; Political Science; Primate Behavior; Psychology; Recreation and Tourism; Resource Management; Science Honors Research Program; Science Talent Expansion Program; Sociology; Theatre Arts; Wellness Center; World Wine Program, and Women’s Studies.

We welcome the additional growth in numbers of presenters and participants, as well as an expanded roster of representatives from CWU’s colleges, departments, and programs.

Our vision continues to be to create a signature showcase of all realms of scholarly work at CWU, and share them across disciplines and with the various communities we serve.
STUDENT FASHION SHOW
The CWU Fashion Merchandising program is proud to present a sneak peak of the 16th annual spring fashion show, WILD & FREE. Featuring the latest trends and original student designs, the show is produced by the FCSA 181 Fashion Show Production class and the original designs are from students taking FCSA 488 Fashion Line Development. Join the students on June 2nd, 3pm & 7pm, at the Milo Smith Theatre.

DARWIN EXHIBIT AT JAMES E. BROOKS LIBRARY
The Brooks library is hosting an exhibition, *Rewriting the Book of Nature: Charles Darwin and the Rise of Evolutionary Theory*. The exhibition explores Charles Darwin's vision—"from so simple a beginning, endless forms most beautiful and most wonderful have been, and are being evolved"—a vision that now forms the foundation of the biological sciences. Radical in sweep, Darwin’s idea of naturally innovating and endlessly changing webs of life undercut all previous sciences. This exhibition was developed and produced by the National Library of Medicine, National Institutes of Health and the NIH Office of History.

BUSINESS PLAN COMPETITION
The Institute for Innovation and Entrepreneurship (I4IE) Business Plan Competition is generously sponsored by the Herbert B. Jones Foundation. All CWU students were encouraged to enter a business plan in the competition. A total of $10,000 for business start-up funding was available for 2012 prizes. Five finalists will present their oral presentations at SOURCE. The 1st place winner will receive $5,000, the 2nd place winner will receive $3,000 and the 3rd place winner will receive $2,000. The winners will be announced at the SOURCE awards ceremony on May 23 at noon in the SURC Pit.

PROGRAM COVER DESIGN
This year’s SOURCE program cover was designed by graphic design undergraduate student Danielle O’Malley under the mentorship of professor Glen Bach.

CWU CAREER SERVICES EMPLOYER APPRECIATION AWARD
Since 2003, Career Services has presented an annual Employer Appreciation Award to the company or organization that has demonstrated outstanding assistance to students in the college to career transition. One of the goals of SOURCE is to “enhance local, regional and global engagement by building partnerships between higher education, industry and government.” The 2012 recipient of the Employer Appreciation Award is Kittitas Valley Community Hospital, who has exhibited this partnership and commitment to CWU students by offering 13 internships during the 2011-2012 academic year. Seven professional KVCH staff supervised and mentored interns across six majors. We are honored to have this opportunity to recognize KVCH during the opening ceremony of SOURCE. Congratulations KVCH!

DISABILITIES AWARENESS WEEK
CWU is celebrating the conclusion of Disabilities Awareness Week activities. On May 17, from 6:30 to 8:30 in the Sue Lombard Dining Room, the Rob Harden Retirement & Sheamus Healy-Harden Memorial Scholarship Dinner will take place. On May 18, from 2:00 p.m. to 3:00 p.m in SURC 137A & B, there will be a presentation titled *Part-time Social Service Work as an Option for Part-Time Student Employment*. These events are sponsored by the Center for Disability Services whose goal is to ensure that individuals with disabilities have equal access to programs, services, and facilities here at Central Washington University.
PRESIDENT’S WELCOME

May 17, 2012

On behalf of the Central Washington University administration, I welcome you to CWU’s 17th annual Symposium on University Research and Creative Expression, the university’s largest, multi-disciplinary event. SOURCE offers us an annual opportunity to marvel at the high quality and vast quantity of research and creative achievements of our undergraduate and graduate students, faculty, staff, alumni, and other members of our university community.

In 1996, the first SOURCE was held as the Undergraduate Research Symposium. It recognized the work of 23 undergraduate students and their faculty mentors. In comparison, last year’s SOURCE was the largest on record, encompassing 330 presentations by 580 individuals, while showcasing the greatest range of scholarly achievement to date, in presenting the intellectual and creative activities of 44 different academic programs.

This year’s SOURCE will again set records for the numbers and types of presentations, and participating academic departments.

While SOURCE highlights the university’s incredible academic vitality, it would not be possible without the invaluable contributions of administrators, faculty and staff members, and volunteers who selflessly give of their time, energy, and expertise to serve as session chairs and judges, not to mention the generous financial support of university academic and administrative units, corporate sponsors, and individuals.

SOURCE would also be impossible were it not for a team of committed university administrators, faculty, and staff, chaired by Dr. Natalie Lupton, CWU professor of Information Technology and Administrative Management, who work nearly year-round to bring the symposium to life. After helping lead the committee for the past four years, Dr. Lupton is stepping down as chair after this year’s event.

Dr. Kara Gabriel, CWU Psychology professor, who has served on the committee this year, will become chair for SOURCE 2013. Please join me in thanking Dr. Lupton for leading the efforts that have made SOURCE an inclusive showcase of the “scholarship and entrepreneurial talents of students, faculty, and staff at CWU,” which has also led to the building of “partnerships between higher education, industry, and government.” Also, please join me in wishing continued success to Dr. Gabriel for next year’s event and beyond.

Once again, welcome to SOURCE 2012. It is truly a community effort of which we can—and should—take great pride.

Sincerely,

James L. Gaudino
President
An exhibition in celebration of the 200th anniversary of Darwin’s birth & the 150th anniversary of the publication of

On the Origin of Species

Now on exhibit at the Brooks Library through June 16, 2012
Each year, *Manastash* showcases creative work from the entire university student body. The magazine is housed in the English Department and has been published annually for more than 40 years.

*Manastash* provides a forum for dialogue not only between students and the academic community, but between students and alumni, prospective students, and the town of Ellensburg. The advisors and structural support for this activity function within the Writing Specialization program in the English Department. Katharine Whitcomb is the current coordinator for this program. Lisa Norris and Lee Honeycutt were the advisors this year for editing and production, respectively.

The goal of *Manastash* is to recognize the diverse student university community and to celebrate the achievements of that community through a quality publication. *Manastash* is distributed across campus and to the centers, and is a source of pride to a wide variety of CWU students.

Please join us at SOURCE from 10:00-11:20 a.m. for the *Manastash* Showcase, featuring students whose works are published in this year’s issue! You are also invited to the *Manastash* reading, exhibition, and party on Thursday, May 24, 7:30 p.m. at Alley Cat Artists Gallery in Ellensburg.
STUDENT UNION AND RECREATION CENTER MAP
(Second Floor)

Ballroom A
Ballroom B
Ballroom C/D
210 - Theatre

Mezzanine

Registration

Stairs & Elevator to Room 301

Women’s
Men’s

202 Sessions
201 Sessions
271 Sessions
ORAL PRESENTATION SCHEDULE

Only authors are listed for each paper/poster.
Mentors are shown in the ABSTRACT portion of this program.

SESSION 1:
Room 135

8:30-8:50  A Heroine Whom No-one Will Much Like: The Redemption of Emma Woodhouse
           Van Mersbergen, Jessica

8:50-9:10  Privilege or Prison: Limitations of the Gentry in *Emma*
           Nilsen, Cassandra

9:10-9:30  Green Chasms between Romantic Rocks': Exploring Romanticism in Jane Austen’s *Persuasion*
           Frankovic, Jennifer

9:30-9:50  “Of the Greatest Influence with Everybody”: Persuasion in Jane Austen’s *Persuasion*
           Montoya, Matthew

SESSION 2:
Room 137A

8:30-8:50  Identifying Missing and Unidentified Persons: A New Methodology
           Blume, Andrea

8:50-9:10  The Role of Libraries in Offender Rehabilitation
           Head, Justin

9:10-9:30  Standardizing a Universal Privacy Policy Concerning Internet Transactions
           Baumann, Scott; Alhamrani, Shuruq; Lai, Man Gee; Slagle, Rachel

9:30-9:50  Well That Was Easy: Misdirecting Respondus LockDown Browser for Fun and Profit
           Moncrief, Donald; Foster, Ramsey

SESSION 3:
Room 137B

8:30-8:50  Gladmar: An Ever Present Resource
           Andrews, Bryce

8:50-9:10  Comparison of State and County Management of Public Access Impacts to Intertidal Zone
           Biodiversity: A Case Study of Rocky
           Grant, Travis

9:10-9:30  Livestock Ban and Clanism Impact on the Social and Physical Landscape of Sool and Sanaag
           Regions in Somaliland
           Mohamed, Hamza

9:30-9:50  Holocene Housing Hunting: Assessing a Potential Method for Locating Archaeological Sites in
           Arctic Alaska Using High-Resolution Satellite Imagery
           Keeney, Joseph
SESSION 4:  
Room 140

8:30-8:50  The Effects Of Campaign Finance Reform On Donation Rates  
Williams, Andrew

8:50-9:10  Hispanic's Political Behavior: A Case Study of the Hispanic Community in the City of Yakima, Washington  
Valencia, Marisela

9:10-9:30  Economic Trends of Income and Race  
Cole, Alexander

9:30-9:50  Status and Trends: Comprehensive Economic Development Strategy  
Gardner, Ingrid

SESSION 5:  
Room 201

8:30-8:50  GPS Cockpit  
Stahl, Rosie; Kostick, Megan; Stockwell, Wendy; Kinkade, Kyle; Abundiz, Sergio

8:50-9:10  Clustering of GPS Sensor Network Data Streams Using Self-Organizing Maps For Automatic Seismic Event Recognition  
Smigaj, Andrew

9:10-9:30  Optimization and Performance of a Template and Histogram-based Image Classifier  
Smigaj, James

9:30-9:50  Analysis of CWU Foundation Data: Pre-processing and Data Mining  
Wang, Ying

SESSION 6:  
Room 202

8:30-8:50  Happiness and Beyond the Happiness: Buddhism Viewpoint  
Takei, Hideki

8:50-9:10  The Juxtaposition of Divine and Physical Love  
Thompson, Ruby Lynn

9:10-9:30  Satire of Genesis  
Arledge, Jennifer

9:30-9:50  Children of the Holocaust: Faith  
Byrnes, Andrea
SESSION 7:
Room 271

8:50-9:10  Academic Language and Student Voice in an Inquiry Lesson about Iraq
           Kaviani, Khodadad

9:10-9:30  Never Too Old: Reading Aloud to Secondary Students
           Savage, Alyson

9:30-9:50  Social History of Blogging and its Evolution into Parenthood
           Hahn, Whitney

SESSION 8:
Room 301

8:40-9:20  Versi Events
           Shepherd, Kassidy

9:30-10:10 Hostalaxy
            Paulson, Christopher

10:20-11:00 Rosie’s Market
              Almquist, Ashley

11:10-11:50 Outdoor Adventures
              Miller, Alexa

12:00-12:40 School House Brewery
              Rhome, Andrew; McClain, Wesley

SESSION 9:
Room 135

10:00-11:20 Manastash Showcase
             Whitcomb, Katharine; Hasseries, Patrick; Cawley, Nick; Borst, Erick; Sauby, Crystal; Degon, Ashley
SESSION 10:
Room 137A

10:00-11:20  **U.S. Supreme Court in Connick v. Thompson Lets Prosecutors Off the Hook for a 14 Million Dollar Civil Rights Claim**
Phe, Salomon

**United States v. Jones**
Siljeg, Ashley

**Lafler v. Cooper**
Wynne, John; Klein, Matthew

United States Supreme Court Case **Missouri v. Frye**
Wassall, Alison

Analysis of the **Brown v. Plata** Case and its Effect on the Status Quo of Judicial Decision Making: An Examination of the Three Branches of Government the Judiciary, the Judiciary, and the Judiciary
Kaskla, Kristian

**Graham v. Florida** and Evolving Standards of Decency: The Supreme Court’s Approach to Constitutional Punishment for Juvenile Offenders in Felony Crimes
Sturgis, Rebecca

SESSION 11:
Room 137B

10:00-10:20  **Glaciation in the Wenatchee Mountains, Washington State**
Collins, Brad

Weidenaar, Mark

10:40-11:00  **Documenting Metamorphism, Deformation, and Cooling across Gianbul Dome, Zanskar, NW India**
Bowman-Kamaha'o, Meilani

11:00-11:20  **Black Carbon Concentrations from an Ice Core from Tupungatito Glacier in the Central Andes**
Berg, Kayla
SESSION 12:
Room 140

10:00-10:20  The Effect of Post Exercise Cocoa Consumption on Muscle Soreness and Endurance Running Performance Following Downhill Treadmill Running  
Peschek, Katelyn; Pritchett, Kelly; Pritchett, Robert; Bergman, Ethan; Eldredge, Michael

10:20-10:40  Examining the Learning Methods of Coaches: Implications for Sport Leaders  
Van Mullem, Pete

10:40-11:00  Baseball by the Numbers  
Robertson, Brian

11:00-11:20  Quantitative Study of the Use of the Recreation Center  
Nakamichi, Dustin

SESSION 13:
Room 201

10:00-10:20  More Than Just The Money: A Look at The Psychological Effects of Sexual Human Trafficking  
Caballero, Jordan

10:20-10:40  Verbal Overshadowing and Humor Perception  
Sigel, Erin

10:40-11:00  Field Dependence-Independence and Harmonic Dictations in Music Theory Students  
Chandler, Brandon

11:00-11:20  Effects of Victim Sex on Perceptions of Intimate Partner Violence Severity in Heterosexual Relationships  
Shores, Alanna

SESSION 14:
Room 202

10:00-10:20  The Saxophone Vibrato-An Illustration and Methodology  
Babbitt, Angela

10:20-10:40  Music is the Voice  
Hoffman, David

10:40-11:00  Art and Science: Confronting the Need for Explication  
Smith, Naomi

11:00-11:20  Boom - A play by Peter Sinn Nachtreib  
Grove, Kyle
SESSION 15:
Room 271

10:00-10:20  Outsourcing
Allers, Vince; Chicano, Alex; Larsen, Chris; Skorney, Andrew

10:20-10:40  The Practice of Child Labor in Developing Countries
Mailhot, Brittney; Kangas, Nikki; Ikeda, Arisa; Lindberg, Jessica

10:40-11:00  Impact of Illegal Immigration in the United States
Schmidt, Jenna; Mingming, Mark; Songsangcharntara, Vantanee; Richards, Jonathan

11:00-11:20  Monsanto: Controlling America’s Food Supply
St. John, Jordan; Shepard, Kassidy; Flem, Levi; Carlson, Garrett

SESSION 16:
Ballroom A

10:00-10:20  Merry Wives of Windsor, Scene 3, No. 7A; Scene 5, No. 7B; Scene 6, No. 7C and 7D
Roeder, Murphy; Rice, Ben; Salisbury, Emily; Mendez, Bo

10:20-10:40  “Soon Speeds the Morning Light Proclaiming” from The Magic Flute
McLean, Kristina

10:40-11:00  Die Fledermaus
Jonson, Justin; Curia, Angela; Hemenway, Sarah; Stephens, Terrell

11:00-11:20  Hansel und Gretel
Redden, Blyn

SESSION 17:
Room 135

11:40-12:00  “A Flirt with Death—My Adventure with Heat Stroke”
Roddy, Rachel

12:00-12:20  “Unspoken Chains—Releasing a Dark Secret and Breaking the Bond of Fear”
Roddy, Rachel

12:20-12:40  Constructing the Creative Castle 2011: Student Experiences from Study Abroad in Medieval France
Whitcomb, Katharine; Degen, Ashley; Blons, Suzanne; Gatlin, Alexander; Ottenad, Daniel; Antilla, Lindsey

12:40-1:00  Exhaustive Confusion and Problems with Prefixes: Reclaiming David Foster Wallace’s “Octet”
Milne, Stefan
SESSION 18: Room 137A

11:40-12:00 Assay Protocol Development for *In Vitro* Testing of Drugs against the Hookworm *Ancylostoma ceylanicum*
   *McNutt, Sarah*

12:00-12:20 Neutralization of Interleukin-5 in Experimental Hookworm Infection Leads to Higher Parasitemia
   *Moesch, Stephanie*

12:20-12:40 *In Vivo* Inhibition of Nitric Oxide Production Leads to Clinical and Immunological Improvement of Hookworm Infection
   *Berndt, Amanda*

12:40-1:00 Characterization of Experimental *Leishmania/hookworm* Co-infection Model
   *Ek, Diana*

SESSION 19: Room 137B

11:40-12:00 Plants of the Western United States: Expanding the Collection and Biological Testing of Extracts
   *Galvan, Fernando; John, Aaron*

12:00-12:20 Identification of Neocortical Proteins that Interact with the Transcription Factor Sp8
   *Mullan, Michael*

12:20-12:40 Preparation of Polyelectrolytes Chemisorbed to a Silica Surface
   *Bryce, David*

12:40-1:00 Polyelectrolyte Surfactant Complexes
   *Buck, Kathleen*

SESSION 20: Room 140

11:40-12:00 Analyzing the Participants of the Food Stamp Program
   *Cheung, Kwok Wai*

12:00-12:20 Effective Mathematics Instruction for Children with Learning Problems
   *Tsai, Shu-Fei*

12:20-12:40 An Analysis of Healthcare Needs through Census Data
   *Dyer, Graham*
SESSION 21:
Room 201

11:40-12:00  Item Response Theory in Psychotherapy Assessment  
Parker, Joshua

12:00-12:20  Health-Promoting Behaviors and Well Being of Undergraduate Facebook Users  
Rae, James

12:20-12:40  Current Trends in Behavioral Interventions in Patients with Traumatic Brain Injury  
Martell, Brittany

12:40-1:00  College Women’s Perceptions of Music Video Sexual Content  
Stefani, Whitney; Greenwald, Ralf

SESSION 22:
Room 202

11:40-12:00  Women in Combat: The Combat Rescue Officer  
Rambish, Natalie

12:00-12:20  Innovation and Necessity: The Evolution of Military Vehicles from Vietnam to the GWOT  
Woodard, Elizabeth

12:20-12:40  Redefining the Timeline of the Cold War: United States-Soviet Tension around the Conclusion of the Great War  
Mitchell, Cole

12:40-1:00  American Turner Societies, 1880-1930  
Prpich, Lucas

SESSION 23:
Room 271

11:40-12:00  The Enron Scandal Breakdown  
Leatherman, Jason

12:00-12:20  Literacy in Washington State  
Vickrey, Taylor

12:20-12:40  Greeks In Washington: An Ethnographic Study  
Athan, Stavroula
SESSION 24:  
Ballroom A

11:40-12:00  Scene from *L’etoile* written by Emmanuel Chabrier  
Waywell, Brittany; Deenin, Alix; Woyvodich, Taylor

12:00-12:20  *Il Matrimonio Segreto*  
Koreski, Gemma; Ochoconski, Colleen; Tisdale, Jessikah

12:20-12:40  *Eugene Onegin: Act III Finale* - Pyotr Ilych Tchaikovsky (Part 1)  
Hansen, Andrea

12:40-1:00  *Eugene Onegin: Act III Finale* - Pyotr Ilych Tchaikovsky (Part 2)  
Hansen, Andrea

SESSION 25:  
Theatre

11:40-12:00  *28 Drinks Later*  
Giles, Mark; Franklin, Cole; Thomas, Chris; Klettke, Tara; White, Nick

12:00-12:20  *Plastic Baggage*  
Garber, Melanie

12:20-12:40  *Just Friends* (Part 1)  
Keyes, Devin

12:40-1:00  *Just Friends* (Part 2)  
Keyes, Devin

SESSION 26:  
Room 135

1:10-1:30  Adapting to Meet New Literacies: Teaching Composition in an Online Environment  
Gornik, Charles

1:30-1:50  Academic English as L2: Effectiveness of Modeling and Noticing  
Kienast, Kristine

1:50-2:10  What We Talk about When We Talk about Grammar: Integrating Grammar into the Writing Process  
Ruppert, Amy

2:10-2:30  English Consonant Production among Native Chinese Speakers  
Greene, Brian
SESSION 27:
Room 137A

1:10-1:30  
*Leishmania major* Exacerbates Infection with *Leishmania infantum* in BALB/c Mice  
*Nation, Catherine*

1:30-1:50  
Selection of Cold-tolerant *Arthrospira platensis* strains by way of cold-shock treatments  
*McNolty, Alan*

1:50-2:10  
Energetics and Development of Washington State *Rhagoletis pomonella* (Apple Maggot)  
*Lehrman, Nathan*

2:10-2:30  
Geographic Variation of Freeze Tolerance in the Pacific Chorus Frog, *Pseudacris regilla*  
*Healas, Sara*

SESSION 28:
Room 137B

1:10-1:30  
Studies Toward the Total Synthesis of Clavatadine A  
*Conn, Stephanie; Vreeland, Shannon; Wexler, Alexandra*

1:30-1:50  
Synthesis of 5,6-Dihydropyran-2-ones as Potential Inhibitors of HIV-1 Protease  
*Sigurjónsson, Kristín; Nye, Jesse*

1:50-2:10  
Towards the Synthesis of 1,3-Azaborines as Potential Inhibitors of HIV-1 Protease  
*Jennings, Julia*

2:10-2:30  
Towards the Synthesis of Boronated Amino Acid Analogs: Precursors for Novel HIV-1 Protease Inhibitors  
*Faulkner, Andrea*

SESSION 29:
Room 140

1:10-1:30  
A Statewide Analysis of Health Care with Respect to Behavioral Risk Factors  
*Little, Tanya*

1:30-1:50  
Quantitative Study of Hospitalization Rates in Kittitas County  
*Karas, Joshua*

1:50-2:10  
Obesity Health and Risk Factors for Kittitas County  
*McGrath, Monte*

2:10-2:30  
Health in Kittitas County  
*Roberts, Taylor*
SESSION 30:  
Room 201

1:10-1:30  
**Using Type-Token Ratio as Measurement for Lexical Diversity in Chimpanzee Conversations**  
*Keenan, Susan Ann; Jensvold, Mary Lee*

1:30-1:50  
**Audible Communication Comparison of Western Lowland Gorillas (Gorilla gorilla gorilla) and Virunga Mountain Gorillas (Gorilla beringei beringei)**  
*Wilding, Lisa*

1:50-2:10  
**Comparative Genetic Diversity of Captive-Born Gorillas**  
*Simons, Noah; Wagner, Steven; Lorenz, Joseph*

2:10-2:30  
**The Effect a Novel Outdoor Environment has on the Behavior of Chimpanzees in a Sanctuary Setting**  
*Heggs, Laura; Matheson, Megan; Ross, Stephen R.; Mulcahy, J.B.*

SESSION 31:  
Room 202

1:10-1:30  
**The Zemstvo and Russian Gentry Liberalism, 1864-1890**  
*Owens, Kristopher*

1:30-1:50  
**Why Russia Saved the United States during the American Civil War**  
*Ribera, Loredana*

1:50-2:10  
**Propaganda Posters and Literacy in Early Soviet Russia**  
*Ribera, Loredana*

2:10-2:30  
**The Failure of the League of the Militant Godless**  
*Hastings, Rebecca*

SESSION 32:  
Room 271

1:10-1:30  
**Northwest Regional Smart Grid Demonstration Project**  
*Davis, Nathan; Pringle, Charles; Beardsley, Roger; Whelan, Michael*

1:30-1:50  
**Safety and Health Laboratory Development**  
*Bednarik, Dana*

1:50-2:10  
**The Ellensburg Community Renewable Park: A Proposed Display of Renewable Energy Technologies for Public Education**  
*Fuhrman, Darryl*

2:10-2:30  
**Design, Construction, and Assembly of an Acoustically Responsive Fireplace with Resonant Flame Tubes**  
*Lyman, Greg*
SESSION 33:
Room 301

1:10-1:30 Edgar Degas: The Practice and Process of Painting
   Berberick, Katie

1:30-1:50 Speaking Through Color: How Color Choices in Artwork Influence Our Thinking
   Schlonga, Michelle

1:50-2:10 Three Views of a Woman: Using Hatshepsut as a Lens Through Which to Examine Gender
   Hegstrom Oakey, Jesse

2:10-2:30 Reconsidering the Perception of Female Strength in the Gothic Romance Novel
   Nassif, Sarah

SESSION 34:
Ballroom A

1:10-1:30 The Nostalgic Trance
   Brown, Marianna

1:30-1:50 Ambivalent Love
   Kernell, Marq

1:50-2:10 The Ship of Life
   Sutherland, Camille

2:10-2:30 Moving Forward
   Heikkila, Rachel

SESSION 35:
Room 135

2:40-3:00 Solo Mothers in Society
   Murphy, Lisa; Pruitt, Calista

3:00-3:20 Single Mothers and Their Challenges
   Pickrel, Ally

3:20-3:40 Family is Family
   Shields-Gravitt, Aly

3:40-4:00 Destructive Representations of Gender Roles as Portrayed in Film
   Clark, Patrick
SESSION 36:  
Room 137A

2:40-3:00  Reproductive Biology of *Anodonta californiensis* in the Yakima River Basin  
*Maine, Alexa*

3:00-3:20  To Conform or Regulate, Are These the Only Options? Thermal Biology of the Mexican Beaded Lizard (*Heloderma horridum horridum*) in a Tropical Deciduous Forest  
*Holcomb, Kerry*

3:20-3:40  Shelter Availability and Use by Mexican Beaded Lizards in a Tropical Dry Forest  
*Rayburn, Micah; Watson, Haley; Butterfield, Taggert*

3:40-4:00  Thermal Biology of the Northern Alligator Lizard (*Elgaria coerulea*): A Laboratory Study  
*Butterfield, Taggert; Beck, Daniel*

SESSION 37:  
Room 137B

2:40-3:00  C-H Bond Cleavage in Saturated Hydrocarbons Catalyzed by the Diatomic Clusters of Group 8B Transition Metal Elements: A B3LYP Theoretical Study  
*Livingston, Ben*

3:00-3:20  Study of Host-to-Activator Energy Transfer Efficiency of YBO$_3$:Pr$^{3+}$  
*Wallace, Max*

3:20-3:40  Far Infrared Laser Lines Produced from an Optically Pumped Molecular Laser  
*Holman, Robert; Minton, Rolf; Alves, Henrique*

3:40-4:00  Assessing The Performance of a Stark Spectrometer  
*Saucedo, Nick*

SESSION 38:  
Room 140

2:40-3:00  Student Evaluation of Instruction  
*Dwyer, Cara*

3:00-3:20  Changes Throughout American Families  
*Eklof, Lindsay*

3:20-3:40  RSA: Keeping Your Secrets Secret - Part 1  
*Wheel, Derek; Livingston, Ben; Chappelle, Candace; Dean, Raven; David, George*

3:40-4:00  RSA: Keeping Your Secrets Secret - Part 2  
*Wheel, Derek; Livingston, Ben; Chappelle, Candace; Dean, Raven; David, George*
SESSION 39:  
Room 201

2:40-3:00  
Does Tourism Have a Market Effect on the Grooming for Tolerance Interchange in Tibetan Macaques (*Macaca thibetana*) at Mt. Huangshan, China?  
*Dunayer, Erica; Matheson, Megan; Sheeran, Lori; Beck Dan; Li Jinhua; Wagner, R. Steven*

3:00-3:20  
Tourist Knowledge and Perceptions of Tibetan Macaques at Mt. Huangshan, China  
*Faulkner, Alicia*

3:20-3:40  
Adaptive Evolution of Primate Mandibles across Taxa: Diet and Feeding Ecology Shapes the Jaw  
*Arrañaga, Daniel*

3:40-4:00  
Infant and Juvenile Play Patterns in Tibetan Macaques (*Macaca thibetana*)  
*Batts, Courtney; Sheeran, Lori; Li, Jinhua; Wagner, R. Steven*

SESSION 40:  
Room 202

2:40-3:00  
Vigilantism in Washington State: A Counterpoint To National Trends  
*Miller, Aaron*

3:00-3:20  
A Move Towards Farming: How Indian Agents Sought to Convince Yakamas to Accept Allotment  
*Miller, Scott*

3:20-3:40  
Independent Women in the Civil War Medical Field  
*Roundtree, Alyssa*

3:40-4:00  
Confederate States of America’s Taxation Policy Failure in 1863  
*Ellis, Justin*

SESSION 41:  
Room 271

2:40-3:00  
The Geoarchaeology of Raven Bluff, a Fluted Point Site in NW Alaska  
*Buvit, Ian*

3:00-3:20  
Amazonian Communities and Sense of Place  
*Steele, Rozsika*

3:20-3:40  
What Have We Missed by Perpetuating the Pristine Myth?  
*Alberg, Winifred*

3:40-4:00  
House Settlement and Food Procurement Strategies at Archaeological Sites 45KT12 and 45KT13  
*Vargas, Estanislado*
SESSION 42:
Room 301

2:40-3:00  Literature and Moral Philosophy
           Baker, Taylor

3:00-3:20  Religion, Culture and Conformity During the Cold War
           Schmidt, Alec

3:20-3:40  Turning Oppression into Success: How an English Restoration Actress Achieved Poetic Justice
           Nelson, Reesa

3:40-4:00  Trichloroethylene, the Silent Massacre Part II: Creating a Bill
           Pace, Terri

SESSION 43:
Ballroom A

2:40-3:00  Performance by Nada Cantata: Central’s Student Run A Cappella Group
           Ragland, Isaiah

3:00-3:20  Phoenix - Concerto for Alto Saxophone and Prepared Electronics
           Petersen, Benjamin

3:20-3:40  National Trumpet Competition, Part 1
           Fredrickson, Chris; Guerrero, Cameron; Bull, Brian; Utt, Steven; Hurd, Tristan; Hinckley, David;
           Utt, Steven; Greif, Darin; Floe, Skyler; Waddell, Braden

3:40-4:00  National Trumpet Competition, Part 2
           Fredrickson, Chris; Guerrero, Cameron; Bull, Brian; Utt, Steven; Hurd, Tristan; Hinckley, David;
           Utt, Steven; Greif, Darin; Floe, Skyler; Waddell, Braden

SESSION 44:
Room 135

4:10-4:30  X-Men
           Burck, Ryan

4:30-4:50  Mutant Analysis in X-Men: First Class
           Mazhar, Asra

4:50-5:10  Gender Issues Brought Up in James Bond Movies
           Wemhoff, Jennifer

5:10-5:30  James Bond and Gender
           Doblado, Nicole
SESSION 45:
Room 137A

4:10-4:30  Genome-wide Demethylation Affects Epigenetic Inheritance of a Defensive Trait in *Mimulus guttatus*
           Stout, Amanda; Scoville, Alison

4:30-4:50  Sequence Assembly Validation: Examining Gene Order in Physical Maps Versus Sequence Assembly
           McFadden, Angela

4:50-5:10  Determining the Phylogenetic Utility of the Nuclear Gene XDH in the Conifer Family Cupressaceae
           Garcia, Erik; Peery, Rhiannon; Wilcox, Kevin

5:10-5:30  Phylogenetic Accuracy: Examining the Effects of Rate and Composition Using Simulated Data
           Coons, Arthur

SESSION 46:
Room 137B

4:10-4:30  Electronic Realization of a Chaotic Differential Equation
           Ingham, Matthew

4:30-4:50  Development of a Computer Model for Investigating the Effects of Internal Pressure on the Resonance of Spherical Shells
           Mith, Drake; Abdul-Wahid, Sami

4:50-5:10  Observing Program Calculator for Binary Star Systems
           Neal, Colby

SESSION 47:
Room 140

4:10-4:30  Euler’s Early Work in Diophantine Equations
           Livingston, Ben

4:30-4:50  Developing Actuarial Software for Model Analysis-AMOOF 2.0
           Haberman, Zachary; Spencer, Cameron; Smigaj, James; Brown, Noble

           Wright II, Michael R.
SESSION 48:
Room 202

4:10-4:30  Froebel, Peabody, and the Roots of American Kindergarten Philosophy
Erickson, Amy

4:30-4:50  Soiled Doves and Gentlemen Miners: Ambiguous Gender Roles in the Klondike Gold Rush, 1897-1902
Anderson, Talea

Godwin, Ashlee

SESSION 49:
Room 301

4:10-5:30  An Experiment in Integrated Learning: Baseball in American Life and Culture
Wood, Natasha; Taylor, Cody; Armstrong, Liahna; Quirk, Wayne

SESSION 50:
Ballroom A

4:10-5:30  Tent Cities are Normal before Black Friday
Velasquez, Charles

4:30-4:50  Soul Surgeon: A Historical Drama on the Rise and Fall of Lobotomy
Pierre, Kelley

4:50-5:10  Expressions of the Soul
Cahill, Mackenzie
POSTER PRESENTATION SCHEDULE

Only authors are listed for each paper/poster.
Mentors are shown in the ABSTRACT portion of this program.

UNIVERSITY CENTERS

CWU-DES MOINES
Posters on display May 14, 4:00-6:00 p.m.

   Pelkey, Crystal

2. Music-Evoked Emotions and Nostalgia
   Pelkey, Crystal

3. Priming Emotions: The Effects of Emotional Cues on Interpretation of Social Situations
   Beitlich, Stephanie

CWU-LYNNWOOD
Posters on display May 16, 5:00-8:00 p.m.

1. Whirpool—Challenges in Supply Chain Management
   Boivin, Alan; Cramer, Travis; Sherdiwala, Jugal

2. Internal Controls and Integration Lead to an Ethical, Effective, and Efficient Purchasing System
   Edwards, Jason; Jong, Joe; Joersz, Ryan

3. Organic Milk Supply Declines in the United States. Can the Problem be Fixed?
   Kochugur, Volodymyr; Kulesza, Iwona; Kahihia, Paul

4. The Supply Chain of Amazon.com Fresh
   Lamas, Gerald; Le, Sam; Liang, Hui

5. A Study of A Coffee Supplier: Mazza Coffee
   Ness, Blake; Mamon, Mark

   Rae, Benjamin; Nickel, Bryce; Ngo, Thuan

7. Barrage Cellars
   Rinaldi, Sam; Ruth, Darlene; Richins, Martin

8. Univar Chemicals
   Tang, Bich; Ta, Linh; Starkenburg, Tyler

9. Silvercup Coffee
   Tang, Pingping; Vlasenko, Maria; Vo, Duc
POSTER PRESENTATION AND CREATIVE WORKS SCHEDULE

Only authors are listed for each paper/poster. Mentors are shown in the ABSTRACT portion of this program.

POSTER SESSION 1
BALLROOM C/D

Posters on display from 8:30-11:00
Presenters must be by posters during judging from 9:30-11:00

POSTERS

BIOLOGY

1. Species Diversity of the Intertidal Zone (Tide Pools) in Chamela, Jalisco, Mexico
   Gutstein, Ruben; Montgomery, Sarah; Martin, Kelsey

2. Dietary Analysis of Lizard Species in the Dry Forest in Chamela, Mexico
   Healas, Sara; Witt, Jared; Hassler, Nick; McFadden, Angela

GEOLOGICAL SCIENCES

3. Design and Sediment Characteristics of Mexican Beaded Lizard Burrows in Jalisco, Mexico
   Free, Bryon; Webb, John; Stone, Wyatt; Holcomb, Kerry

4. Cavity Nests in Cacti: Influences of Geology and Microclimate in a Tropical Dry Forest in Mexico
   McBride, Amara; Meyers, Lewis; Moeller, Greg

BIOLOGY

5. Assessment of Biological Activity for Crude Extracts and Isolated Compounds from Plants
   Diamond, Jane

6. Soil Nitrogen Effects on Black Cottonwood (Populus trichocarpa) Growth Rates in the Taneum Canyon Hyporheic Corridor
   Seiler, Ian

7. Effects of High Light on Photosynthesis and Artemisinin Production for the Medicinal Plant, Artemisia annua
   Boukalis, Michiela; Loiseau, Abigail; Thai, Tony; Inions, Eric

8. Phenotype Change through Light Manipulation and DNA De-methylation
   Marrese, Anthony; Dechaine, Jennifer

9. Multigenerational Analysis of Selection on Domestication Traits in Sunflower (Helianthus annuus) Crop-wild Hybrids
   Owart, Birkin; Dechaine, Jennifer; Burke, John; Baack, Eric; Seiler, Gerald
10. UV-induced DNA Damage in *Daphnia magna* from Ecologically Disparate Populations
   Smith, Amanda

11. DNA Repair of *Daphnia magna* in Response to Ultraviolet Radiation
   Tompkins, Amanda; Smith, Amanda

12. DNA Barcoding in *Saprolegnia*
   Mueller, Ryanne

13. Regulation of Host Immune System by the Hookworm *Ancylostoma ceylanicum*
   Diliani, Nicholas

14. Inoculation of Mice against *Leishmania major* by Immunization with Purified Paraflagellar Rod Proteins
   Anderson, Heidi; Reis, Ashleigh

15. Induction and Isolation of Bacteriophages from the Spoilage Bacterium *Lactobacillus*
   Larson, Kyle

16. Development of Gram Stain Alternatives for Use with Haloalkaliphilic Bacteria
   Lu, Shao

17. Quantitative Histological Analysis: Calcineurin’s Role in the Developing Nervous System
   Dickerson, Andre; Albright, Chelsea; Linn, Megan; Selski, Daniel

18. Quantification of the Inhibition of Calcineurin by Protein Phosphatase Assay
   Schultz, Kaytlyn; Nelson, Joseph; Vu, Haong; Selski, Daniel

19. Correlation of Environmental Temperature and Ice Content During Freezing in *Pseudacris regilla*
   Yeabsley, Jeff

CHEMISTRY

20. Investigation of *Salvia columbariae* for Dopamine Receptor Related Activity
   Bell, Logan

21. *Dalea searlsiae*
   Aronica, Mario

22. Towards the synthesis of novel boronates as potential HIV-1 protease inhibitors
   Frank, Michael; Faulkner, Andrea; Jennings, Julia; Sigurjonsson, Kristin; Schreiber, John

23. Investigation of the Effect Gd$^{3+}$ on Nanoparticle Host-to-Europium Transfer Efficiency in YBO$_3$: Gd$^{3+}$, Eu$^{3+}$ Under VUV Excitation
   Harrietha, Benjamin

24. New Synthesis of Novel Phosphor for LED Technology: Sr$_3$B$_2$O$_6$:Eu$^{2+}$ Using SrB$_4$O$_7$:Eu$^{2+}$ as a Precursor
   Kilburn, Troy; Orme, Patrick; Way, Zack

25. Size-Dependent Surface Energy Loss In Nanocrystalline YBO$_3$:Eu$^{3+}$
   Lawler, Andrew; Olson, Kristopher
26. 23 Years of Decreased Sulfate and Nitrate Concentrations in Wet Precipitation at Paradise, Mt. Rainier National Park
   Agren, James; Johnson, Cody; Lofgren, Rebecca; Samora, Barbara

27. Cross-Calibration of Long Pathlength Absorbance vs. Chemiluminescence Flow Injection for Analysis of Trace Fe(II) Concentrations in Aqueous Media
   Hinz, Daniel; Teng, Hsiang; Ting, Hoi

28. Quantitative Application for SDS-PAGE in an Undergraduate Biochemistry Lab
   Petersen, Brandon; Printz, Sarah; Carter, John

29. Effect of Fat Supplemented Diets and Deficient Nicotinamide Nucleotide Transhydrogenase on Oxidative Stress Levels in C. elegans
   Carter, John

ANTHROPOLOGY

30. Calculating Genetic Variation of Vervet Monkeys through Alu Insertions
    Carter, Samantha

31. Species Identification of Oncorhynchus through DNA
    Barker, Brenden

32. Rendering a Bull Bison
    Finley, Nick; Corwin, Kaitlyn; Day, Lianne; Michael, Kraig; Willis, Tamara

33. Faunal Analysis of the Umtanum Creek Site
    Keller, Alfred

34. Analysis of Small Mammal Bones from the Wenas Creek Mammoth Site
    Rennaker, Patrick

35. Salmon Species Use at the French Rapids and Hole-In-The-Wall Archaeological Sites on the Columbia River, Vantage, WA
    Dinubilo, Shaun

36. Fish Heads, Fish Heads Revisited
    McBride, Rhianna; Mosher, Malinda

37. Experimental Effects of Burning and Boiling on Modern Land Snail Shell δ18 O and δ13 C
    Morse, Nathaniel; Kaufman, Rowan

38. Of Mice and Men: A Faunal Analysis of the Rosa Rockshelter Site (45YK301)
    Aymond, Ayla; Euster, Lisa

    Barrick, Wilbur; Euster, Lisa; Matthes, Whitney; Porter, Laurie

40. Central Washington Anthropological Survey Data Recovery & Analysis at the Powerhouse Bridge Lithic Scatter (45Sa00444), Skamania County, Washington
    Steinkraus, Mark; Ferry, Joy
41. Evaluating the Reintroduction of Salmon to the Elwha River as a Means of Influencing Sense of Place
   Johnson, Kelsey

42. Changing Religious Practices Among Young Women in Morocco
   Shabazz, Basmah

43. HIV/AIDS Prevention and Treatment in Sub Saharan Africa: The Partnership of Traditional Healers and Biomedicine Practitioners
   Allen, Chelsy; Roberts, Hannah

MATHEMATICS

   Rui, Huang

45. MCM, a Mathematical Contest in Modeling: Boat Scheduling
   George, David; Livingston, Benjamin; Raven, Dean
POSTER SESSION 2 AND CREATIVE WORKS

BALLROOM C/D

Posters and creative works on display from 11:15-1:45
Presenters must be by their work during judging from 12:00-1:30

POSTERS

PHYSICS

1. Single Photon Interference by Attenuation  
   Affholter, Randle

2. Optical Follower Feedback Control Loop for the Photon Calibrator at LIGO  
   Minton, Rolf

3. Investigation of Classical and Quantum Interference Using Interferometry  
   Powell, Adam

4. Lind Hall Foucault Pendulum Repair  
   Wenger, Addison; Minton, Rolf; Inghamm, Matthew; Corbin, Ryan

5. Monkey and Hunter Demonstration: An Interactive Example of Projectile Motion  
   Grove, Lukas

6. An Investigation of Virtual Learning  
   Powers, Kegan

STEP

7. The Science Talent Expansion Program (STEP) at CWU: A Model for Improving Recruiting and Retention of College Students  
   Nye, Jessica; Bohrson, Wendy; Foss, Rachel; Braunstein, Michael; Ely, Lisa; Piacsek, Andrew

NUTRITION, EXERCISE AND HEALTH SCIENCE

8. Investigation of BLUE100 Whole Egg Replacement Powder as a Low Cholesterol and Vegan Alternative in Apple Cake Mix  
   Copeland, Kari; Shelman, Melissa; Hunt, Heather

9. Perceptual Responses during a 5K Running Performance Following Exercise Induced Muscle Soreness  
   Nodine, Matt; Page, Robby; Eldredge, Michael; Campbell, Stephanie

10. A Healthy Hot Lunch at School  
    Weigt Taylor, Katie; Walker, Whitney

11. Chia Gel is an Acceptable Cholesterol-Free Alternative to Egg in Spice Cake  
    Diamond, Jane; Krantz, Kaleigh; Houser, Whitney
PHYSICAL EDUCATION, SCHOOL AND PUBLIC HEALTH

12. **PhotoVoice**  
   O’Brien, Kaitlin; Crawford, Kailonna; Sexton, Sarah

13. **Social Life at CWU: A Study about CWU Students as Part of the Kittitas County Community Health Assessment**  
   El kabouss, Nazha

14. **Stress and the CWU Employee**  
   Martinez, Audelia; Sanchez, Martin

RECREATION AND TOURISM

15. **Sustainable Development, An Ecolodge: A Plan for the Quiet Mountain Lodge**  
   Kutzke, Sara

LAW AND JUSTICE

16. **Meth Action Council Research Project**  
   Hankins, Holly

EDUCATION

17. **Views of Pre-service Teachers and School Law**  
   Benson, Kelly; Byers-Kirsch, Jan

INDUSTRIAL ENGINEERING TECHNOLOGY

18. **Battle Bot Analysis**  
   Rutherford, David

PUBLIC POLICY

19. **The Forgotten: Testing Standardized Testing on our Kids**  
   Echeverria, Raquel
20. Does the Amount of Forest Canopy Closure Affect the Amount of Thistle Seed Eaten?  
*Henrichsen, Willow; Eames, Alexis*

21. Is There a Difference Between Soil and Tree Temperatures Throughout the School Year?  
*Romero, Ozzyona; Jones, Katlynn; Parcel, Salena*

22. Will There Be a Difference in Elk or Deer Sign in Cle Elum Roslyn School District Forest?  
*Selzer, Christina; Zabik, Sarah*

23. Does the Amount of Forest Canopy Closure Affect the Amount of Precipitation on the Ground-Rain and Snow?  
*Weis, Lydia; Montague, Lauren*

24. Is There a Difference in Wind Speed in Open Versus Forested Area on the Cle Elum Roslyn School District Campus?  
*Stanley, Emily; Bennett, Taryn*

25. What Affects Temperature in the Cle Elum Roslyn School District Outdoor Classroom?  
*Auger, Paige; Jameson, Tayler*

WATERS

26. An Analysis of the Reecer Creek Floodplain Restoration Project, Poster 1  
*Giblin, Jessica; Hashimoto, Jeff*

27. An Analysis of the Reecer Creek Floodplain Restoration Project, Poster 2  
*Giblin, Jessica; Hashimoto, Jeff*

28. A Comparative Study of Yakama Nation and Selah, Washington Residents’ Sense of Place, Poster 1  
*Johnson, Kelsey*

29. A Comparative Study of Yakama Nation and Selah, Washington Residents’ Sense of Place, Poster 2  
*Johnson, Kelsey*

30. WATERS Independent Student Projects, Lincoln Elementary School, Poster 1  
*Hegna, Jonathan; Morrill, Tyson; Graff, Ben; Rogers, Cailyn; Leah, Wilson*

31. WATERS Independent Student Projects, Lincoln Elementary School, Poster 2  
*Hegna, Jonathan; Smith, Dawn; Sanchez, Zitlalli*

32. WATERS Independent Student Projects, Lincoln Elementary School, Poster 3  
*Hegna, Jonathan; Klindworth, Sam; Bachman-Rhodes, Fisher*

33. A Closer Look at Air: Measuring Visible Particulate Matter at Harrah Elementary and Considering Sources of Variation in the Air Quality  
*Bowman-Kamaha’o, Meilani; Estock, Dan; Carey, Ashley; Fernandez, Maria; Broncheau, Anton; Pineda, Gladis; Estock 5th Grade Class, 2011-2012*

34. How Much Air Will a Match Consume at Different Temperatures?  
*Menking, James; Davis, Logan*
35. Yakima WATERS Project: Pond Ecosystem Health Selah, WA
   Holt, Renee; 6th Grade Science Club; Ranger, Ryan; Gazis, Carey

36. Middle-school Projects Focused on Water Quality of Crystal Creek in Cle Elum, WA, Poster 1
   Healas, Sara; Sweet, Dale

37. Middle-school Projects Focused on Water Quality of Crystal Creek in Cle Elum, WA, Poster 2
   Healas, Sara; Sweet, Dale

38. Middle-school Projects Focused on Water Quality of Crystal Creek in Cle Elum, WA, Poster 3
   Healas, Sara; Sweet, Dale
CREATIVE WORKS

FASHION DESIGN

39. **Gi Jane**
   Eklund, Andrea

40. **Sky’s the Limit**
   Ambrose, Annette

41. **Dream**
   Halone, Katy

42. **Oh Snap Raw!**
   Garza, Emilyesteli

43. **Peach Caviar**
   Rich, Angelina

44. **Sticks & Stones**
   Tyler, Kelsey

45. **Bare Ambition**
   West, Megan

46. **Untouched**
   Westendorf, Amy

47. **Purple Lily**
   Render, Lauren

48. **Devasree**
   Lewis, Cassie
POSTER SESSION 3 AND CREATIVE WORKS

BALLROOM C/D

Posters and creative works on display from 2:00-4:30
Presenters must be by their work during judging from 3:00-4:30

POSTERS

GEOLOGICAL SCIENCES

1. Documenting Magmatic Processes at Filicudi Island, Aeolian Arc, Italy: Integrating Plagioclase Textural and In Situ Compositional Data
   Harris, Michelle

2. Determining Patterns in the Britannia Range of the Transantarctic Mountains
   Juergensen, Mindy

3. Deformation Across the Western Mina Deflection: Field Studies in the Huntoon Springs Quadrangle, California-Nevada
   Hogan, Eliya

4. Mountain Building in the Greater Himalayan Range, India: Insight from Metamorphic, Kinematic, and Deformation Temperature Studies
   Stordahl, Jon

5. Improving Efficiency and Safety of Mineral Separation Methods for the Minerals Apatite and Zircon
   Fagin, Brittany; Edwards, Ashley

6. The Day the Earth Moved: Detecting Evidence of Earthquakes
   McBride, Amara

7. Using LiDAR to Unravel the Mystery Behind Neo-tectonics
   Turnley, Aaron

GEOGRAPHY

8. Qualitative Assessment of Potential Hydrologic and Ecologic Impacts of the Pebble Mine, Alaska
   Bortner, Jefferson

   Ferri, Serafina

    Duke, Haley; Walsh, Megan
11. Fire and Vegetation of Upland Meadows, Willamette National Forest, Oregon
   Cox, Tamara

   Haydon, Kevin; Walsh, Megan

13. Prioritizing Forest Restoration Treatments Using Decision Support and Geospatial Analysis on the Okanogan-Wenatchee National Forest, Washington, USA
   Cannon, Jamie; Hickey, Robert; Gaines, William; Walsh, Megan

14. Geospatial Information System Use: The Results of a Survey
   Thompson, Marc

PSYCHOLOGY

15. Analysis of Voice Pitch, Perception of Male Sexual Orientation, and Homonegativity
   Lowther, Carinna

16. The Effect of Contextual Variables on Gossip Transmission
   Campbell, Bradley; Parker, Joshua

17. Perceptions of Students with Learning Disabilities on a University Campus
   Jackle, Samantha; Bistricean, Cristina

   Ackley, Daniel; Chaffee, Rosalind; Southland, Tanner; Wall, Adrienne; Barrio, Stevi

19. An Analysis of the Effects of WhyTry on Behavior in Low Socioeconomic Status Early Adolescent Populations
   Albin, Kali

20. Developmental Trajectories of Children Diagnosed with Autism Spectrum Disorders and Hyperlexia
   Englehart, Vanessa

21. Academic Self-Efficacy, Coping, and Academic Performance in College
   Khan, Mehjabeen

22. Gender and Ethnic Differences in Learning and Study Strategies
   Marrs, Heath; Sullivan, Caitlin; Sarria-Wiley, Natalie; McIntyre, Jacki; Khan, Mehjabeen; Caughie, Andrew

23. Mexican-American Students and Pursuit of the Doctorate
   Marrs, Heath; Campbell, Brad; Golden, Meaghan; Caughie, Andrew; Liudahl, Rachel

24. Academic Help-seeking at CWU
   Caughie, Andrew; Golden, Meagan; Khan, Mehjabeen; McIntyre, Jacki; Sarria-Wiley, Natalie; Sullivan, Caitlin

25. An Analysis of Information Regarding False Confessions with a College Sample
   Caughie, Andrew
26. Lying Words  
   Spears, Charlie

27. Attention Restoration: The Effects of Elevated Vibrancy on the Perceived Environment  
   Stirret, Jason

28. Differences between Traditional and Electronic Bullying amongst College Students  
   Durst, Leeland; Stein, Stephanie; DeVietti, Terry

PRIMATE BEHAVIOR

29. The Effects of Signage on Zoo Visitors at a Chimpanzee (Pan troglodytes) Exhibit  
   Mas, Jessica; Pritchard, Alexander; Jensvold, Mary Lee; Zager, Lindsay

SOCIOLOGY

30. The Changing Social Constructions of Marijuana Users  
   Grimmer, Brian

31. The Occupy Wall Street Movement in the Pacific Northwest  
   McCluskey, Tristan; Fox, Victoria; Vadner, Becky; Lee, Michael

32. Social Architecture of Modern-day Political Extortion  
   McFadden, Joseph
CREATIVE WORKS

ART

33. An Image of the City
   Berberick, Katie

THEATRE

34. Little Women Draping by Brian Johnson
   Johnson, Brian

35. A Bright Idea: Designing a Lighted Wig
   Nelson, Reesa

36. Costume Design for Icarus: A New Noh
   Pribble, Jessica

ART

37. The New Apocalypse Project
   Quesnell, Ross

INDUSTRIAL ENGINEERING TECHNOLOGY

38. Spring Powered Assist Motor
   Schmid, Brendan

39. Remote Control Aerial Inspection Vehicle
   Sweeney, Edward; Grist, Christopher; Smith, Zachary

PHYSICAL EDUCATION, SCHOOL AND PUBLIC HEALTH

40. A Design for Active Central Students
   Cain, Laura; Disbrow, Kelsey; Fields, Lisa; Woods, Stephanie
Neuropsychological Origins of the Visual P300 Event-related Potential

Ackley, Daniel; Chaffee, Rosalind; Southland, Tanner; Wall, Adrienne; Barrio, Stevi

Faculty Mentor(s): Ralf Greenwald, Psychology

Poster Presentation Session #3, Poster # 18
2:00-4:30 in Ballroom C/D

The aim of this study was to examine the possible brain regions responsible for the visual P300 brain wave. The P300 waveform has been linked to several cognitive processes including attention, memory and event categorization. In order to investigate the possible brain regions of the visual P300, this study utilized the non-invasive source localization software sLORETA (Standardized Low Resolution Electromagnetic Tomograph), coupled with a variant of the classical odd-ball Event-related Potential (ERP) detection paradigm (Comerchero & Polich, 1999). The study was carried out in five neurologically healthy adults and found several distinct regions of brain activation related to sensory and cognitive processing.

Single Photon Interference by Attenuation

Affholter, Randle

Faculty Mentor(s): Michael Braunstein, Physics

Poster Presentation Session #2, Poster # 1
11:15-1:45 in Ballroom C/D

This project represents the initial phase of developing a Bell's Inequality Test of Quantum Mechanics laboratory at Central Washington University. We set up and performed an investigation of the interference of light using a double slit apparatus. For the experiment, a 632.8 HeNe laser beam was passed through an optical system consisting of mirrors, neutral density filters, linear polarizers, irises, multiple lenses and a pinhole. The light was spatially filtered, producing a clean profile, and collimated by the placement of the irises, lenses, and pinhole within the path of the light. The beam intensity was varied using the neutral density filters and polarizers to obtain interference patterns consistent with single photon events. A SBIG ST-7 CCD camera was used as detector and the interference fringes measured using pixel specifications of the CCD chip. The camera was evaluated for effectiveness as a single photon detector by attenuating the beam until its irradiance was consistent with single photon events in the camera pixels for one exposure and examining the signal. These attenuation procedures were then employed using single photon counting modules to detect the interference pattern. The single photon counting modules provided a TTL signal corresponding with single photon detection. A statistical analysis of two detector’s counts is consistent with detection of the phenomenon of single photon interference.
Since 1988, weekly wet precipitation samples from Paradise in Mt. Rainier National Park, WA, have been analyzed for major anions and cations, conductivity and pH. Volume weighted 3-month averages were tested for significant trends throughout the 23-year monitoring period and compared with analogous data collected at established National Atmospheric Deposition Program sites throughout the state. Over the last 23 years, (i) sulfate concentrations decreased by 51%, (ii) nitrate concentrations decreased by 55%, (iii) proton concentrations decreased by 59%, and (iv) pH increased from 5.1 to 5.5 (P=0.001). These results indicate that air pollution standards contribute significantly to the decrease in acid rain deposition to this pristine and vulnerable high elevation location, and that no apparent trans-Pacific transport of pollution is detected from Asia.

In The Pristine Myth: The Landscape of the Americas in 1492, William Denevan focuses on the issues, misconceptions and residual problems associated with the “Pristine Myth” which is a term he uses to describe the common perception by certain scholars that the Indians in the New World had not altered their natural landscape. This perpetrated the idea that after 1492, the colonists and settlers who came to the New World dramatically and detrimentally altered the former “pristine” landscape the Indians inhabited. Indians are nature and thus their alteration of the landscape is natural, albeit a modification nonetheless. Contemporary researchers have examined the Pristine Myth and continually demonstrate that the Pristine Myth is not supported in the Archaeological Record; promulgating the idea of the Pristine Myth masks the true history of human occupation and the subsequent effects of landscape alteration and environment. Native populations were efficient resource managers who tailored their practices to the landscape they were using and implemented techniques to protect and sustainably exploit their resources as ‘ancient conservationists’. The Pristine Myth is a state of mind, not reality. It is my argument that the long held biases in the study of prehistory have misguided research for much too long and that as researchers we have to ask ourselves, what have we missed in the record by perpetuating the Pristine Myth?
An Analysis of the Effects of WhyTry on Behavior in Low Socioeconomic Status Early Adolescent Populations

Albin, Kali
Faculty Mentor(s): Suzanne Little, Psychology

Poster Presentation Session #3, Poster # 19
2:00-4:30 in Ballroom C/D

The purpose of the current study was to investigate the effects of the WhyTry curriculum on behavior of students from low socioeconomic (SES) households in order to evaluate the program’s ability to help students cope with the risk factors associated with low SES. The need for this study was highlighted by research findings that suggest that students from low SES exhibit more instances of internalizing and externalizing behaviors. WhyTry is a curriculum designed to develop resilience, and improve behavior in school-aged children. The sample consisted of seven students from low SES households, two of which were in the control group with the other five participating in WhyTry. The students were given the Strengths and Difficulties Questionnaire as a pre and posttest. Data were also collected on the number of Office Discipline Referrals at pre and posttest. Preliminary analysis demonstrated slight differences between the control group and the WhyTry group with behaviors changing over time in both groups. Although further analysis, which is currently being conducted, will determine the statistical significance of these differences. Limitations of the study including small sample size, lack of a comparative economic group, and short timespan to implement the program which may influence the results. Overall, programs to mediate the effects of low SES for school-aged students must be examined further, and this study shows data trends that support further research of using the WhyTry curriculum for this purpose.

HIV/AIDS Prevention and Treatment in Sub Saharan Africa: The Partnership of Traditional Healers and Biomedicine Practitioners.

Allen, Chelsy; Roberts, Hannah
Faculty Mentor(s): Tracy Andrews, Anthropology

Poster Presentation Session #1, Poster # 43
8:30-11:00 in Ballroom C/D

Access to effective HIV/AIDS treatment and prevention is not a universal standard; however, it is a global disease. Throughout the world there are many different culturally-based medical belief systems that explain disease causation, as well as appropriate healing practices and preventative measures. We address the question of how effective and sustainable HIV/AIDS healthcare programs can be developed across varied cultural contexts. We analyze two HIV/AIDS programs in Sub-Saharan Africa, where traditional medical belief systems include both a more holistic approach to healthcare than biomedicine, as well as similarities to its germ theory of HIV/AIDS etiology. Biomedicine, as a medical belief system, relies on science and pharmaceuticals that developed in the context of Western cultural emphasis on the individualized experience of and treatment for illness. Although it has been proven effective in some settings, when used alone in non-western cultures, it rarely achieves optimal effectiveness. Paul Farmer and the Partners in Health (PIH) organization include a focus on local community capacity building and important political economic factors in developing viable global health care programs addressing HIV and other diseases. We argue that when biomedical and traditional healing are included in a collaborative partnership, and in combination with the PIH approach, more effective and economically sustainable health care programs for local communities can be created. Such programs also provide the framework for global healthcare efforts to address HIV/AIDS prevention and treatment.
Outsourcing

Allers, Vince; Chicano, Alex; Larsen, Chris; Skorney, Andrew

Faculty Mentor(s): Hideki Takei, ITAM

Oral Presentation, Session # 15
10:00-10:20 in Room 271

Outsourcing is the process of contracting a business function to someone else, usually overseas in order to minimize production costs. It has been a part of the American business culture since the 1960s, when the U.S. started losing automotive manufacturing jobs to Japan. Outsourcing is good for corporations because it helps minimize production costs, and it allows them to either reduce product costs, or invest more money into research and development if they wish. Society benefits from outsourcing because it usually allows people to purchase goods cheaper than what it would cost if the same things were produced here in the United States. However, the social issue is that many Americans don’t feel all of the savings are being passed on to the consumer, especially when executives are rewarding themselves with tens of millions of dollars in bonuses every year while thousands of workers are laid off in favor of cheaper labor overseas. The purpose of this presentation is to show the reality of the advantages and disadvantages of outsourcing. These are all areas we investigating upon by using secondary sources such as journal articles, databases, and search engines as a means of researching this topic.

Rosie’s Market

Almquist, Ashley

Faculty Mentor(s): Bill Provaznik, Management

Business Plan, Session # 8
10:20-11:00 in Room 301

Rosie’s Market is a full service grocery store which serves as a local community developer by offering local sourced products, and customized product lines and services which satisfy needs that are unique to a particular local area. Rosie’s will suit the budget of all customers offering both name brand and private label products. This is not the warehouse store that leaves customers roaming, requires a club card in order to get the sale price, or that creates a culture where outsiders feel unwelcome. This is your community market, where anyone receives a good honest value, no strings, no gimmicks. With the availability of store-to-car carry out and home delivery there will be added convenience to each shoppers experience. To add a sense of community Rosie’s will feature community events and local products. The market will work with local farmers to bring in fresh produce to support the local economy. The meat department will offer a full service meat counter, staffed with meat cutters who will be available for expert knowledge on cuts and can fill special orders on request. To cut costs on packaging and to better anticipate sales there will be no pre-wrapped fresh meat. In order to maximize customer satisfaction a customer service specialist will be available during peak hours near the check stands to get customers their forgotten items. Rosie’s Market isn’t like big name stores. It’s what people want. It’s quality and great service in a traditional yet intimate environment—a neighborhood environment.
**Sky’s the Limit**  
*Ambrose, Annette*  
*Faculty Mentor(s): Andrea Eklund, Family and Consumer Sciences*

Poster Presentation Session #2, Creative Works # 40  
11:15-1:45 in Ballroom C/D

I desired to create a garment that combined colors to add value. The target market for this design is a woman in her late 20’s who is ready for a night out on the town. The garment combines pastel and bright colors to show a woman’s curves, assets and her fun flirty personality. Process: Research was conducted through reviewing Pinterest. Details of images were used and incorporated into my garment. I drew inspiration for bright colors from the recent movie, *The Hunger Games*, along with Australian boutiques that also feature pastels with bright colors. The form fitting style of the garment was drawn upon Australian designs. Techniques: I created my dress through the draping technique using a size 14 body form. After draping the pieces, they were trued and pattern pieces were made. A sample sheet from the Goodwill was used to create a sample that was fit to my model. Modifications from the fitting sample were made to the paper pattern, which was made up of eight pattern pieces. For the final garment the lining and exterior were constructed separately with boning on the bodice to add structural support. Materials: 100% cotton lining, 100% exterior, 100% polyester sheer fabric.

**Soiled Doves and Gentlemen Miners: Ambiguous Gender Roles in the Klondike Gold Rush, 1897-1902**  
*Anderson, Talea*  
*Faculty Mentor(s): Karen Blair, History*

Oral Presentation, Session # 48  
4:30-4:50 in Room 202

The Klondike Gold Rush of 1897-1900 drew thousands of people north in search of gold. Among these stampeders were women who famously defied Victorian conventions by dressing in masculine attire, working in the public sphere, and openly participating in the entertainment and prostitution industry of Dawson City, the epicenter of the gold rush. As seen in the *Klondike Nugget*, a prominent newspaper in Dawson City, Klondike society at once feared the corrupting effects of masculine settings on northern women, yet also perceived benefits in women’s participation in the public sphere. The ambivalence displayed by the *Klondike Nugget* provides one glimpse of the struggle to define new roles for North American women at the beginning of the twentieth century.
Inoculation of Mice against *Leishmania major* by Immunization with Purified Paraflagellar Rod Proteins

*Anderson, Heidi; Reis, Ashleigh*

*Faculty Mentor(s): Gabrielle Stryker, Biological Sciences; Blaise Dondji, Biological Sciences*

Poster Presentation Session #1, Poster # 14
8:30-11:00 in Ballroom C/D

*Leishmania major* is a single-celled, vector-borne parasite responsible for the disease cutaneous leishmaniasis. This infection leads to disfiguring skin ulcers at the bite-site, which self-heal in immune competent individuals. Leishmaniasis has become an emerging zoonotic disease not only in the United States but worldwide. This can be attributed to increased global travel for military and recreational purposes and the disruption of vector habitats through industrialization in endemic areas. The World Health Organization estimates that *Leishmania* infects some 12 million people in 88 countries with an estimated 2 million new cases every year. Studies in a related parasite, *Trypanosoma cruzi*, have established that the paraflagellar rod (PFR) proteins of the flagellum are highly immunogenic and can protect mice from succumbing to infection. The PFR is a unique protein lattice that runs along the flagellum found only in the order kinetoplastids, to which both *Leishmania* and *Trypanosoma* belong. The aim of our research is to investigate the immune potential of the PFR proteins derived from *L. major*. This study used a refined protocol of protein purification of the PFR to test the protective immune response generated in mice. In this trial, PFR and Freund’s adjuvant were combined to immunize highly susceptible BALB/c mice, compared to a control mice immunized with Freund’s adjuvant alone. The lesion size in the immunized and control mice was followed over a five month period. Data from this study will be used to design further trials to refine and improve the immunization protocol.

Gladmar: An Ever Present Resource

*Andrews, Bryce*

*Faculty Mentor(s): Ken Cohen, Recreation & Tourism*

Oral Presentation, Session # 3
8:30-8:50 in Room 137B

The Gladmar Research and Education Area (GREA) is a reach of the Yakima River located near the north side of I-90 near Exit 101 and contains 38 acres of which 10 acres of this are water. This field site encompasses the interface of the riverine environment and its associated floodplain which includes the mainstem and a side-channel of the Yakima River, a backwater slough and littoral habitats. The presence of pools, riffles, and braided channels, a variety of graded and un-graded substrate sizes, and the presence of a variety of flow-velocity regimes provide additional complexity to the aquatic habitat within the area. The Gladmar Research and Education Area provides a living outdoor laboratory and promotes active partnerships across educational and governmental communities to enhance integrated learning. In 2007, Central Washington University (CWU) entered a fifty year lease agreement with Kittitas County, Washington for a 38-acre reach of the Yakima River. Past and future research at the site is highlighted while future plans and its intrinsic natural and cultural value are presented.
Satire of Genesis
Arledge, Jennifer
Faculty Mentor(s): Heidi Szpek, Philosophy and Religious Studies

Oral Presentation, Session # 6
9:10-9:30 in Room 202

Satire—the political ribbing of the educated mind. From Juvenal to Horace and Pope to Swift, great satirists have spared no expense in criticizing those in political power and the world around them. Likewise, those of the Jewish Hellenistic Period recorded their lives and thoughts in literature, which has become known as extra-biblical to the Hebrew Bible. While some of these stories are very familiar, Joseph’s exile into Egypt for example, others strike scholars as so foreign, it is debated whether they’re valuable as religious texts. The Testaments of the Twelve Patriarchs is one such text. While the sons of Jacob were never seen as moral pariahs, The Testaments illustrate men of such ill repute that one must wonder what the author’s purpose could have been. Analyzing such a text through a literary eye gives readers, scholars, and the faithful a new understanding of Jewish thought during this troubling time. If one were to understand The Testaments of the Twelve Patriarchs as a political satire, then the representations of the sons of Jacob do not seem as outlandish as before, and perhaps this text—and more like it—can then be used as a historical lens to better understand this time of Jewish factions and budding Christian ideals.

Dalea Searlsiae
Aronica, Mario
Faculty Mentor(s): Gil Belofsky, Chemistry

Poster Presentation Session #1, Poster # 21
8:30-11:00 in Ballroom C/D

This research involves the study of natural products chemistry. The goal is to isolate and characterize new compounds from the plant Dalea searlsiae to test for antimicrobial activity, specifically against Staphylococcus aureus. S. aureus is a bacterium that can develop multidrug resistance and is a developing problem, with limited treatment options. In order to overcome multidrug resistance in the cells, natural products can be mixed with a known antibiotic and both are added to the cells. The cells have transporters within their walls that pump compounds in and out of the cell. The drug penetrates the cell and, in this scenario, the pump inhibitor can stop the cell from pumping out the drug, which then can more effectively kill the cell. The components of the aerial parts of the plant were extracted then characterized and analyzed. Chromatography is a refinement process consisting of successive stages, taking crude mixtures to pure compounds. Some of the general experimental procedures include thin layer chromatography (TLC), size exclusion chromatography, and linear solvent gradient chromatography. The structure elucidation of pure compounds is accomplished by nuclear magnetic resonance spectroscopy (NMR) and mass spectrometry. To date, six pure compounds have been isolated from D. searlsiae. NMR spectra were obtained for the compounds and biological testing is currently in progress.
Adaptive Evolution of Primate Mandibles across Taxa: Diet and Feeding Ecology Shapes the Jaw

Arrañaga, Daniel

Faculty Mentor(s): Steven Wagner, Primate Behavior

Oral Presentation, Session # 39
3:20-3:40 in Room 201

Recent investigations into the functional link between diet and form have focused on rigorous quantitative methods for describing shape using geometric morphometrics. I used geometric morphometric analysis to investigate primate mandibular shape with respect to four dietary categories: frugivores, folivores, ripe fruit specialists, and the cooked food specialist. I used statistical shape analysis to evaluate the contribution of dietary composition and feeding ecology to jaw morphology compared to other factors (e.g., phylogeny). Twenty-eight landmark coordinates on 178 haplorhine mandibles of 9 different taxa were collected using a 3D Microscribe. Coordinates were superimposed using procrustes analysis and then analyzed using MorphoJ software analysis package. Landmark coordinate values were analyzed using two sets. The first set utilized all 28 landmarks to represent the overall shape of the mandible, whereas the second set used only landmark coordinates found along the corpus and symphysis. Canonical variate analysis (CVA), ANOVA and discriminant function analysis revealed significant variation between frugivores, folivores and cook food specialists with less variation between ripe fruit specialists and frugivores in both data sets. This study not only shows predictable relationships to dietary classifications but also adds to the hypothesis that our bodies are adapted to a diet of cooked food.

Greeks In Washington: An Ethnographic Study

Athan, Stavroula

Faculty Mentor(s): Nelson Pichardo, Sociology

Oral Presentation, Session # 23
12:20-12:40 in Room 271

This ethnographic research project will be focused on the immigration, settlement, and practices of the Greek community into the greater Seattle area. This culture has been making its mark in Washington through their rich cultural heritage in the forms of food and festivals, as well as religion and cultural displays of dance. Though many assume that assimilation for Greeks would be simple, there are still assimilation barriers that they must cross. Language in their case would be a big one, also their religious viewpoints and the way they choose to raise their families have received scrutiny over the years. My research will be focusing on the effectiveness of the assimilation into American culture through the generations. I will look at how they effectively keep their culture alive, while making concessions to the American ways. The family structure and value system is something that will play a big part in this, and will be examined to gain a better understanding of this particular facet of Greek culture. I plan on interviewing various people from different age groups to see the success rates of their families financially and in terms of assimilation, education, and happiness.
What Affects Temperature in the Cle Elum Roslyn School District Outdoor Classroom?
**Auger, Paige; Jameson, Tayler**
*Faculty Mentor(s): Trish Griswold*

**Poster Presentation Session #2, Poster # 25**
11:15-1:45 in Ballroom C/D

Fostering a Sense of Place at Walter Strom Middle School, 7th grade students conducted inquiry based investigations in the outdoor classroom. Data was collected several times per month throughout the school year. Our research question involves what affects soil and air temperature - forests or open canopies, surface or below the surface of the soil. We also recorded weather and air temperature. We found some patterns and the probability of getting our data if the null hypotheses is true.

Of Mice and Men: A Faunal Analysis of the Rosa Rockshelter Site (45YK301)
**Aymond, Ayla; Euster, Lisa**
*Faculty Mentor(s): Patrick Lubinski, Anthropology; Steven Hackenberger, Anthropology*

**Poster Presentation Session #1, Poster # 38**
8:30-11:00 in Ballroom C/D

Rosa Rockshelter, located in the Yakima River canyon near Selah, Washington, was originally excavated in 1970 by Dr. William C. Smith (CWU, Anthropology). The shelter was likely used for storage during the Late Cayuse Phase (ca. 1000 BP). In this study, 234 faunal specimens were analyzed to determine whether they represent animals that died on the shelter, or were food remains left by humans or other animals. The faunal specimens include: Salmonidae (31), Marmota flaviventris (5), Neotoma cinerea (5), ground squirrel (4), jackrabbit (2), rattlesnake (2), and owl (1). Roughly 20% of all specimens were fish, 20% mammals of size class II (e.g. rats and squirrels), and 20% mammals of size class III (e.g. marmots, rabbits, and hares). More than 15% were not identified. One instance of possible modification, which might represent evidence of human processing, in the form of cut marks was observed. No evidence of burning was found. Green breaks were also recorded, but the cause was not determined. The presence of owl pellets and various types of animal scat strongly suggests that some or all of the specimens originated from animal predation and use of the shelter for nests and dens. Since the collection from the site includes cultural materials, including lithics and textiles, there is little doubt that the shelter was used by humans in some capacity, but no indication was found that the faunal remains are associated with that use.
The Saxophone Vibrato—An Illustration and Methodology
*Babbitt, Angela*

*Faculty Mentor(s): Joseph Brooks, Music*

Oral Presentation, Session # 14
10:00-10:20 in Room 202

Vibrato is a technique that musicians use to add beauty, shape and character to the sound. Vibrato is the fluctuation or oscillation of a note that happens by bending or pulsating up and down at various speeds. It is used consistently by musicians worldwide. This is a difficult thing to teach because it is challenging for students to hear vibrato apart from their sound as a whole. Some students will think that they are bending the pitch of the notes drastically, while the listener cannot hear a change. This confusion occurs because students do not have an auditory example of what their vibrato should sound like and the explanations given by their teachers can be rather vague. At Central Washington University (CWU), saxophonists are taught to employ vibrato in their playing. College students struggle because they do not fully understand what vibrato is and what it should sound like. As a future music educator, my goal is to introduce the concept of vibrato to my students and help them use it expressively. The purpose of this project is to create a tool that students and educators can use to learn saxophone vibrato. The project consists of a book containing vibrato exercises and lessons and a cd of CWU saxophone professor Joseph Brooks and myself. With this product, students will learn how to produce vibrato on their instrument by hearing examples of vibrato and incorporating it into their playing.

Literature and Moral Philosophy
*Baker, Taylor*

*Faculty Mentor(s): Matthew Altman, Philosophy and Religious Studies*

Oral Presentation, Session # 42
2:40-3:00 in Room 301

Morality plays a massive role in the lives of nearly everyone in one form or another. But can we use literature as a tool for moral philosophy? Plato began the practice of casting the poet out of the good city, and this tradition has informed most philosophy ever since. If philosophy is to lead us to truths about our world, how could fiction, or lies, help us toward the ends of truth? This research explores the connections and boundaries between philosophy and literature and how, in the act of moral reasoning, we can utilize both methods. In detecting old biases in philosophy, as well as defining literature as valuable for moral development, the division between the philosophers of the good city and the lying poets is illuminated and undermined, ultimately in a bid to understand literature as valuable to moral thought.
Species Identification of Oncorhynchus through DNA

*Barker, Brenden*

*Faculty Mentor(s): Joseph Lorenz, Anthropology*

Poster Presentation Session #1, Poster # 31
8:30-11:00 in Ballroom C/D

When a Northwest Native American archeological site is uncovered, many times there are remains left of various faunal species. Typically, these remains are severely damaged to a point where simply identifying the genus, much less the exact species, of an individual is a great challenge, but it is possible through DNA identification. Different species of Oncorhynchus (Pacific salmon) have unique and identifiable genetic markers that make them identifiable, where in normal circumstances they might otherwise be indistinguishable from one another. By observing variation in their SMC (structural maintenance of chromosomes) and cytochrome B (mtDNA), one can observe these subtle differences between the species, and thus determine the exact species. This study takes several species of Pacific salmon and, using methods such as PCR and gel electrophoresis, constructs a genetic profile for these individual species and compares these to already established gene sequences provided by GenBank. It is hoped that this work can be implemented by other local studies, primarily of anthropological archaeology and zooarchaeology natures, in the further identification of remains, both having innumerable possible implications, including furthering other aquatic fauna studies.

Rosa Rockshelter Archaeological Site: A History of Investigations

*Barrick, Wilbur; Euster, Lisa; Matthes, Whitney; Porter, Laurie*

*Faculty Mentor(s): Shane Scott, Steven Hackenberger, Anthropology*

Poster Presentation Session #1, Poster # 39
8:30-11:00 in Ballroom C/D

Rosa Rockshelter is located in Yakima County, Washington, approximately 1.6 miles south of the Rosa Dam on the Yakima River. Dr. William C. Smith, of Central Washington University, excavated the site in 1970 as a summer fieldschool. Rosa Rockshelter, 45YK30I, was most likely occupied during the Cayuse Phase (100 B.C.— A.D. 1850), and utilized for the storage of various perishable materials. The site produced a relatively abundant and varied assemblage of well-preserved cordage materials of tule, dogbane, cedar, and sagebrush. Textile fragments of S and Z twist cordage, tule matting, and basketry are the basis of ongoing research from both scientific and traditional cultural perspectives. This poster looks at the 1970 excavation project and the unique artifacts that were found; it discusses current research questions, efforts to curate the collection, and describes the upcoming field investigations planned for 2012.
Infant and Juvenile Play Patterns in Tibetan Macaques (*Macaca thibetana*)

Batts, Courtney; Sheeran, Lori; Li, Jinhua; Wagner, R. Steven  
Faculty Mentor(s): R. Steven Wagner, Biological Sciences

Oral Presentation, Session # 39  
3:40-4:00 in Room 201

Primate play is an important feature of physical and cognitive development. Functions of play include facilitating development of motor and cognitive abilities, providing opportunities to practice adult skills, and learning social roles. Previous research indicates differences among age and sex classes for type and amount of play, suggesting that primates modify play behaviors in relation to adult social roles. Other play research has highlighted preference for a play partner within the same age and sex class, which is also in concordance with the play’s function in learning adult social roles. Tibetan macaques (*Macaca thibetana*) have been studied in relation to their social hierarchy and sexual behaviors, but there has been no study of juvenile play behavior. We investigated play among Tibetan macaque infants, juvenile females, and juvenile males. We collected three minute focal samples and scored play behaviors using an ethogram. We hypothesized differences would exist in type and amount of play between age and sex classes and that individuals would prefer same age/sex play partners. Results showed that infants spent more time playing (N=39.87%) than did juvenile males (N=16.00%) and females (N=14.73%). There is a trend for partners of the same age class to play. All age and sex classes engaged in a wide variety of sexual play behaviors. Overall, there were differences in the variety of play observed among macaque age and sex classes. We also noted ontogenetic shifts in behaviors as individuals transitioned into adulthood.

Standardizing a Universal Privacy Policy Concerning Internet Transactions

Baumann, Scott; Alhamrani, Shuruq; Lai, Man Gee; Slagle, Rachel  
Faculty Mentor(s): Hideki Takei, ITAM

Oral Presentation, Session # 2  
9:10-9:30 in Room 137A

Our group is working on the contemporary issue in aspects of internet privacy. The purpose of this presentation is to look into recent case studies regarding the legal use of personal information that is gathered by commercial entities via the internet, both with and without the knowledge of the individual. Our scope will cover only current, unresolved issues that focus primarily on internet transactions and social media sharing (Facebook, Amazon, eBay etc.). Next, we will search for a universal solution, possibly in the form of a standardized end-user license agreement. We hope that this will result in individuals being more aware of their rights and greatly strengthen the proper use of personally gathered data. As a result, there will be an increase of awareness in privacy policies contributed in constructing a positive environment in future eCommerce platforms.
Safety and Health Laboratory Development

**Bednarik, Dana**

**Faculty Mentor(s): Sathyanarayanan Rajendran, Industrial & Engineering Technology**

Oral Presentation, Session # 32
1:30-1:50 in Room 271

Work-related injuries and illness continues to be major concern for the American work force. One of the major factors to improve and maintain world class safety performance in our workplace is the sustained supply of highly skilled safety professionals. Since 1976, graduates of the CWU safety and health management (SHM) program have left CWU with the knowledge and skill, and have helped maintain safe and health workplace across the country. However, one of the major challenges for the SHM program has been the absence of a SHM lab, that enhances their skill set with hands-on training. The new Hogue Technology facility will add a SHM lab to be opened in June 2012. The major objective of this study is to help recommend the major components of a state-of-the-art SHM lab. Some of the recommendations will include: (1) a list of equipment that meets current industry standards, and (2) a lab layout that will provide a good learning environment. To achieve these objectives the following research activities has been planned: (1) a survey of SHM labs from ABET accredited safety programs in the US and (2) a survey of safety professionals from a diverse group of industries. The results of this study will help the SHM program setup a world class lab that will help students hands-on learning and make the CWU-SHM program graduates as an employer’s first choice.

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**Priming Emotions: The Effects of Emotional Cues on Interpretation of Social Situations**

**Beitlich, Stephanie**

**Faculty Mentor(s): Danielle Polage, Psychology; Steve Schepman, Psychology; Sara Bender, Psychology**

Des Moines Center - Poster Presentation, Poster # 3

On a daily basis we are exposed to interactions, and we make judgments about them. The influence that recent ideas or events have on an interpretation of something else is called priming. Through the process of priming, our interpretations of the world around us can be influenced by recently or frequently accessible stimuli. The purpose of this current research is to study how emotions can influence one’s impression of a social interaction. The priming effects of emotions on interpretations of social situations are being studied to make a connection between one’s emotional state and their perception/opinion of others. This may lead to an understanding of how emotions affect our relationships with others. In this research, to consciously expose the subjects to emotional words for priming, a sentence completion task with different variations of each sentence for each condition will be conducted. There will be the three conditions of neutral, positive (happy), and negative (angry). After the subjects have been primed by completing the sentence completion task, they will then view an ambiguous image to interpret. The hypothesis of this study is that participants exposed to the negative emotional primes will have an interpretation of the ambiguous image that has assimilated to the primed emotion. The results are expected to show that both conditions will have some assimilation to the primes, but the negative condition will assimilate at a higher rate.
Investigation of *Salvia Columbariae* for Dopamine Receptor Related Activity

*Bell, Logan*

*Faculty Mentor(s): Gil Belofsky, Chemistry*

Poster Presentation Session #1, Poster # 20
8:30-11:00 in Ballroom C/D

The plant *Salvia columbariae* is native to Western California, Utah, and ranges south to Northern Mexico. It has been used historically by indigenous peoples as a dietary supplement and a medicinal herb. A relative of *S. columbariae* is *S. divinorum* which is used as a recreational drug and has known opioid receptor binding activity. Prior work with extracts of *S. columbariae* revealed diterpenes to be present in the plant. A large scale extraction has been done and the crude extract does exhibit moderate dopamine receptor binding activity. We have used techniques such as vacuum liquid chromatography (VLC) and Sephadex LH-20 to purify, and thin-layer chromatography (TLC) for ongoing analysis. Future plans are to further refine these materials to purity, and to get more biological testing done. We hope to see if there is dopamine receptor activity in pure compounds for potential applications to Parkinson’s disease, for which there is currently no cure.

Views of Pre-service Teachers and School Law

*Benson, Kelly; Byers-Kirsch, Jan*

*Faculty Mentor(s): Kelly Benson, Education*

Poster Presentation Session #2, Poster # 17
11:15-1:45 in Ballroom C/D

This study sought to ascertain the perceptions of pre-service teachers in P-12 education enrolled in a school law course and students enrolled in student teaching at a large Washington state university. The purpose of the study was to shed light on the perceptions of students prior to accepting their first teaching assignment. Question: Qualitative and quantitative methodologies were utilized to address “What are pre-service teacher’s perceptions of school law?” Descriptive statistics were used to evaluate the participant responses. Evidence: Two groups of students were electronically surveyed; one group enrolled in an undergraduate school law class and another group who completed the law course and were student teaching. Of those students enrolled in the education law course (n= 25), 12 responded or 48%. Of those students who took the education law course and were student teaching (n=217), only 16.5% responded. Conclusions: This study began the foundational work to enlighten our profession with regard to the perceptions of pre-service teachers’ knowledge of school law. When looking at the results, the majority of questions were answered correctly by students enrolled in the educational law course on areas covering student/teacher rights, religion, child abuse, copyright law, and special services. Areas where both groups scored high were student rights, child abuse reporting, electronic media, special services, and teacher rights. Areas where both scored low included teacher contracts, freedom of speech, parent rights, extra-curricular drug testing, and curriculum. All pre-service teachers reported the education law class as beneficial to becoming a teacher.
**An Image of the City**  
*Berberick, Katie*  
*Faculty Mentor(s): Maya Chachava, Art*

Poster Presentation Session #3, Creative Works # 33  
2:00-4:30 in Ballroom C/D

My creative project is a series of eight paintings along with photo and video projections that investigate the architecture of downtown Ellensburg. Historically, Ellensburg was a cross roads for fur trappers, cowboys, missionaries, miners, and Native Americans. Today, Ellensburg is still a dynamic community and a meeting ground for diverse groups of people. Architecture is one way in which people are able to leave marks of an earlier time while finding a space for community interactions. I am interested in the architecture of downtown Ellensburg a historical landmark a well a space for observing human relationships and community today. The body of work will be a reference to the buildings of Ellensburg and the history that they represent in combination with the contemporary image of the city that is created through architectural spaces. The project is funded through the C Farrell Research Grant. I am honored to have had this opportunity for historical research while investigating traditional and contemporary methods in art.

**Edgar Degas: The Practice and Process of Painting**  
*Berberick, Katie*  
*Faculty Mentor(s): Maya Chachava, Art; Matt Altman*

Oral Presentation, Session # 33  
1:10-1:30 in Room 301

Edgar Degas’ paintings of people in personal, everyday moments are images that have resonated through generations of viewers. He worked in France during the late nineteenth century when the country was in a state of total panic and anxiety. Artistically this environment added unique influences to Degas’ work, which was consistently about loneliness and seclusion. I argue that Degas ingeniously manipulated the formal elements of art so that his paintings could reach viewers on a more emotional level. This thesis will explore the context of the painting *The Absinthe Drinker* through French and art history and will also examine the formal elements of art in Degas’ work.
Black Carbon Concentrations from an Ice Core from Tupungatito Glacier in the Central Andes

*Berg, Kayla*

*Faculty Mentor(s): Susan Kaspari, Geological Sciences*

Oral Presentation, Session # 11
11:00-11:20 in Room 137B

Black Carbon (BC) is a particle formed from the incomplete combustion of biomass and fossil fuels. When BC is deposited on a glacier or snow surface, the surface albedo (reflectivity) is reduced. The BC absorbs sunlight producing heat, which can accelerate snow and glacier melt if substantial BC is present. This can lead to a decrease in water availability for major urban areas that rely on snow/glacier runoff as a water resource. BC has not previously been measured in snow or ice in South America, even though snow and glacier water from the Central Andes provides an important source of runoff. Herein, we present a record of BC from a shallow ice core spanning 2000-2010 from the Tupungatito glacier in the Central Andes. BC was determined using a Single Particle Soot Photometer (SP2). The BC concentrations peak during the summer months, and exhibit interannual variations. The record is being examined further to determine if the variations are due to changes in emissions, transport, and/or precipitation. BC on Tupungatito has caused an albedo reduction of up to 4.6% between 2000 and 2010, suggesting that BC has the potential to affect water resources in this region.

In Vivo Inhibition of Nitric Oxide Production Leads to Clinical and Immunological Improvement of Hookworm Infection

*Berndt, Amanda*

*Faculty Mentor(s): Blaise Dondji, Biological Sciences*

Oral Presentation, Session # 18
12:20-12:40 in Room 137A

Hookworm infection is a major cause of anemia, malnutrition, growth delay and cognitive defects in resource poor countries. Human and animal studies suggest that infection with these intestinal nematodes is associated with impaired cellular immunity, characterized by reduced lymphocyte proliferation in response to both parasite and heterologous antigens. In vitro studies have shown that nitric oxide (NO) is one of the leading agent causing impaired cellular responses. Spleenocytes from infected hamsters secreted more NO in culture than did those from naive animals. In order to further identify the role of NO in hookworm pathogenesis and pathology, we conducted an experiment where the production of NO was inhibited using N-Monomethyl-L-Arginine (L-NAME). Hamsters were infected with 100 third stage larvae of the hookworm, *Ancylostoma ceylanicum*. Hamsters that received L-NAME showed lower worm burden (4 + 2) at day 36 post-infection (PI). The worm burden in the control group, without L-NAME was (21 + 4, p < 0.005). Similarly, the L-NAME group had lower egg count as from day 22 PI to day 36 PI. Anemia was assessed by measuring the hemoglobin levels and showed that the hamsters in the control group were more anemic. Together, these data suggest that NO modulates the clinical outcome of hookworm infection.
Identifying Missing and Unidentified Persons: A New Methodology
Blume, Andrea
Faculty Mentor(s): Dr. Charles Reasons, Law & Justice

Oral Presentation, Session # 2
8:30-8:50 in Room 137A

The challenges in Washington State for missing and unidentified persons are complex and part of a national problem. The National Institute of Justice estimates that there are 40,000 unidentified remains in the United States, and that there are as many as 100,000 active missing person’s cases at any given time (National Missing and Unidentified Persons System, 2011). My project study will identify how many additional missing and unidentified person cases there are by compiling the databases of the private and other governmental-run databases to Washington State’s database. From these comprehensive comparisons, I will identify the Washington cases that are not in our State’s database or the National database. I will also identify the Washington cases that lack dental, DNA and family reference DNA submissions, which like other states, contribute to the growing number of unidentified remains across the nation. From there, law enforcement agencies will be given the data to update their system which ultimately uploads into the state system. By identifying the cases specific to the agencies that lack DNA and Dental, it will bring awareness to each case of what samples are still needed in order to give these cases the best chance they have for identification and recovery.

Whirlpool—Challenges in Supply Chain Management
Boivin, Alan; Cramer, Travis; Sherdiwala, Jugal
Faculty Mentor(s): Kun Liao, Operations & Supply Chain Management

Lynnwood Center - Poster Presentation, Poster # 1

Appliance manufacturer Whirlpool was already in the process of centralizing its supply chain strategy when it acquired Maytag in 2005. Consequently, the company faced even greater challenges in the development and consolidation of their supply chain. As the country’s largest manufacturer of major household appliances, the company was compelled to develop a robust supply chain system satisfying its various stakeholders—suppliers, carriers, distributors, customers, and shareholders. The purpose of our project is to examine and analyze the choices made by Whirlpool in the development of their supply chain system and determine the reasoning behind the company’s decisions. Additionally, we will explore the consequences of Whirlpool’s actions, compare their results with major competitors, and determine what other possible options may have taken.
This paper uses existing studies and baseline data reports to evaluate 19 categories of potentially affected resources by the proposed Pebble Mine in Alaska. Of the 19 categories of resources, five were selected for more thorough analysis: these are surface water hydrology, groundwater hydrology, trace elements, water quality, and wildlife and their habitats (most specifically salmonoid species). Specifically, this paper focuses on the methods of ore removal, denudation of waterways from the removal of 35 billion gallons of water from surface and groundwater systems, storage of mine tailings in at least two tailings ponds, creation and infiltration into the water systems of Acid Mine Drainage, potential for slurry pipe failures, dissolved copper, and lastly how any and all of these could affect the water quality that salmonoid species rely upon. The importance of this study is that the site of the mine would lie at the headwaters of the largest sockeye salmon (Oncorhynchus Nerka) fishery in the world. Because this mine has the potential to be the largest producer of gold and copper in the world, the debate surrounding its construction has led to the popular title of “Fish vs. Gold.”

Artemisia annua L., produces a secondary compound (artemisinin) that is currently one of the most effective drugs for combating malaria. Limitations in commercial production of artemisinin include the relatively low yield of the compound within the plant (usually 0.01-0.50% of the total dry weight) and the fact that, as yet, we do not understand the metabolic pathways that produce the compound well enough for artificial synthesis. High-yielding strains of A. annua have been produced using traditional breeding methods that yield up to 1.0% artemisinin (per total dry weight). Unfortunately, these strains are proprietary and not available to all farmers seeking to grow A. annua for Artemisinin production. We are working to determine the effect of high light and other environmental stresses such as drought and UV-B exposure on the production of artemisinin and photosynthetic productivity of low-yielding strains of A. annua. When plants are grown in moderate light (about ¼ full sunlight) and then treated with high light (full sunlight) for up to six hours, they experience some light-induced loss of photosynthetic efficiency, increased formation of compounds indicating oxidative stress (e.g. singlet oxygen, superoxide and hydrogen peroxide radicals) and increased in artemisinin production. This occurs without an appreciable loss to photosynthetic carbon assimilation indicating that treatment with high light prior to harvest may be an effective way to increase artemisinin production, even in non-proprietary, low-yielding strains of A. annua.
Documenting Metamorphism, Deformation, and Cooling across Gianbul Dome, Zanskar, NW India  
**Bowman-Kamaha'o, Meilani**  
*Faculty Mentor(s): Jeff Lee, Geological Sciences*

Oral Presentation, Session # 11  
10:40-11:00 in Room 137B

The Himalayan Mountains, characterized by high elevations and rapid erosion, are the consequence of continent-continent collision. Although collision is distinguished by contractional deformation, a major extensional fault zone, the Southern Tibetan Detachment System (STDS) trends parallel to the primary contractional fault, the Main Central Thrust (MCT). The channel flow hypothesis (CFH), characterized by a 30km thick, southward flowing channel of ductile mid-crustal rocks bounded above by the STDS and below by the MCT, was developed to explain simultaneous motion on these faults. One prediction of the CFH is the development of gneiss domes, such as Gianbul Dome, that expose mid-crustal rocks within the mountain front. To test the application of the CFH in NW, India this study documents metamorphism, kinematic shear sense, deformation temperatures, and cooling ages across Gianbul Dome. Migmatites in the core of the dome are mantled by decreasing metamorphic grade metapelites and orthogneiss, cross cut by generations of leucogranites. Metamorphism reached temperatures and pressures up to 750°C and 8kbar (Robyr et al, 2002). Kinematic shear sense indicators reveal top-down NE in the northeast side of the dome and top-down SW in the southwest. High grade metamorphic minerals grow synchronously with the deformation fabrics, indicating deformation at peak metamorphism. Deformation temperatures decrease from ~700°C across the center of Gianbul Dome to 400°C on the flanks. Near symmetric cooling of the dome below ~400°C occurred at ~19-22 Ma and after formation of the domal geometry. Results indicate that deformation accompanied exhumation from ~700-400°C agreeing in part with the CFH.

**A Closer Look at Air: Measuring Visible Particulate Matter at Harrah Elementary and Considering Sources of Variation in the Air Quality**  
**Bowman-Kamaha'o, Meilani; Estock, Dan; Carey, Ashley; Fernandez, Maria; Broncheau, Anton; Pineda, Gladis; Estock 5th Grade Class, 2011-2012**  
*Faculty Mentor(s): Lisa Ely, Geological Sciences*

Poster Presentation Session #2, Poster # 33  
11:15-1:45 in Ballroom C/D

The air we breathe in our homes, school, and outdoors is much more than a solution of oxygen, carbon-dioxide, and nitrogen gases. In fact, visible solid particles make up an important component of nearly all air. Visible particulate matter can be picked up by the wind, kicked up by animals, stirred up by people, or blown out of vents from buildings and factories. This study measured the quantity of visible particles at four sample locations across the Harrah Elementary School campus over three weeks. Fifth grade students recorded simultaneous changes in the environment, such as rain, heavy winds, and room cleaning, to better understand how and potentially why the air quality changes across campus. Three stations were outside and one station was inside: 1) Harrah Road/Front school yard, 2) main parking lot, 3) basketball court/playground tree, and 3) Mr. Estock's 5th grade classroom. Three visible particulate detectors were hung at each station and replaced every 3-4 days. The detector plates were then photographed through a microscope at 100x magnification. Using the photomicrographs, students counted the number of visible particles, greater than ~100microns, in a 1 mm x 1 mm square, and took the average of the three detector cards for each 3-4 day sample period. Comparing these data with the observed changes in the environment during the sampling period, we found that the parking lot had the greatest number of visible particles, dust storms greatly increased the number of visible particles, and the classroom had the fewest visible particles.
The Nostalgic Trance
Brown, Marianna
Faculty Mentor(s): Therese Young, Physical Education, School and Public Health

Creative Expression Presentation, Session # 34
1:10-1:30 in Ballroom A

This piece was created in a choreography dance class, in which our requirements for the project constituted finding a poem, followed by a piece of art and then finally using key words brainstormed from those two works, creating movements, from which the dance would begin. This was a very different process from which I usually choreograph, but I believe it strengthened my art as it grew in depth. Having to pull from so many sources to create one creative movement creates a deeper meaning to the movements performed. The poem that started this creative endeavor was “I loved You Once...” by Pushkin. The art piece I drew my inspiration from was, The Erosion of Yang, by Scot Mayberry. The music chosen, Sentimientos, by Andres Linetzky & Ernesto Romeo, is a seductively nostalgic tango piece which strengthens the yearning qualities in the movement. The dance explores concepts of love, rejection, unresolved feelings of desire, and dedication to a cause. The dancer is focused on a loving memory, and continues to become lost in her thoughts of her loved one, fueled by desires to get them back, or at least give it a good try. I believe this concept is easily relatable to real life because mostly all people have been rejected when they were not ready for it. The piece ends with the dancer torn between her heart’s longing, and the truth she must ultimately face.

Preparation of Polyelectrolytes Chemisorbed to a Silica Surface
Bryce, David
Faculty Mentor(s): Dion Rivera, Chemistry

Oral Presentation, Session # 19
12:20-12:40 in Room 137B

In the interest of exploring polyelectrolyte/surfactant complex use to move and deposit hydrophobic molecular cargo to a surface, silica anchored polyelectrolyte complexes were synthesized. These silica complexes were generated by an initial amination of terminal silanol groups of silica nano-particles that were synthesized via the well know Stüber process. Subsequent reaction of anhydride groups of poly(styrene-co-maleic anhydride) with these amine groups via electrophilic substitution was carried out. Throughout synthesis addition of desired groups to the silica surface was monitored using attenuated total internal reflection Fourier transform infrared spectroscopy (ATR-FTIR). The ATR-FTIR spectra show that the polymer is successfully attached to the aminated silica surface and that the resulting surface bound polymer does have bands that correspond to carboxylate functionality and give the bound polymer a polyelectrolyte character.
Polyelectrolyte Surfactant Complexes
Buck, Kathleen
Faculty Mentor(s): Dion Rivera, Chemistry

Oral Presentation, Session # 19
12:40-1:00 in Room 137B

Anionic polyelectrolytes, when in solution with cationic surfactants, form polyelectrolyte-surfactant complexes (PSC). These PSCs display unique characteristics, which have possible implications in the removal of water-soluble organic compounds from water to be used for human consumption. The goal of this research is to understand how these PSCs interact in the absence of water-soluble organic compounds. A model system involving polysodium-4 styrenesulfonate as a polyelectrolyte and cetylpyridiniumbromide as the surfactant will be employed in this study with titanium dioxide (TiO$_2$) present to aid in the removal of the PSC from solution. The concentration of polyelectrolyte is held constant while the concentration of surfactant is adjusted over a range of 40 to 520 times the polyelectrolyte concentration. The range is then used to determine at what point the PSC crashes out of the solution. To determine the amount of PSC that is remaining suspended in solution, ultraviolet-visible spectroscopy will be used. Data from these results will then be compared with an analysis already completed in the research lab involving the PSC interacting with organic compounds to help better understand how the polyelectrolyte surfactant complex interacts with the organic dye compounds in the presence of TiO$_2$.

X-Men
Burck, Ryan
Faculty Mentor(s): Melissa Johnson, English

Oral Presentation, Session # 44
4:10-4:30 in Room 135

The film, X-Men, provides a metaphor for social marginalization regarding views of immigration, racial status, and ethnic minorities. This marginalization forces outcasts to fight back, even if they were previously peaceful. I argue that by creating these social margins and seeing mutants, immigrants, and other ethnic differences as dangerous, people create violence, which would not exist if outcasts were not marginalized. One author, Borges, explains how slums and ethnic suburbs are created by marginalizing people who are outside the norm, which in turn causes them to be violent and fight back. Therefore, the less social marginalization, the more violence would decrease, and cultural differences would not be seen as negative. From my research I draw examples of how immigrants can adapt to a new life while keeping their cultural heritage. If there is negativity from the national identity, however, then immigrants will seek comfort in numbers and create social marginalization between the two.
Thermal Biology of the Northern Alligator Lizard (E. coerulea): A Laboratory Study
Butterfield, Taggart; Beck, Daniel
Faculty Mentor(s): Daniel Beck, Biological Sciences

Oral Presentation, Session # 36
3:40-4:00 in Room 137A

Many reptiles are known to regulate body temperature, but little is known about the thermal biology of the Northern Alligator lizard E. coerulea, which inhabits the Pacific Northwest. I used a thermal gradient to explore the following questions: 1) when given a diversity of temperature options, do Northern Alligator lizards show a specific temperature preference? If so, what is their “preferred” body temperature? 2) Does their body temperature preference change after feeding? and 3) does any tendency to either avoid other lizards, or group-up with other individuals, influence body temperatures of Alligator lizards in a thermal gradient. To address these hypotheses, I divided an ectothermatron (large cage, set up as a temperature gradient) into different temperature regions: one end at 15°C, the middle 25°C, and the other end 35°C. I placed six hideboxes in these regions and observed where lizards spent the most time. I conducted trials on 10 lizards over 4 months. For the “feeding treatment,” data were recorded up to 2 days after eating (meal size ~20 crickets); and 7 days post feeding for the “unfed treatment.” Lizards seemed to prefer intermediate temperatures (mean for all lizards Tb =25.2 ±2.91) but showed no differences in body temperatures before feeding (Tb =25.6±2.93) than after feeding (Tb=24.8±2.87). After feeding, however, lizards seemed to allow less variation in environmental temperature. Preliminary results suggest that lizards chose hide boxes independently of the presence of other lizards.

The Geoarchaeology of Raven Bluff, a Fluted Point Site in NW Alaska
Buvit, Ian, Anthropology

Oral Presentation, Session # 41
2:40-3:00 in Room 271

Raven Bluff is located on a remnant limestone knob overlooking a series of cut terraces formed when the Kivalina River dissected glacial outwash. The site is located on a poorly drained, flat area near the top of the knob. Radiocarbon dates indicate that the site was initially utilized at least 10,000 radiocarbon years ago. Much of the Raven Bluff landform is mantled by coarse, grain-supported limestone gravel covered by a thin veneer of loess, but sub-surface testing identified a portion of the site containing an artifact-rich, 1.5 m-deep layer of matrix-supported gravel overlain by as much as 65 cm of clayey and silty mud. Despite evidence of freeze-thaw and rodent activity at the site, the archaeological material is relatively undisturbed. Understanding formation processes and stratigraphy is important here because of the site’s rare Late Pleistocene-age faunal assemblage and artifacts (microblades, fluted points) that previously have had poor chronological control in Arctic Alaska.
Children of the Holocaust: Faith
Byrnes, Andrea
Faculty Mentor(s): Heidi Szpek, Philosophy and Religious Studies

Oral Presentation, Session # 6
9:30-9:50 in Room 202

My research is attempting to look at how the faith of young children under the age of twenty was affected after surviving the Holocaust. The significance of this study is to understand the differences between religion and faith as compared to the innocence of youth and how it can be affected by trauma. I am analyzing the concepts of faith as displayed within the memoirs and journals of those children who survived. By reading their own words and seeing the experience through their own eyes it has given me a better understanding of just how and why their faith was affected. I discovered that many of the children who survived relied on either the idea of family, or actual members of their family with them. It became obvious that the mother played a vital role with those who would retain faith. Also, if the survivor had a brother or sister alongside them, it gave them a reason to stay alive and keep their family member alive.

More Than Just The Money: A Look at The Psychological Effects of Sexual Human Trafficking
Caballero, Jordan
Faculty Mentor(s): Jason Wallin, Psychology

Oral Presentation, Session # 13
10:00-10:20 in Room 201

This presentation analyzes the psychological effects of sexual human trafficking. It showcases the prevalence of learned helplessness, Stockholm syndrome, and PTSD developed by the victims of human sex trafficking, focusing on the state of Washington. I supplement my library and Internet research with media in the form of video interviews and other documentary footage. The research is presented in a short film documentary. Through this research and presentation, I hope to portray the seriousness of human sex trafficking and bring its effects out of the shadows to our families, classmates, and the community. (Editor’s Note: This presentation may contain adult themes, content or imagery.)
**Expressions of the Soul**  
*Cahill, Mackenzie*  
*Faculty Mentor(s): Bret Smith, Music*

Creative Expression Presentation, Session # 50  
4:50-5:10 in Ballroom A

The different musical structures used in a piece allows for the expression of inner human longings. An understanding of the motivation to express inner longings is needed to explain the content of what an individual composer is attempting to portray in his/her work of musical art. People have needs and wants that they are driven to express. People are motivated to use a means of communication to convey them. So embedded within the musical structures of a piece is the “content” of those longings raised to the surface for the “eyes” of the people in the audience to see. The author will look into and try to better understand the “complex structures” behind musical works of well-known composers to search for how music expresses longings of human-beings. The author will perform one composition of hers on piano to an audience at Central Washington University. Afterwards, she will open it up to the audience and pose her question. The audience will be asked to give their own opinions on how well-known composers have used different structural components in music to express what is on the composers’ hearts and minds. She will transition and focus on the audiences’ responses to her own composition. She will ask the audience to give their opinions on how she emphasized certain structural components to express her “mind.” She will close the discussion with the hope that people will take away a deeper sense of how music is used to express humanity.

**A Design for Active Central Students**  
*Cain, Laura; Disbrow, Kelsey; Fields, Lisa; Woods, Stephanie*  
*Faculty Mentor(s): Vanessa Harbour, Physical Education, School and Public Health*

Poster Presentation Session #3, Creative Works # 40  
2:00-4:30 in Ballroom C/D

Public health educators work to increase the mental, physical, and social health of the population. They do this by planning health interventions for a target audience from the needs found in previous assessments. Precede-Proceed is an eight step model which focuses on planning, implementing, and evaluating a program with the target of an improved quality of life in mind (Green et al 2005). Students in the public health education program at Central Washington University (CWU) are provided a real world experience in planning programs. This builds knowledge, skills and competency as a health professional. Students implemented a health intervention to be innovative and creative while focusing on the needs and desires of the target population (their peers). Question: Students in the public health program conducted a health needs assessment of CWU college students in an effort to develop an intervention to improve their quality of life. Evidence: Public Health Education students used outcomes from the needs assessment to coordinate a campus wide health fair. The health behavior my group targeted was physical activity because of the multidimensional effects on short and long term health. Conclusion: Our group planned and designed a creative and interactive booth at the health fair. The booth was designed to achieve several objectives; increase knowledge of the physical activity resources on campus, increase awareness of the health benefits of physical activity, and demonstrate alternative ways to be active. Additionally, we designed and held a 5 k dog fun run on the Saturday following the fair.
The Effect of Contextual Variables on Gossip Transmission

Campbell, Bradley; Parker, Joshua
Faculty Mentor(s): Kara Gabriel, Psychology; Susan Lonborg, Psychology

Poster Presentation Session #3, Poster # 16
2:00-4:30 in Ballroom C/D

Gossip is the exchange of personal evaluative information about absent third parties. Although gossip and rumor have been traditionally equated, they differ with regard to the context in which they surface and in the type of information they convey. Gossip has been examined from many perspectives such as gossiper approval ratings, gossip veracity, and gossip valence (i.e., positive or negative). The present research sought to further assess the effects of gossip valence as well as the context and the mode of conveyance on self-reported likelihood of transmission. In Experiment 1, 106 undergraduates completed the Gossip Propensity Scale (GPS) in addition to other personality measures. Factor analysis of the GPS revealed three factors, interpreted as emotional consequences/experience, indirect communication, and concern for other’s reactions. In Experiment 2, 252 students completed the GPS and the Toronto Empathy Questionnaire (TEQ; assessing empathic thinking) in response to 1 of 12 vignettes varying in whether the information they conveyed was positive or negative, if the setting was academic or personal, and if the information was conveyed face-to-face, through email, or in text-messaging. An initial 2 x 2 x 3 MANCOVA was conducted on the GPS subscale scores with the TEQ as the covariate, but the TEQ showed a lack of effect and a subsequent 2 x 2 x 3 MANOVA was conducted. The results revealed a multivariate three-way interaction with respect to the three GPS subscales. These findings suggest that several characteristics of the information influence gossip transmission, further analyses of this interaction are currently ongoing.

Prioritizing Forest Restoration Treatments Using Decision Support and Geospatial Analysis on the Okanogan-Wenatchee National Forest, Washington, USA

Cannon, Jamie; Hickey, Robert; Gaines, William; Walsh, Megan
Faculty Mentor(s): Robert Hickey, Geography

Poster Presentation Session #3, Poster # 13
2:00-4:30 in Ballroom C/D

Forest restoration activities are critical to restoring natural processes and functions, including fire and hydrologic interactions. There is also an urgent need to recreate a forest structure suitable for wildlife and aquatic habitat that is resilient to disturbance events, such as wildfire and the threat of insect outbreaks and disease epidemics. Restoration activities, such as prescribed fire and road closures, enhance the resiliency and sustainability of forests through treatments that incrementally return the ecosystem to a state of resilience, while anticipating climate change impacts, including drought. This research examines a process by which to prioritize treatments areas and develop prescriptions, using a decision support tool called the Ecosystem Management Decision Support (EMDS), in a geospatial analysis. Five criteria were evaluated to prioritize restoration treatments areas in two adjacent sub-watersheds on the Entiat Ranger District: vegetation condition, landscape fire movement, wildlife habitats, and a road network evaluation, coupled with an assessment of aquatic/road interactions. The criteria attributes are ranked and weighted in EMDS to produce spatial-model outputs that effectively prioritize treatments areas on the landscape, and suggest management prescriptions to meet restoration objectives. This method has improved efficiencies related to field work, environmental regulations, and land ownership collaboration, in addition to providing a transparent approach to decision making to meet restoration goals.
Effect of Fat Supplemented Diets and Deficient Nicotinamide Nucleotide Transhydrogenase on Oxidative Stress Levels in *C. elegans*

*Carter, John*

*Faculty Mentor(s): Carin Thomas, Chemistry; Lucinda Carnell, Biological Sciences*

Poster Presentation Session #1, Poster # 29
8:30-11:00 in Ballroom C/D

In 2010, the Centers for Disease Control and Prevention reported that in the United States, diabetes affects 25.8 million people or 8.3% of the population. Diabetes is, in fact, the most prevalent metabolic disorder in the world, though the cellular mechanisms which initiate the disease are still unclear. Recent research indicates that there may be a link between mitochondrial dysfunction and type 2 diabetes. The aim of this work was to investigate the role of a mitochondrial enzyme, Nicotinamide Nucleotide Transhydrogenase (NNT-1), in maintaining mitochondrial function in *Caenorhabditis elegans* exposed to fat supplemented diets including stearic or oleic fatty acids. The nnt-1 mutant worms lack functional NNT-1 protein in their mitochondria. These worms are highly susceptible to free radical oxidation as NNT-1 produces NADPH, which is used for free radical detoxification. In this study, the chronic effect of fat supplemented diets and deficient NNT-1 status was investigated in two strains of *C. elegans*, including the wild-type (N2) worm and an nnt-1 mutant. The scope of this research includes observing mitochondrial function through oxygen consumption and ATP measurements, and lipid peroxidation levels through measurements of the oxidized lipid breakdown product malondialdehyde (MDA). Preliminary data suggests that the nnt-1 mutant worms undergo more oxidative stress as seen in their elevated MDA content as compared to wild-type worms. Additionally, the mutant worms exposed to fat supplemented diets have lower ATP levels, suggesting dysfunctional mitochondrial oxidative phosphorylation. This is in contrast to the oxygen consumption studies, where no difference was observed.

Calculating Genetic Variation of Vervet Monkeys through Alu Insertions

*Carter, Samantha*

*Faculty Mentor(s): Joseph Lorenz, Anthropology*

Poster Presentation Session #1, Poster # 30
8:30-11:00 in Ballroom C/D

In this project, research will be conducted on the DNA of vervet monkey populations of Africa. This research is vital to gaining a deeper understanding of the genetic variations within and among populations. This experiment will focus on retroelements called Alu elements. Alus are segments of DNA that repeatedly copy themselves, with these copies being inserted into various places in the genome. The presence, amplification, and number of copies will determine which individuals are more closely related than others. Through the usage of Alus, this research should determine the approximation of which vervet species and subspecies are more closely related than others, as well as the time at which these populations split. This project will utilize a selection of DNA samples collected from about 700 individual vervets from populations all over Africa where vervets are found. This project is still in the beginning phases of its data collection. The Alus selected in this project were chosen for their anticipated insertion lengths and the variability of their insertion lengths. Thus far, results are promising. The individuals have been showing a variety of insertion forms—homozygous positive, heterozygous, and homozygous negative have all been present in individuals. At this point, no sequencing has been conducted, so the variability of band insertion length is not yet known. The variation in insertion presence is still promising, however. It signifies that there are differences between individuals, which could be representative of differences in populations.
An important skill for overcoming academic challenges is seeking help when confronted with difficulty. In addition, previous research has identified gender differences in the tendency to seek professional help for personal problems (Addis & Mahalik, 2003). In this study we investigated various potential influences on academic help-seeking behaviors among students at CWU. Participants were 567 students, 184 men and 376 women, recruited from the psychology department research participation pool. Participants completed the 30-item short form Bem Sex-Role Inventory, the Academic Help-Seeking Behaviors Inventory, as well as a demographic questionnaire which included questions concerning year in college, ethnicity, gender, academic information, and whether students transferred from another university. The Academic Help-Seeking Behaviors Inventory is an original eight-item rating scale that was created for this study by the researchers. Although there were few differences between various student groups in help-seeking behavior, there was a significant effect for sex-role as measured by the Bem Inventory. Those who identified with the androgynous sex-role type were more likely to seek academic help than either feminine or masculine sex-role types. In contrast, no significance was obtained between help-seeking behavior and gender.

An Analysis of Information Regarding False Confessions with a College Sample

Poster Presentation Session #3, Poster # 25
2:00-4:30 in Ballroom C/D

The current study investigated the opinions and thoughts of Central college students in regards to false confessions and the interrogation process. Previous literature has examined circumstances in which false confessions occur, but no research to date has investigated the thought process and reasoning of college students on false confessions. In pursuing this question, an original survey created by the researchers was distributed to participants via the Psychology department’s SONA system. Data was gathered from 70 students, none of which were excluded on the basis of incomplete questionnaires. Results were analyzed utilizing a multiple regression model in an attempt to observe which specific variables constituted the largest effect on the criterion variables. Several regression models were run indicative of the criterion variable tested. Statistical significance was observed between the criterion variable of “convicted after renouncing confession”, and the predictor variables of “confessions coerced by police” and “wrongful convictions involve false confessions”, F(2,67)=6.507, p=.003. Marginal statistical significance was observed between the criterion variable of “police recognize false confessions”, and the predictor variables of “police utilize weaknesses while interrogating”, “police utilize violence while interrogating”, and “police possess lie detecting skills”, F(3,67)=2.667, p=.055. As this study utilized an exploratory questionnaire, additional readmission, as well as psychometric properties must be conducted in order to establish validity and reliability of the questionnaire.
Field Dependence-Independence and Harmonic Dictations in Music Theory Students

Chandler, Brandon

Faculty Mentor(s): Marte Fallshore, Psychology

Oral Presentation, Session # 13
10:40-11:00 in Room 201

Students in music theory classes at Central Washington University participated in a study on field dependent-independent cognitive styles and the relation to students’ scores on harmonic dictation tests. Participants were tested for field dependence-independence using the Group Embedded Figures Test. These scores were then compared with scores on harmonic dictation tests. According to the hypothesis, participants who score as field-independent will score higher on harmonic dictations than those who test to be field-dependent, and this difference will be significant. Keywords: field dependent-independent, harmonic dictation, perception, and cognition.

Analyzing the Participants of the Food Stamp Program

Cheung, Kwok Wai

Faculty Mentor(s): Dominic Klyve, Mathematics

Oral Presentation, Session # 20
11:40-12:00 in Room 140

The Supplemental Nutrition Assistance Program (SNAP) provides financial assistance for food purchasing to low-income and no-income people and families living in the United States. It is a federal aid program - more commonly known as the Food Stamp Program. The United States Department of Agriculture (based on a study of data gathered in Fiscal Year 2010), has summary information about food stamp recipients, but it is hard to find more detailed information. In this project, I used the data from the web site of “The Panel Study of Income Dynamics (PSID)”. The study began in 1968 with a nationally representative sample of over 18,000 individuals living in 5,000 families in the United States. I analyzed the data in 2009, and there were 8,690 observations for each variable. By analyzing the data, we can find out or predict different kind of questions, for example: (1) Is there any difference between the number of males and females receiving the food stamps? (2) Is the average age of male receiver different than the average age of female receiver? (3) Is there a relationship between food stamp receivers and their mortgage status?

Destructive Representations of Gender Roles as Portrayed in Film

Clark, Patrick

Faculty Mentor(s): Melissa Johnson, Communication

Oral Presentation, Session # 35
3:40-4:00 in Room 135

Gender roles and character portrayals of teenage girls in film have been an unrealistic representation of conventional youth behavior throughout the years. From Clueless in 1995, to Mean Girls in 2006, these films have portrayed teenage girls as exactly that, clueless and mean. The characters in these selected films lead unrealistic lives while acting in abnormal fashions. They are often self-entitled, beautiful, and wealthy, while remaining “independent”, thus the characters and their lives seem appealing to their target audience. While these films showcase characters in self-destructive behaviors, the films emerge as comedies, making light of bullying, drug-use, and sexual activities. This diagnostic research study will evaluate how gender roles and character portrayals in film have been shaping what girls deem as acceptable behavior, and the emerging preconceived notions because of these portrayals. The evaluation will be conducted through the viewing and studying of the selected films, Sixteen Candles, Clueless, and Mean Girls. Included will be a cross analysis of these films with secondary research focusing on the psychology of influential behavior and the effect it has on teenage girls.
Economic Trends of Income and Race

Cole, Alexander

Faculty Mentor(s): Rex Wirth, Political Science

Oral Presentation, Session # 4
9:10-9:30 in Room 140

An empirical analysis into trends between race and income found using a cross-sectional regression and created out of data taken at the state level.

Glaciation in the Wenatchee Mountains, Washington State

Collins, Brad

Faculty Mentor(s): Karl Lillquist, Geography

Oral Presentation, Session # 11
10:00-10:20 in Room 137B

The Wenatchee Mountains, an outlier of the Cascade Range, show evidence of previous glaciation. However, no research had previously been done on glaciation in the area. I examined cirque floor elevation, cirque aspect and cirque development with distance from the Cascade Crest in the Wenatchee Mountains. Data was gathered using a combination of Forest Service aerial photographs viewed in stereo, USGS topographic maps, and cross referencing interpretations with Google Earth. Cirques were digitized into ArcGIS so information could be stored in a geo-database, and so cirque distribution may be viewed more clearly. In total, 93 cirques were identified and recorded in the study area, with the mean and median cirque floor elevation being 5,923 feet and 5,940 feet respectively. Cirque floor elevations appear to rise eastward; however, statistical analysis of the data showed that this pattern is not significant. Average cirque floor elevations are 85 feet lower in northern drainages than in southern drainages; however, a difference of means test indicates this number not to be significant. Cirque aspects were highest in frequency to the north east with a median aspect of 80°, paralleling previous studies on cirque morphometry; however, there was no significant correlation between aspect and cirque floor elevation. This study concluded that while cirque characteristics suggest similar patterns associated to North American mountains, more data over a larger area would strengthen statistical results.

Studies Toward the Total Synthesis of Clavatadine A

Conn, Stephanie; Vreeland, Shannon; Wexler, Alexandra

Faculty Mentor(s): Stephen Chamberland, Chemistry

Oral Presentation, Session # 28
1:10-1:30 in Room 137B

Clavatadine A, recently isolated from the marine sponge *Suberea clavata*, is a specific and potent inhibitor of factor Xla. Factor Xla is a component of the coagulation cascade required for the formation of blood clots and is a potential target for treatment of cardiovascular disease. Our efforts to complete the first total synthesis of clavatadine A feature the carbamoylation of a phenol, prepared by dibromination of homogentisic acid lactone, and an azidoisocyanate, derived from ethyl 5-bromovalerate. From our advanced carbamate intermediate, we envision completing the synthesis of clavatadine A by guanylation and lactone hydrolysis.
Phylogenetic Accuracy: Examining the Effects of Rate and Composition Using Simulated Data

Coons, Arthur

Faculty Mentor(s): Linda Raubeson, Biological Sciences

Oral Presentation, Session # 45
5:10-5:30 in Room 137A

Phylogenetic analysis is the process of using the pattern of similarities and differences, usually in DNA sequence data, to infer patterns of evolutionary relationships among groups of organisms. There are several known issues that might cause phylogenetic analyses to be “fooled” into supporting incorrect evolutionary relationships. One of these issues is known as long-branch attraction, and it occurs when two unrelated evolutionary branches both have high rates of mutation, and therefore share enough mutations due to random chance that they are incorrectly grouped together as close relatives. A second issue is called nucleotide composition bias, and this occurs when two unrelated groups share a specific bias (“overuse”) towards particular nucleotides, and so are incorrectly paired together, because they share the biased nucleotides due to chance. Using simulation techniques, my study will examine how long-branch attraction and nucleotide composition bias interact to cause incorrect phylogenetic inference. In simulation studies, DNA data is simulated (“made up”) on a known evolutionary tree under different models of branch length and nucleotide composition, and then the data is used for phylogenetic analysis (using Maximum Likelihood, in my study). I am testing a wide range of evolutionary conditions and for each I will test lack of bias, branch length bias alone, composition bias alone, and the two types of bias together. Already I have found a number of conditions under which data based on the two types of bias together support incorrect relationships whereas data with each type of bias alone support correct relationships.

Investigation of BLUE100 Whole Egg Replacement Powder as a Low Cholesterol and Vegan Alternative in Apple Cake Mix

Copeland, Kari; Shelman, Melissa; Hunt, Heather;
Faculty Mentor(s): Dr. Virginia Bennett, Nutrition, Exercise, and Health Science

Poster Presentation Session #2, Poster # 8
11:15-1:45 in Ballroom C/D

Eggs play several important roles in baked goods, but contain high levels of dietary cholesterol and saturated fat, which may limit the availability to those on low cholesterol diets as well as to vegans. This experiment was designed to determine the acceptability of BLUE100 soy based egg replacer as a low cholesterol and vegan option in Conifer Specialties apple cake mix at 50% and 100% replacement. Samples were tested by 30 Central Washington University students on the qualities of perceived moisture, chewiness, and overall preference. In addition, the samples were tested on tenderness using a TA.TX2 universal texture analyzer and height of the baked product. The results showed that both the 50% and 100% were significantly (p<.05) shorter and more tender than the control. Moisture and chewiness between the control and 100% were significant (p<.05), however there was no significant difference in preference between the control and other samples. Overall, BLUE100 egg replacer is an acceptable replacement in the boxed apple cake mix, though it is marketed towards the manufacturers instead of the consumers.
Fire and Vegetation of Upland Meadows, Willamette National Forest, Oregon

Cox, Tamara
Faculty Mentor(s): Megan Walsh

Poster Presentation Session #3, Poster # 11
2:00-4:30 in Ballroom C/D

Fire plays a critical role in altering local landscapes and shaping vegetation regimes. Prior to Euro-American settlement, Native Americans used fires to maintain the oak savanna of the Willamette Valley, but little is known about the effects of Native American burning in montane meadows. Important resources, such as beargrass and huckleberries, are found in meadows in the Willamette National Forest, but these meadows are now disappearing. Fire and vegetation history of montane meadows can be reconstructed by analyzing the charcoal and pollen deposited in the sediments of nearby lakes. Two lakes have been chosen for this study: Waterdog Lake and Huckleberry Lake in the Willamette National Forest. Records from these lakes will help to reveal the fire and vegetation history of the area, and provide clues about how fire contributes to the biodiversity of upland meadow environments.

Northwest Regional Smart Grid Demonstration Project

Davis, Nathan; Pringle, Charles; Beardsley, Roger; Whelan, Michael

Oral Presentation, Session # 32
1:10-1:30 in Room 271

Please see the faculty members’ expanded peer review abstract on page 194.

Assessment of Biological Activity for Crude Extracts and Isolated Compounds from Plants

Diamond, Jane
Faculty Mentor(s): Eric Foss, Biological Sciences; Gil Belofsky, Chemistry

Poster Presentation Session #1, Poster # 5
8:30-11:00 in Ballroom C/D

Identification of new compounds extracted from plant species that have never before been researched has potential for finding new and better drugs to treat illness. By examining the effects of crude plant extracts on Staphylococcus aureus, a fast-growing, ubiquitous, gram-positive bacterium, biologically active extracts can be identified. Further separation of these by column chromatography may yield pure compounds with antibacterial activity. Most plant species produce at least moderately active antimicrobial compounds as part of their specific and non-specific defense systems. It is possible that some of these defenses hold the keys to treating or curing human diseases caused by bacteria. It is of interest to determine if crude plant extracts and pure compounds have antimicrobial activity or, alternatively, can potentiate the activity of known antibiotics. To explore this, a disk-diffusion based research method is employed to facilitate comparison between effects of the test materials on the growth of S. aureus. Small changes can be made for this method to work with other species based on normal growth rate of the organism used, and minimum inhibitory concentrations (MIC) of the antibiotic drugs needed for each organism used in different assays. The research model involves swabbing ‘lawns’ of bacteria on plates of tryptic soy agar (TSA), and adding sterile disks infused with varying concentrations of known antibiotics, crude extracts, or isolated pure compounds. Zones of inhibition around the disks can then be measured and compared. This model can be used with a variety of organisms, depending on the interests of the researcher.
Chia Gel is an Acceptable Cholesterol-Free Alternative to Egg in Spice Cake

Diamond, Jane; Krantz, Kaleigh; Houser, Whitney

Faculty Mentor(s): Virginia Bennett, Nutrition, Exercise, and Health Science

Poster Presentation Session #2, Poster # 11
11:15-1:45 in Ballroom C/D

Reducing dietary cholesterol can decrease the risk of developing atherosclerosis, hypertension, and cardiovascular disease. To explore a lower cholesterol alternative to a common food product, the sensory effects of reducing and eliminating cholesterol in a commercial cake mix with 25%, 50%, and 100% substitution of chia gel for the required egg by weight were examined. Three altered cake recipes and a control recipe were evaluated subjectively by untrained sensory judges for apparent difference, tenderness, moisture, and preference, and tested objectively for height, density, and texture. The recipe using 50% chia and 50% egg was significantly preferred over the control recipe. The 100% chia gel cake was rated the highest by sensory judges in both moisture and tenderness, but required the most force for a TA-XT2 texture analyzer to penetrate 15mm into the sample in objective tests. In a difference test comparing the control recipe to the 100% chia gel recipe, five of seven judges were able to correctly identify the different sample (significant, p

Quantitative Histological Analysis: Calcineurin’s Role in the Developing Nervous System

Dickerson, Andre; Albright, Chelsea; Linn, Megan; Selski, Daniel

Faculty Mentor(s): Daniel Selski, Biological Sciences

Poster Presentation Session #1, Poster # 17
8:30-11:00 in Ballroom C/D

The visual system is commonly used as a model for analyzing connections among developing neurons, the specialized cells that make up the nervous system. The specific neurons in this study are called retinal ganglion cells which consist of a cell body in the retina of the eye; and an axon which extends to the tectum, a specialized visual information processing part of the mid-brain that receives signals from the retinal ganglion cells. Calcineurin is a protein phosphate and intracellular protein that plays a role in axon growth (Mulero et al. 2009). In order to test calcineurin’s role in retinal ganglion cells axon growth, fertilized chicken embryos are removed from their shell and placed into incubators and treated with calcineurin inhibitors Tacrolimus (FK 506) and Cyclosporin A (CsA). Treatments were administered during the embryonic stages when axon growth is most active; embryonic day 5-9. We hypothesized that the axon layer of the retina within the FK 506 and CsA treated embryos will be thinner than the control embryos due to inhibitory effects of the drugs. We anticipated these finding due to previous work in our lab, calcineurin inhibitors appear to have the capacity to decrease axon growth. Histological analysis measuring the thickness of axon layers within the retina was conducted comparing the thickness between the treated and control embryos. Our preliminary findings show that there was less axon growth in the optic fiber layers of the FK 506 and CsA treated embryos when compared to the thickness of control embryos.
Regulation of Host Immune System by the Hookworm *Ancylostoma ceylanicum*

**Diliani, Nicholas**  
*Faculty Mentor(s): Blaise Dondji, Biological Sciences*

Poster Presentation Session #1, Poster # 13  
8:30-11:00 in Ballroom C/D

Approximately one billion people in the world are currently infected with hookworm. Despite this high prevalence, little research has been done on host immunosuppression by hookworm. Our study focuses on characterizing the mechanisms by which hookworm suppresses the host immune response. We hypothesize that hookworm secretes proteins to shift the immune system away from a Th2 response, a normal response responsible for clearing the infection, to a mixed Th1/Th2 response. This mixed response results in cytokines from each of these two immune responses being released, thereby suppressing a full Th2 immune response.  

Hamsters, *Mesocricetus auratus*, will be infected with 150 stage three larvae by oral gavage and given time to allow the larvae to develop into adult worms. The worms will then be collected from the euthanized hamsters and incubated at 37°C in phosphate buffer saline (PBS) to allow for excretory/secretory protein collection. These proteins will be inoculated subcutaneously into mice, *Mus musculus*, and given time to allow the immune system to recognize the proteins. Proteins will either be inoculated alone, with ovalbumin, or mice will be inoculated with PBS alone. Mice will then be boosted later on with the same priming inoculum. Characterization of the host immune response will be done using a proliferation assay, a flow cytometry assay, and enzyme-linked immunosorbent assay, and a delayed-type hypersensitivity measurement.

Salmon Species Use at the French Rapids and Hole-In-The-Wall Archaeological Sites on the Columbia River, Vantage, WA  
**Dinubilo, Shaun**  
*Faculty Mentor(s): Steve Hackenberger, Anthropology; Patrick Lubinski, Anthropology*

Poster Presentation Session #1, Poster # 35  
8:30-11:00 in Ballroom C/D

The French Rapids (45KT12) and Hole-In-the-Wall (45KT13) sites were excavated in the 1960s by Robert Kidd, but the fish remains were never analyzed. At least two periods of occupation have been identified at each site: upper house occupations (ca. 700 BP) and lower house occupations (ca. 1700-1900 BP). Between these times there is a suggested change in salmon use throughout the region, based on the Swiftwater Shelter site. This change is from an emphasis on Chinook to steelhead, for either behavioral or environmental reasons. As part of my analysis of fish bone from these two sites, I identified salmon vertebrae from both the upper and lower levels of the house features at 45KT12 and 45KT13. Determination of salmon species from vertebrae is difficult, but two methods were attempted here: the radiographic technique from Cannon and the measurement technique from Huber et al. Measurements of vertebra length and height and radiographs were taken for 13 whole vertebrae. Both tests suggest all 13 vertebrae are from Chinook. Although the sample size is small, these results provide no evidence of dietary change at these sites as purported for the Swiftwater Shelter at about the same time.
In the James Bond movies, there are consistent instances of clear gender stereotyping. In these films, it seems as though men and women are meant to play separate, definitive roles. These roles are clearly defined and give the viewer an idea of what is masculine and what is feminine. James Bond is strong, assertive, independent, and in charge of his own life. The women in the films, including the ones Bond is directly associated with, are sexually appealing; easy to manipulate and overtake; and are unable to accomplish tasks by themselves. Scholarly research notes that all of the portrayals of masculinity and femininity that are reflected through the characters in these films enforce these gender stereotypes. The gender traits demonstrated in the Bond movies are shallow and only graze the surface of what it means to be feminine or masculine. I use examples from the films as well as additional research to illustrate the dominant portrayal of men and the degrading portrayal of women as objects in the James Bond franchise.

The Sinlahekin Wildlife Area is a 14,000 acre reserve located in the Okanogan Valley of north central Washington. Sitting in the rain shadow of the Cascade Mountains, its forests consist primarily of ponderosa pine (Pinus ponderosa), which are adapted to frequent low-severity fires. However, because of fire suppression over the past approximately 100 years, fire has all but disappeared from this ecosystem. As a consequence, excess biomass has accumulated on the forest floor, leading to catastrophic forest fires. To better understand the current dilemma, a long-term perspective on fire history is needed. Lakes hold much information on fire history in the form of fossilized charcoal. Identifying changes in charcoal accumulation in lake sediments allows for a calculation of past fire frequency. This information can then be used as a guideline for prescribed burning and managing forest health. In summer 2011, a three-meter-long sediment core was retrieved from Fish Lake in the Sinlahekin Wildlife Area. Macroscopic charcoal analysis was used to reconstruct fire history for the last 2,500 years. Loss on ignition and magnetic susceptibility were also used to characterize the lithology of the core, and to investigate the relationship between fire and erosional events. Results show that fire activity was high at the site prior to the last century. Fires burned mainly herbaceous material (i.e., grass), indicating that fires were of low severity. Further analysis of the core, including pollen analysis, will highlight the relationship between fire and vegetation change, human activity, and regional climate change.
Does Tourism Have a Market Effect on the Grooming for Tolerance Interchange in Tibetan Macaques (*Macaca thibetana*) at Mt. Huangshan, China?
*Dunayer, Erica; Matheson, Megan; Sheeran, Lori; Beck, Dan; Li, Jinhua; Wagner, R. Steven*

Faculty Mentor(s): Megan Matheson, Psychology

Oral Presentation, Session # 39
2:40-3:00 in Room 201

Tolerance, defined as increased proximity, is an important commodity in primate societies, especially when resources are monopolizable. We examined the impact situational stressors have on the grooming for tolerance trade in a group of provisioned Tibetan macaques (*Macaca thibetana*) subject to tourism. Our results provide evidence for increased rates of self-directed behaviors (Bonferroni corrected repeated measures ANOVA, N=12, p=0.042) and aggression (Bonferroni corrected repeated measures ANOVA, N=12, p=0.012) during tourist presence and provisioning, making tolerance a commodity. We therefore predicted a higher proportion of interchange trading would occur when tourists and corn provisioning were present. Rates of post grooming proximity for 120 grooming bouts were compared to matched controls when grooming was absent. Post grooming rates were significantly higher than matched controls, supporting the existence of a tolerance market (T test, T(46)=4.524; p<0.001). We then compared the proportion of interchange behavior by condition (just corn, just tourists, both, neither) and found that a higher proportion of interchange occurred when neither stressor was present compared to when both stressors were present (Bonferroni corrected repeated measures ANOVA, N=30, p= 0.045). These results suggest tourism and provisioning do not have the predicted impact on the tolerance trade, and may represent an acute stressor. Future research should examine proportion of interchange behavior during the summer, when tourism is high, compared to the winter, when tourism is low, to examine a seasonal effect.

Differences between Traditional and Electronic Bullying amongst College Students
*Durst, Leeland; Stein, Stephanie; DeVietti, Terry;*

Faculty Mentor(s): Stephanie Stein, Psychology

Poster Presentation Session #3, Poster # 28
2:00-4:30 in Ballroom C/D

Abstract Differences between Traditional and Electronic Bullying amongst College Students by Leeland Dale Durst

Fall 2011 This study examines the prevalence and impact of electronic and traditional bullying among college students. In this study eighty three men and women were surveyed in several sections of a large, lower-division psychology course at Central Washington University in the Pacific Northwest. The current study examines whether there are differences between electronic and traditional bullying among college students. Likert scale format and dichotomous questions are used to assess the students’ experiences of traditional and electronic bullying. In addition, open-ended questions in the survey addressed why students electronically bully. Results reveal high, statistically significant differences in occurrence for each context of bullying which are traditional, text-message, Internet and picture-phone. Significant differences were also found for each type of bullying consisting of five conditions which are physical, verbal, rumor, exclusion and secret exclusion. These findings may help in the establishment of treatments for psychological distress that may occur as a result of electronic intimidation and harassment. Implications for future research are discussed.
Student Evaluation of Instruction

Dwyer, Cara
Faculty Mentor(s): Dominic Klyve, Mathematics

Oral Presentation, Session # 38
2:40-3:00 in Room 140

This study has been performed using Student Evaluation of Instruction (SEOI) data acquired from the Office of Undergraduate Studies at Central Washington University. The data have been redacted to omit specific departments, course numbers, and instructors, but there remained ample data for running several interesting statistical tests. The tests presented show a comparison of the overall mean rating (1-5 scale) of instruction based on class (Freshman, Sophomore, Junior, Senior, Graduate, Other). I will show which particular mean ratings differ. I also divided the data into two groups to determine whether the overall rating differed based on whether the course was in a student’s major. I am presenting the relationship between student responses to instructor’s effectiveness and their overall ratings on the previous questions. Several other questions are considered as I continue to work with the data. I will answer questions such as: (1) Do Freshman rate instructors differently than Seniors? (2) Do students who are evaluating a course required for their major rate instructors differently than those who are enrolled for other reasons? (3) Do students tend to rate the course as a whole based on their overall ratings for instructors (questions 1-14)? Because SEOI administration at Central is shifting to online evaluations as of Spring 2012, I feel this study is particularly well timed. This information can be useful in determining whether certain student evaluations should carry a weight, and if, in general, certain answers are strongly deterministic of the answers to others.

An Analysis of Healthcare Needs through Census Data

Dyer, Graham
Faculty Mentor(s): Dominic Klyve, Mathematics

Oral Presentation, Session # 20
12:20-12:40 in Room 140

Healthcare in the United States has become an increasing concern for Americans during the past few years. Many Americans are without coverage, and with the passage of the recent healthcare reform law, we will be seeing some major changes in the years to come. These changes will have a broad impact on our society and future generations. Using data from the “American Community Survey” and the “Behavior Risk Factor Surveillance System”, we look at several aspects of a population sample in regard to their healthcare coverage in the US. More specifically, we analyze possible relationships between healthcare coverage and certain characteristics, including employment status, marital status, race, disability, and income. The primary purpose of this report is to observe whether the presence of healthcare coverage can be reliably modeled using publicly-available US census and health data.
There is an astonishing correlation between the increasing dropout rates in the United States and the implementation of new accountability standards under the 2001 No Child Left Behind Act (NCLB). This research deals with the following consequences of the new system on the learning environment: 1. States are forced to punish consistently low scoring schools through shutdowns, decreased funds, and or a re-organization of faculty/administration. 2. Principals are getting pressured to raise test scores. 3. Teachers are increasingly evaluated on the basis of these scores to such an extent that testing has become the goal and not just a measure. 4. Students are no longer students; they are assets (good test takers) or liabilities (bad test takers). The NCLB, one size fits all, testing with its heavy accountability system has proven to be a formula for disaster. Students are now pawns on this chessboard with the state on one side and school administrators on the other. The more students dropout (are really left behind) the higher the test scores become. This leaves happy principals with a bonus, teachers with a job and the government getting credit for “leaving no child behind’ as the dropout rate soars. We need to get back to the basics — that being learning, not test taking!

The University of Washington is the state of Washington’s largest university and third largest employer, behind Boeing and Microsoft. Purchasing is performed using a hybrid system, made up of a central purchasing department that oversees many sub-buying units assigned to individual departments. Facilities Services is responsible for maintaining the operation and maintenance of the campus. They have a Finance and Business unit that is responsible for all procurement needs for the department. The department also includes “stores”, a warehouse location of MRO supplies. Problem: The university has established an e-procurement system offering a vast number of suppliers and e-catalogs. It is an on-going challenge for the Purchasing department to control what is being purchased and through what means it is being purchased. Customers continue to seek out suppliers and look for loopholes in policies that allow them to conduct business in their own self-interest, conflicting with university policies. Examples include: 1) personnel issuing multiple purchase orders to equal the amount of a single purchase to bypass the RFQ process; 2) low-level employees able to request material purchases without any department approval; and 3) supplier selection based on personal relationships. Objective: We will focus our research on Facilities Services’ Finance and Business unit and how they are governed by Central Purchasing. We will research more in-depth the issues and recommend solutions to help them achieve greater value and efficiency through integration.
Characterization of Experimental *Leishmania*/hookworm Co-infection Model

**Ek, Diana**

*Faculty Mentor(s): Blaise Dondji, Biological Sciences*

Oral Presentation, Session # 18  
12:40-1:00 in Room 137A

Co-infection with different infectious agents within a host is a common occurrence. However, no study has focused on Leishmania/hookworm co-infection. Such studies are of interest since both parasites do occur in the same geographical regions. Our study examined disease progression during the co-infection with the hookworm *Ancylostoma ceylanicum* and *Leishmania major* in the hamster *Mesocricetus auratus*. We hypothesized that the hookworm’s ability to increase levels of nitric oxide (NO) in the host will help the host resolve *L. major* lesion because NO effectively kills *L. major*. Hamsters were infected with either 75 stage three hookworm larvae, 6x10^6 *L. major*, or both. Measurement of weight and lesion size, serum collection, hookworm fecal egg count and hemoglobin assays were conducted weekly. Parasite burden and characterization of immune response were determined by intestinal hookworm count, limiting dilution assay, proliferation assay, FACS, ELISA, and NO assay after sacrifice at 15 weeks post-infection (PI). There was no significant difference seen in hemoglobin level, egg count, cell proliferation, or antibody levels against hookworm soluble antigens between mono-infected and co-infected hamsters. There was however a significantly lower *Leishmania* antibody level in the co-infected group compared to the mono-infected groups at 15 weeks PI. The lesion size of co-infected hamsters was also significantly reduced as from 10 weeks PI suggesting that co-infection with hookworm might assist the host to successfully resolve *L. major* infection as predicted.

Changes Throughout American Families

**Eklof, Lindsay**

*Faculty Mentor(s): Dominic Klyve, Mathematics*

Oral Presentation, Session # 38  
3:00-3:20 in Room 140

This study involves the “Panel Study of Income Dynamics” data, which is the longest running longitudinal household survey in the world. The study began in 1968 with a nationally representative sample of over 18,000 individual people living in 5,000 different families in the United States. Information on these individuals and their descendants has been collected continuously, including data covering categories such as employment, income, health, marriage, childbearing, child development, education, and a number of other topics. For my project I examine the data by running several statistical tests on a number of different household factors and characteristics in order to determine how they have changed over the last several years. Doing statistical tests on this data helped show how our American families have changed over time. We find significant differences between different groups of American families in terms of their values and lifestyles over the past several years. Knowing this information could be beneficial to businesses which would like to know what families value most, so they could target these key factors. Also examining trends for families over the last few years could help predict where families are heading in the future, and what American society could possibly expect.
GI Jane  
*Eklund, Andrea*  
*Faculty Mentor(s): Andrea Eklund, Family and Consumer Sciences*

Poster Presentation Session #2, Creative Works # 39  
11:15-1:46 in Ballroom C/D

The idea for this garment came from receiving military uniforms from a friend who is a Veteran. The goal was to create a garment that combined the masculine aspects of the military and war with the feminine side of women. Women have an increased role in the military and the final product illustrates the juxtaposition of the traditional thought of maleness and the military with the liberated ideals of today's woman with a feminine touch. Process: Keeping some of the original garment details intact was a very important part of creating this garment. I wanted to create a very feminine garment but keep the basic details, design lines and aesthetics of the original uniform intact. Many sketches were created and revised to assure that the final garment did encompass the femininity of a women but the functionality and design details of the military uniform. Techniques: The dress was creating through draping technique using the original garment pieces as a guide to assure the aesthetic properties were kept intact. Once draped the final fully lined garment was then created. Materials: Recycled Military Uniforms, 100% Polyester lining, invisible zipper, and thread.

**Social Life at CWU: A Study about CWU Students as Part of the Kittitas County Community Health Assessment**  
*El kabouss, Nazha*  
*Faculty Mentor(s): Rebecca Pearson, Physical Education, School and Public Health*

Poster Presentation Session #2, Poster # 13  
11:15-1:45 in Ballroom C/D

The purpose of this study was to survey students about health and quality of life issues as part of the Kittitas County Community Health Assessment. We wanted to find out how social CWU students are and what types of communication they prefer to use the most. Being social is important for overall health and well-being. A survey invitation and link were sent to students' CWU email addresses. Over 601 participants took the survey, 396 females and 205 males. The design of this study was cross sectional, as most questions were designed to understand the social life of CWU students in the past 24 hours. Results showed that the average CWU student spends 2.57 hours using the internet for academic purposes, and 3.22 hours for nonacademic purposes. Both males and females prefer to use text messaging as their main form of communication. In addition, most students rated themselves as social. With approximately 225 paper surveys recently added to the dataset, we may be able to compare student responses to see potential differences in responses for electronic versus paper survey completers. Similar studies about social life should be conducted using a random sample. Future assessment should investigate the relationship between the use of internet for nonacademic purposes and students’ academic achievements, such as GPA. If a negative relationship is observed, it will be crucial to create programs to better inform students about using the internet.
Confederate States of America’s Taxation Policy Failure in 1863

*Ellis, Justin*

*Faculty Mentor(s): Daniel Herman, History*

Oral Presentation, Session # 40
3:40-4:00 in Room 202

The Confederate government struggled to finance its war efforts. In an attempt to create a strong financially and stable economy, its congress passed the Tax and Assessment act of April 25th, 1863. The act; however, failed to accomplish what it was intended to do. Because the Confederate government remained weak because states’ rights continued to be the dominant political philosophy, the act failed. To understand its failure, this paper examines the Confederate Constitution, the Confederate bank ledgers, and it explores the rising rate of inflation throughout the war.

Developmental Trajectories of Children Diagnosed with Autism Spectrum Disorders and Hyperlexia

*Englehart, Vanessa*

*Faculty Mentor(s): Suzanne Little, Psychology*

Poster Presentation Session #3, Poster # 20
2:00-4:30 in Ballroom C/D

Hypothesis: The purpose of the study is to determine at what pace children with autism spectrum disorders (ASD) and hyperlexia make developmental gains relative to children with autism and without hyperlexia. Rationale: Hyperlexia is characterized by the remarkable ability to read words, relative to cognitive ability and comprehension, and research has shown a relationship between ASD diagnosis and hyperlexia. Reading fluency is used as the best prediction of reading ability in education; thus, it is possible that children with hyperlexia may go overlooked for needed intervention in reading comprehension. It is important for educators to understand at what pace children with hyperlexia develop to help determine need for intervention. Methods: Academic achievement, intellectual, and social-emotional archival data, on children assessed at 9 years and again between 13 and 18 years-old, will be used from the University of Washington Autism Center. Results: Dataset is in-hand, and analyses will be conducted to determine differences, if any, in reading skills, reading comprehension, and social skills between students with Autism with and without hyperlexia. Final approval from the Human Subjects Review Committee (HSRC) for exempt research is in process. Principal Conclusions: The purpose of the study is to research a population of children who have difficulty communicating and who have remarkable ability to read words with greater superiority than their IQ and comprehension predict. Children with hyperlexia and ASD may be overlooked for needed services; however, it is important to understand developmental trends in these children to help educators determine how hyperlexia affects development.
Froebel, Peabody, and the Roots of American Kindergarten Philosophy
Erickson, Amy
Faculty Mentor(s): Karen Blair, History

Oral Presentation, Session # 48
4:10-4:30 in Room 202

This paper describes the lives and philosophies of the two most important Kindergarten pioneers, German educator Friedrich Froebel, who invented the Kindergarten method, and Elizabeth Peabody, who is responsible for establishing the Kindergarten as an American institution. By investigating their lives and influences I argue that nineteenth-century American Kindergarten was successful because it was able to reflect American cultural beliefs while maintaining allegiance to the German pedagogy. When Friedrich Froebel invented the Kindergarten in 1840 in Germany, he stressed children’s unique ability to learn and develop. The basis of the Froebelian Kindergarten rested in the philosophical perfection of the human spirit. Nurturing the child’s natural instincts would allow for the development of a deeper level of understanding and thus a greater level of human perfection. Elizabeth Peabody embraced Froebel’s method but modified it to suit American households of all social classes.

Improving Efficiency and Safety of Mineral Separation Methods for the Minerals Apatite and Zircon
Fagin, Brittany; Edwards, Ashley
Faculty Mentor(s): Chris Mattinson, Geological Sciences

Poster Presentation Session #3, Poster # 5
2:00-4:30 in Ballroom C/D

Mineral separations concentrate the heavy minerals apatite and zircon necessary to accurately date rock samples, but current methods are time consuming, toxic, expensive, and have unknown yield efficiencies. To evaluate and improve separation methods, we processed test samples with a new procedure using a spiral panning table (panner) to wash and pre-concentrate heavy minerals before magnetic and lithium polytungstate (LST) heavy-liquid separations. Our control sample was hand washed, separated magnetically, and processed with LST. Panner trial #1 used a fast sample feed rate and slow rotation speed, resulting in 11 mg of heavy minerals. Our yield was approximately doubled in trial #2, using a slow sample feed rate. Jet Dry® was used in trial #3 to cut surface tension, but yielded less than trial #2. Last, trial #4 used a fast rotation speed and a fast feed rate, which produced the highest yield of 38 mg of heavy minerals. Compared with our expected yield (~5000 mg), yields from control (~800 mg) and panner (11-38 mg) were much less. However, the panner yielded 10x the concentration of the denser zircon than the control, so toxic methylene iodide was not needed to separate apatite from zircon, which makes our protocol safer than current methods. Our experimental process took ~2.5 hours per sample, compared to ~47 hours in the control, to complete. The greater speed, improved zircon concentration, and avoidance of toxic liquids are significant advantages of the new method, and further development should improve recovery efficiency.
Towards the Synthesis of Boronated Amino Acid Analogs: Precursors for Novel HIV-1 Protease Inhibitors
Faulkner, Andrea
Faculty Mentor(s): Levente Fabry-Asztalos, Chemistry

Oral Presentation, Session # 28
2:10-2:30 in Room 137B

A class of HIV drugs called protease inhibitors have proven effective in slowing progression of the disease. This research aims to create two boronated amino acid analogs that will later be incorporated into potential HIV-1 protease inhibitors. These structures have been designed to decrease toxic exposure to patients and aim to increase bioavailability, allowing for more effective uptake and smaller required dosages. To synthesize the analogs, boronic acids were coupled with the protecting group (1R,2R)-dicyclohexyl-1,2-ethanediol (DICHED), which also served as a chiral director giving the product correct stereospecificity for biological activity. The product was homologated using butyllithium and dichloromethane to insert a new chiral chlorinated carbon between the R group and boron. In an SN2 reaction the chlorine was substituted for hexamethyldisilazane, which contains nitrogen and creates the analog amino group. The product was desilylated using methanol and immediately acylated with acetic anhydride and acetic acid. DICHED was removed and exchanged for two hydroxyl groups using phenyl boronic acid to yield the boronated amino acid analog. In the future, the boronated amino acid analogs will be coupled with tripeptides to create potential HIV-1 protease inhibitors.

Tourist Knowledge and Perceptions of Tibetan Macaques at Mt. Huangshan, China
Faulkner, Alicia
Faculty Mentor(s): Lori Sheeran, Anthropology

Oral Presentation, Session # 39
3:00-3:20 in Room 201

Primate tourism is used as a tool to promote conservation of and education about primates, but research has shown that tourist behavior may negatively affect primates. There is a growing body of research quantifying various impacts of tourism on macaques, but few studies quantify what tourists bring to and gain from the experience. The purpose of this study was to provide such data using a survey administered to tourists as they viewed Tibetan macaques (Macaca thibetana) at a tourist site called The Valley of the Wild Monkeys (VWM) in Huangshan, Anhui Province, China. I hypothesized that answers would be unequally distributed among options presented for each question, particularly for those questions related to feeding or otherwise interacting with the monkeys. For example, tourists answered questions about their: experience at VWM, understandings of monkey behaviors, opinions of other tourists’ behaviors, satisfaction with park facilities, perceived likelihood of disease transmission, and whether they would enjoy feeding the monkeys. Between August 5-20, 2011, I distributed 376 surveys, with a response rate of 261 (60.1%). Chi-square analyses were run for each question. For 15 of 18 questions, answers selected significantly differed from an even distribution. The results indicated that tourists are interested in an intimate experience with the monkeys, but are not properly educated on several aspects of monkey threat behavior or disease transmission that may occur during such contact. A tourist education plan focusing on how to safely act around the monkeys could enrich tourist experiences in ways that successfully promote conservation efforts.
Assessment of Groundwater Contamination and Associated Remediation Efforts, Hanford, Washington

Ferri, Serafina

Faculty Mentor(s): Mike Pease, Geography

Poster Presentation Session #3, Poster # 9
2:00-4:30 in Ballroom C/D

The Hanford Nuclear Reservation is a decommissioned facility that processed and refined radionuclides, including plutonium, strontium, and uranium, for military purposes. Located along the western bank of the Columbia River in southeastern Washington, Hanford produced and stored these, and other caustic materials associated with nuclear armaments production, for 45 years. In 1987, plutonium production ceased and the U.S. Department of Energy, in collaboration with the U.S. Environmental Protection Agency and the Washington Department of Ecology, embarked on the largest environmental clean-up in U.S. history, requiring 11,000 employees. As this project has evolved, numerous studies have attempted to model and measure the migration of radionuclides from Hanford facilities. One of the major environmental implications of this diffusion of radioactive materials is their negative effects on groundwater stores. This project will assess the diffusion of these materials and provide a qualitative assessment of the ongoing clean-up initiatives.

Rendering a Bull Bison

Finley, Nick; Corwin, Kaitlyn; Day, Lianne; Michael, Kraig; Willis, Tamara

Faculty Mentor(s): Patrick Lubinski, Anthropology

Poster Presentation Session #1, Poster # 32
8:30-11:00 in Ballroom C/D

In February 2012, a dead bull was found dead on the Badger Pocket Bison Ranch owned by Ron Barela. The bull died from a wound to the neck after an altercation with a second bull. This gave an opportunity for the winter quarter ANTH 425 Zooarchaeology class to do a group rendering project on the specimen. Previously, the only bison was a female within the CWU comparative collection, and there is considerable sexual dimorphism between males and females. This bull was at the top size of his herd, weighing 2,600 lbs. and measuring 12.5 feet from the tip of his snout to the end of his tail. A group of 11 volunteers went out for initial butchery of this massive animal. Much of the meat was discarded and the group disarticulated the bones. The bones were taken in coolers to different locations for rendering during the rest of winter quarter. They were then rendered using the hot water maceration and scraping method. The recovered rendered parts will be used within Dr. Lubinski’s comparison collection here at Central Washington University. (Editor’s Note: This presentation may contain adult themes, content or imagery.)

Towards the Synthesis of Novel Boronates as Potential HIV-1 Protease Inhibitors

Frank, Michael; Faulkner, Andrea; Jennings, Julia; Sigurjonsdottir, Kristin; Schreiber, John

Faculty Mentor(s): Levente Fabry-Asztalos, Chemistry

Poster Presentation Session #1, Poster # 22
8:30-11:00 in Ballroom C/D

Drug discovery for HIV/AIDS has resulted in many life-saving therapies, making a profound impact on modern medicine. Current drug therapies exist, but are susceptible to resistance development, have poor bioavailability, and cause several side effects. For this reason, there is an urgent need to develop new types of inhibitors that address those problems. We are synthesizing novel boronates as potential dual-mode, competitive and associative, inhibitors of HIV-1 protease. Recent studies showed that boron-modified inhibitors have a higher affinity for the protease than their corresponding non-boronated analogs. Furthermore, the boron-modified structures were inhibitory to an HIV-1 protease variant that is resistant to several HIV-1 protease inhibitors. A library of both straight chain and cyclic boronates are being synthesized.
Austen scholars today do not argue whether Jane Austen is incorporating Romanticism in her novel *Persuasion*, but questions of how and why Austen uses romantic conventions are still much in debate. Furthermore, whether Austen seems to admire or to criticize the Romantics is also controversial. Though Jane Austen scholar Charles Rzepka argues that Austen’s focus on the utilitarian undermines any romantic ideals, it is important to realize that *Persuasion* is nevertheless rife with romantic imagery that cannot be ignored or treated as irrelevant; perhaps it is only the ideology of the Romantics that Austen is criticizing. Austen critic Sarah Wootton believes that Austen was influenced by Romanticism and purposefully incorporated elements of the Romantic that were useful for making her own narrative points. Ultimately, in my paper “‘Green Chasms between Romantic Rocks’: Exploring Romanticism in Jane Austen’s *Persuasion*,” I claim that a balanced analysis of *Persuasion* reveals that Austen appreciated many of the aesthetic conceptions of Romanticism, while she avoided the ideology of the Romantic and criticized the self-centered and isolationist ideas of Romanticism. I demonstrate that Austen’s appreciation of Romanticism did not lead to her allying herself with the Romantics of her time. The emotion and imagery that fill *Persuasion* clearly show a romantic influence on the novel, but Austen merges her own style with romantic conventions to critique both her society and the Romantic Movement, making it clear that though she admires the aesthetics of Romanticism, she herself is anti-romantic in purpose.

**National Trumpet Competition**

*Fredrickson, Chris; Guerrero, Cameron; Bull, Brian; Utt, Steven; Hurd, Tristan; Hinckley, David; Utt, Steven; Greif, Darin; Floe, Skyler; Waddell, Braden*

*Faculty Mentor(s): John Harbaugh, Music*

Creative Expression Presentation, Session # 43
Part 1: 3:20-3:40 in Ballroom A
Part 2: 3:40-4:00 in Ballroom A

In September, an ensemble of seven trumpeters began rehearsing in order to submit an audition video to the National Trumpet Competition with the hopes of being selected to play in the semifinal round. In December, the ensemble, as well as several soloists from CWU, submitted these audition tapes via YouTube. The ensemble and two soloists were selected to perform. From March 14th to 18th, this group of nine attended the National Trumpet Competition. The ensemble performed on the first day, playing *Fantasia for Seven Trumpets* by Eric Ewazen. Both soloists performed on the third day, David Hinckley playing *Concerto in F minor* by Oskar Boehme, and Tristan Hurd playing *Concertpiece No. 1* by Vassily Brandt. Although none of the CWU performers made it to the final round, each individual benefitted immensely from the trip. There were several top-notch concerts including the U.S. Army Blues with Doc Severinsen, as well as master classes with some of the most prestigious teachers of the trumpet from around the country. An entire ballroom was full of vendors selling a vast array of trumpets, sheet music, and various accessories. All of the people attending the competition stayed in the same hotel, which provided the opportunity to meet and talk with all the performers, teachers, and fellow trumpeters. Perhaps the greatest benefit was the opportunity to perform and showcase everyone’s hard work in front of colleagues and a panel of judges who are an influential part of the trumpet community.
Design and Sediment Characteristics of Mexican Beaded Lizard Burrows in Jalisco, Mexico
*Free, Bryon; Webb, John; Stone, Wyatt; Holcomb, Kerry*
*Faculty Mentor(s): Lisa Eily, Geological Sciences; Dan Beck, Biological Sciences*

Poster Presentation Session #1, Poster # 3  
8:30-11:00 in Ballroom C/D

A diverse group of vertebrates and invertebrates insulate themselves in subterranean refuges from variability and extremes found in above ground environments. However, little is known about the design of these burrows or the geological characteristics of the sediments into which they are excavated. Geological and design characteristics of Mexican beaded lizard wet and dry season burrows were compared at a field site near Chamela, Jalisco, Mexico. We assessed two hypotheses: 1) Ectothermic vertebrates are selective when choosing refuge sites; and 2) Ectothermic vertebrates choose particular burrow designs depending on season. At 10 sites previously used by beaded lizards we collected sediment samples at the surface, 20cm, and 75cm depths. At 8 of these sites the previously or currently occupied burrow was located and excavated to examine the design of the burrow and to sample the chamber sediment. Sediment samples were analyzed for grain-size distribution, current soil moisture, and water-retention capacity. Burrow site selection was found to be systematic. Percent sediment moisture content was found to be higher at burrow sites as compared with two systematically placed transects. Dry-season burrows were longer, deeper and had a smaller diameter relative to wet-season burrows. Wet-season burrow sediments retained more water and had lower percent gravel content relative to dry-season burrows. These results emphasize the importance of certain burrow characteristics to the seasonal survival of beaded lizards and possibly other ectothermic vertebrates.

The Ellensburg Community Renewable Park: A Proposed Display of Renewable Energy Technologies for Public Education
*Fuhrman, Darryl*
*Faculty Mentor(s): Michael Whelan, Industrial & Engineering Technology*

Oral Presentation, Session # 32  
1:50-2:10 in Room 271

Renewable energy is gaining increasing attention as wind and solar projects become more visible across the region. The City of Ellensburg is installing solar photovoltaic arrays and residential wind turbines to evaluate their performance characteristics in the Kittitas Valley. Instrumentation is being included in the project to measure wind speeds, sunlight intensity, relative humidity, and ambient temperature, as well as energy output of the various configurations. Having this available data stream leads to the possibility of displaying the results for public information and education in the new Hogue Hall Addition. This presentation summarizes a proposed display that explains the various technologies, shows the correlation between energy output and meteorological variables, and compares various wind turbine design parameters. The result will be a better understanding of renewable energy production possibilities in the Kittitas Valley.
Plants of the Western United States: Expanding the Collection and Biological Testing of Extracts

Galvan, Fernando; John, Aaron

Faculty Mentor(s): Gil Belofsky, Chemistry

Oral Presentation, Session # 19
11:40-12:00 in Room 137B

The goal of this research was to find compounds that could be used medicinally and potentially for other uses. Multidrug resistance describes the ability of a microorganism to resist antibiotics. Many microorganisms use a mechanism known as active efflux to move antibiotics out of cells. In this way, the effectiveness of an antibiotic is then reduced partially or completely, allowing the pathogen to survive. A major theme of this research was to look for compounds that inhibit active efflux processes that are related to multidrug resistance. After the diffusion of an antibiotic into a bacterial cell, an efflux pump inhibitor can prevent the antibiotic from being expelled from the organism, leading to rapid cell death. Efflux pump inhibitors may therefore be helpful to increase the potency and useful lifespan of antibiotics. We also screened for compounds showing neuropharmacological activity in a dopamine D1 radioligand binding/displacement assay. Dalea schottii and Collomia grandiflora were the major subjects of study in this research. Dalea schottii was collected in the Anza Borrego Desert of Southern California, while Collomia grandiflora was collected near Ellensburg, Washington. The collected plants were extracted with methanol in a heavy duty homogenizer. Next, compounds were separated and purified using several techniques of chromatography with bioassay guidance. Biological testing results pointed to the fractions in which active compounds were located throughout the experimentation process. The structure elucidation process has started for the compounds isolated using carbon, proton, DEPT, and COSY NMR spectroscopy.

Plastic Baggage

Garber, Melanie

Faculty Mentor(s): Michael Ogden, Film and Video Studies; Maria Sanders, Film and Video Studies

Video Presentation, Session # 25
12:00-12:20 in Theatre

A short-form narrative, this film tells the story of Margaret, a quirky librarian who whispers secrets to strangers. When she comes upon an item in the lost-and-found, she makes a decision to chase her heart. She has one week to overcome her biggest fear. This film runs 00:12:30.
Determining the Phylogenetic Utility of the Nuclear Gene XDH in the Conifer Family Cupressaceae  
_Garcia, Erik; Peery, Rhiannon; Wilcox, Kevin_  
Faculty Mentor(s): Linda Raubeson, Biological Sciences

Oral Presentation, Session # 45  
4:50-5:10 in Room 137A

We are examining the phylogenetic utility of the nuclear gene XDH (xanthine dehydrogenase) in gymnosperms. Phylogenetic analysis attempts to determine the evolutionary relationships of groups of organisms, usually using DNA data. Any particular portion of DNA (genes or other regions) may or may not be effective for inferring relationships of a particular group. Low-copy nuclear genes so far have not been used much in plant phylogenetics, yet they are an important potential source of additional, independent phylogenetic information. However, low-copy nuclear genes must be tested in a pilot study to determine, for the group in question, if they can be amplified, if they exhibit sufficient variation, and if the variation is phylogenetically informative. The XDH gene has been successfully used to determine the relationships among the conifer family Podocarpaceae, and we now are investigating its value for determining relationships in another conifer family, Cupressaceae. We have developed a new set of primers and optimized PCR conditions in order to amplify 1141 base pairs of XDH in members of this family. We are in the process of constructing a phylogeny of Cupressaceae with our preliminary XDH data to assess the phylogenetic utility of the data, and determining whether or not amplifying the XDH gene of additional Cupressaceae representatives is worthwhile.

Status and Trends: Comprehensive Economic Development Strategy  
_Gardner, Ingrid_  
Faculty Mentor(s): Delores Cleary, Sociology; James Huckabay, Geography; Steve Hackenberger, Anthropology

Oral Presentation, Session # 4  
9:30-9:50 in Room 140

The 2007 Comprehensive Economic Development Strategy (CEDS) report is an economic tool developed to assist the Northern Cheyenne Tribe for comprehensive planning focusing on economic development. The CEDS report has initiated the planning process to improve the economic conditions of the reservation economy. The CEDS document identifies the opportunities and risks related to economic development on the Northern Cheyenne Reservation. The CEDS can be used to provide a comprehensive analysis of the past, present and future economic data of the local reservation economy. This article will identify the key economic data trends and current economic development projects highlighted in the report, which will lead to a model to use in other reservation communities.
Oh Snap Raw!

Garza, Emilyesteli

Faculty Mentor(s): Andrea Eklund, Family and Consumer Sciences

Poster Presentation Session #2, Creative Works # 42
11:15-1:45 in Ballroom C/D

The purpose of creating this garment was to execute my interpretation of the 80’s. Process: I was inspired by my Mom’s senior photo. She was wearing a light pink jumpsuit, white pumps, and big 80’s hair, my love of 80’s music, and her image. I wanted to eat, sleep and live in the 80’s. I continued to look at old yearbooks of my mom from that era. I drew further inspiration from watching quintessential 80’s movies: Valley Girl, Blade Runner, The Breakfast Club, The Big Chill, and The Goonies to name a few. The focus of the garments are the bright colors and crazy black and white prints that were most popular. Techniques: I created this garment through the draping technique. Draping tape was applied to the body form as a guide to achieve the desired lines of the final garment. Pieces of fabric were pinned and manipulated onto the body form and once pinned I marked the key points on the draping. Truing the lines once the pieces were off the dress form was essential in the process and a pattern was then made from the draping. A sample was made to fit on the model and many changes were completed in order to achieve proper fit of the garment. Once the changes were made they were transferred to my pattern pieces and a final dress was created. Materials: 82% nylon 18% spandex mesh, 100% cotton, 100% polyester lining, bleach, fabric paint, invisible zipper and thread.

MCM, a Mathematical Contest in Modeling: Boat Scheduling

George, David; Livingston, Benjamin; Raven, Dean

Faculty Mentor(s): James Bisgard, Mathematics

Poster Presentation Session #1, Poster # 45
8:30-11:00 in Ballroom C/D

The Mathematical Competition in Modeling (MCM) is an undergraduate contest that uses mathematics to model real life problems. The problem we worked on this year had to do with boat scheduling for the Big Long River wildlife park. The river managers needed us to determine the best way to schedule boats for groups going through the 225 mile long park. This may seem simple, but the catch is that there are two kinds of boats, oar and speed boats, that travel at different speeds. We needed to account for slower boats being passed by faster boats, because the managers wanted little to no interaction between groups passing through. Also, each camp site along the Big Long River Park can only have one group staying at each camp site per night. To make things more simple we gave oar boats and speed boats a maximum allowed daily rowing time. We asked ourselves many questions such as how to work around the speeds of the boats, scheduling of people, and how to handle campsites. We came up with three models. However, our main model was the most flexible, because it allowed travelers to choose which campsite they wanted to stay at each day. Our model would automatically schedule boats to camp sites within their maximum allowed daily rowing time. Because we still had to deal with speed boats passing oar boats, we allocated times when each type of boat could be in the river.
An Analysis of the Reecer Creek Floodplain Restoration Project

Giblin, Jessica; Hashimoto, Jeff
Faculty Mentor(s): Jennifer Lipton, Geography

Poster Presentation Session #2, Posters # 26 & 27
11:15-1:45 in Ballroom C/D

Reecer Creek in Ellensburg, Washington was confined by a straight levee for the past 100 years. Frequent flooding when Reecer Creek overtops the levee has caused damage to nearby neighborhoods and businesses. Also, Reecer Creek is habitat for anadromous fish including the endangered steelhead. The Reecer Creek Floodplain Restoration Project (RCFRP), completed in 2011, restored the creek into a more natural form to allow floodplain function and habitat improvement. A meandering channel was constructed and 50,000 trees were planted in the riparian area. The Ellensburg High School AP Environmental Science classes conducted research to monitor the success of the RCFRP. Students designed research projects that compared conditions in October 2011 and April 2012 to see how the floodplain changed and adapted. Some students investigated characteristics of the stream itself including channel shape, cross section, sediment, water quality, and invertebrate populations. Other students investigated the recovery of the riparian areas including soil chemistry, texture, organic compounds, plant populations, and an evaluation of revegetation. Comparison of the conditions immediately after the completion of the project (October 2011) and after the first winter runoff season will provide information about how well the RCFRP is accomplishing its goals. Our data will provide information that will aid in management of the RCFRP.

28 Drinks Later

Giles, Mark; Franklin, Cole; Thomas, Chris; Klettke, Tara; White, Nick
Faculty Mentor(s): Michael Ogden, Film and Video Studies; Jon Ward, Film and Video Studies

Video Presentation, Session # 25
11:40-12:00 in Theatre

A highly respected physicist, two confused friends, and a nuclear reaction. 28 Drinks Later is a screw-ball comedy/disaster movie mash-up pitting Randy and Buck against irradiated townspeople before running into Celeste, their only hope for isolating the incident and saving the world. This film was created by a talented group of film majors entirely in 48 hours for CWU FVS program’s 48 Hour Film Slam. This means it was written, cast, filmed, and edited within the 48 hour window. Such a short deadline presented numerous problems, including locking down locations to film, getting enough people cast to fill all the roles, and pulling of some of the more technical shots of the film. It was chosen because it shows what the film students are capable of, even when under extreme pressure from such a short deadline. It was filmed on a Canon 60D at ISO 800 using a Canon 50mm f/1.4 and Tokina 11-16mm f/2.8 lens. The film can be viewed here: https://vimeo.com/37546438. Awards at the 48 hour film slam: Best of Festival, Best Directing, Best Screenplay, Best Male Actor, and Best Ensemble Cast.

*Godwin, Ashlee*

*Faculty Mentor(s): Karen Blair, History*

Oral Presentation, Session # 48
4:50-5:10 in Room 202

In the political arena, control of sexual behavior is used to prevent individuals having freedom from reproductive enslavement. The right to birth control was first legally protected in 1965 in the case *Griswold v. Connecticut*. However, both women and men during 1972-1973 have stated many times that it is ethical to allow individuals sexual freedom. The rulings of *Eisenstadt v. Baird* and *Roe v. Wade* demonstrate that government would maintain a separation from the private lives of all citizens and protect the choice to utilize contraception, even emergency contraception like abortion. The Supreme Court Justices recognized that the sexual ethics deemed consensual sex between adults as acceptable. Many forms of birth control were available at this time, and the legal allowance to utilize them also aided the sexual revolution. *(Editor’s Note: This presentation may contain adult themes, content or imagery.)*

Adapting to Meet New Literacies: Teaching Composition in an Online Environment

*Gornik, Charles*

*Faculty Mentor(s): Patsy Callaghan, English*

Oral Presentation, Session # 26
1:10-1:30 in Room 135

Traditionally, English instructors see writing as happening in a specific, physical place and thus have avoided the use of technology, especially online mediums, as a means of teaching composition. The reluctance to move to an online space has caused researcher Jeff Rice, as early as 2006, to claim that English is “falling behind” the rest of the academic world in meeting the needs of students. Few authors make an explicit case against teaching composition online. Rather, most of the field of composition is concerned with figuring out “how” to move writing online and “why” it is worthwhile. This paper, which is part of a larger work on building a successful online composition course, argues that, due to advantages unique to networking and computer software, online composition courses are as viable an option as traditional “in-class” composition courses. As such, composition should be taught in an online space. By the time that students are of the age where they can learn writing skills, they are already familiar with working online, whether for social media, entertainment, or school. As a result, online composition courses can make use of mediums that can engage students in ways that traditional courses cannot. Additionally, this article bases its argument in the same composition and educational theories of the “contact zone,” cognition, and writing process on which traditional composition is based.
Comparison of State and County Management of Public Access Impacts to Intertidal Zone Biodiversity: A Case Study of Rocky Grant, Travis
Faculty Mentor(s): Anthony Gabriel, Geography; Michael Pease, Geography

Oral Presentation, Session #3
8:50-9:10 in Room 137B

Since 1972, the Coastal Zone Management Act requires all Washington State Shoreline Master Programs implemented by Island County and public shorelines managed by Washington Department of Natural Resources (WDNR) to promote public access while ensuring environmental protection. Human trampling of intertidal organisms poses serious threats to fragile populations and requires strategic management to maintain accessibility and biodiversity along public shorelines. Representing various levels of public access intensity classified by Washington Department of Ecology, public access criteria sheets and intertidal survey techniques were used to determine the amount of public access and biodiversity at 10 WDNR and 8 Island County sites. Biodiversity at previously sampled sites were compared to select study sites to validate sampling techniques. Management documents, interviews, and field surveys were used to determine the level of management at all public access sites using indicators established by Kreutzwiser et al. (1993). No significant differences were found in biodiversity between study and comparison sites, while several species were more abundant at high public access sites, suggesting higher accessibility does not negatively impact biodiversity, pre-determined levels of public access were not accurate, or other variables may be impacting biodiversity. Management scores indicated both agencies were very similar in protecting biodiversity and did not recognize unique environmental characteristics among sites that may be more related to varying biodiversity levels. However, Island County had a clear disadvantage in regard to budget, staff, and potential for collaboration. Despite the lack of site-specific plans, high public access sites are still effective in preserving biodiversity.

English Consonant Production among Native Chinese Speakers
Greene, Brian
Faculty Mentor(s): Charles Li, English

Oral Presentation, Session #26
2:10-2:30 in Room 135

This study examines the English final obstruent consonants, final consonant clusters, and interdental fricatives produced by native Chinese speakers through an analysis of the spoken English of Mandarin speakers from China, Mandarin speakers from Taiwan, and Cantonese speakers from Hong Kong. The phonological data analyzed in the study comes from The Speech Accent Archive, an online database of sound files and corresponding transcripts featuring NS and NNS readings of a single English text, which elicits a variety of phonetic and phonological features. Sound files and transcripts of two Mandarin speakers from China, two Mandarin speakers from Taiwan, two Cantonese speakers from Hong Kong, and two native English speakers are compared and contrasted to elucidate the particular issues native Chinese speakers have in producing English final obstruent consonants and interdental fricatives. Moreover, three suprasegmental environments are examined to provide insight into how NNS learners approach linking in natural speech vis-à-vis native speakers. The analysis confirms that Chinese learners of English demonstrate instances of obstruent deletion, obstruent devoicing, and interdental substitution in their production of English consonants. The results also show incongruent assimilation strategies between the NNS and NS data sets, which should be of pedagogical value not only to EFL/ESL instructors working with Chinese native speakers but also to Chinese native speaking EFL/ESL learners from the three major Chinese-speaking contexts.
The Changing Social Constructions of Marijuana Users

Grimmer, Brian

Faculty Mentor(s): Nelson Pichardo, Sociology; Karen Francis-McWhite, Ian Buvit

Poster Presentation Session #3, Poster #30
2:00-4:30 in Ballroom C/D

The social construction of marijuana users and the effects of marijuana have been undergoing a continual process of definition and redefinition across time. According to public opinion polls, the attitudes and perceptions regarding marijuana have grown more favorable over the last eight decades. Public opinion has many potential influences including government, news media, and mass media. This research focuses on the how changing perceptions of marijuana have been reflected in the mass media (movies and documentaries) and the real world similarities in society. Relying on several sources, I have compiled a nearly comprehensive listing of 817 films produced from 1934 to 2011 that contain some reference to marijuana. These films were coded in terms of how they framed marijuana and its effects according to four classifications (favorable, unfavorable, both, and neutral). I have organized these representations by year of release and then linked this information to the dates of relevant public opinion polls regarding marijuana and important legislative events. The data show there is a potential correlation between these films and their effect on public opinion and policies regarding medical and recreational uses of marijuana.

Boom - A play by Peter Sinn Nachtreib

Grove, Kyle

Faculty Mentor(s): Marc Haniuk, Theatre

Oral Presentation, Session #14
11:00-11:20 in Room 202

I recently served as Technical Director for a production of Boom by Peter Sinn Nachtreib. This production served as a culminating project and opportunity for me and my collaborators to practice the skills we have learned in our time in Central’s Theatre Arts Department. One of our primary goals with this production was to embrace the philosophy of collaboration in the design process of a theatrical production, interweaving the lighting and set designs extensively. Care was taken to gather input from every member of the production team during the preproduction planning stage. Boom also served as an opportunity to practice the art of grant writing, an incredibly important skill within the nonprofit arts community. Boom was produced without funding from the Theatre Arts Department. Funding instead came from community outreach to the Ellensburg Arts Commission, the C. Farrell Grant, and two CWU student clubs, United States Institute for Theatre Technology and Central Theatre Club. On an individual basis, Boom allowed me to explore the worlds of manpower estimation, materials estimates, and working drawings. I took an active role, working with the scenic designer to alter the designs to fit our capabilities. I personally lead the construction effort of the set and oversaw the completed installation. Boom demonstrated to the University, the Theatre Arts Department, and our peers, the level of theatrical production that can be achieved by students working on their own initiative, and set a new standard for studio productions with in the Theatre Arts Department.
Monkey and Hunter Demonstration: An Interactive Example of Projectile Motion

Grove, Lukas
Faculty Mentor(s): Bruce Palmquist, Physics; Greg Lyman, Physics

Poster Presentation Session #2, Poster # 5
11:15-1:45 in Ballroom C/D

Demonstrations have proven to be an effective instructional method while teaching many different aspects of introductory physics. This project was designed and assembled to be easily implemented in introductory physics courses. It demonstrates a classic physics example known as the monkey and hunter problem. The example revolves around basic kinematic concepts where the ideas behind projectile motion are applied to two falling bodies. A projectile is launched pointed directly at a hanging object in the distance. At the precise moment the projectile leaves the launcher the object it was pointed at is released in free-fall. Assuming the projectile was close enough to the hanging object so that they do not intercept the floor, the projectile and the object will always collide with each other. The demonstration was designed and constructed to recreate this phenomenon using a spring launcher, ball bearing, photogate circuitry, and an electromagnet to hold the hanging object. The construction used a variety of tools and materials including basic logic circuitry components to manage the release of the hanging object. The setup was then presented in an introductory calculus based physics course, where students filled out a worksheet before and after the demonstration so that comparisons could be made on how understanding was affected by what they observed. The comparison of worksheets established an overall improvement in understanding after having observed the demonstration.

Species Diversity of the Intertidal Zone (Tide Pools) in Chamela, Jalisco, Mexico

Gutstein, Ruben; Montgomery, Sarah; Martin, Kelsey
Faculty Mentor(s): Dan Beck, Biological Sciences; Lisa Ely, Geological Sciences

Poster Presentation Session #1, Poster # 1
8:30-11:00 in Ballroom C/D

Intertidal habitats, and more specifically tide pools, can provide an excellent system for investigating the relationship between environmental stress and species diversity. We investigated invertebrate species diversity in the intertidal zone along the coast of Jalisco, Mexico. In the intertidal zone, environmental stress is thought to be related to location along a tidal gradient, with high zones having greater environmental stress due to being isolated from the ocean for longer periods. We tested the intermediate disturbance hypothesis, which states that species diversity will be at its maximum in intermediately disturbed areas (the mid-tidal zone in our system). We measured species diversity along an elevation (or tidal) gradient by counting the number of individuals (or area) of each invertebrate species, then calculating diversity indices for all tide pools. We used correlation analysis to identify any relationships between the distance above sea level along the tidal gradient and species richness, diversity, or evenness. We also explored the relationship between tide pool size (volume) and species diversity at similar elevations. The greatest species diversity occurred at the high and intermediate elevation pools, and the lowest species diversity occurred at the low elevation pools, which were dominated by sea urchins, a dominant predator in this system. Larger tide pools had greater species diversity than small tide pools. Our results seem to support the intermediate disturbance hypothesis, although predation may also be an important factor.
Developing Actuarial Software for Model Analysis-AMOOF 2.0
Haberman, Zachary; Spencer, Cameron; Smigaj, James; Brown, Noble
Faculty Mentor(s): Yvonne Chueh, Mathematics

Oral Presentation, Session # 47
4:30-4:50 in Room 140

Actuarial Model Outcome Optimal Fit Version 2 (AMOOF 2.0) is a collaborative software project engineered by a team of computer science seniors for the purpose of analyzing actuarial and insurance stochastic model outcomes. AMOOF 2.0 is a substantial upgrade from the original AMOOF, engineered in 2005 and tested by insurance companies through a research grant from the Society of Actuaries in 2011. The AMOOF 2.0 software will receive funding support from the Actuarial Fundation, and once completed, will provide the actuarial/insurance fields an unique and valuable research tool for model efficiency research and implementation.

Social History of Blogging and its Evolution into Parenthood
Hahn, Whitney
Faculty Mentor(s): Elizabeth Kerns, Communication

Oral Presentation, Session # 7
9:30-9:50 in Room 271

With the evolution of the Internet as a formal mode of communication, individuals have become citizen journalists. Chronicling their lives through web logs, or blogs, has become standard practice for many, especially families with young children. Additionally, stay-at-home mothers have found an outlet from their solitude at home through an ever-growing online community. Looking at the social history of the medium of blogging can help further understand why people, specifically parents, blog.

Dream
Halone, Katy
Faculty Mentor(s): Andrea Eklund, Family and Consumer Sciences

Poster Presentation Session #2, Creative Works # 41
11:15-1:45 in Ballroom C/D

I wanted to create something a woman could feel beautiful, fun and unique in. I was inspired by a lot of gorgeous dresses found in bridal magazines—beautiful, form-fitting with unique details. Though it is not necessarily a bridal gown, I choose to construct the dress with the same idea: something fitted that flows with a mermaid tail on the bottom, allowing the woman who wears it to feel as if she is in a dream. Process: My research for the dress consisted of flipping through magazines and dog-earring pages. When it came time to sketch the design, I had plenty of images for inspiration. The dresses I liked all had something in common—they were long and feminine. From there I began to sketch an image of my own version—a simple silhouette with a mermaid tail starting at the knee. Techniques: The draping technique was used to create the garment. Draping was challenging because I wanted the body of the dress to be form fitting, but flair out at the bottom. I created the pattern for the body of the dress through draping and the mermaid portion of the dress through flat patterning. From the trued draping, patterns were made and a sample was created. The sample was fit to the model and changes were then made to the patterns. The final fully lined garment was then created with tulle in the mermaid portion to accentuate the detail. Materials: Crepe back satin, polyester lining, tulle, invisible zipper, and thread.
Meth Action Council Research Project
Hankins, Holly
Faculty Mentor(s): Charles Reasons, Law & Justice

Poster Presentation Session #2, Poster # 16
11:15-1:45 in Ballroom C/D

The Meth Action Council Resource Project focused on the drug problems, with an emphasis on Methamphetamines, which affect Kittitas County. This data collection project was designed to gain a picture of the drug cases and trends in Kittitas County. Along with the Meth Action Team, the Kittitas County Community Network Coalition had a large hand in the research and data collection. The Meth Action team was formed in 1993 and their main goal has been the awareness and the prevention of the usage of Methamphetamines. The data was gathered using the Prosecutor’s files of felony drug cases. The focus was on identifying the trends from a time period of 2004 through 2011 and then looked at each drug individually. In addition, the drug cases were broken out by gender, age, county of residence, repeat offenders, and poly vs. single drugs involved in the cases. At the conclusion of this project, the evidence of Meth usage in Kittitas County shows a drastic decrease. Although it still holds the number 2 spot in popularity for drug usage, the instance at which Meth is being used is steadily declining.

Eugene Onegin: Act III Finale - Pyotr Illych Tchaikovsky
Hansen, Andrea
Faculty Mentor(s): Gayla Blaisdell, Music; Maria Roditeleva-Wibe, Music

Creative Expression Presentation, Session # 24
Part 1: 12:20-12:40 in Ballroom A
Part 2: 12:40-1:00 in Ballroom A

Eugene Onegin is a Russian opera in three acts by Pyotr Illych Tchaikovsky, one of the most prominent Russian composers of the late Romantic period of the 19th century. The storyline for the opera is based on the novel of the same title by Alexander Pushkin, about the complicated relationship between the title character and Tatyana, the object of his uncertain affection. The third act Finale portrays the complex emotions of first love and the necessity of duty as Onegin tries to rekindle the affections of the now-married Tatyana. Tatyana herself is torn between giving in to the man she has always loved and remaining faithful to her husband, thus preventing a scandal. In her last attempt to prove her resolve, Tatyana rejects Onegin’s pleas of love and sends him away forever, leaving him alone in his despair. This opera contains expressive and engaging melodies that, while often repetitive, give the true impression of dialogue to the characters, in addition to lush orchestration that has a distinctive Russian flavor - both hallmarks of Tchaikovsky’s training and compositional style. Though not very popular outside of Russia at the time of the premier, Eugene Onegin has today become acknowledged as a prime example of Russian lyric opera composition, as well as evidence of Tchaikovsky’s talents in opera among the many genres of music composition. Preparation for this scene has required extensive Russian language training in addition to the already-rigorous demands of learning Tchaikovsky’s music and preparing dramatic and engaging staging.
Investigation of the Effect Gd\(^{3+}\) on Nanoparticle Host-to-Europium Transfer Efficiency in YBO\(_3\): Gd\(^{3+}\), Eu\(^{3+}\) Under VUV Excitation

_Harrietha, Benjamin_

*Faculty Mentor(s): Anthony Diaz, Chemistry*

Poster Presentation Session #1, Poster # 23
8:30-11:00 in Ballroom C/D

YBO\(_3\):Eu, Gd, is a red phosphor that has several industrial uses such as in plasma display panels and lighting. The host-to-activator transfer efficiency of the phosphors was observed through their respective excitation and reflectance spectra gathered using vacuum ultraviolet (VUV) spectroscopy. These spectra were compared to previous research done on YBO\(_3\):Eu to observe the effect that Gd has on the observed transfer efficiency, particularly when the particle size is decreased. The data at this point are inconclusive, but based on the data thus far; it is likely that Gd cannot overcome the surface loss in smaller particle sizes.

Documenting Magmatic Processes at Filicudi Island, Aeolian Arc, Italy: Integrating Plagioclase Textural and In Situ Compositional Data

_Harris, Michelle_

*Faculty Mentor(s): Wendy Bohrson, Geological Sciences; Chris Mattinson, Geological Sciences*

Poster Presentation Session #3, Poster # 1
2:00-4:30 in Ballroom C/D

Documenting the physiochemical processes that influence magma composition is critical for predicting eruption styles and managing volcanic hazards. Silica-rich eruptions tend to be more explosive and hazardous, whereas magnesium-rich eruptions tend to be more effusive. Previous studies have documented how magma composition changes from magnesium-rich to silica-rich in subduction-zone volcanoes, but controversy remains regarding the effects different magmatic processes have on eruption styles. A combination of three magmatic processes dominates chemical changes within magmas: Recharge, Assimilation, and Fractional Crystallization. Recharge is the injection of new, hotter magma into existing magma, which may trigger volcanic eruptions. Assimilation is the mixing between magma and melt from surrounding rock, and results in a more silicic, explosive magma. Fractional Crystallization occurs within all magmas and is the process of formation and segregation of solid minerals from liquid melt. Volcanic rocks from Filicudi Island, Italy, span a compositional range from low-silica, high-magnesium to higher-silica, lower-magnesium, which cannot be related by a single process. My MS research examines compositional data, both elemental and isotopic, collected at a small spatial scale from the core-to-rim of plagioclase (a silica, calcium, and sodium-rich mineral stable within magma from low-silica basalt to high silica andesite). Results will provide insight into the processes that caused compositional diversity and contributed to explosive volcanism on Filicudi Island. Although the Filicudi volcano is no longer active, results can be applied to active subduction-zone volcanoes and will improve understanding of processes that catalyze volcanic eruptions.
The Failure of the League of the Militant Godless

Hastings, Rebecca
Faculty Mentor(s): Roxanne Easley, History

Oral Presentation, Session # 31
2:10-2:30 in Room 202

The League of the Militant Godless was a nominally independent and voluntary organization that existed in the Soviet Union from 1925 to 1947 and was associated with the Communist Party. As a part of the regime’s effort to combat religion in all forms in accordance with Marxist and Leninist doctrine, the government of the Soviet Union created and fostered a number of different organizations that were meant to conduct antireligious campaigns, sometimes by force and sometimes by persuasion. The League represents an important phase in this campaign, when the regime’s emphasis shifted from direct attacks on religion and religious institutions to the use of propaganda. The League’s failure to implement an effective antireligious campaign or to promote atheism to any significant degree reflects the ineffectiveness of the broader antireligious campaign, due to a poor understanding of the fundamental role that religion played in Russian life. Its failure was also due to administrative problems that were characteristic of Bolshevik political culture in general, including poor organization, lack of resources, and internal ideological conflicts.


Haydon, Kevin; Walsh, Megan
Faculty Mentor(s): Megan Walsh, Geography

Poster Presentation Session #3, Poster # 12
2:00-4:30 in Ballroom C/D

Environmental change and human activity have been the driving forces of fire activity in Pacific Northwest forests throughout the Holocene. Fire exclusion policy following the fires of 1910 was intended to remove fire from federally managed forest ecosystems. To evaluate the effectiveness of fire suppression over the last century, we examined areas burned by wildfires in the Okanogan-Wenatchee National Forest, in decadal intervals, using GIS. Analyses of these data indicate that, for the better part of the 20th century, fire exclusion efforts were very successful. However, despite technological advancements in wildfire suppression, the data demonstrate that areas burned in recent decades has greatly increased. It is understood that the removal of fire from eastern Cascade forests has increased their susceptibility to high-severity wildfires. In order to more effectively manage these forests it is important to understand how fire regimes have varied in longer timescales. To address this, we retrieved Holocene-length sediment cores from Blue Lake and Doheney Lake in the Sinlahekin Wildlife Area, Okanogan County, WA. Through the use of macroscopic charcoal and pollen analysis, we will reconstruct the vegetation and fire history for the Sinlahekin study sites. Preliminary results indicate major shifts in fire activity prior to and after Euro-American settlement. Further analysis of these records will establish a Holocene fire record and determine its linkages with vegetation change, climate variability, and human activities. The results of this research will aid in management decisions regarding the use of fire in eastern Cascade forests.
The Role of Libraries in Offender Rehabilitation

Head, Justin
Faculty Mentor(s): Mary Ellen Reimund, Law & Justice

Oral Presentation, Session # 2
8:50-9:10 in Room 137A

The United States currently has the largest incarcerated population in the world at approximately 2.3 million individuals. Of this population roughly 95 percent will be released from prison and will reenter society. With increasingly scarce resources due to budgetary constraints, correctional facilities are experiencing difficulties in providing rehabilitative programs for incarcerated populations. This reduction in emphasis on rehabilitation of inmates is leading to increasing rates of recidivism. This issue presents an opportunity for prison, public, and academic libraries to play an active role in facilitating the rehabilitation process. For successful rehabilitation to occur, it is important to address current juvenile and adult offender needs by highlighting the ways correctional, public, and academic libraries can meet these needs through the programs and services they offer. To address these needs, current obstructions to offender rehabilitation must be negotiated, including the issues of censorship, access, literacy, and the changing nature of state and federal legislation. By addressing these issues, programming can be implemented increasing parolee attachment and utility to society. It is also important to investigate some of the most innovative approaches taken by libraries today. Research evaluating many of these programs suggests that there is a need for more empirically designed programs to increase offenders’ education, vocational training, and social control. Innovative programs addressing these issues have proven to be successful in reuniting ex-convicts with communities. It is important to use these existing models to develop national initiatives aimed at offender rehabilitation, thereby reducing the threat of offender recidivism.

Geographic Variation of Freeze Tolerance in the Pacific Chorus Frog, Pseudacris regilla

Healas, Sara
Faculty Mentor(s): Jason Irwin, Biological Sciences

Oral Presentation, Session # 27
2:10-2:30 in Room 137A

This study is comparing the physiological responses to freezing of Pacific Chorus frogs from a coastal (Mill Creek) site, a central inland (Ellensburg) site, and a high-elevation site on Snoqualmie Pass. Pacific Chorus frogs have an amazing ability to freeze solid during the winter months. They are able to do this because they store massive amounts of glycogen that they break into glucose. Glucose is used for (1) to protect the cells during freezing and (2) to support general metabolism throughout the entire winter. The hypotheses are (1) where frogs would experience colder winters with less snow pack those frogs would produce more glucose and survive freezing to lower temperatures and (2) where frogs would experience longer winters, those frogs will produce more liver glycogen. We collected frogs in the spring from the Mill Creek, Ellensburg, and Snoqualmie Pass areas and housed them until the fall when they had developed their cold tolerance. They were then moved inside to an incubator set at 2°C. In January, the frogs were frozen in a cooling bath down to -2.5°C. Once frozen, the frogs were dissected and liver and thigh were extracted and frozen. Each tissue was later homogenized in acid and then neutralized with a base to extract the glucose and glycogen for measurement. The glucose and glycogen solutions were mixed with a color reagent which forms a colored product in the presence of glucose which was measured with a spectrophotometer. Results from the past three years’ experiments will be presented.
Dietary Analysis of Lizard Species in the Dry Forest in Chamela, Mexico

Healas, Sara; Witt, Jared; Hassler, Nick; McFadden Angela

Faculty Mentor(s): Dan Beck, Biological Sciences; Lisa Ely, Geological Sciences

Poster Presentation Session #1, Poster # 2
8:30-11:00 in Ballroom C/D

This study was conducted during the dry season at the Chamela-Cuixmala Biosphere, a tropical dry forest reserve in coastal Jalisco, Mexico. Many lizard species are active during the dry season, yet little is known about their diet during this period of drought. Local lizard populations play a large role in the seasonal dry forest ecosystem. Three species of lizards were examined in this study: Sceloporus utiformis, Aspidoscelis communis, and Ameiva undulata. We expected that larger lizards would show greater diversity of stomach content when compared to smaller lizards. Pitfall arrays were used to trap the lizards. Once captured stomachs were measured, then flushed with water to extract their stomach contents. We measured volume of stomach contents of approximately 20 lizards and determined the diversity and overall volume of insect and plant matter in those samples. The majority of the lizards captured during this study were juveniles, with little to no food items in their stomachs. Only one adult was captured (a Sceloporus utiformis) and it had the greatest volume and diversity of food items in its stomach. Our results suggest that few lizards are eating during the period we sampled in the dry season indicating that food resources, in addition to water, is restricted during this time of year. Our methods and study design could serve as a starting point for further studies focused on dietary analysis of lizards.

Middle-school Projects Focused on Water Quality of Crystal Creek in Cle Elum, WA

Healas, Sara; Sweet, Dale

Faculty Mentor(s): Jason Irwin, Biological Sciences

Poster Presentation Session #2, Posters # 36, 37, & 38
11:15-1:45 in Ballroom C/D

Sixth grade students at Walter Strom Middle School in the Cle Elum—Roslyn School District conducted research focused on measuring the water quality of Crystal Creek, a small stream located near the school. These students are part of the National Science Foundation’s GK-12 program which places graduate students in elementary through high school classrooms to enhance the state curriculum with hands on inquiry based science. Our GK-12 program, called the Watershed Activities to Enhance Research in Schools (WATERS) focuses on the Yakima River Watershed. Every year, Mr. Sweet’s sixth graders get to raise Chinook salmon in their classroom. The sixth graders were asked a year-long question of “Could we release the salmon we raise in our classroom into Crystal Creek?” The students were divided into groups, and each group came up with a testable hypothesis focused on one of four water quality indicators: temperature, flow rate, dissolved oxygen, or pH. The student presentations will focus on their answer to the research question based on their data.
The Effect a Novel Outdoor Environment has on the Behavior of Chimpanzees in a Sanctuary Setting
Heggs, Laura; Matheson, Megan; Ross, Stephen R.; Mulcahy, J.B.
Faculty Mentor(s): Megan Matheson, Primate Behavior
Oral Presentation, Session # 30
2:10-2:30 in Room 201

The presence of species-typical behavior is considered an indicator of captive animal welfare and a measure of the animals’ relationships to the captive environment. Creating the environmental complexity that animals experience in the wild is challenging in captive settings, although previous research indicates a positive influence that an outdoor environment has on captive primate behavior. The current study assessed the behavior of seven captive chimpanzees (*Pan troglodytes*) (1 male, 6 females, 34-38 years, M age= 35 years) at Chimpanzee Sanctuary Northwest in Cle Elum, WA, before and after the introduction to Young’s Hill, a two-acre novel outdoor environment enclosed by electric fencing. All of the chimpanzees were previously housed in a laboratory with no outdoor access. Behavior was assessed from August 2011 to October 2011. Individuals were observed by conducting 10-minute focal samples with 30-second instantaneous recording on behavior, resulting in approximately 50 scans per individual in each condition. A Wilcoxon Signed Ranks Test showed that there was a significant effect in 5 of the 7 behavioral categories analyzed, including a decrease in inactivity (Z= -2.120, P=.034), increase in locomotion (Z= -2.371, P=.018), decrease in object manipulation (Z= -2.366, P=.018), increase in attention (Z= -2.047, P=.041), and a decrease self-directed behaviors (Z= -2.117, P=.034). Results suggest that a large outdoor environment promotes species-typical behaviors, especially locomotion.

WATERS Independent Student Projects Lincoln Elementary School
Hegna, Jonathan; Morrill, Tyson; Graff, Ben; Rogers, Cailyn; Leah, Wilson
Faculty Mentor(s): Kristina Ernest, Biological Sciences
Poster Presentation Session #2, Poster # 30
11:15-1:45 in Ballroom C/D

This poster is part of the WATERS project funded by the NSF GK-12 program. Students were challenged to work in groups of two to independently investigate a question by following the scientific method. In this project the interaction between material color and stain removal was analyzed. Three white, blue, and red square cloths (6X10in) of 100% cotton were used. One half of a teaspoon of Smuckers blueberry jam was then put uniformly onto the fabric. The cloths were then put into a washer and washed on a warm rinse cycle and then dried for 28 minutes. Once washed, the cloths were compared to a Likert scale to determine how well the stain was removed. White cloth retained the most stain, while the blue cloth retained the least amount of stain. Red cloth retained an intermediate amount of stain. In conclusion, darker colors should be used to prevent stains from permanently damaging clothing material. In the second project, the strength of three different types of tape were determined, including gorilla tape, duct tape, and painters tape. The results showed that gorilla tape was the strongest and longest lasting tape. Painters tape was shown to be the weakest type of tape.
This poster is part of the WATERS project funded by the NSF GK-12 program. Students were challenged to work in groups of two to independently investigate a question by following the scientific method. The first project investigated the impact of water temperature on the depletion of red marker ink. They found that higher water temperature tended to produce more ink. However, over long periods of time there was not much difference in ink production. The second project investigated the impact of different amounts of lipids on the quality of popcorn produced. They quantified the number of corn kernels and looked at burning.

This poster is part of the WATERS project funded by the NSF GK-12 program. Students were challenged to work in groups of two to independently investigate a question by following the scientific method. In this project students investigated the interaction between the amount of lipids and sugars in popcorn and the quality of the popcorn after being cooked. The three types of popcorn tested were kettle corn (increased sugar), butter popcorn, and plain popcorn. The results of the experiment showed that kettle corn had the most burnt kernels. Butter popcorn had the second most amount of burnt popcorn kernels, while plain popcorn had the least amount of burnt popcorn kernels. Therefore, the amount of heat should be adjusted accordingly when cooking popcorn with sugar and increased amounts of lipids to limit the amount of burning.

In order to study Hatshepsut, the female ruler of ancient Egypt, one must not only study her within the context of her own culture, but must also understand the views of the early archeologists who discovered her. Because of the respective cultures of the early archeologists, many misconceptions about Hatshepsut’s life arose—such as perceptions of her as a usurper to the throne, or the idea that her erasure from history was brought on because of her gender. Recent evidence disproves many of these misconceptions. The three views together—that of the early archeologists, that of the ancient Egyptians, and contemporary views of her today—create a fascinating lens through which to study perceptions of gender. What does studying Hatshepsut tell us about the Egyptians’ and the early archeologists’ ideas of women? What does it say about our own views? How do the three compare?
Moving Forward
Heikkila, Rachel
Faculty Mentor(s): Therese Young, Physical Education, School and Public Health

Creative Expression Presentation, Session # 34
2:10-2:30 in Ballroom A

This solo piece was created using an integrated arts approach, meaning that I fully developed my concept using poetry, art, and music before I ever choreographed a single movement. My concept was first inspired by a short poem that expressed the feeling of being stuck, and then finally freed. To follow through with this idea, I found a piece of art that I thought had themes of “change” and “movement.” Next, when I went to choose the music to set my piece to, I searched for a song with lyrics that supported my motifs of being bound, then free, and stuck, then in motion. Choreographing at that point became easier because of all the preparation—I knew exactly what I wanted to say through dance. When I choreographed this piece, I never would have thought that its meaning would go past what I was experiencing as a college sophomore. Now, as I prepare to graduate, I see that its themes will revisit throughout life. I had felt free and in motion two years ago, but since then I have been stuck again, and again I am ready for change. Moving forward in life is inevitable; it is a continuous process of ups and downs. I have put my heart into this dance, and my hope is that the audience will see that and be able to relate their personal experiences to it as well.

Does the Amount of Forest Canopy Closure Affect the Amount of Thistle Seed Eaten?
Henrichsen, Willow; Eames, Alexis
Faculty Mentor(s): Trish Griswold, Other

Poster Presentation Session #2, Poster # 20
11:15-1:45 in Ballroom C/D

Fostering a “Sense of Place” at Walter Strom Middle School, 7th grade students conducted inquiry based investigations in the outdoor classroom. Data was collected several times per month throughout the school year. We filled two bird feeders with thistle seed—one in the open area and another under the forest canopy and made observations throughout the school year. We used a statistical test to decide if we thought our hypothesis or our null hypotheses was true.

Cross-Calibration of Long Pathlength Absorbance vs. Chemiluminescence Flow Injection for Analysis of Trace Fe(II) Concentrations in Aqueous Media
Hinz, Daniel; Teng, Hsiang; Ting, Hoi
Faculty Mentor(s): Anne Johansen, Chemistry

Poster Presentation Session #1, Poster # 27
8:30-11:00 in Ballroom C/D

My research is part of a larger project intended to understand the mechanism of iron redox chemistry in aerosol particles that supply phytoplankton in the open ocean with the limiting micronutrient iron, we developed the parallel use of two analytical instruments that combined allow us to detect ferrous iron from 50pM to 300 nM. Analysis of crustal iron aerosol samples from the South Atlantic Ocean in 2005 and the equatorial Pacific Ocean in 2006 are being analyzed for iron content via flow injection analysis (FIA) and liquid waveguide capillary cell (LWCC) instruments. The FIA operates by the interaction of iron (II) with luminol to produce chemiluminescence. LWCC operates by measuring the absorbance of iron (II)-ferrozine complex. Cross calibration has been carried out initially by analyzing synthetic samples and subsequently actual atmospheric samples to test the effect of sample matrix on the signal. Samples from equatorial Pacific Ocean between Hawaii and Papua New Guinea during a 2-month research cruise (R/V Kilo Moana) in Aug-Oct 2006 were analyzed using the FIA and LWCC.
**Music is the Voice**  
*Hoffman, David*  
*Faculty Mentor(s): Matthew Altman, Philosophy and Religious Studies*

Oral Presentation, Session # 14  
10:20-10:40 in Room 202

Music becomes a voice for people. Not just individuals, but for whole generations. Music expresses the emotion that people of a certain culture and particular time period are feeling, and by doing so, music unites them. I am looking at the philosophy of music, mainly Peter Kivy’s formal interpretation of emotional expressiveness in music. Kivy maintains that music is not able to express a garden variety of emotion to the listener. What moves us is the form and structure of the music. If this theory holds true, then, it does not account for historical relativism and music for the generation. I am looking deeper into how music becomes the voice of a generation. To do so I must acknowledge that Kivy’s theory has flaws and look at a theory that can account for this phenomenon, that being, emotivism.

**Deformation Across the Western Mina Deflection: Field Studies in the Huntoon Springs Quadrangle, California-Nevada**  
*Hogan, Eliya*  
*Faculty Mentor(s): Jeff Lee, Geological Sciences; Wendy Bohrson, Geological Sciences; Anne Egger, Geological Sciences; Chris Mattinson, Geological Sciences*

Poster Presentation Session #3, Poster # 3  
2:00-4:30 in Ballroom C/D

The Mina deflection (MD) defines a major right step in the northwest-trending eastern California shear zone (ECSZ)-Walker Lane belt (WLB) dextral system, and transfers fault slip from the ECSZ to the WLB along east-northeast- and northwest-trending faults. Three models have been proposed to explain this fault slip transfer: (1) the displacement transfer model suggests that Pliocene slip was transferred along northeast-striking normal faults, (2) the transtensional strain model suggests that Pleistocene strain was transferred by extension-dominated transtension in the west and wrench-dominated transtension in the east, and (3) the rotational block model suggests that slip was transferred by clockwise rotating blocks bounded by northeast-striking sinistral faults. New geologic mapping and structural studies in the Huntoon Springs quadrangle (HSQ) of the western MD evaluate these hypotheses. Here, Pliocene andesite lavas, basalt lavas, and unconformably underlying Miocene ignimbrite are cut and offset by primarily high-angle east-northeast-striking sinistral faults and by lesser northwest-striking normal faults. Sinistral faults are identified by linear fault traces, alternating scarp-facing directions, sinistral offsets of normal faults, fractures, and volcanic units, and by the presence of extensional basins at releasing steps, or pop-up structures at restraining steps. Normal faults are identified by sinuous fault traces, the lack of lateral offset along strike, or as connecting faults between left-stepping sinistral faults. Major NE-striking sinistral faults documented in the HSQ may be related to block rotation, but further study is required to verify this hypothesis.
**To Conform or Regulate, Are These the Only Options? Thermal Biology of the Mexican Beaded Lizard (Heloderma horridum horridum) in a Tropical Deciduous Forest**

_Holcomb, Kerry_

*Faculty Mentor(s): Dan Beck, Biological Sciences*

Oral Presentation, Session # 36  
3:00-3:20 in Room 137A

By shuttling between cool and warm patches in their habitat, reptiles can maintain stable as well as suitable body temperatures—this is known as active thermoregulation. Nevertheless, active thermoregulation is physically challenging and behaviorally expensive for medium to large reptiles (>500g). We contrasted Mexican Beaded lizard body temperature management between the wet and dry seasons, in a tropical deciduous forest, near Chamela, Jalisco, Mexico. Animals were tracked using radiotelemetry and monitored for habitat use patterns and behavior. Implanted Thermochron ibutton™ temperature dataloggers were used to record body temperatures at 15 minute intervals (n = 6 lizards). Body temperatures of active beaded lizards were found to correlate strongly with concurrent ambient temperature, in both the dry and wet seasons, indicating a conformist strategy to thermal management. Yet, shelters occupied by beaded lizards showed ambient temperatures close to this species’ preferred body temperature. Thermal selectivity in refuge choice, as well as temporal patterns of refuge use, enabled beaded lizards to regulate body temperature tightly. For instance, 54.4 percent of dry-season and 30.4 percent of wet-season body temperatures fell between 27.1 and 29.9°C, which agrees with this species’ preferred body temperature—27.5 to 31.25 °C (n=5 lizards). Rather than actively thermoregulate, beaded lizards seem to manage body temperature through careful refuge selection and activity scheduling. Furthermore, homeothermy achieved using this strategy can be held for many days, a level of thermal stability that is impossible to maintain through active behavioral thermoregulation.

**Far Infrared Laser Lines Produced from an Optically Pumped Molecular Laser**

_Holman, Robert; Minton, Rolf; Alves, Henrique_

*Faculty Mentor(s): Michael Jackson, Physics*

Oral Presentation, Session # 37  
3:20-3:40 in Room 137B

LASER is an acronym for Light Amplification by Stimulated Emission of Radiation. Initially dubbed “the solution in search of a problem,” the laser was originally invented with no specific application in mind. Since its invention in 1960, the laser has been a significant asset to society with its countless applications in science, technology, and beyond. Today, some of its practical uses include checkout scanners, laser cutting and welding, along with defense and medical applications, such as LASIK surgery. Lasers have even found their way into the entertainment industry. One of the laser projects at Central Washington University involves the discovery of new sources of laser light in the far-infrared region, defined as spanning wavelengths from 30 to 1000 microns. For this project, a carbon dioxide (CO₂) laser was used to excite the medium in a recently constructed far-infrared laser cavity. This new laser cavity was evaluated using either CH₃OH, CH₃OD, CH₂F₂, CD₂OH, CD₂J, HCOOH, or H¹³COOH as the far-infrared laser medium. Using these various media, 140 laser lines were generated with our experimental system, ranging from 41.4 to 1136.2 micron. Of the 140 laser lines we detected, fourteen were new. This presentation will focus on discussing the experimental system and the process involved in the discovery of far-infrared laser lines.
Wenas Creek runs through a large portion of Selah, Washington, providing hydration to an otherwise arid region. The use of water by humans returns water to the ecosystem with added nutrients, in some cases at levels detrimental to the environment. Riparian zones and ponds along Wenas Creek are the few places within the watershed where aquatic life is supported. Water mixing in conjunction with aquatic life processes cycle natural and anthropogenic nutrients through the ecosystem. The objective of this study was to assess pond ecosystem health by documenting living and non-living members. Data was collected at Wenas Creek and a nearby pond in fall, winter, and spring. Measurements of dissolved oxygen, conductivity, temperature, and nitrate were taken. Water quality was determined to be fairly good for most organisms with average dissolved oxygen being slightly low, at about 4.1 parts per million (ppm), and average conductivity being slightly high at roughly 538 micro-Siemens per centimeter. Crude measurements of nitrate concentrations using Hach kits suggest that levels were about 3 ppm. An inventory of invertebrates was taken. Species ranged from pollution tolerant to pollution sensitive. Particular attention was paid to gilled snails as they are an invertebrate species found in excellent quality water due to their high sensitivity to pollution. Amphibians which are known to be reliable ecological indicators were caught, described, and released. Several pacific tree frogs were found all of which appeared to be in good physical health except one found missing a limb. Algae were present in limited extent.

Electronic Realization of a Chaotic Differential Equation

Ingham, Matthew

Faculty Mentor(s): Michael Braunstein, Physics

An electronic realization of a third order nonlinear ordinary differential equation was designed and built using operational amplifiers, a voltage multiplier integrated circuit, and a variety of other electronic components. The behavior of the circuit was investigated both qualitatively and quantitatively, and modeled using Mathematica. As anticipated, the behavior of the system exhibited both periodic and aperiodic chaotic behavior as indicated by both qualitative examination of the phase space of the system and the spectrum of the largest characteristic Lyapunov exponent. The results of these investigations were used in conjunction with a program implemented in Mathematica to calculate the Lyapunov exponent for the chaotic differential equation for particular values of the control parameter.
Perceptions of Students with Learning Disabilities on a University Campus

Jackle, Samantha; Bistricean, Cristina
Faculty Mentor(s): Kara Gabriel, Psychology

Poster Presentation Session #3, Poster # 17
2:00-4:30 in Ballroom C/D

The Americans with Disabilities Act (ADA), passed in 1990, prohibits discrimination against individuals with any physical and/or mental impairment(s)—ensuring equal access to education, employment, and other public accommodations nationwide. Perhaps an effect of the ADA is that college campuses are experiencing increased enrollment rates among individuals with disabilities. The present study is designed to measure undergraduate students’ perceptions of individuals with learning disabilities, as well as their knowledge of the resources available at Central Washington University to support said individuals. Participants are asked to respond to forty-five questions using a Likert scale of 1 to 6 (1 = strongly disagree; 6 = strongly agree). Questions measure respondents’ own attitudes toward individuals with learning disabilities, in addition to their perceptions of other students’ attitudes. Although data collection is ongoing, preliminary data analysis has been conducted on responses from two male and three female undergraduate students, recruited from undergraduate psychology courses, and that have attended Central for one to three years. Data indicate that the majority of respondents view Central as welcoming towards individuals with disabilities (Mean = 5.56), in addition to providing more services for said individuals than do other universities (Mean = 4.44). While respondents agree with the statement that other students may ostracize those with disabilities (Mean = 4.11), they disagree that they, themselves, would feel nervous around someone with a disability (Mean = 1.89). These preliminary findings suggest that Central students, in general, support services for those with learning disabilities.

Towards the Synthesis of 1,3-Azaborines as Potential Inhibitors of HIV-1 Protease

Jennings, Julia
Faculty Mentor(s): Levente Fabry-Asztalos, Chemistry

Oral Presentation, Session # 28
1:50-2:10 in Room 137B

Currently, approximately 33.3 million people are living with HIV/AIDS worldwide and each year an additional 2.1 million people become infected. The goal of this research is to develop 1,3-azaborines that could potentially inhibit HIV-1 protease. HIV-1 protease is an enzyme involved in the protein processing step of the replication cycle. By inhibiting HIV-1 protease, the drug would slow the progression of HIV into AIDS. The target compounds are expected to have both competitive and associative inhibition and may inhibit mutated HIV viruses as well. To synthesize these compounds, boronic acids were coupled with a chiral directing/protecting group. A homologation was then performed to insert a chlorinated carbon. The chlorine was then replaced with hexamethyldisilazane. Attempts are being made toward cyclization which would result in 1,3-azaborines, which can be coupled with tripeptides to yield potential HIV-1 protease inhibitors.
My name is Brian Johnson, I am a graduating Senior, and want to showcase my draping for the theatre department’s production of *Little Women*, the musical. I have worked on these outfits trying to replicate civil war female garments. The character that I worked on is Jo, who is the main character, and have built three outfits, a poke bonnet, undergarments (such as petticoat and pantaloons) as well as a corset. This project has allowed me to explore my draping skills and pattern alteration skills. I work side by side with the costume designer, Jessica Pribble, who gives me her renderings of how she envisions the character to look and I work with different fabrics to make the outfits come alive for her. This project has also allowed me to explore the world of millinery, as I have never made a hat before, and Mrs. Pribble has given me the freedom to be creative with the hat to fit my outfits. I am also working with the wig designer, Jennee Leavitt, on fronting a wig, which involves taking the hard front off of the existing wig, adding wig lace, and retying the hairs on individually, then styling to look realistic.

Located on the Olympic Peninsula in Washington State, the Elwha and Glines Canyon Dams have blocked the Elwha River and, subsequently, salmon runs for nearly 100 years. The removal of the dams and restoration of the ecosystem is the largest project of its kind in the nation’s history. Despite the monumental nature of the Elwha River Restoration (ERR), little information is available about the cultural implications of this project. Specifically, little attention has been paid to how the return of salmon affects perceptions of the Elwha landscape. Spanning decades and affecting generations, this project has changed and will continue to change the landscape. In using an interpretive methodology to interview key stakeholders, this research evaluated the connections between humans and salmon, and how these connections influenced broader perceptions of the landscape. Accounting for these current, varying connections between people and resources will aid in addressing future restoration challenges. Preliminary analysis indicated that stakeholders assigned meanings and values to salmon. In turn, the reintroduction of this meaningful and valued species to the Elwha River changed peoples’ perceptions of the landscape.
A Comparative Study of Yakama Nation and Selah, Washington Residents’ Sense of Place

Johnson, Kelsey
Faculty Mentor(s): Kathleen Barlow, Anthropology
Poster Presentation Session #2, Posters # 28 & 29
11:15-1:45 in Ballroom C/D

Flowing from the Cascade Mountains to the Columbia River, the Yakima River is a source of significant meaning for many eastern Washington communities. The river travels approximately 215 miles through private, state, federal and tribal lands. Previous modifications, such as dams and diversions for irrigation and flood control, have had significant impacts on not only the physical features of the river, but to the communities connected to the river. Research suggests that changes such as these can have a profound impact on peoples’ perceptions of those landscapes. These perceptions, also known as sense of place, often determine how resources are used and managed. Often these perceptions are subjective to the individuals and cultures connected to the landscape. This research evaluates key stakeholders’ sense of place of the Yakima River in order to gain a snapshot of current perspectives that will aid in tailoring future resource management policies. In using a survey approach to interview key stakeholders, this research will evaluate the connections between people and the Yakima River. Specifically, this research will compare Yakama Nation tribal members’ sense of place with Selah community members’ sense of place.

Die Fledermaus

Jonson, Justin; Curia, Angela; Hemenway, Sarah; Stephens, Terrell
Faculty Mentor(s): Gayla Blaisdell, Music; Torrance Blaisdell, Music
Creative Expression Presentation, Session # 16
10:40-11:00 in Ballroom A

Die Fledermaus was written in 1874 by Johann Strauss II. The opera takes place in Vienna, Austria, in the 1890's. Gabriel von Eisenstein is sentenced to a fortnight in jail for a civil offense. A good friend, Dr. Falke, invites Eisenstein to a masquerade, suggesting he bring along his repeater stop-watch, which charms all the ladies, so he can accumulate pleasant memories to sustain him during his confinement in jail. Rosalinde, Eisenstein's wife, joins her maid Adele in a “bittersweet” farewell to Eisenstein before he leaves home for prison. Both Eisenstein and Rosalinde are secretly thrilled by the idea of being separated from one another. (Editor’s Note: This presentation may contain adult themes, content or imagery.)
Determining Patterns in the Britannia Range of the Transantarctic Mountains  
*Juergensen, Mindy*  
*Faculty Mentor(s): Audrey Huerta, Geological Sciences*

Poster Presentation Session #3, Poster # 2  
2:00-4:30 in Ballroom C/D

Antarctica is home to the Transantarctic Mountains (TAM), which extend more than 2,000 km. Located centrally within the TAM, and approximately 80 km in length, Britannia Range provides a rare opportunity to understand how crust compresses, folds, and faults due to subduction from colliding plates. Rocks currently exposed consist of magmatic rocks emplaced by the Ross Orogeny during the Paleozoic Era. Thin sections of collected rock samples help to accurately examine and identify various types of igneous and metamorphosed migmatites, such as gneisses and schists. Generally, through hand specimen, and locally, through thin section, mineralogies and textures are examined to define each rock sample. Notably, quartz and epidote provide compelling evidence towards the depth at which these magmatic rocks cooled and deformed. The quartz grains exhibit ductile deformation (polygonal quartz) and high temperature deformation through subgrain rotation (~400-500 degrees Celsius), grain boundary migration (~500-550 degrees Celsius), and chessboard (>630 degrees Celsius) extinction textures. Epidote may appear in the rock samples as either a magmatic or metamorphic mineral. The formation depth of rocks containing epidote may be deduced by the crosscutting relationships between epidote and the surrounding minerals. Presently, data shows epidote most likely crystallized at pressures of ~0.8 to 0.5 GPa. The samples will be mapped on a satellite image to determine geological zone patterns within the Britannia Range. The history, evolution, and deep metamorphism of the Britannia Range area may be better understood through examination of the mineralogical and textural compositions within the rock samples.

Quantitative Study of Hospitalization Rates in Kittitas County  
*Karas, Joshua*  
*Faculty Mentor(s): Dominic Klyve, Mathematics*

Oral Presentation, Session # 29  
1:30-1:50 in Room 140

Kittitas County currently lacks a statistician to interpret county health data. My presentation deals with data collected and analyzed from the “Behavioral Risk Factor Surveillance System” (BRFS). The BRFS is the world’s largest telephone health survey. The Center for Disease Control collected the data on behavioral health risks, which revolved around the use of preventative medicines and health relating to chronic disease or injury. I used data from two regions: Washington State and Kittitas County. Kittitas Country is a subgroup of Washington State, but this will allow us to compare county data to state data. I compared multiple variables regarding hospitalization rates of Kittitas County and Washington State and found statistically significant results. These results show interesting relationships in the behavioral health risk data among Kittitas County and Washington State, which led to further in-depth statistical tests. These results show that there are differences between Kittitas County and Washington State and could be acted upon politically.
Analysis of the *Brown v. Plata Case* and its Effect on the Status Quo of Judicial Decision Making:
An Examination of the Three Branches of Government the Judiciary, the Judiciary, and the Judiciary

*Kaskla, Kristian*

*Faculty Mentor(s): Cody Stoddard, Law & Justice*

Oral Presentation, Session # 10
10:00-11:20 in Room 137A

The Supreme Court’s decision in *Brown v. Plata* has set a new precedent in the field of criminal law and has further expanded the power of the judiciary. The *Brown v. Plata* case was a United States Supreme Court decision which ordered a reduction in the population size of California’s prisons. The effects of the case are wide reaching, from the criminal justice system to the judiciary as a whole. This case indicates an expanding role of the judiciary in bureaucratic decision making. It appears the courts have been consistently increasing their power and their range of jurisdiction. The legislative branches have been compliant with these changes as they are often unwilling to make difficult decisions, leaving them to the courts instead. The decisions made in *Brown v. Plata* had a direct impact on California’s government. If the courts can make decisions entirely overriding the power of state governments, questions arise as to what, and if anything, can check the power of the courts. This presentation will be divided into two main sections; first the facts of the case will be outlined as well as the logic, and illogical thought, that the judges utilized to come to their decision. Once the case itself is examined the possible ramifications of the case will be discussed.

Academic Language and Student Voice in an Inquiry Lesson about Iraq

*Kaviani, Khodadad*

Oral Presentation, Session # 7
8:50-9:10 in Room 271

Please see this faculty member’s expanded peer review abstract on page 195.

Using Type-Token Ratio as Measurement for Lexical Diversity in Chimpanzee Conversations

*Keenan, Susan Ann*; Jensvold, Mary Lee

*Faculty Mentor(s): Mary Lee Jensvold, Primate Behavior*

Oral Presentation, Session # 30
1:10-1:30 in Room 201

Using Type-Token Ratio as Measurement for Lexical Diversity in Chimpanzee Conversations

*Type-Token Ratio* (TTR) is a measurement commonly used to measure lexical diversity of conversations, spontaneous utterances, and literature (Richards, 1987). The ratio describes the variation of vocabulary used in spoken or written utterances and can track changes in this variation between samples of comparable composition. The vocabulary of four adult cross-fostered signing chimpanzees living at the Chimpanzee & Human Communication Institute at Central Washington University was examined using TTR. The types were different glosses, or word meanings for signs. The tokens were the total number of signs in the transcript. Two samples of 150 utterances from transcripts from Bodamer and Gardner (2002) were selected for analysis and indicate TTR is another way to describe the chimpanzees’ use of signs. The chimpanzees use similar amounts of types in each sample, but vary in the amount of tokens. The chimpanzees also showed differences in their most frequently signed words in both number of instances and topic category. Personality may influence lexical diversity through knowledge of vocabulary based on interests and what is being discussed. Results suggest that the human caregiver may influence the lexical diversity used in a conversation by varying glosses for each chimpanzee.
Holocene Housing Hunting: Assessing a Potential Method for Locating Archaeological Sites in Arctic Alaska Using High-Resolution Satellite Imagery

Keeney, Joseph
Faculty Mentor(s): Robert Hickey, Geography

Oral Presentation, Session # 3
9:30-9:50 in Room 137B

As satellite imaging technologies advance, they are producing images capable of distinguishing ground-cover reflectance patterns at ever finer spatial resolutions. Successes have been reported of using satellite imagery to locate large archaeological features such as structures or mounds. However, few examples currently exist in the literature of its attempted applications toward small archaeological sites. We addressed this dearth in the literature by testing whether satellite images could be used to locate spectral anomalies associated with known archaeological sites surrounding Lake Matcharak and Desperation Lake in Arctic Alaska. We employed a method using 1 meter resolution, multispectral IKONOS satellite data and digital elevation models to generate vegetative indices and slope. We then stacked the resulting data and generated supervised and unsupervised classifications of the spectral and slope characteristics, and overlaid GIS data of known archaeological sites to compare to the classification results. Here we report on the methods and results of our study and its implications for future archaeological research.

Faunal Analysis of the Umtanum Creek Site

Keller, Alfred
Faculty Mentor(s): Patrick Lubinski, Anthropology

Poster Presentation Session #1, Poster # 33
8:30-11:00 in Ballroom C/D

The Umptanum Creek site was excavated multiple times in the 1960s and 1990s, but the fauna was never analyzed. Our project involved analyzing a sample of fauna recovered from the 1969 William Smith excavation at the site. For this project, we selected 151 bags of faunal remains, containing 865 faunal specimens. This sample consists of all faunal remains found in unit N37, quadrants 5 through 16. In this analysis, each specimen was examined for the following characteristics: side, element, portion, class, taxon, and indentifying landmarks and the kind of breakage, burning, degree of root-etching, weathering, length, and modification. This analysis showed that the majority of the specimens in this collection derive from mammals that fall into size classes 4, 5, and 6 (dog to deer-size), and that the majority of the identifiable specimens come from deer (Odocoileus sp.). There were also a few fragments of cattle or bison, sheep, pocket gopher, and other unidentified rodents and bird. A significant proportion of the remains were burned (42%) and broken to a high degree. Some of the remains are clearly historic in age (cattle and saw-cut bones). The results of this sample analysis project clearly indicate that the subsequent analysis of the complete collection will have excellent potential to yield results that will tell us about the lifeways of the people that once lived along the Yakima River.
**Ambivalent Love**  
**Kernell, Marq**  
*Faculty Mentor(s): Therese Young, Other*

Creative Expression Presentation, Session # 34  
1:30-1:50 in Ballroom A

The creative artistic work that I am submitting is titled *Ambivalent Love*. I used an integrated arts approach to the choreography of this piece, as per the choreography assignment in which my piece originated. I started with a poem, Tupac Shakur’s “In the Event of my Demise.” and pulled several themes from the poem. The main themes that I found were ambivalence and love, so I choreographed movements to the two themes I extracted. Next, I found a student painting of a ghostly woman on a bed with a male counterpart at the bed’s edge; I extracted the theme of a dying relationship from this painting and choreographed movements to this theme. The next part of my integrated arts approach was to find a song. I found the perfect song while getting ready in the morning, *Try with Me* by Nicole Scherzinger. The song shared the themes of both the poem and the painting. After finding dancers who I knew had experienced failing relationships, I fit my choreography to their bodies as to maximize the intensity of their outward emotion. The complete story of the dance is that my male dancer leaves the female and she is broken hearted, then she does everything she can to get him back. Once he decides to come back to her, they share precious moments that result in a fight between them and the female dancer leaves the male, resulting in him doing everything he can to get her back.

**Just Friends**  
**Keyes, Devin**  
*Faculty Mentor(s): Michael Ogden, Film and Video Studies*

Video Presentation, Session # 25  
Part 1: 12:20-12:40 in Theatre  
Part 2: 12:40-1:00 in Theatre

*Just Friends* is a short film written and directed by Devin Keyes. This project was an independent study Devin carried out in order to put to the test the culmination of what he had learned throughout his college career. Michael Ogden worked as an advisor on the project. In order to complete the film, the help of Jordan-Michael Whidbey, FX Wood, Dana Winter, Ashlen Hodge, Jordan Simmons, and Tony Morales was enlisted to star in the film. For help behind the camera, John Benson filled the role of Director of Photography, Tony also did much of the sound recording, and Jordan Simmons and Lisa Herring worked behind the scenes by filling rolls when needed. In the process of filming, Devin had to manage a schedule in which he could accommodate cast and crew’s class and work schedules as well as finding locations in which to film. Numerous challenges were presented to the cast and crew such as filming in the loud and noisy SURC, where recording quality audio was difficult, filming outside in freezing weather, getting together large groups of people for a classroom scene and a party scene, and always racing the clock to make sure filming was done on time. At the end of filming, Devin went through over seven hours of footage to edit together the final twenty-five minute piece.
Academic Self-Efficacy, Coping, and Academic Performance in College  
Khan, Mehjabeen  
Faculty Mentor(s): Heath Marrs, Psychology  

Poster Presentation Session #3, Poster # 21  
2:00-4:30 in Ballroom C/D  

This study is proposing to find a relationship in the college academic setting between academic self-efficacy, stress coping skills, and academic performance. The hypothesis is that students who have high academic self-efficacy and effective stress coping skills achieve at high levels, in college. This study is being in done in hopes of having a better understanding of what makes a student successful in college. Participants will be Central Washington University undergraduate students, 18 years of age or older. The expected primary age group of the participants is 18-25 years of age, with approximately equal numbers of males and females, and some ethnic diversity. However, gender, ethnicity, and age are not contributing factors to the study. Participants will complete the study online, and may receive extra credit for a psychology course that they are enrolled in. There is no limit to the number of participants that can participate in the study. Stress coping skills will be measured using the COPE Inventory (Carver, Scheier, & Weintraub, 1989). Academic self-efficacy will be measured using the Academic Self-Efficacy Scale (Chemers, Hu, & Garcia, 2001). Academic performance will be measured using the participants’ high school GPA, college GPA, and either SAT or ACT score. Additionally, demographic questions will be asked as well. Data is currently in the process of being collected, therefore, results are currently absent. However, results are anticipated to be available before the date of SOURCE.

Academic English as L2: Effectiveness of Modeling and Noticing  
Kienast, Kristine  
Faculty Mentor(s): Patsy Callaghan, English  

Oral Presentation, Session # 26  
1:30-1:50 in Room 135  

Academic writing, that language of the elite, the powerful, the educated—we expect it from freshman college students almost immediately upon matriculation. But to many entering students, academic writing is almost another language, requiring a unique vocabulary and syntax. In the field of Second Language Acquisition (SLA), these students would be considered L2’s, meaning that academic writing is a “second language.” With this view in mind, composition instructors should be compelled to find effective ways to teach academic writing, especially as the demographics of the student population change over time. The question, then, is if academic writing can be viewed as a second language, what are effective ways to bring students to fluency in that L2 of academic writing? Incorporating research in both composition studies and SLA, I will explore how both “modeling” and “noticing” may be used to increase fluency in academic writing and examine the interrelatedness of the two approaches.
New Synthesis of Novel Phosphor for LED Technology: \( \text{Sr}_3\text{B}_2\text{O}_6: \text{Eu}^{2+} \) Using \( \text{SrB}_4\text{O}_7: \text{Eu}^{2+} \) as a Precursor

Kilburn, Troy; Orme, Patrick; Way, Zack

Faculty Mentor(s): Anthony Diaz, Chemistry

Poster Presentation Session #1, Poster # 24
8:30-11:00 in Ballroom C/D

Phosphors, used in plasma screens, medical imaging, and LED lighting, are materials that absorb energy and emit light. A promising activator for use in phosphors is Europium\(^{2+}\). Depending on the host, this dopant can emit anywhere in the visible spectrum. According to the literature, it is difficult to dope Eu\(^{2+}\) into \( \text{Sr}_3\text{B}_2\text{O}_6 \) due to the stability of Eu\(^{3+}\). The literature indicates that the phosphor \( \text{SrB}_4\text{O}_7 \) readily incorporates Eu\(^{2+}\) into its structure. This work describes an investigation of a new method of making \( \text{Sr}_3\text{B}_2\text{O}_6: \text{Eu} \) that uses \( \text{SrB}_4\text{O}_7: \text{Eu}^{2+} \) as a precursor. If \( \text{SrB}_4\text{O}_7: \text{Eu}^{2+} \) is used as a starting material for \( \text{Sr}_3\text{B}_2\text{O}_6: \text{Eu} \), then there should be less Eu\(^{3+}\) and more Eu\(^{2+}\) in the resulting compound than when prepared by traditional methods. Samples of \( \text{Sr}_3\text{B}_2\text{O}_6: \text{Eu} \) were prepared using traditional methods: grinding stoichiometric amounts of strontium carbonate (\( \text{SrCO}_3 \)), boric acid (\( \text{H}_3\text{BO}_3 \)), and europium oxide (\( \text{Eu}_2\text{O}_3 \)) and firing in a reducing atmosphere. Samples using the new method were prepared by grinding stoichiometric amounts of \( \text{SrCO}_3 \), \( \text{H}_3\text{BO}_3 \), and \( \text{Eu}_2\text{O}_3 \) and firing in a reduction atmosphere to form \( \text{SrB}_4\text{O}_7: \text{Eu}^{2+} \). Stoichiometric amounts of \( \text{SrCO}_3 \) were added, and samples were fired in a reducing atmosphere again. Samples prepared by the new method had a higher ratio of Eu\(^{2+}\) to Eu\(^{3+}\) emission than samples prepared by the traditional method. This method may be applied to other phosphors to incorporate Eu\(^{2+}\), such as \( \text{Sr}_3\text{Y}_2(\text{BO}_3)_4: \text{Eu} \). This method may also lead to previously unmade novel phosphors.

Organic Milk Supply Declines in the United States. Can the Problem be Fixed?

Kochugur, Volodymyr; Kulesza, Iwona; Kahihia, Paul

Faculty Mentor(s): Kun Liao

Lynnwood Center - Poster Presentation, Poster # 3

Many farmers switched from conventional to organic dairy farming in recent ten years, but starting in 2011 some of them switched back to conventional production despite of increasing demand on organic milk. What issues affect the supply and demand of this industry? Why do farmers turn back? Demand for organic milk products has outpaced supply. The base payments to farmers, which closely regulated by USDA, do not cover the total production cost of organic milk which recently increased due to many factors. In many cases organic production becomes less profitable than conventional milk production. Some changes are necessary to fix this situation. The purpose of this paper is to analyze the reasons of the previous years’ increase in shifting from conventional to organic farming systems in the United Stages, analyze supply issues that currently affect this industry, and look for possible solution to prevent declining organic milk production. In order to gather the necessary information we will conduct our research through the Internet, public libraries, and interviews including recently published articles from newspapers and business magazines, professional journals, reports of government organizations and professional associations, reports of research companies, business websites, and questionnaires.
Il Matrimonio Segreto
Koreski, Gemma; Ochoconski, Colleen; Tisdale, Jessikah
Faculty Mentor(s): Gayla Blaisdell, Music

Creative Expression Presentation, Session # 24
12:00-12:20 in Ballroom A

Domenico Cimarosa composed *Il Matrimonio Segreto*, which translates to “The Secret Marriage”, in 1792. It is his most famous work. It is considered an Opera buffa, meaning a comedic opera and is written in Italian. It was received with much appraisal and it is said to be one of the greatest comedic operas in addition to those of Mozart. The opera is set in the 18th century. Geronimo is a wealthy man with two daughters, Elisetta and a younger daughter, Carolina. His sister, Fidalma, runs the household. Geronimo also has a secretary, Paolino, who is secretly married to Carolina. Paolino attempts to secure a marriage between his patron, Count Robinson, and Elisetta. This scene comes after an argument the two sisters have had. Fidalma makes every attempt to stop the bickering but is unsuccessful. To prepare for this, we had to learn our music on our own, write translations and understand word stress.

Sustainable Development, An Ecolodge: A Plan for the Quiet Mountain Lodge
Kutzke, Sara
Faculty Mentor(s): Dorothy Chase, Recreation & Tourism

Poster Presentation Session #2, Poster # 15
11:15-1:45 in Ballroom C/D

The graphic representation of the proposed lodge highlights the principles of sustainable development. Quiet Mountain is conveniently located 20 miles east of bustling downtown Seattle. This North Bend ecolodge will represent new tourism in the Pacific Northwest that provides a unique experience. With 15 comfortable, simple rooms that reflect the beauty of the Northwest, guests will appreciate the spirit of the region. The Quite Mountain provides locally sourced food, which allows for a distinctive taste. The lodge, located on a secluded 5-acre property, is constructed of all environment-friendly systems including water, energy and waste. Local guides take guests on tours of the area including biking around Fall City, hiking Mt. Si, and floating the Snoqualmie River, experiencing the great outdoors right! The lodge also provides interpretive tours, organic wine tasting, and participation in local craft markets. With 55 million American households considering themselves “geotravelers”, ecolodges can serve a growing market type. The niche market is expanding and people with a sustainable mentality are beginning to explore different destinations and activities. Most importantly, the lodge will support an array of organizations around the area. Through community social projects, such as assisting clinics, local schools, and providing sustainable tourism training, the lodge strives to make a positive impact for the community members. Compared to the mid to large scale hotels of the area, Quiet Mountain provides an range of eco-friendly activities, a different level of care and attentiveness, and a personalized touch that will leave the guest feeling relaxed and transformed.
The Supply Chain of Amazon.com Fresh  
*Lamas, Gerald; Le, Sam; Liang, Hui*  
*Faculty Mentor(s): Kun Liao, Operations & Supply Chain Management*

Lynnwood Center - Poster Presentation, Poster # 4

Amazon.com, Inc. operates as an online retailer in North America and internationally. It operates retail websites, such as amazon.com and amazon.ca. The company serves consumers through its retail websites and focuses on selection, price, and convenience. In addition, the company provides fulfillment services; miscellaneous marketing and promotional agreements, such as online advertising; and co-branded credit cards. Starting in August 2007, Amazon entered the online grocery business with the goal of selling groceries and other perishables the same way the website does with electronics, clothing and books. While Amazon Fresh begins to expand their products and services into new markets and communities, they have struggled to meet their customers’ demand due to insufficient data. Many of the issues that plague Amazon Fresh directly affect the company’s ability to secure a consistent and accurate forecast of their inventory. The issues that we will address in our project will be Amazon’s ability to effectively communicate with vendors, appropriate forecasting/planning, and order promising or fulfillment.

Induction and Isolation of Bacteriophages from the Spoilage Bacterium *Lactobacillus*  
*Larson, Kyle*  
*Faculty Mentor(s): Holly Pinkart, Biological Sciences; Lucinda Carnell, Biological Sciences; Gabrielle Stryker, Biological Sciences*

Poster Presentation Session #1, Poster # 15  
8:30-11:00 in Ballroom C/D

Due to the complex multi-step nature of wine-making, the introduction of unwanted bacteria like Lactobacilli during production can lead to serious contamination problems. The goal of this project is to isolate bacteriophages (bacterial viruses), from *Lactobacillus* populations isolated from local wineries and vineyards. Once isolated, the bacteriophages can be tested for their ability to infect and kill other wild Lactobacilli. Many bacteriophages have the ability to integrate their DNA into the genome of its host cell as part of its normal replication cycle. The integrated viral DNA is termed a prophage and it can remain in the genome over many generations of bacterial reproduction. Viral replication will resume only after the host bacterium experiences physiological stress, which triggers excision of the prophage DNA, ultimately killing the host and releasing infectious viruses from the host cells. Like many bacteria, Lactobacilli can harbor prophage DNA within their genomes. In this project, prophage viruses were recovered from their bacterial hosts by chemically damaging the host’s DNA (a stressful event) to initiate the lytic cycle of viral reproduction. A total of 38 wild Lactobacilli were isolated and, under various stress conditions, 17 showed signs of prophage induction. To test for virulence, these 17 prophage isolates were then exposed to other Lactobacilli species, but did not cause infection. Although prophages have been identified in Lactobacilli associated and isolated from wine, the host range for these prophages appears to be too narrow for use as for treatment of contaminated wine.
**Size-dependent Surface Energy Loss in Nanocrystalline YBO$_3$:Eu$^{3+}$**

*Lawler, Andrew; Olson, Kristopher*

*Faculty Mentor(s): Anthony Diaz, Chemistry*

Poster Presentation Session #1, Poster # 25  
8:30-11:00 in Ballroom C/D

(Y,Gd)BO$_3$:Eu$^{3+}$ is a commonly used plasma-display television phosphor, with high host to activator energy-transfer efficiency. My project is working to quantify the effects of energy loss to the surface on this efficiency. Host-to activator transfer efficiency calculations for nanocrystalline (≈50-500 nm) YBO$_3$:Eu$^{3+}$ show measurable surface loss for particles as large as 300 nm. Spectroscopic data describing absorbed and emitted energies were evaluated with published kinetic models and show size-dependent surface loss, increasing as particle size decreases, with approximately 40% of energy lost to the surface for particles smaller than 100 nm. Further research focuses on testing the kinetic models with different host lattices (specifically YPO$_4$), with current work involving gaussian curve fitting to accurately quantify peak height for absorbance and excitation intensity.

**The Enron Scandal Breakdown**

*Leatherman, Jason*

*Faculty Mentor(s): Eric Cheney, Sociology*

Oral Presentation, Session # 23  
11:40-12:00 in Room 271

What was the social architecture of the infamous Enron corporate scandal? The purpose of this presentation is to identify the main actors who pulled off one of the biggest multi-layered white-collar crimes in United States history. Sociometrics are created using several books that thoroughly chronicle the conspirators’ actions. Sociometrics offer a set of analytical tools that enable social researchers and criminal investigators to “mapout” the social action of criminal conspiracies. The findings show who the most central actors were in the conspiracy as well as other information about the social structure of this major enterprise conspiracy. The study also documents the repertoires of wrongdoing that Enron used to carry out its criminal conspiracy and the damages.

**Energetics and Development of Washington State Rhagoletis pomonella (Apple Maggot)**

*Lehrman, Nathan*

*Faculty Mentor(s): Jason Irwin, Biological Sciences*

Oral Presentation, Session # 27  
1:50-2:10 in Room 137A

Apple maggots are a common pest of apple in Washington State. Native to hawthorn fruit, when apples were introduced into the United States during the 19th century, apple maggot populations began to infest both hawthorn and apple fruit. For an insect that has such a major impact in Washington State, little research has been done in this state: the majority of what we know about apple maggots comes from East Coast populations. A general principle of evolution is that as populations are separated over time, the different populations could look or behave differently, so we expect apple maggots in Washington to different significantly from those of the East Coast. My project is in collaboration with the USDA Wapato Research Lab. I am first investigating the basic biology of the insect in Washington, especially with regards to diapause. The second step will be to rear apple maggots in simulated Washington and tropical environments, and measure the effects of the tropical environment on diapauses and metabolic rates. This information will be used to assess the potential of apple maggots to successfully colonize tropical environments –useful information to create regulations in regards to the exportation of potentially infested apples. Initial results show that apple maggots can develop in a tropical condition, and at certain conditions, will develop up to 25% faster than those in a Washington condition. My presentation will consist of an overview of the insect and preliminary results.
Devasree Lewis, Cassie
Faculty Mentor(s): Andrea Eklund, Family and Consumer Sciences

Poster Presentation Session #2, Creative Works # 48
11:15-1:45 in Ballroom C/D

Devasree is an Indian name meaning divine beauty. This piece is inspired by the culture and the native dress of India. I was drawn to the vibrant bursts of color and intricate draping of garments the Islamic and Muslim women wear. I wished to find a way to translate this beauty into an evening gown, which could be worn by women all across the globe. Process: Much of the research done for this piece was conducted online. I searched for images of Indian women as well as how Indian customs such as head coverings are being incorporated into American fashion. I used the online resource Pinterest as a place in which to store my research for easy access and viewing. I took the colors and visual images and began to sketch ideas for how to bring the modern Indian evening gown to life. Techniques: This dress was created through the draping technique. Draping is the smoothing, contouring, and manipulation of fabric on a dress form to create a pattern. From this pattern, I created a sample garment using cost effective materials. I fit the sample gown to my model who is significantly smaller than the dress forms available. Through the fitting I made major changes to the pattern to assure proper fit. Once the pattern was updated I then started on the fully lined final garment. Materials: Crepe back satin, plain weave lining, 22” zipper

A Statewide Analysis of Health Care with Respect to Behavioral Risk Factors
Little, Tanya
Faculty Mentor(s): Dominic Klyve, Mathematics

Oral Presentation, Session # 29
1:10-1:30 in Room 140

The “Behavioral Risk Factor Surveillance System” (BRFSS), is an annual survey executed by the Center for Disease Control and Prevention, across America. The BRFSS is the largest continuously conducted telephone health survey in the world. The information summarized by the variables collected in this survey is vital for health agencies to monitor risk factors for chronic diseases, as well as to learn more about health care in communities across the United States. This study involved the use of the BRFSS data to analyze differences among Kittitas County residents and the rest of Washington State. The analysis presented interesting results that could be helpful to health care providers in these communities, as well as to individuals who live within them. We used various statistical methods, including ANOVA, to compare Kittitas County health data to other communities within the state in order to better understand Kittitas County population. The results will be shared with the Kittitas County Health Department, as they reveal new information about its residents.
C-H Bond Cleavage in Saturated Hydrocarbons Catalyzed by the Diatomic Clusters of Group 8B Transition Metal Elements: A B3LYP Theoretical Study

Livingston, Ben
Faculty Mentor(s): Yingbin Ge, Chemistry

Oral Presentation, Session # 37
2:40-3:00 in Room 137B

The dehydrogenation of methane, catalyzed by the diatomic clusters of transition metal elements in group 8B, was studied using the B3LYP density functional theory. We found that Rh$_2$ had an exceptional catalytic ability, where the insertion of Rh$_2$ into a C-H bond of methane was essentially barrierless. The formation of the complex between Rh$_2$ and methane released enough energy to overcome the barrier of the insertion reaction. Ir$_2$, Pt$_2$, and Pd$_2$ were found to have larger energy barriers of 12, 40, and 82 kJ/mol, respectively. With one electron being removed, the positively charged diatomic clusters of Rh, Ir, Pt, and Pd can all break the C-H bond of methane without overcoming any barrier due to the strong charge-induced dipole interaction between the cluster and methane. The studies on the catalytic behaviors of the aforementioned transition metal clusters towards ethane and propane are currently in progress. Our results indicate that the nanoclusters of Rh, Ir, Pt, and Pd can effectively activate the C-H bonds of alkanes and thereby reduce the energy cost in the industrial processes of converting alkanes to alkenes.

Euler’s Early Work in Diophantine Equations

Livingston, Ben
Faculty Mentor(s): Dominic Klyve, Mathematics

Oral Presentation, Session # 47
4:10-4:30 in Room 140

We examine the mathematical and historical context of Leonhard Euler’s first paper on Diophantine Equations, “De Solution Problematum Diophanteorum Per Numeros Integros” (E29). We reexamine and verify Euler’s calculations, and we translate his work into modern notation. Euler struggled in working with Diophantine Equations at first, which makes his work difficult to follow. In fact, his difficulties are made more evident by the fact that we found several previously-unreported errors in the paper. We show how these errors can be fixed without changing the main idea of Euler’s argument. We also compare E29 to another paper on Diophantine Equations which Euler wrote late in his life. In this second paper, Euler’s mathematical ideas are much easier to understand and to verify, and his work is more complete, demonstrating that he had progressed in his understanding of this type of problem. In order to put the paper in context, other problems in Diophantine Equations such as solutions to the Pell Equation and Fermat’s Last Theorem are traced back to their roots and followed to their completion, and Euler’s life is examined briefly.
Analysis of Voice Pitch, Perception of Male Sexual Orientation, and Homonegativity

Lowther, Carinna
Faculty Mentor(s): Marte Fallshore, Psychology

Poster Presentation Session #3, Poster #15
2:00-4:30 in Ballroom C/D

This research is looking at how people perceive male voice pitch. The hypothesis in this research is that after controlling for homonegativity, the lower voice will be rated as heterosexual more often than the higher voice which will be rated as homosexual. This study aims to find if there is any relation between different voice pitches and how a listener interprets the sexual orientation of a person, based on the voice alone. A recording was made of a male voice reading from Harry Potter and the Sorcerer's Stone. That recording was then copied into three files. One of the files was digitally altered to be 10% lower than the original; another file was digitally altered to be 10% higher than the original. All three recording were used in the experiment. Participants are randomly assigned to one of three groups: high voice, average voice, low voice. The only differences in these three groups are the participants and the voice to which the participants listen. The participants are asked to truthfully fill out the evaluation of the voice they hear on the recording. A homonegativity measure (Modern Homonegativity Scale-Gay) is used as a covariate because those who score high on the measure will most likely judge the sexual orientation of the high and low voices differently. Data have not been analyzed at this time, so no results have been collected and no conclusion has been made.

Development of Gram Stain Alternatives for Use with Haloalkaliphilic Bacteria

Lu, Shao
Faculty Mentor(s): Holly Pinkart, Biological Sciences

Poster Presentation Session #1, Poster #16
8:30-11:00 in Ballroom C/D

The ability to microscopically differentiate bacteria is an important first step in the identification of bacterial species. Introduced in 1884, the Gram Stain is commonly used to differentiate between two groups of bacteria, termed either gram-negative or gram-positive based on their cell wall architecture. It is useful for bacteria inhabiting “normal” environments, but often unreliable for characterizing bacteria isolated from sites exhibiting extremes of pH, temperature, salinity, etc. The goals of this study were to develop alternative differential staining methods suitable for bacteria found in “extreme” environments then evaluate their effectiveness using bacteria isolated from Soap Lake, a haloalkaline lake located in Grant Co., WA. Wheat germ agglutinin (WGA) is a compound that selectively binds to cell wall molecules (N-acetylglucosamine and N-acetylgalactosamine) present on the surface of gram-positive bacteria. WGA was linked to a second molecule, either HRP (visualized with light microscopy), or FITC (visualized with fluorescence microscopy). Common species of gram-positive and gram-negative neutrophilic bacteria were used to verify the specificity of the stains. Thirty Soap Lake bacterial strains with previously determined cell wall structures were used to test the efficacy of WGA-HRP and WGA-FITC for haloalkaliphilic bacteria grown at pH 10. While both stains were effective at differentiating between the 2 cell wall types, the WGA-FITC method was better in terms of accuracy and visual quality, and suffered less background interference compared to the WGA-HRP-metal conjugates. Future work will utilize additional extremophiles (acidophiles, thermophiles, etc) to determine its utility in other extreme environments.
Design, Construction, and Assembly of an Acoustically Responsive Fireplace with Resonant Flame Tubes  
Lyman, Greg  
Faculty Mentor(s): William Bender, Industrial & Engineering Technology; Roger Beardsley, Industrial & Engineering Technology; Darren Olson, Industrial & Engineering Technology  
Oral Presentation, Session # 32  
2:10-2:30 in Room 271

The resonant flame tube, or “Rubens” tube, is a popular physics demonstration that has been utilized in science education for decades. The apparatus uses acoustics and resonance to create a visualization of a standing sound wave in flames along a length of perforated tube. This closed tube apparatus will resonate at different frequencies as a function of the length of tube and the properties of the gas within the tube. The resonant flame tube operates most effectively when a single frequency is applied. The goal of this project is to create a system that can take any source of music, which consists of frequencies throughout the audible 20Hz to 20kHz range, and then distribute these frequencies into corresponding resonant flame tubes. The end product would be able to filter audio from your home entertainment system and display it in your fireplace. Investigations into acoustics of closed tube systems, thermodynamics of gas pressures in closed tubes, and audio filtering with LabVIEW are made. Since flammable gases are being utilized within a pressurized tube, a comprehensive safety procedure has also been developed to ensure the system is safe to operate.

The Practice of Child Labor in Developing Countries  
Mailhot, Brittney; Kangas, Nikki; Ikeda, Arisa; Lindberg, Jessica  
Faculty Mentor(s): Hideki Takei, ITAM  
Oral Presentation, Session # 15  
10:20-10:40 in Room 271

The use of child labor in developing countries, especially by U.S. companies is a hot-button issue in the modern business world. Often times, when prominent companies, such as Nike and Gap, are exposed for their use and/or exploitation of child labor, the backlash from the general public can have a drastic effect on the company’s bottom line. Our investigation questions whether the issue of child labor is perceived so negatively in the public eye because of its inherent nature, or because of how it is portrayed by the general media. There are seemingly countless reports of instances when U.S. companies have abused their authority as job providers in developing countries. It is also reasonable to believe that, when executed appropriately and humanely, the economic benefits of child labor can become a great asset to a growing country’s economy. American companies have high standards for their workers in the United States, but the very nature of a developing country makes it nearly impossible; and therefore, easier to adopt less stringent labor laws and regulations. Whether this issue centers on simply the physical conditions children often work in, the fact that children are being used as a labor source to begin with, or biased media coverage, this business practice has more aspects than many people realize. Our objective is to show that there is an ethical side of using children in the work force.
Reproductive Biology of Anodonta californiensis in the Yakima River Basin

Maine, Alexa
Faculty Mentor(s): Clay Arango, Biological Sciences

Oral Presentation, Session # 36
2:40-3:00 in Room 137A

The importance of freshwater mussels in stream ecosystems is apparent in their remarkable ability to effectively cycle nutrients and improve water quality. Listed as a federal species of concern and a candidate species for listing in the state of Washington, the California Floater (Anodonta californiensis) mussel has potentially significant ecological benefits. This study identifies a suite of suitable host fish species for this mussel, filling a significant data gap for A. californiensis and building a pathway for successful conservation efforts. Using a combination of artificial larval infection of potential host fish in a laboratory setting and field observation techniques, two fish species, speckled dace (Rhinichthys osculus) and torrent sculpin (Cottus rhotheus), were confirmed as hosts for A. californiensis. Two more fish species, three-spine stickleback (Gasterosteus aculeatus) and Redside Shiner (Richardsonius balteatus), were identified as potential hosts for A. californiensis, but confirming either species as a host will require further tests. Previous conservation efforts for A. californiensis may have fallen short without the knowledge of suitable host fish; however, the information obtained from this study can help to develop a holistic watershed management approach that focuses on A. californiensis and its suite of fish hosts in a community context rather than a species-specific strategy.

Phenotype Change through Light Manipulation and DNA De-methylation

Marrese, Anthony; Dechaine, Jennifer
Faculty Mentor(s): Jennifer Dechaine, Biological Sciences

Poster Presentation Session #1, Poster # 8
8:30-11:00 in Ballroom C/D

Epigenetics is the study of heritable changes in observable characteristics in an organism (phenotype) that occur without a change in the DNA sequence. For example, although clones of a plant species have identical DNA, they may respond differently to shading stress due to variation in expression of shade-tolerance genes among individuals. These variations in gene expression may be controlled by DNA methylation, but the effect of DNA methylation on plant phenotype in different environments is poorly understood. In this study, we examine the relationship between quantity and quality of light and its effect on several growth traits. This is accomplished by treating several lines of Arabidopsis thaliana plants with a crude de-methylating agent (5-azacytidine), and comparing their phenotypes to those of untreated plants. Eight lines of treated and untreated A. thaliana plants were grown under three different light conditions- 1) control (created using clear lighting filters), 2) Simulated foliar shade (green lighting filters) and 3) neutral shade (white lighting filters). Our preliminary results show that multiple flower branching, an unusual trait in A. thaliana, is more common in treated members than in untreated members of the same line in all light treatments, suggesting that DNA methylation is an important aspect of how plants control their phenotypic expression within a single generation. This study is important because deepening our understanding of how DNA methylation effects species can have important consequences in agriculture and medicine as well as overall health of plants and other organisms.
Gender and Ethnic Differences in Learning and Study Strategies

*Marrs, Heath; Sullivan, Caitlin; Saria-Wiley, Natalie; McIntyre, Jacki; Khan, Mehjabeen; Caughie, Andrew*

*Faculty Mentor(s): Heath Marrs, Psychology*

Poster Presentation Session #3, Poster # 22
2:00-4:30 in Ballroom C/D

Saenz and Ponjuan (2009) stated that research on the experiences of Latino male college students is needed, especially considering the growing gender gap in educational attainment. Although an increasing number of Latino students are pursuing and graduating from college, the proportion of male Latino students continues to decline in comparison to women. One important aspect of the college experience is successfully employing adaptive learning and study strategies. In this study, we explored gender differences in learning and study strategies for 106 white (41 men, 65 women) and 56 Mexican American (31 men, 25 women) undergraduates attending a mid-sized public university in the Pacific Northwest. Variables measured included control of learning beliefs, self-efficacy for learning and performance, peer learning, help seeking, and time and study environment. For white students, no significant gender differences were found. However, for Mexican American students, the multivariate effect of gender was significant, (Wilk's lambda = .73, F= 3.24, p < .05, Partial Eta squared = .27). Follow-up tests revealed that men scored higher than females on self-efficacy for learning and performance and time study environment. The effect sizes for both were in the large range. These results add to our knowledge base regarding gender differences in learning and study strategies among students from diverse ethnic groups. In this sample, Mexican American men scored higher than women in the area of self-efficacy for learning and performance and time study environment.

Mexican-American Students and Pursuit of the Doctorate

*Marrs, Heath; Campbell, Brad; Golden, Meaghan; Caughie, Andrew; Liudahl, Rachel*

*Faculty Mentor(s): Heath Marrs, Psychology*

Poster Presentation Session #3, Poster # 23
2:00-4:30 in Ballroom C/D

Providing greater opportunities and support for Mexican-American students pursuing advanced education is an important educational goal. Despite progress in the rate of college attendance, Mexican-American students continue to be significantly underrepresented among doctoral recipients and college faculty (Oseguera, Locks, & Vega, 2009). In order to increase the number of Mexican-American faculty members, an important first step is to increase the number of students pursing doctoral degrees. In the current study, we explored whether perceptions of the university environment and mentoring would predict more of the variance in intention to pursue a doctorate for Mexican-American students than white students. Because Mexican-American students often face additional barriers to the pursuit of education, we thought that a supportive university environment and mentoring would be especially important. A total of 162 undergraduate students (106 white: 41 men, 65 women; 56 Mexican-American: 31 men, 25 women) at a mid-sized public university in the western United States participated in the study. Separate multiple regressions for white and Mexican-American students were computed with Perceptions of the University Environment and Mentoring as predictor variables and intention to pursue a doctoral degree as the criterion variable. The regression equation for white students was not significant. However, for Mexican American students, the regression equation was significant (F = 5.76, p < .05, R squared = .19). As predicted, these variables were more important for Mexican-American than white students, although not in the predicted directions for each variable.
Current Trends in Behavioral Interventions in Patients with Traumatic Brain Injury  
Martell, Brittany  
Faculty Mentor(s): Ralf Greenwald, Psychology

Oral Presentation, Session # 21  
12:20-12:40 in Room 201

Traumatic brain injury has become a major source of disability. Brain injuries vary greatly depending on the location and severity of injury; however, some common difficulties have been reported, such as problems with self-care, poor decision making skills, distraction, impulsivity, and memory trouble. Studying current treatments will allow practitioners to present persons with brain injury evidence-based interventions that will most greatly increase functional independence. The present literature review will examine the research on current interventions, more specifically behavioral interventions.

Stress and the CWU Employee  
Martinez, Audelia; Sanchez, Martin  
Faculty Mentor(s): Rebecca Pearson, Physical Education, School and Public Health

Poster Presentation Session #2, Poster # 14  
11:15-1:45 in Ballroom C/D

When we think about professors we see them as a stress free population. It came to our attention that things are not necessarily as good as they seem. We state this because through the data that we gathered from the faculty and staff of Central Washington University, we determined that there are many issues regarding their overall health status. The study that was done winter 2012 investigated the habits and quality of life of the faculty and staff at CWU. The participants (n=210) took a voluntary online survey regarding their everyday health habits. The purpose of this study was to find out the health choices that faculty and staff had made in the last 24 hours; it was also part of a larger study being done in the Kittitas County area. Our group focused specifically on stress and how men and women that are categorized as faculty and the men and women that are categorized as staff are affected by stress and differ from one another. We anticipate that staff as a whole is going to report more stress when compared to the faculty at CWU. We believe that with this study it will let us know the overall health status of the groups surveyed. Public health and other wellness professionals should make sure that a larger sample is studied ensuring that we have a better outcome and more accurate statistics. Results can help improve health and quality of life for university employees.

The Effects of Signage on Zoo Visitors at a Chimpanzee (Pan troglodytes) Exhibit  
Mas, Jessica; Pritchard, Alexander; Jensvold, Mary Lee; Zager, Lindsay  
Faculty Mentor(s): Mary Lee Jensvold, Primate Behavior

Poster Presentation Session #3, Poster # 29  
2:00-4:30 in Ballroom C/D

Zoo visitors can be stressful to zoo residents, particularly the popular apes. This study explored ways to impact the interaction between visitors and zoo living chimpanzees (Pan troglodytes). A sign depicting a friendly chimpanzee behavior, the head nod, was present at an exhibit in an experimental condition. The absence of the sign was the control condition. From videotape of visitors, observers recorded the duration of looks toward the sign and the occurrence of a head nod in the subsequent 10 s. The mode duration of looks toward the sign was 3 s. Of those looks, 37.5% were followed by a head nod. This shows that signs are a way to affect visitor behavior and is a potential way to improve animal welfare.
Mutant Analysis in X-Men: First Class
Mazhar, Asra
Faculty Mentor(s): Melissa Johnson, English

Oral Presentation, Session # 44
4:30-4:50 in Room 135

The standards set forth by society and around the world are characteristics that we demarcate as acceptable. Any deviation that exists from this conventional definition is rejected or marginalized to exclude the individuals that do not fit this template. The X-Men movies are a prime example of the marginalization that takes place in our society. Differences among individuals are the main contribution to diversity; however, when these variances are tested by the judgmental nature of others, marginalization occurs. Although not always apparent, marginalization takes place in many forms including racial, ethnic and gender-based discrimination. In X-Men: First Class, the mutants are victims of this insensitivity. With the daily struggles they face to find acceptance in a cold society, the characters represent the historic battle of discrimination that was once faced in the United States through the battle for civil rights and the gender based discrimination that occurs to this day. As society had once highlighted individual differences, they continue to do so and therefore hinder diversification.

Cavity Nests in Cacti: Influences of Geology and Microclimate in a Tropical Dry Forest in Mexico
McBride, Amara; Meyers, Lewis; Moeller, Greg
Faculty Mentor(s): Lisa Ely, Geological Sciences; Daniel Beck, Biological Sciences

Poster Presentation Session #1, Poster # 4
8:30-11:00 in Ballroom C/D

Many species of desert birds appear to orient their nest entrances non-randomly, which can serve to regulate the interior temperature of their nests. This study focused on the golden cheeked woodpecker (Melanerpes chrysogenys) that makes its home in the large, tree-like cardon hecho cactus (Pachycereus pecten-aboriginum). The study took place in Jalisco, Mexico during mid-March 2012 at the Chamela Biological Research Station in the tropical dry forest. We collected data to test the hypothesis that golden-cheeked woodpeckers in Chamela select non-random nest entrances. A secondary objective was to study how Hurricane Jova (October 2011) had affected woodpecker nesting habitat. We searched for hecho cacti and woodpecker cavity nests along ~8,500 meters of established forested trails within the field station. For each cactus we encountered, data were recorded on number of cactus arms, cavity-nest orientations, extent of damage (number of cactus arms broken off), and cacti elevation for that specific site. Of 61 cacti observed, 36 cavity nests were found; woodpecker cavities were not randomly oriented, but rather faced in a northeastern direction, away from direct sunlight. Most nests were located on the upper third of the hillslopes, away from the thicker canopies of the lower valleys. Storm activity from Hurricane Jova caused the greatest damage to hecho cacti located at higher elevations: 37% and 34% of potential nesting arms were lost from cacti on the upper and middle thirds of the slopes. Cacti on the lower third (near the valley floors) only lost 6% of their potential nesting habitat.
Fish Heads, Fish Heads Revisited
McBride, Rhianna; Mosher, Malinda
Faculty Mentor(s): Patrick Lubinski, Anthropology

Poster Presentation Session #1, Poster # 36
8:30-11:00 in Ballroom C/D

Our experiment is based on an experiment previously performed by Dr. Lubinski and shown in the article “Fish Heads, Fish Heads: An Experiment on Differential Bone Preservation,” published in the Journal of Archaeological Science. The purpose of our experiment was to see effects of acidic, alkaline, and H₂O solutions on the vertebra and select cranial bones of three tilapia specimens over a 12 day period, as well as which sections of bones were preserved best under the circumstances. It is important to understand the effects that different laboratory conditions have on skeletal remains being studied for the benefits of zooarchaeology and other natural sciences. The methods that we performed differently from Dr. Lubinski’s experiment were based on time constraints and the chemical solutions used, as well as adding a control group (H₂O), the latter of which the original experiment did not have. Our theory was that the bones would show the most extreme changes in the acidic solution, the alkaline would produce less of a change than acid, and the bones submerged in H₂O would show the least change. We used a .05 mol of sodium citrate tribasic dihydrate with 98% titration as the basis of both the acidic and basic solutions to submerge our specimens. Our results showed that the vertebra had the highest percent of change, especially in the acidic solution, the opposite of what occurred in the original experiment.

The Day the Earth Moved: Detecting Evidence of Earthquakes
McBride, Amara
Faculty Mentor(s): Caroline Whitehill, Geological Sciences

Poster Presentation Session #3, Poster # 6
2:00-4:30 in Ballroom C/D

In 1989, the 7.1 M Loma Prieta earthquake (LPEQ) occurred on a previously locked section of the San Andreas fault system (SAF) in northern California, resulting in more than $6 billion in damages, 63 fatalities, ~4,000 injuries, and 12,000 homeless. Oddly, this event produced no known surface ruptures, which pose problems for understanding the overall paleo-seismic history of the Loma Prieta segment of the SAF and its role assessing local seismic hazards. Comparisons between the pre- and post-LPEQ surface expressions along the Loma Prieta segment of the SAF provide new insights into the spatial and geomorphological impacts of seismic activity associated with the LPEQ. Through comparative analysis of field and desktop mapping based on hi-resolution (0.5 m) airborne light detection and ranging (LiDAR) data, and digitization of pre-LPEQ fault mapping of the Loma Prieta segment of the SAF, I was able to identify and, in some cases, quantify subtle changes in the tectonic geomorphology that provide new constraints on the paleoseismology and seismic hazards associated with this portion of the San Andreas fault system. The focus of my study is a ~20 mile, strike-parallel transect along the SAF that spans the southeast Mindego Hill, southern Cupertino, Castle Rock Ridge, and northern Los Gatos 1:24K USGS Quadrangles. Along this transect, I was able to identify previously unmapped landslides, growth of existing landslides, offset streams, shudder ridges, and ponded Holocene alluvium. Identification of these features will guide future paleoseismic studies and further refinement of seismic hazard models.
The Occupy Wall Street Movement in the Pacific Northwest
McCluskey, Tristan; Fox, Victoria; Vadner, Becky; Lee, Michael
Faculty Mentor(s): Nelson Pichardo, Sociology; Pamela McMullin-Messier, Sociology; Eric Cheney, Sociology

Poster Presentation Session #3, Poster # 31
2:00-4:30 in Ballroom C/D

Late last year the Occupy Wall Street Movement burst on the scene. It quickly spread across the country, particularly here in the Pacific Northwest. However, the movement is fairly leaderless and unstructured and as a consequence the manifestations of the movement have shown considerable local variance. We are in the process of chronicling the emergence of the movement in Seattle, Tacoma, Portland and Olympia. There are several dimensions of the movement we wish to examine. We are interested in detailing their ideology, who participates on individual and group level, how the movement is locally structured and the chronology of events that mark each specific Occupy. Has the movement demonstrated any continuity in terms of actions, tactics and ideology? Does the movement have a regional identity, or is it more local? How have the movements gathered resources and planned for the future? We will explore these questions and more in our final presentation.

Sequence Assembly Validation: Examining Gene Order in Physical Maps Versus Sequence Assembly
McFadden, Angela
Faculty Mentor(s): Linda Raubeson, Biological Sciences

Oral Presentation, Session # 45
4:30-4:50 in Room 137A

The gene order of the chloroplast genome of Podocarpus macrophylla has been determined twice — once by shotgun sequencing, and, with a different sample, once by physical mapping. Although the gene order should be the same regardless of method, these two gene maps are inconsistent—a large region of genes is inverted in one map relative to the other. It is possible that the sequence-based map is incorrect, since mapping using sequence data is indirect, and because various attributes of sequence data can sometimes lead to misassembly causing inversions in maps. However, it is also possible that there was a true difference between the genomes of the two samples. Therefore, I am preparing a physical map using the Podocarpus macrophylla DNA sample, in order to compare directly a physical map and the sequence-based map. I have designed a physical mapping strategy that uses restriction enzymes that will generate distinct fragment patterns when the enzyme-digested Podocarpus DNA is run on a gel using electrophoresis. Depending on which set of fragments I recover I will be able to determine which gene order is actually correct.

Social Architecture of Modern-day Political Extortion
McFadden, Joseph
Faculty Mentor(s): Erik Cheney, Sociology

Poster Presentation Session #3, Poster # 32
2:00-4:30 in Ballroom C/D

What is the social architecture of modern-day political extortion rackets? Sociometrics will be created using the book Heist by Peter Stone. Sociometrics offers a set of analytical tools that enable social researchers and criminal investigators to “map out” the social action of criminal conspiracies. This study uses sociometrics of archival data to map out who did what with whom in the infamous Jack Abramoff political extortion racket involving some of the biggest political stars in recent US history. The findings show that Abramoff used his structural position of betweenness to extort millions of dollars from Indian casinos. The extortion involves six casinos, dozens of congressional politicians and others. The study shows the utility of sociometrics in criminal investigations in mapping out the social relations between the targets of political extortion, politicians, shell companies, conduits and the extortionists themselves.
Obesity Health and Risk Factors for Kittitas County

McGrath, Monte

Faculty Mentor(s): Dominic Klyve, Mathematics

Oral Presentation, Session # 29
1:50-2:10 in Room 140

This study examines the Kittitas County health data from the “Behavioral Risk Factor Surveillance System” (BRFSS). The BRFSS is a state-based system of health surveys that collects information on health risk behaviors, preventive health practices, and health care access primarily related to chronic disease and injury. More than 350,000 adults are interviewed each year, making the BRFSS the largest telephone health survey in the world. States use BRFSS data to identify emerging health problems, establish and track health objectives, and develop and evaluate public health policies and programs. Many states also use BRFSS data to support health-related legislative efforts. The research project further compares Kittitas County Health data averages from the BRFSS to Washington State as a whole. Statistical concepts such as regression, variances and ANOVA are applied to evaluate the impact exercise have on obesity. The information will be useful, for example, to determine the amount of exercise it takes to lower the BMI average from the sample. It is common knowledge that people who exercise are less obese than people who do not; however, this study shows the significance of exercise specifically to obesity. In conclusion, this study will provide useful information on the health habits of the citizens of Kittitas County in relation to the broader state-level data.

“Soon Speeds the Morning Light Proclaiming” from The Magic Flute

McLean, Kristina

Faculty Mentor(s): Gayla Blaisdell, Music

Creative Expression Presentation, Session # 16
10:20-10:40 in Ballroom A

Wolfgang Amadeus Mozart (1756-1791) was a musical prodigy and an influential composer of the Classical era, accomplished on the violin and keyboard and composing by the age of five. During his final year, he composed The Magic Flute. It was so highly received that it reached hundreds of performances and is one of the most performed operas to date. The opera follows Tamino as he journeys through the realm of the evil Queen of the Night and falls in love with her daughter, Pamina. The Queen enlists Tamino’s help in regaining her daughter from the hands of her enemy, Sarastro. Pamina learns that help is coming and falls in love with Tamino. Tamino then undergoes many challenges in the hope of soon finding and rescuing Pamina. In the second act, three spirits see a distraught Pamina attempting to commit suicide because she believes Tamino has abandoned her. They restrain her and take away her dagger, promising that she will see him soon, restoring in her a hope for rescue and love (“Soon speeds the morning light proclaiming”). Performing scenes like this requires more work than just learning the notes and memorizing the words. The musicians must learn the parts of everyone else while still maintaining a separate identity within the ensemble. They must empathize with and bring to life these “paper” characters in order to engage the audience and share that ethereal quality which is music.
Selection of Cold-tolerant *Arthrospira platensis* Strains by Way of Cold-shock Treatments

**McNolty, Alan**

*Faculty Mentor(s): Mary Poulson, Biological Sciences; Jennifer Dechaine, Biological Sciences*

Oral Presentation, Session # 27
1:30-1:50 in Room 137A

*Arthrospira platensis* is an alga that shows great promise as a human food source. It is rich in nutrients and both simple and inexpensive to cultivate. However, *A. platensis* requires relatively high temperatures for optimal growth: around 30°C. If a strain of *A. platensis* that is capable of growing in even slightly lower temperatures was developed it would have great potential as a source of nutrition for impoverished regions as well and increased yields for commercial growing operations. The goal of this project is to explore the possibility of developing a cold-tolerant strain of *A. platensis* using periodic exposure to low temperatures. Growth rates at less than optimal temperatures will be compared for survivors of a short-term cold shock versus control strains. If the cold-shocked strain shows enhanced growth under sub-optimal temperature as compared to the control strain, this will indicate that cold-tolerant strains of *A. platensis* have been successfully selected.

Assay Protocol Development for In Vitro Testing of Drugs against the Hookworm *Ancylostoma ceylanicum*

**McNutt, Sarah**

*Faculty Mentor(s): Blaise Dondji, Biological Sciences; Gil Belofsky, Chemistry*

Oral Presentation, Session # 18
11:40-12:00 in Room 137A

Hookworm infections are one of the most common in the world, infecting over 600 million people worldwide, mainly in impoverished areas. The current major approach to treating hookworm is periodic deworming with benzimidazoles. However, the frequent treatment of populations with this drug has lead to a serious problem of drug resistance which is largely irreversible. Thus, efforts are moving towards developing new drugs and vaccines. We successfully developed a series of assays for the purpose to be able to test the anthelmintic effect, defined as the ability of test samples to kill helminth worms, of certain plant extracts. We removed worms on day one, performed a series of washes with mediums, and then incubated overnight. The next day, we took the surviving worms and placed with increasing concentrations of the testable material (fetal calf serum, DMSO, etc). Our assay maintained a 40% overnight survival rate of hookworm, which successfully allows live worms further available for drug testing. With this protocol set up, we will be testing the anthelmintic effect of organic compounds extracted from the plants *Oemleria cerasiformis, Adenocaulon bicolor, Dais cotinifolia, Collomia grandiflora.*
How Much Air Will a Match Consume at Different Temperatures?

*Menking, James; Davis, Logan*

*Faculty Mentor(s): Carey Gazis, Geological Sciences*

Poster Presentation Session #2, Poster # 34
11:15-1:45 in Ballroom A

“How much air will a match consume at different temperatures?” That was the question I was trying to answer in my investigation. To test this, I let a match burn in a closed system indoors and outdoors (during the winter) until it extinguished itself. I timed how long it took the match to burn until extinguished, and after each test, I measured the percentage of the match used. My hypothesis was that the match would burn less air and for a longer period of time in colder air because the air is denser. However, after analyzing my collected data, I disagree with my hypothesis. The results of this experiment indicate that in a closed system where air is limited, a match will burn longer in cold air because there is more air per unit of volume. There are many valuable reasons to know that air is denser when it is colder. A wood stove, or any fire for that matter, would need less air intake in the winter. Airflow through our valley (convection current) can be better understood knowing cold air is denser than warm air. Pollution in air (depending on its relative density) could sink below less dense air in the summer and accumulate in cities. My experiment simply shows that cold air is denser than warm air. This concept is related to other, complex ideas, but they are related to the same overarching property of matter: colder equals denser!

Outdoor Adventures

*Miller, Alexa*

*Faculty Mentor(s): Dwyane Douglas, ITAM*

Business Plan, Session # 8
11:10-11:50 in Room 301

Outdoor Adventures will be a free website that provides the average person with the tools and information needed to plan and personalize outdoor adventures. Many people want to experience nature's playground, but don’t know where to start. Solving this problem, Outdoor Adventures will be the first comprehensive site that provides a one stop “information shop”, giving any site visitor the tools, advice, ratings, and ideas that they need in order to plan an adventure. This website will have cheap startup costs, will create large monetary return from advertisements, and encourage social health and wellness. Users can simply search by location or adventure type and find hundreds of companies, guide services, national parks, and other adventure destinations. Along with these finds are personal ratings and comments that members of Outdoor Adventures have posted that provide users with unbiased evaluations and reviews of each company or experience. While Outdoor Adventures helps users find companies and agencies, it helps users create their own trips as well. By simply entering the type of trip they want to make (i.e. hiking, backpacking, kayaking, rock climbing), and the location, Outdoor Adventures provides information for every aspect of a desired trip. What clothing is recommended, what gear is needed, what rations are required, maps, directions and weather forecasts are all included for site users. Along with many other features, Outdoor Adventures is a fun, interactive website that allows users to get inspired and get outdoors!
Vigilantism in Washington State: A Counterpoint To National Trends
Miller, Aaron
Faculty Mentor(s): Daniel Herman, History

Oral Presentation, Session # 40
2:40-3:00 in Room 202

The United States of America went through a period of vigilante justice stretching from the 1760s to roughly 1900. National and local historians have studied the motivations behind this trend. In the early period, vigilantes argued that their actions were necessary because of a lack of organized law on the frontier. Later, vigilantism became a form of social and race conflict. Vigilantes often targeted African-Americans, Mexicans, and sometimes Indians. Washington State followed this trend but it is in some ways actually a special case. It had well-established systems of justice and a distinct lack of social and racial conflict yet it experienced a surge in lynching precisely when lynching declined elsewhere. This research project sought to determine the cause of the abnormal trend of Washington State’s vigilantism. By looking at the different instances of lynching and the individuals involved, a pattern seemed to emerge to suggest that, in a divergence from the national trend, Washington vigilantes were the elite members of the citizenry who were attempting to maintain the stability of the burgeoning communities. Their actions created an abnormal trend in Washington that separated it from the vigilantism that plagued the rest of the nation. The elite citizens of Washington were motivated by a desire to see justice dealt swiftly and a distrust of the state’s ability to maintain the developing frontier communities’ structure through due process. This is a work in progress with plans to further study the subject and expand upon the evidence already collected.

A Move Towards Farming: How Indian Agents Sought to Convince Yakamas to Accept Allotment
Miller, Scott
Faculty Mentor(s): Daniel Herman, History

Oral Presentation, Session # 40
3:00-3:20 in Room 202

My research focused on the actions and policies of the Yakima Indian Agency in the 1890s when the Bureau of Indian Affairs “allotted” family farms to Yakama heads of family. By exploring contemporary newspapers and agency records I seek to understand how the Agency planned to convince Yakamas to become farmers, a practice, unlike many other Indian peoples, the Yakama had not engaged in to any great degree before. The BIA agents, I argue, tried to convince Yakamas to take up allotments and become farmers by promoting Christian ideals, and by resolving problems that threatened to hinder farm productivity, such as the lack of irrigation ditches. Agents also dealt with fishery rights issues with other settlers in the area, a problem that inhibited their ability to afford the improvements needed to begin farming.
Exhaustive Confusion and Problems with Prefixes: Reclaiming David Foster Wallace’s “Octet”

Milne, Stefan
Faculty Mentor(s): Laila Abdalla, English

Oral Presentation, Session # 17
12:40-1:00 in Room 135

Various critics have used David Foster Wallace’s short story “Octet” as an emblem of post-postmodern fiction writing. They find the story to be a univocal plea from its narrator for sincerity. My paper argues that this reading of the story oversimplifies the story and its relationship with postmodernism. The story, instead, works both as a postmodern piece of metafiction, one full of recursive paradoxes, and as a sincere plea, and neither reading can be easily extricated from the other. To accomplish this, I compare “Octet” with John Barth’s “Lost in the Funhouse,” which stands in for “traditional” postmodern metafiction and which I argue is often read too relativistically. I then compare both stories with the writing of Jacques Derrida and Roland Barthes, both of whose writing exemplifies the relativism that “Octet” and “Lost in the Funhouse” have a complicated relationship with. And because the paper argues that the meaning of “Octet” lies in its recursive paradoxes, the paper mimics the style of “Octet” and creates paradoxes out of the paper’s own argument, which become part of the support for the paper.

Optical Follower Feedback Control Loop for the Photon Calibrator at LIGO

Minton, Rolf
Faculty Mentor(s): Michael Braunstein, Physics; Rick Savage, Paul Schwinberg, Jonathan Berliner

Poster Presentation Session #2, Poster # 2
11:15-1:45 in Ballroom C/D

The Advanced Laser Interferometer Gravitational wave Observatory (LIGO) calibration will rely on power-modulated auxiliary laser beams to induce time-varying displacements of the end test masses (ETMs). Photon calibration (Pcal) induces two kinds of displacement noise, relative power noise (RPN) and harmonic noise due to impurities in the modulated signal. To minimize the injection of displacement noise, the sinusoidal power modulation needs to be purified. To improve the spectral purity, we employ an “Optical Follower” feedback control system. The Optical Follower samples a fraction of the modulated power and compares it with a reference waveform. The difference is fed back to an acousto-optic modulator (AOM) to reduce differences between the generated and the reference waveforms. The servo was able to meet the requirements for harmonic noise and extended the linear range of the AOM. However more work needs to be done to improve RPN. This project was a proof of principle to design and fabricate an Optical Follower servo during a summer Research Experience for Undergraduate (REU) at LIGO in 2011.
Redefining the Timeline of the Cold War: United States-Soviet Tension around the Conclusion of the Great War

Mitchell, Cole
Faculty Mentor(s): Jason Knirck, History

Oral Presentation, Session # 22
12:20-12:40 in Room 202

The question that I explored in this essay is: To what extent can the Cold War be thought of as a conflict that originated with the events surrounding the conclusion of the Great War as opposed to WWII? I started this essay by first highlighting three key hallmarks (as I referred to them) that have come to define the Cold War as we know it today. These three hallmarks include militarism manifested through proxy warfare, societal fear of communism (commonly known as the “red scare”), and international ideological struggling manifested through foreign affairs policy. I then began outlining some “long term” historiography surrounding the beginnings of the Cold War, including the publication of the Communist Manifesto and Russo-British imperialism. After the historiography section, I began using several newspaper propaganda editorials and Woodrow Wilson’s book *Case for the League of Nations*, as well as several secondary source books from notable Cold War historians to prove my hypothesis: that because the Cold War hallmarks of militarism, societal fear, and ideological struggle are undoubtedly present surrounding the conclusion of the Great War, historians ought to shift validity to the idea of the Cold War’s timeline beginning upon the 1917 Bolshevik revolution as opposed to the conclusion of WWII.

Development of a Computer Model for Investigating the Effects of Internal Pressure on the Resonance of Spherical Shells

Mith, Drake; Abdul-Wahid, Sami
Faculty Mentor(s): Andy Piacsek, Physics

Oral Presentation, Session # 46
4:30-4:50 in Room 137B

A computational model of a fluid-filled spherical aluminum shell is used to investigate how the resonance frequency of the shell responds to an increase in internal pressure. The model is created using COMSOL, which is a finite-element solver that allows the user to specify the geometry and the physics of the system. An important feature of COMSOL is that multiple physical processes can be combined in one problem. In the present case, a two-stage approach is followed: first, the hydrostatic pressure inside the shell is specified and a static solution is obtained for the resulting stresses and strains within the shell; these values are then used as inputs to the second stage, in which the pattern and amplitude of shell vibration is computed for a range of excitation frequencies. The result is a response curve, which shows how vibration amplitude depends on frequency. A response curve is generated for several values of the internal pressure. Results are compared to laboratory measurements, which show a shift in the response peaks towards higher frequencies as the internal pressure is increased. The goal is to develop a reliable method for noninvasively assessing changes in intracranial pressure.
Neutralization of Interleukin-5 in Experimental Hookworm Infection Leads to Higher Parasitemia

Moesch, Stephanie
Faculty Mentor(s): Blaise Dondji, Biological Sciences

Oral Presentation, Session # 18
12:00-12:20 in Room 137A

Hookworm infection is associated with anemia and malnutrition in developing countries and affects nearly 800 million people worldwide. Human and animal studies suggest that infection with these intestinal parasites is associated with suppression of the host immune response including effect on host cytokine production. Interleukin-5 (IL-5), a cytokine involved in the maturation/differentiation of eosinophils has been shown to play a role in resistance to hookworm and other worm infections. In order to further characterize the role of IL-5 in hookworm infection, we conducted experiments where the antibody TRFK-5 was used to neutralize IL-5 production in hamsters. The animals were infected with 75 third stage larvae of Ancylostoma ceylanicum hookworm. A group of hamsters received the antibody TRFK-5 three days before infection and at day 7 and 14 post infection (PI), and another group got the control antibody following the same schedule. Infected hamsters receiving TRFK-5 showed higher worm burden and weight loss than those injected with the control antibody. Egg count was assessed and was higher in the TRFK-5 group at 21 days PI (5411 ± 174 versus 3400 ± 200 in control antibody group, p = 0.001). The A. ceylanicum-specific antibody levels were assessed at day 21 PI and hamsters in the TRFK-5 group had lower optical density reflecting a lower amount of antibodies (0.329 ± .126 versus 0.56 ± .05 in control antibody group, p=0.0001). Together, these data highlight the important role of IL-5 in the host immune defense against hookworm.

Livestock Ban and Clanism Impact on the Social and Physical Landscape of Sool and Sanaag Regions in Somaliland

Mohamed, Hamza
Faculty Mentor(s): Jennifer Lipton, Geography; Craig Revels, Geography

Oral Presentation, Session # 3
9:10-9:30 in Room 137B

Livestock export is the backbone of livelihood earnings for the inhabitants of the Horn of Africa. This study examines the effect of the Saudi ban of livestock commerce on the physical and social landscape of the Sool and Sanaag regions of Somaliland. It reviews the historical context of the research topic during the pre-colonial era. Against this backdrop, the study will compare the impact of livestock commerce on the land and the people of Sool and Sanaag before and after nearly a decade of the Saudi ban. This study also will account the Harti tribe (Internal Displaced Persons) IDPs from the civil war in Somalia and the impact of their return to their regions of origin. This research will examine the disrupted traditional grazing system as a result of the civil war between 1988 and 1991, due to the privatization of the communal lands. The civil war also caused people mostly from the Harti tribe to move from the Southern region to Sool and Sanaag where they felt safe and secure. The coupling of destitute pastoralists and the Harti IDPs accelerated the land degradation in Sool and Sanaag because of their combined involvement in the charcoal trade for livelihood. Finally, the study will gauge the existing policies, rules, and regulations related to livestock and environmental management in Somaliland and make recommendations for stakeholders. The methodology of this research will be based on satellite image analysis, structured interviews with individuals from Sool and Sanaag, participatory mapping, and archival research.
Well That Was Easy: Misdirecting Respondus LockDown Browser for Fun and Profit

Moncrief, Donald; Foster, Ramsey
Faculty Mentor(s): Chet Claar, ITAM

Oral Presentation, Session # 2
9:30-9:50 in Room 137A

Respondus LockDown Browser is the specialized web browser which many students are forced to use. It is intended to provide a secure testing environment and discourage cheating. It is also trivially easy to manipulate into loading an attack page which could steal a student’s CWU login credentials. The information collected by such an attack would give the attacker access to the student’s Novell, Safari and GroupWise accounts. This would allow them to view the student’s name, address, telephone number, and any other contact information which they had on file in Safari. The attacker could alter a compromised student’s course registrations and financial aid acceptance; send email messages as though they were the student; or use the school network for nefarious purposes, which would then be traced back to the compromised student’s account. Further, since an attacker would have access to the student’s GroupWise email account, they would be able to compromise any accounts on services for which the student had used their cwu.edu email address as a password reset contact. This could include, bank, credit card, online bill payment, social networking, job search sites, or even additional email accounts from other providers. During this presentation we will demonstrate how difficult Respondus LockDown Browser makes it for a user to determine if a site is legitimate before entering their credentials. We will also provide guidance on how students can spot and avoid such an attack.

“Of the Greatest Influence with Everybody”: Persuasion in Jane Austen’s Persuasion

Montoya, Matthew
Faculty Mentor(s): Christine Sutphin, English

Oral Presentation, Session # 1
9:30-9:50 in Room 135

Critics often view the titles of Jane Austen’s novels as indicative of important themes. This is particularly true for Pride and Prejudice and Sense and Sensibility. While Austen’s Persuasion also seems to boast a thematically significant title, critics have largely ignored this novel, the importance of its title, and its primary implications. Persuasion chronicles the attempts of several characters within a close-knit social circle to persuade one another to think or act differently. Yet persuasive acts are not only limited to the characters in this novel—the narrator also attempts to persuade the reader to trust certain assumptions, some of which prove false at the end of the novel. In the proposed paper, I will explore these various instances of persuasion, both between characters and between narrator and reader. I will also explore the consequences of each instance for those involved. Next, I will show how each example of persuasion works in harmony with the others to teach us several important lessons. First, the examples teach us the importance of understanding another’s motives before allowing that person to convince us. Second, the examples show us that any persuasion carried out on our behalf, even when conducted with the best intentions, may nonetheless impede our progress or obscure our vision of truth. Finally, the examples reveal to us our ability to persuade ourselves into adopting certain attitudes, and how this self-persuasion can have a positive or negative effect on our lives.
Experimental Effects of Burning and Boiling on Modern Land Snail Shell δ18 O and δ13 C
Morse, Nathaniel; Kaufman, Rowan
Faculty Mentor(s): Pat Lubinski, Anthropology; Steve Hackenberger, Anthropology

Poster Presentation Session #1, Poster # 37
8:30-11:00 in Ballroom C/D

An analysis of the effects of experimental burning and boiling on the isotopic composition of shell aragonite in a land based gastropod found no comparable difference between unmodified and modified specimens. Specifically, this analysis sought to address the effects on the chemical composition of shell aragonite, which is expected to remain unchanged through time excepting the process of diagenesis. To test this hypothesis, experiments were conducted on 21 modern specimens of Oreohelix strigosa collected near Knight Creek in Idaho. The shells were divided into three test groups. One shell group remained unmodified, one group was roasted, and one group was boiled. Shells were later tested for δ18O and δ13C composition through Finnegan GasBench II analysis. Additionally, this study investigated qualitative methods for testing shell aragonite, finding that a minimum sample size of 200μg is required for testing. This research can be used to facilitate research in paleothermometric studies and the effects of diagenesis.

DNA Barcoding in Saprolegnia
Mueller, Ryanne
Faculty Mentor(s): James Johnson, Biological Sciences; Steve Wagner, Biological Sciences

Poster Presentation Session #1, Poster # 12
8:30-11:00 in Ballroom C/D

Saprolegnia is a genus of common freshwater protists that have been found to contribute to the mortality of amphibians and fish in hatcheries. One problem with these protists is that they are very hard to identity down to the species level. Traditionally, different species have been identified based on the anatomy of their reproductive structures, but recent research has clearly indicated that this is more unreliable than to compare the genetic relationships among these protists. The goal of our research is to simplify the process of identification by finding an appropriate region of DNA that is suitable for DNA barcoding; identification through the use of standardized short sequences of DNA. Another problem in the selection of an appropriate barcoding region in these organisms is the observation that the two main (nuclear ITS and mitochondrial CO1) genes used in DNA barcoding studies produce conflicting phylogenies and species boundaries. In order to better understand the evolution of these protists and find the best choice for a DNA barcoding gene, multiple additional mitochondrial genes from a number of isolates of Saprolegnia species were amplified via PCR and sequenced. Phylogenetic trees for each gene were estimated using several different methodologies and resulting trees were compared to the trees from each gene. Preliminary results suggest that differences among gene phylogenies may be due to hybridization or lineage sorting.
Identification of Neocortical Proteins that Interact with the Transcription Factor Sp8

Mullan, Michael
Faculty Mentor(s): Todd Kroll, Chemistry

Oral Presentation, Session # 19
12:00-12:20 in Room 137B

The neocortex is the mammalian brain structure that mediates conscious decision making and actions. This structure initially appears homogenous but is divided into functionally and architecturally distinct areas by a process called neocortical arealization. Neocortical arealization is mediated by several key transcription factors, proteins that control when genes are turned on or off, including the zinc finger protein Sp8. Sp8 is differentially produced within the embryonic neocortex; high levels of Sp8 are present in the anterior aspect of the neocortex, where it induces the motor area, while gradually reduced levels of Sp8 are found while examining areas more and more posterior. The mechanism through which this smooth gradient of Sp8 is converted into different areas with distinct boundaries remains undetermined. The ability of Sp8 to regulate its target genes is therefore likely assisted by interactions with additional neocortical proteins. To initiate experiments that will test this hypothesis, we have conducted a yeast two-hybrid screen to identify binding partners for Sp8. This technique has revealed several candidate Sp8-binding proteins, including Polyubiquitin-C (Ubc), PCNA, rRNA binding protein and ribosomal protein S20. Ubc is an ubiquitin-activating enzyme that indirectly interacts with a larger CCR4-Cnot complex and regulates the modification of other proteins. One job of the multifunctional CCR4-Cnot complex is to control genes by modifying chromatin or other gene-regulating proteins. Thus, we hypothesize that the Sp8-Ubc interaction mediates the formation of a complex containing Sp8 and the CCR4-Cnot complex to regulate gene expression patterns, and thus boundary formation, within the developing neocortex.

Solo Mothers in Society

Murphy, Lisa; Pruitt, Calista
Faculty Mentor(s): Melissa Johnson, English

Oral Presentation, Session # 35
2:40-3:00 in Room 135

This paper examines society’s views of the “normal” family and how its definition has evolved. In earlier years, solo mothers were frowned upon; however, now they are embraced. We use evidence to explain why women feel pressured to have children and fit into the status quo family structure, but that this structure is not necessary. Using scholarly essays, we address the different concerns that society places on single mothers and provide counter explanations. With the uprising acceptance of solo mothers, women do not need a partner to raise a child in society.
Quantitative Study of the Use of the Recreation Center

Nakamichi, Dustin

Faculty Mentor(s): Dominic Klyve, Mathematics

Oral Presentation, Session # 12
11:00-11:20 in Room 140

The data collected for my study came from the CWU’s University Recreation Center. There are two types of data collected; one came from the electronic scans created each time a student uses their connection card to enter the facility, and the other source came from what the staff calls the “rounds sheets”. This data is collected by student employees of the facility as they go throughout the facility and count the number of patrons using the various sections of the gym. My project analyzes the collected data to find any trends that would be of use to the staff of the facility as well as all potential and current patrons. This project is important for many reasons. For students it is important because it would assist them in knowing which times are the busiest—this may help them to not feel rushed in their work out or to make a class before it fills up. The results are important to the professional staff of the facility because if we can accurately forecast when throughout the day the gym is the busiest, then they can make sure to have an appropriate amount of workers on duty and not waste payroll, be understaffed, or leave patrons unattended. Finally, the results may be of interest to faculty members who are members of the URC, as the information can let them come in and use the facilities and not have to try and work out around a mass of college students.

Reconsidering the Perception of Female Strength in the Gothic Romance Novel

Nassif, Sarah

Faculty Mentor(s): George Drake, English; Karen Gookin, English; Matthew Altman

Oral Presentation, Session # 33
2:10-2:30 in Room 301

The gothic romance novel is deeply rooted in the tradition of the Victorian era in which it was established; the stories of moral young women resisting the temptations of the world around them linger as relics of societal values long since dismissed. The gothic heroine remains an important member of literary tradition, yet alienates modern readers who hold different ideals of feminine strength. Can we make such influential literary works (Charlotte Brontë’s Jane Eyre, Emily Brontë’s Wuthering Heights, and Daphne du Maurier’s Rebecca) relevant to a new audience so as to protect their position in the modern-day canon? By revisiting these works through the lens of modern feminine values, I hope to do just that. Using an internal-motivation model of strength, I will establish that by today’s standards feminine strength is no longer exemplified by the gothic heroine, but rather by the femme fatale. By adjusting our reading to emphasize the strength of the femme fatale character rather than the heroine, we can update our understanding of the gothic romance to correspond with modern values and make them, once again, relatable to today’s readers.
Leishmania major Exacerbates Infection with Leishmania infantum in BALB/c Mice
Nation, Catherine
Faculty Mentor(s): Gabrielle Stryker, Biological Sciences; Blaise Dondji, Biological Sciences

Oral Presentation, Session # 27
1:10-1:30 in Room 137A

Leishmania is an intracellular protozoan parasite that is transmitted by the bite of the phlebotomine sand fly. There are over 20 species of Leishmania that infect humans causing a range of diseases from cutaneous to systemic, potentially fatal infections. The geographic distribution of Leishmania major, responsible for cutaneous leishmaniasis, overlaps with several of the more virulent species of Leishmania. This study examined what effect previous exposure to L. major has on the outcome of infection with Leishmania infantum, the causative agent of highly pathogenic visceral leishmaniasis. The L. major immune response is well characterized with a strong cell-mediated immune response leading to resolution of disease, and protection against subsequent re-infection. A contrasting antibody-mediated immune response leads to disseminated disease. The immune response proteins (cytokine) profile, antibody titer and parasite burden were evaluated in the susceptible BALB/c mouse after L. infantum infection in either naive mice or those previously infected with a low/self-healing dose of L. major. Using qPCR, expression of the immune protein Interleukin 4, associated with increased antibody response, was found to be significantly increased in mice previously exposed to L. major over controls. Exacerbated disease, with a notably higher parasite burden, was observed in the L. major exposed mice compared to those infected with L. infantum only. Cross-reactive antibodies were seen in both groups of infected mice regardless of their immune history. We speculate cross-reactive antibodies may be playing a role in augmenting visceral disease in mice with immunological memory to L. major.

Observing Program Calculator for Binary Star Systems
Neal, Colby
Faculty Mentor(s): Dr. Michael Braunstein, Physics

Oral Presentation, Session # 46
4:50-5:10 in Room 137B

We have developed a Microsoft Excel application that utilizes eclipsing binary ephemerides to calculate useful information for a program of observing eclipsing binary systems. Eclipsing binary star systems consist of two stars orbiting a common center of mass and oriented so that their plane of orbit is in the line of sight relative to the observer allowing the stars to eclipse each other. Consistent monitoring of eclipsing binary stars is important for establishing fundamental astronomical parameters, for instance mass and composition of stellar systems, and this application supports effective use of resources in such monitoring programs. The input variables to the application include system coordinates, system period, starting Epoch, and the user’s latitude and longitude. The program uses astronomical algorithms to calculate the epoch, Julian date, Gregorian date, local time, times of primary/secondary eclipse, altitude, Universal Time, Local Mean Sidereal Time, and hour angle of the eclipsing binary system. Currently the project is set up for the eclipsing binary system SV Camelopardalis. The calculator has been demonstrated effective through its application to obtain differential photometry data for SV Camelopardalis, a system which is of interest because of variability in its period caused by a potential third body.
A Bright Idea: Designing a Lighted Wig
Nelson, Reesa
Faculty Mentor(s): Scott Robinson, Theatre

Poster Presentation Session #3, Creative Works # 35
2:00-4:30 in Ballroom C/D

I will explain the research, renderings, and production processes of wigs created for Central Theatre Ensemble’s production of *A Christmas Carol*, produced in November and December 2011. The highlight of the wigs built for the show is the wig worn by the Ghost of Christmas Past. It is a conical shape, with hair held in place by wire, lace and hairpins. Underneath the hair rests a small light source that illuminates the wig from the inside out during particular scenes. The construction of this wig took several weeks of planning meetings between myself as the Wig Designer, the Costume Designer, and the Lighting Designer. Many elements, potential problems, and factors had to be taken into consideration.

Turning Oppression into Success: How an English Restoration Actress Achieved Poetic Justice
Nelson, Reesa
Faculty Mentor(s): Brenda Hubbard, Theatre

Oral Presentation, Session # 42
3:20-3:40 in Room 301

The development of English-language theatre was forever changed with the addition of women to theatre companies. Restoration actresses were able to use the changes in political, social, and religious climates to their advantage despite the manipulation of women’s sexuality through the roles they played. Actresses such as Nell Gwyn were able to turn their on-stage success with titillating roles into court connections and a sumptuous lifestyle. This paper examines the newly empowered women who earned prestige and financial stability through a career in the theatre while avoiding subversion by the patriarchal English Restoration society.

A Study of A Coffee Supplier: Mazza Coffee
Ness, Blake; Mamon, Mark
Faculty Mentor(s): Kun Liao, Operations & Supply Chain Management

Lynnwood Center - Poster Presentation, Poster # 5

There are many attributes and tools that create a flawless supply chain. Although they vary across all organizations, the goal remains the same. Mazza Coffee Company began roasting and bagging coffee in Mukilteo, WA, in 2008. Mazza Coffee sells roasted coffee to many small and specialty retailers in the northwest and has developed a new venture of private labeling. With limited market share, every dime made counts for a company of this size, so our goal is to ensure that Mazza Coffee is using its resources to maximize its production and sales. While studying Mazza Coffee, we hope to expose new solutions in the upstream and downstream of the company’s production and distribution processes. We will focus on its current purchasing process as well as marketing and sales to determine if and when the company can expand so that it can eventually become a supplier of larger organizations. As of right now, the owner has inquired about supplying its products to the company Costco, but was refused because its current capacity to sell did not meet their criterion. We hope to find the solution for Mazza to compete and fulfill those larger organizations supplier guidelines to become a qualified, if not preferred, supplier. In doing so Mazza Coffee could potentially generate greater return on investment, provide greater customer service, and overall increase revenue.
“Privilege or Prison: Limitations of the Gentry in Emma” enters a literary debate regarding the privileged life of Emma Woodhouse in Jane Austen’s novel, Emma. On one side of the debate is the belief that it is Emma’s privilege that causes the troubling situations she finds herself in, while the other side argues that Emma is not as privileged as she first appears. By researching critical essays on the subject, as well as examining Emma’s actions through her relationships with other characters in the novel, this analysis demonstrates that privilege for Emma comes at a personal cost. While she may have all the comforts money and status can secure, her life is quite constricted by the rules of the society in which she lives as well as the demands of her relationship with her father. Consequently, even though Emma may appear to be making independent decisions throughout the novel, the people around her heavily influence her choices, taking away the very freedom her level of privilege should allow.

Caffeine functions as an adenosine receptor antagonist by blocking pain reception. However, research is warranted to examine the efficacy of caffeine on delayed onset of muscle soreness (DOMS). PURPOSE: This study investigated the effects of caffeine on 5km time trial performance following exercise-induced muscle soreness. METHODS: Recreationally trained male participants (n=9) completed a 30min downhill run at 70% VO2max to induce muscle soreness. Participants returned to the lab 48 h after the downhill run to complete a 5k-time trial (TT). Using a double blind, counterbalanced design the participants ingested either the placebo (5mg/kg) (PLB) or caffeine (5mg/kg) (CAFF) 1h prior to the 5km TT. RPE was recorded every 2 min during each minute of the TT. A repeated measures ANOVA (treatment x time) was used to analyze dependent measures. RESULTS: There was no interaction for the treatments (PLB, CAFF) across time for RPE or heart rate. No significant difference was detected for 5k performances between trials (1036.2 ± 92.6 sec vs. 1043 ± 91.9 sec for CAFF and PLB, respectively). There was no difference between CAFF and PLB trials for RF muscle soreness (p = .216) or VMO muscle soreness (p = .679). These findings of similar physiological and pain responses between trials suggest that caffeine has a limited ergogenic effect after severe muscle damage on subsequent sustained maximal exercise performance.
The Science Talent Expansion Program (STEP) at CWU: A Model for Improving Recruiting and Retention of College Students
Nye, Jessica; Bohrson, Wendy; Foss, Rachel; Braunstein, Michael; Ely, Lisa; Piacsek, Andrew
Faculty Mentor(s): Wendy Bohrson, Geological Sciences

Poster Presentation Session #2, Poster # 7
11:15-1:45 in Ballroom C/D

The Science Talent Expansion Program (STEP) at CWU (supported by the National Science Foundation and COTS) works to increase the number of students obtaining science, technology, engineering, and mathematics (STEM) degrees. The program focuses on recruiting and retaining traditionally underrepresented students in STEM disciplines by providing academic, social, and financial support. Recruiting of STEP students is accomplished through collaboration between STEP and Admissions. Retention efforts focus on preparing students for rigorous STEM classes by engaging them in inquiry-based classes that enhance critical-thinking skills (e.g., writing research proposals) and allowing them to execute student-designed research projects. Freshmen engage in the STEP Freshman Science Seminar Series, three classes that explore interdisciplinary topics. Students propose and conduct experiments that test energy-related hypotheses as well as write proposals to engage in faculty-mentored research, teaching, or recruiting experiences during the sophomore year. STEP transfer students take two classes that prepare them for faculty-mentored research experiences. STEP has served 370+ students from 2003-2011. Statistical measures demonstrate that STEP is succeeding in improving retention and academic performance of STEM majors. Compared to the STEM control group, STEP students declare STEM majors to a greater extent and have higher GPAs. Feedback from students suggests that the key aspects of STEP that enhance student success include participation in the STEP Living Learning Community (LLC), close professional ties between students and faculty/staff, and financial support. The CWU STEP Program can be used as a model for non-STEM disciplines to improve recruiting and retention of students, particularly those who are underrepresented.

PhotoVoice
O'Brien, Kaitlin; Crawford, Kailonna; Sexton, Sarah
Faculty Mentor(s): Rebecca Pearson

Poster Presentation Session #2, Poster # 12
11:15-1:45 in Ballroom C/D

Alcohol consumption on college campuses may be over exaggerated by the media and under exaggerated by others. This may result in a distorted view of college drinking and behaviors. In order to understand how best to serve this population from a public health standpoint, an accurate portrayal of the attitudes and behaviors of college students around this subject was needed. The goal of this Photovoice poster was to showcase a study done by CWU students to research this question. We got a volunteer group of 10 college students to conduct this research (they themselves chose to take part after learning of the project), in the hopes that it would be more controlled and less influenced by authority figures. These researchers took photos of their own lives and their perceptions of alcohol consumption on Central Washington University’s campus. These photos were presented at weekly meetings and discussed, using a specific set of questions used in social studies research. The questions (the set of specific questions asked was called “SHOWED”) tended to make the student researchers focus on what the pictures meant in a social context. This Photovoice process was created by two researchers at the University of London in 1992. This social research method has been used for all different kinds of populations, specifically homeless children in Ann Harbor, Michigan and also brain surgery patients. This poster presents the results of this study on alcohol consumption and inform the public of the norms on our campus in 2012.
Multigenerational Analysis of Selection on Domestication Traits in Sunflower (*Helianthus annuus*)
Crop-wild Hybrids
Owart, Birkin; Dechaine, Jennifer; Burke, John; Baack, Eric; Seiler, Gerald
Faculty Mentor(s): Jennifer Dechaine, Biological Sciences

Poster Presentation Session #1, Poster # 9
8:30-11:00 in Ballroom C/D

In recent years, one of the most controversial public policy issues has been the commercialization of genetically engineered (GE) crops. One concern is that harmful transgenes could escape into wild populations through hybridization with GE crop plants. Although crop-wild hybridization readily occurs throughout the range of many cultivated species, whether a crop allele will persist in the wild is determined by its selective advantage. Understanding what cultivar traits are advantageous in natural environments over multiple generations is an initial step to predicating the relative risk of transgenes. Replicates of 171 F6-F8 recombinant inbred line sunflowers (*Helianthus annuus*) were exposed to three generations of selection under natural conditions in the field followed by a common garden experiment comparing phenotypic changes between the first and third generations. The first generation was planted in spring of 2007 in Fargo, ND and the following generations were seeded according to the reproductive output of the maternal plant. Known phenotypic indicators of domestication were measured within each generation. Selection favored earlier flowering, larger flowering disks, more heads, taller plants, and more leaves in at least two generations for each trait. In accordance with these results, plants were significantly taller and had more leaves and heads after three generations in the field. In contrast to selection, plants flowered later and had smaller flowering disks in generation three than generation one. These results suggest that domestication traits were generally disadvantageous in natural conditions and would not be expected to establish in wild populations.

The Zemstvo and Russian Gentry Liberalism, 1864-1890
Owens, Kristopher
Faculty Mentor(s): Roxanne Easley, History

Oral Presentation, Session # 31
1:10-1:30 in Room 202

Zemstvos were institutions of local democratic self-government created in 1864 in the Russian countryside designed to replace the authority of noble landlords after the emancipation of serfdom. The concept of democratic self-rule, if even only on a local level, was a novel idea in a strictly autocratic Russia. Educated liberals were excited to utilize the new establishment to make progressive change on their own. The state, however, was wary to give the zemstvos too much power, and constantly limited the ability of the zemstvos to make significant change. My research examines the struggle between liberals and the state within the arena of the zemstvo by observing the goals and successes of the liberal gentry class, how they used the zemstvo to spread and enact their ideas, and the difficulties they faced from above. The zemstvos represent one of the pieces of modernization in Imperial Russia, and it is important to understand their function in order to understand the changes Russia experienced in the latter 19th century and early 20th century as a whole. My research therefore addresses the question: What role did the zemstvos have in modernizing Russia? Using a strong selection of secondary literature and primary material which described how the zemstvos operated, I came to my conclusion. I argue that liberal Russians of the landed gentry class used the zemstvos to help modernize Russia, by building infrastructure, schools, and hospitals, and also used them as a vessel to promote a constitutional movement.
Trichloroethylene, the Silent Massacre Part II: Creating a Bill

Pace, Terri
Faculty Mentor(s): Rex Wirth, Political Science; Matthew Altman; Ian Buvitt

Oral Presentation, Session # 42
3:40-4:00 in Room 301

Trichloroethylene (TCE) is used worldwide as a solvent. Case studies are proving that TCE is highly carcinogenic. This substance causes miscarriages, birth defects, heart, brain, skin, autoimmune system diseases like Lupus, MS, nerve damage, blood, bone, as well as types of cancer, especially renal cell carcinoma. The United States government laws are catching up by admitting responsibility to some of the victims of Camp Lejeune who were exposed to TCE in their drinking water. The statute of limitations on environmental degradation involving human harm must be changed. How does one challenge the United States Government to change such statutes? I believe that by proving that it is unconstitutional to have the current two to three year statute in each state, that it might be possible to change the current laws. I will start with the state of Oregon.

Item Response Theory in Psychotherapy Assessment

Parker, Joshua
Faculty Mentor(s): Terrence Schwartz, Psychology

Oral Presentation, Session # 21
11:40-12:00 in Room 201

Item Response Theory (IRT) has traditionally evolved in the context of psychometrics and has been invaluable in the advancement of testing and measurement fields across disciplines. Because of its ability to accurately estimate abilities and model their interaction with characteristics of individual items on tests, it has been one of the most studied and progressive frameworks in these fields, offering the foundation for many variations to grow. With the advancement of these sophisticated assessment techniques, there has been a relative lack of their application outside of the testing arena. The purpose of the paper off which this presentation is based is two fold. The first is to offer a straightforward introduction to the basics of IRT models for those who are unfamiliar with their usage as well as to mention specific advances in IRT modeling which highlights its versatility to many different measuring situations. The second purpose of the paper is to present a theoretical discussion of using an IRT framework in order to evaluate the structure of psychotherapy in order to offer a more efficient means of facilitating the therapeutic process of change and healing. This is discussed in terms of the selection and assessment of therapeutic tasks depending on how people with similar abilities (here it is the Global Assessment of Functioning score) respond to a task. Because IRT models estimate characteristics of individuals and how they interact with stimuli, they are particularly attractive for assessing how individuals with certain characteristics would respond to a given psychotherapeutic regimen.
Hostalaxy
Paulson, Christopher
Faculty Mentor(s): Chet Claar, ITAM

Business Plan, Session # 8
9:30-10:10 in Room 301

The internet has become an essential part of our lives, but what is it that powers the internet? Servers, they are what drive the content that you view everyday on sites such as Google and Facebook. Servers are expensive though and can easily cost several hundred dollars a month, and what if you don’t need all of the resources that a dedicated server offers? The solution to this problem is to use Kernel Based Virtual Machine (KVM) technology to create multiple virtual private servers (VPS) on one host server that act and feel like completely dedicated machines, each running their own independent operating system, so that you gain the benefits of a dedicated server without the price. Instead of paying hundreds of dollars a month for a server, you can pay a fraction of that and only use the resources you need. This creates an extremely affordable solution for businesses looking to expand beyond simple shared hosting, but are not ready for a full dedicated server. By purchasing my own hardware consisting of premium components, colocating my custom built servers at a Seattle based datacenter such as Swiftco, and using a Debian 6 operating system with KVM technology, I would be able to offer quality and affordable Seattle based virtual private servers using the best hardware and software possible. Startup costs would include $200 to form an LLC, $20 for a master business application, $2,542 for one 2U size server, and around $2,694 annually in licensing and colocating costs.

Working Memory: An Investigation of the Effect of Auditory and Visual Presentation on Immediate Serial Recall
Pelkey, Crystal
Faculty Mentor(s): Danielle Polage, Psychology

Des Moines Center - Poster Presentation, Poster # 1

The multi-component model of working memory can be broken down into four sections, one of which includes the phonological loop. The phonological loop processes language based information. It is thought that language based information is allowed direct or indirect access to the phonological loop depending on whether it is seen or heard. It was hypothesized that while concurrently articulating a word, lists of words that were seen would be recalled more accurately than lists of words that were heard. Undergraduate students participated in two experimental conditions, in which they were presented with a list of words that were heard and a list of words that they read, all while concurrently articulating. After the presentation of the word lists, the participants were asked to recall the list of words in the order that they were presented. It was found that those who saw the words recalled more accurately than those who read words. This is thought to be caused by the act of concurrent articulation while trying to rehearse a word list, conflicting more with the heard words than with the seen words, thus preventing access to the phonological loop for the heard words. This coincides with previous research suggesting that there is a difference in the way seen versus heard words are given access to the phonological loop. Ultimately these results point to the importance of understanding the limited attentional resources available in how much and what types of information can be processed simultaneously in working memory.
Music-Evoked Emotions and Nostalgia  
*Pelkey, Crystal*  
*Faculty Mentor(s): Danielle Polage, Psychology*

Des Moines Center - Poster Presentation, Poster # 2

Music is a powerful tool that can be used to evoke emotions and salient autobiographical memories. A common emotion brought about by listening to meaningful music is nostalgia. Nostalgia can be defined as a sentimental longing for the past and is usually a positive emotion that brings pleasure to those who experience it. Twenty undergraduate students participated in this study where it was hypothesized that those who heard the songs would feel more nostalgia than those who read lyrics to the same songs. Participants were exposed to songs by either hearing them as music or reading lyrics. The participants were asked to rate how nostalgic each song made them feel and how many memories they associated with each song. There were some songs that provided statistically significant results between the hearing the songs and reading the lyrics groups, however this was not the case for all of the songs. When the data was grouped for all of the participants, the average nostalgia rating was significantly higher for the group who heard the songs.

The Effect of Post Exercise Cocoa Consumption on Muscle Soreness and Endurance Running Performance Following Downhill Treadmill Running  
*Peschek, Katelyn; Pritchett, Kelly; Pritchett, Robert; Bergman, Ethan; Eldredge, Michael*  
*Faculty Mentor(s): Kelly Pritchett, Nutrition, Exercise, and Health Science*

Oral Presentation, Session # 12  
10:00-10:20 in Room 140

Athletes are constantly searching for the optimal nutritional recovery aid. This study examined the effectiveness of cocoa-flavanols (CocoaCHOC) compared to chocolate milk (CHOC) on markers of muscle recovery, and exercise performance following exercise induced muscle soreness. (N=8) Endurance trained male athletes (VO₂max: 64.35 ± 7.60 mL/kg/min) completed a downhill running protocol to induce muscle soreness. Participants consumed 1.0 g of carbohydrate per kilogram of bodyweight (1g CHO/kg BW) of a randomly assigned beverage (CHOC vs. CocoaCHOC) immediately after the downhill run and again 2h later. Participants returned to the lab 48h later to complete a 5K timed trial. Creatine kinase (CK) and subjective measurements of muscle soreness were taken at baseline, 24h, and 48h post the downhill running session. The same protocol was repeated 3 weeks later with the other beverage. A 1-way repeated measures analysis of variance (ANOVA) revealed no significant difference (p = 0.97) between trials for 5K time. No significant difference (p = 0.30) was found for creatine kinase (CK) levels between treatment groups. These findings suggest that the addition of cocoa flavanols to a post exercise recovery beverage offers no additional recovery benefits when consumed acutely for endurance runners.
Phoenix - Concerto for Alto Saxophone and Prepared Electronics
Petersen, Benjamin
Faculty Mentor(s): Elaine Ross, Music

Creative Expression Presentation, Session # 43
3:00-3:20 in Ballroom A

Phoenix is an exploratory composition combining style characteristics of composers of classical saxophone concerto literature, such as Ibert and Glazanouvy, with sounds and techniques of popular electronic dance music (EDM) producers, such as Above and Beyond and Tiesto. The purpose for writing this piece stemmed from listening to EDM artists sample classical orchestral works, such as Barber’s *Adagio for Strings*, into their tracks to expose fans to a different sound and genre of music. I endeavored to create a piece that would present the sounds and style of EDM to a ‘concert hall’ audience. I chose to write for saxophone, as it is the instrument I am most comfortable with and is also a newer invention of the acoustic instrument family. I chose a concerto because it is a familiar form in the classical repertoire and would provide a framework to integrate characteristics of both genres. From the classical world, *Phoenix* features a typical three movement layout (fast-slow-fast), virtuosic and expressive saxophone playing, motifs which are presented and then varied, canonic treatment of the melody, an extended cadenza, and functional harmonic progressions. From the electronic medium, the piece includes four-on-the-floor beats, low decibel synthesized bass, drum kit, and manipulated samples of acoustic instruments. The title *Phoenix* was given as a personal memento signifying the reigniting of my musical passion; however, it programmatically works well to depict the mood in each of the three movements (“Soaring”, “Burnout”, and “Rebirth”).

Quantitative Application for SDS-PAGE in an Undergraduate Biochemistry Lab
Petersen, Brandon; Printz, Sarah; Carter, John
Faculty Mentor(s): Timothy Sorey, Chemistry; Todd Kroll, Chemistry

Poster Presentation Session #1, Poster # 28
8:30-11:00 in Ballroom C/D

The most common technique for separating and visualizing proteins in their native state is polyacrylamide gel electrophoresis (PAGE), while the incorporation of sodium dodecyl sulfate (SDS-PAGE) is often used to analyze denatured proteins. SDS-PAGE is frequently utilized in undergraduate teaching labs to analyze the composition of a sample of protein(s) and/or to determine the molecular weight of a particular protein. However, quantitatively determining the concentration of a particular protein within a mixture has generally required the implementation of expensive imaging and gel analysis software. Here, we describe an inexpensive protocol to accurately quantitate the concentration of a single protein from a mixture of serum proteins using this common technique. Briefly, this exercise uses SDS-PAGE to separate the protein components of human serum, along with a standard curve of bovine serum albumin (BSA). The resulting gel is then dried between sheets of cellophane and scanned with a common flatbed scanner. Free software from the National Institute of Health is then used to quantitate the amount of albumin in the sample of human serum. This protocol produces consistently reliable results at a dramatically reduced cost when compared to standard protocols that require a laser densitometer and/or expensive imaging equipment and analysis software.
U.S. Supreme Court in *Connick v. Thompson* Lets Prosecutors Off the Hook for a 14 Million Dollar Civil Rights Claim

**Phe, Salomon**

*Faculty Mentor(s): Mary Ellen Reimund, Law & Justice*

**Oral Presentation, Session # 10**
**10:00-11:20 in Room 137A**

In this U.S. Supreme Court case John Thompson sought to find the Orleans Parish District Attorney, Harry Connick, liable for a civil rights claim under Section 1983. Thompson alleged that the prosecution’s failure to disclose exculpatory evidence (as required by the Brady rule) to his defense violated his civil rights. As a result of their failure, Thompson spent 18 years in confinement with an approaching death sentence. The exculpatory evidence was discovered by his private investigator one month prior to his execution date. With the new evidence in hand, Thompson was retried for murder and acquitted. At the lower court level, Thompson was awarded $14 million in damages on his claim. Connick appealed this decision to the U.S. Supreme Court claiming that the deliberate indifference standard, outlined in *Canton v. Harris*, had not been satisfied. By a notable 5-4 decision, the majority agreed with Connick holding that a District Attorney’s Office cannot be found liable under Section 1983 for a failure to train its prosecutors based on a single Brady violation. The presentation will discuss the facts of the case and the policy implications for agencies based on the size of this award and the potential to provide a substantial deterrent for non-disclosure of evidence along with the social policy concerns regarding a person being held behind bars for 18 years. Also discussed will be what this case shows regarding trends of the U.S. Supreme Court based upon its current composition.

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**Single Mothers and Their Challenges**

**Pickrel, Ally**

*Faculty Mentor(s): Melissa Johnson, English*

**Oral Presentation, Session # 35**
**3:00-3:20 in Room 135**

Parenting can be very difficult at times, and even more challenging for someone trying to raise a child (or children) on their own. There are many different reasons why women become single mothers and this can either be by choice or by chance. Either way, mothers have to make many sacrifices in order to “do it all”. These women usually have one source of income and half the time to spend with their children. After doing some research, I found the bonding with the mother and the child at birth, as well as different stages of growing up, can be very life changing. The role a mother has in a single parent position is more difficult than it would be with a partner.
**Soul Surgeon: A Historical Drama on the Rise and Fall of Lobotomy**

*Pierre, Kelley*

*Faculty Mentor(s): Elise Forier-Edie, Theatre*

Creative Expression Presentation, Session # 50  
4:30-4:50 in Ballroom A

*Soul Surgeon* is a play I first conceptualized almost two years ago. The play revolves around the life's work of Walter J. Freeman, inventor of the ice-pick lobotomy and how his hunger for medical greatness effected, saved, but most often destroyed the lives of thousands of American citizens. My purpose in writing this script is the same purpose with which anything in the arts is made, to hopefully affect those who see it, give them something new, and most of all to impact audience members in a way that will stay with them beyond their time spent sitting in the theatre. My hope is that the proper audience for this piece is anyone who may be watching it and as far as my method is concerned for creating this script, the only thing I can say is research—lots and lots of research. Not only to capture the facts but to get a sense of who these people were over fifty decades ago and how I could be able to represent them as real three-dimensional people. My personal reasons for writing this show are a culmination of a love of play writing, psychology, and theatrical performance. All in all, I believe that this topic is one that not only delves into the fascinating history of medicine but also contains personal stories that we can learn from and connect to in a way that all human connection hopes to be meaningful.

**Investigation of Classical and Quantum Interference Using Interferometery**

*Powell, Adam*

*Faculty Mentor(s): Michael Braunstein, Physics; Mike Jackson, Physics*

Poster Presentation Session #2, Poster # 3  
11:15-1:45 in Ballroom C/D

As part of developing a Bell’s Inequality Test of Quantum Mechanics laboratory at CWU we have investigated classical interference using a Fabry-Perot and a Mach-Zehnder interferometer. The classical interference investigation was done using several HeNe lasers of different wavelengths. Optimization of data collection for the classical systems was accomplished by fabricating several pieces: a motorized micrometer platform, building a mount for a piezo electric tube, and building a fringe counting circuit. To investigate quantum interference the same Mach-Zehnder interferometer was used but the HeNe laser beam was attenuated. We investigated alternative methods for attenuating the HeNe laser beam. An SBIG ST-7 CCD camera was evaluated for use as a single photon detector and used to collect data from the Mach-Zehnder interferometer. The results were compared with results using a single photon counting module. The results were consistent with the predictions of single photon interference in the Mach-Zehnder interferometer.
An Investigation of Virtual Learning

Powers, Kegan

Faculty Mentor(s): Bruce Palmquist, Physics

Poster Presentation Session #2, Poster # 6
11:15-1:45 in Ballroom C/D

Learning is becoming a more and more virtual experience as teachers are beginning to come from a new generation, a generation raised on technology. The main question of my study is: Do students benefit more from virtual simulation-based experiments or from doing experiments hands-on? Virtual simulation often provides more information than can be acquired in hands-on experiments. In order to test this question a pre- and post-tests about the relevant physics concepts were given to a class of 40 general physics students. The students were put into 3-person groups and the groups were randomly assigned to either the virtual or the hands-on lab. The pre- and post-test were administered before and after students were to complete their assigned experiment. The assessments and activities covered material relevant to the unit being covered in the class. This process was repeated twice during the quarter with the two units covered being projectile motion, and forces in a plane. During the projectile motion lab students were to observe and predict the properties of projectile motion, while in the forces in a plane experiment the students were asked to solve and demonstrate the effects of frictional forces. In the end, the virtual learners seemed to have the greatest increase in comprehension, increasing their assessment scores by an average of 12 percent while hands on students averaged only an increase of 4 percent.

Costume Design for Icarus: A New Noh

Pribble, Jessica

Poster Presentation Session #3, Creative Works # 36
2:00-4:30 in Ballroom C/D

Central Theatre Ensemble, the producing organization of the Central Washington University Theatre Department, produced Icarus: a New Noh in March of 2012. Icarus is the retelling of the Greek myth of Daedelos and Icarus through the lens of traditional Japanese Theatre. Designing the costumes for this production involved researching the traditions of Ancient Greek and Japanese Theatre to discover the parallels between them. It was my goal with this production to allow the Greek story to influence the aesthetic of the costumes and still present the characters in a distinctly Noh style. Using materials which could be sourced locally whenever possible, we attempted to create a fusion of Noh, Greek and Modern styles to create a cohesive visual production. Because the play is set in modern day, this included creating a Noh style mask and wig from modern materials, blending traditional Japanese and Greek clothing pieces and infusing certain characters with a modern style. Performers in the Noh, have very specific needs which must be met inside of a blended production which include the style of Mask, special foot wear in which they can properly dance, and a specific size and style of Japanese paper fan. The production team included playwrights Elise Forier-Edie and Keven Salfen, Director George Bellah III, Scenic Designer Marc Haniuk, Lighting Designer Christina Barrigan, Costume/Mask Designer Jessica Pribble, Wig and Mask Artisan M. Catherine McMillen, Drapers Jennee Leavitt Megan Hawkins and Brian Johnson.
American Turner Societies, 1880-1930  
Prpich, Lucas  
Faculty Mentor(s): Jason Knirck, History

Oral Presentation, Session # 22  
12:40-1:00 in Room 202

My research examines late nineteenth-early twentieth-century German-American Turnvereine (gymnastic clubs) in the United States, focusing more on a comparison between the societies in Seattle and Chicago. I sought to find out just how similar these clubs were. Each was part of a national association that had given guidelines on how to start and operate such a society. Using published contemporary documents from Chicago and primary sources held at the University of Washington Special Collections, I was able to determine that although these two clubs were, on paper, identical, the Chicago club held working class Germans and generally operated as an organ of the labor movement. The Seattle society in turn had a more middle and upper class membership, which used the club as a place for leisure and recreation.

The New Apocalypse Project  
Quesnell, Ross  
Faculty Mentor(s): Joan CawleyCrane, Art

Poster Presentation Session #3, Creative Works # 37  
2:00-4:30 in Ballroom C/D

The New Apocalypse Project is my intensive and ever-changing printmaking study. It is inspired by the masterful prints of old and my own eclectic passion for creating modern-day interpretations of subjects that have long-plagued humanity. For this project, I was inspired by one artist in particular, the German printmaker Albrecht Dürer (1471-1528). His Apocalypse woodcuts caught my interest. These centuries-old prints are religious in their nature, but even without their religious connotations, I find the subject of human destruction to be powerful. Rather than a supernaturally induced end to humankind, I seek to depict humans as their own cause for ruination. Enter, The New Apocalypse Project. From the beginning of the project in Spring of 2011, I have researched imagery, sketched compositions, and completed three of the nineteen plates. Sheer scale and tediously devoted labor are both areas that distinguish this project. Each 9”x12” linoleum plate takes about 100 hours to draw, carve, and print. Multiply this by 19, and I have a project that will take approximately 2,000 hours of labor to finish (if everything runs smoothly). I am ready to accept the challenge of creating a piece that will capture the attention of viewers, and hopefully inspire other art students to explore printmaking as a valuable addition to their art vocabulary.

Glenco Supply Co.  
Rae, Benjamin; Nickel, Bryce; Ngo, Thuan  
Faculty Mentor(s): Kun Liao, Operations & Supply Chain Management

Lynnwood Center - Poster Presentation, Poster # 6

Glenco Supply Co. of Kent, WA, is a small business whose major service is screen printing. Glenco has on a few employees, along with a manager who oversees all operations. The manager spends excessive time driving to Issaquah, WA, where their major wholesaler is located, to pick up blank items to be printed for customers. When there are a lot of small orders to fill, too much time and money is wasted on shipping items. We would like to help develop a system of options for Glenco to use to be flexible and profitable with certain types of orders.
Despite its widespread use, few studies have examined the relationship between Facebook use and health. Therefore, this study will analyze Facebook users’ health in two ways: First, by examining the impact of Facebook use on well-being using several domains of mental health. Secondly, it will examine the health-promoting and health-compromising behaviors of Facebook users to determine whether the intensity of Facebook use predicts the health outcomes found in other forms of media consumption. In both endeavors, the study will follow the examples of previous research by using intensity of media use as a predictor variable, but will also analyze Facebook users by categorizing them on the basis of their type of Facebook usage. Research questions will include whether high Facebook users report lower levels of well-being than low Facebook users on mental health questionnaires. Additionally, this study will also investigate whether high Facebook users report less health-promoting behaviors than low Facebook users in areas such as physical activity, nutrition, and stress management. This question is important for two reasons: First, to this date, there have been no published studies analyzing the relationship between Facebook use and health-promoting behaviors. Second, this analysis will indicate whether the previous findings of a positive relationship between high media consumption and reduced health behaviors (e.g., exercise) can be extended to Facebook. Also, by classifying respondents on why they use Facebook, this study will determine if participants with varying general uses for the site report different levels of well-being or health behaviors.

I am Isaiah Ragland, a Choral Music Education major and student director of Nada Cantata. We are a student-run a cappella group who rehearse, arrange, choreograph, and perform at CWU and around the Northwest. Nada Cantata has two primary purposes. First, the ensemble allows its members to gain precious experience working with and leading ensembles. Second, the group provides its members with valuable performance experience. For a future music educator like me, directing Nada Cantata allows me to practice my choral leadership in a friendly, classroom-like atmosphere. This way, I will be ready to lead ensembles in my career as a music educator. In Nada Cantata, I am working with students who are my age, so it is not the same as working with school-age children. However, this experience will help me bridge the gap between training and reality, and lets me hone my skills before I graduate. In addition to its educational value, Nada Cantata provides ample opportunity for performance. We perform two large concerts on the CWU campus a year and many smaller performances and competitions around the Northwest throughout the year. Here are three of our songs that we have arranged and performed at concerts this year. The performance order goes as follows. Ain’t No Mountain High Enough, originally performed by Marvin Gaye and Tammi Terrell, arranged by Reece Sauve; Already Gone, originally performed by Kelly Clarkson, arranged by Isaiah Ragland; and Stereo Hearts, originally performed by Gym Class Heroes, arranged by Matt Mayrhofer.
Women in Combat: The Combat Rescue Officer
*Rambish, Natalie*
*Faculty Mentor(s): Thomas vonAhlefeld, Aerospace Studies*

Currentl there is a large ongoing debate about whether the United States military should be legally obligated to make jobs which are classified as combat positions available to females. My research takes a closer look at one of the Air Force’s Special Operations jobs, the Combat Rescue Officer. As a recently added combat position, women are not yet allowed to apply or compete for this job. The study discusses the positive and negative aspects that the Air Force would encounter if they opened this and other combat positions to women. I’ll advocate that without changing the current physical and mental requirements for acceptance into the field, women can and should be allowed to compete to be a Combat Rescue Officer. In addition to the question of mental and physical fitness for the job, my research also examines other issues that are specific to women in combat situations. Two issues examined in the study are the use of sexual abuse and misconduct toward female soldiers in prisoner of war type situations, and the impact of the human instinct on job performance in combat. I will present a few counter examples from real events that will serve as a testament to the fortitude of women and their capabilities as war fighters. Exploratory and constructive research methods provide both the information and examples used to develop a strong argument for the rights of women to be permitted in combat jobs.

Shelter Availability and Use by Mexican Beaded Lizards in a Tropical Dry Forest
*Rayburn, Micah; Watson, Haley; Butterfield, Taggert*
*Faculty Mentor(s): Daniel Beck, Biological Sciences; Lisa Ely, Geological Sciences*

We investigated factors affecting shelter use by the Mexican Beaded Lizard, *Heloderma horridum*, in a tropical dry forest of costal Jalisco, Mexico. Our study aimed to understand 1) how shelter (burrow) availability varies over the landscape, 2) if beaded lizards choose to inhabit areas that have a high frequency of potential burrows, and 3) how the extreme seasonality of a tropical dry forest might influence microhabitat selection. We hypothesized that there would be a higher frequency of potential shelters in areas that had known beaded lizard use. To test our hypothesis, we ran transects near 10 known burrow sites (5 wet season and 5 dry season) and 5 areas with no known *Heloderma horridum* activity, recording all potential burrows within a meter of each transect line. We found that beaded lizards tended to choose burrows with sediment roofs and floors, with the remaining potential shelters having tree root or rock components as well. Significantly more potential burrows were found in areas of known use (3.0 shelters/80m transect) than in non-site areas (1.4 shelters/80m transect). A chi-squared analysis showed that beaded lizards also prefer burrows with a west-facing entrance, most notably for dry season sites. Our results suggest that shelters (burrows) may be a limiting habitat feature for beaded lizards and that these lizards are selective in their choice of shelter sites, a result that may also apply to other species that inhabit tropical dry forests.
**Hansel und Gretel**  
*Redden, Blyn*  
*Faculty Mentor(s): Gayla Blasidell, Music*

Creative Expression Presentation, Session # 16  
11:00-11:20 in Ballroom A

*Hansel und Gretel* is a well-known fairy tale opera by the late romantic composer, Engelbert Humperdinck. It was originally sung in German but for this scene it will be sung in English. Our scene takes place deep in the woods just before dusk. Hansel and Gretel are searching for strawberries when they realize they have lost their way home. The sandman comes to come calm their fears and sprinkles magical sand in their eyes to help them fall asleep. They end the scene singing a prayer and sleep in each other’s arms. *Hansel und Gretel* is a great example of late romantic German opera. Many German operas of this genre had elements of magic, a wide variety of characters, were set in the outdoors, and were often based on fairytale, myth, or legend. Humperdinck was a student of Richard Wagner; he used his teacher’s works as inspiration. This can be heard in the chromatic and dramatic writing in *Hansel und Gretel*. The preparation for this scene started in December when we received our music. We were given all of winter quarter to learn our parts and were expected to have it memorized at the beginning of spring quarter. Then within the course of about seven weeks we worked on staging and refining our characters. The week before the show performances we rehearse intently making sure the lighting and all details were performance ready for the performances in Hertz Hall.

**Purple Lily**  
*Render, Lauren*  
*Faculty Mentor(s): Andrea Eklund, Family and Consumer Sciences*

Poster Presentation Session #2, Creative Works # 47  
11:15-1:45 in Ballroom C/D

Inspiration for this garment came from street fashion and the Fall/Winter 2011 *Dior Couture* show. Dior had a very imaginative runway show that displayed pops of color and bold cuts with flower inspiration. I wanted to expand on that inspiration with the cut of the garment being an asymmetrical hem overskirt with a fun color brought in through the garment. I also took the idea of a mini skirt underneath the overskirt from street fashion where having a mini skirt under a longer skirt is fun, flirty and fashionable. Process: Researching cuts and colors was a large part of the process. I really wanted to throw back to the Dior inspiration with an on trend color for Fall 2012 as well as with the lace exhibiting the floral inspiration. I also researched color forecasts for Fall 2012 and found the perfect purple combination. Techniques: The piece was created through the draping technique. Draping is the smoothing, contouring and manipulation of fabric on a dress form to create a garment. The draping pieces were then transferred to pattern paper and cut to create the pattern pieces. Fabric was cut according to the pattern and sewn into a sample and eventually into the final garment. Materials: 100% cotton plain weave fabric, 100% nylon lace, 70% polyester, 30% cotton lining.
Analysis of Small Mammal Bones from the Wenas Creek Mammoth Site

Rennaker, Patrick
Faculty Mentor(s): Patrick Lubinski, Anthropology

Poster Presentation Session #1, Poster # 34
8:30-11:00 in Ballroom C/D

The purpose of this project was to identify the small mammal bones recovered from the Wenas Creek Mammoth site, with the idea that, once identified, the use of provenience data would enable us to determine if the animals are Pleistocene fauna or are they more recent commensal fauna. The analysis looked at 217 small mammal bones from the site. Using a faunal tabulation form designed by Dr. Lubinski, the bones were recorded and then tabulated to try to get identification down to species. Of the 217 bones analyzed, 120 of them were only identifiable to taxonomic class Mammalia and size class I-II. The remaining 97 bones were identified as follows, 56 order Rodentia, 32 family Sciuridae (26 of which compare favorably to Spermophilus sp.), seven identified to Thomomys talpoides, and two to the family Heteromyidae. Unfortunately, because of the depth that these species burrow, I was unable to determine whether these animals are from the Pleistocene. Further analysis of the faunal remains is needed to determine age of the remains.

School House Brewery

Rhome, Andrew; McClain, Wesley
Faculty Mentor(s): Terri Wilson, Marketing Management

Business Plan, Session # 8
12:00-12:40 in Room 301

Ellensburg, Washington, has gone long enough housing only one brewery in a craft beer culture where so many thirsty patrons are expanding their palates and demanding for new beer; School House Brewery can offer both and more. School House Brewery is a student-driven brewery that will dedicate its energy in producing craft beer while educating the community on the beer making process. We create craft beer brewed by students, for students, in a college town where education and beer consumption go hand in hand. School House Brewery promotes the employment of students from Central Washington University (CWU) to create an innovative and fun working environment that will help us effectively meet the Brewery's objectives. The School House Brewery targets CWU students, alumni, and tourists along with the Ellensburg community. The Pacific Northwest is a power house of craft beer consumers. Within the past three years, the majority of nano-breweries operating in the PNW have doubled in revenue during their first two years of operation. The media covering craft beer in the PNW would help booster not only the brewery but CWU as well. Opportunities are rampant: student-driven prices create an affordable product for consumers; it is close in proximity to student which provides an area for community and social gatherings; it is educationally driven, encouraging programs and majors from CWU to come together to strengthen the operations. Programs and majors include business; recreation and tourism; science; culinary; and fashion and merchandising. A competitor analysis shows that there is no brewery in Washington driven by higher education. The mission of School House Brewery is to provide an educational environment for students while producing quality craft beer at an affordable price.
Why Russia Saved the United States during the American Civil War
Ribera, Loredana
Faculty Mentor(s): Daniel Herman, History

Oral Presentation, Session # 31
1:30-1:50 in Room 202

The relationships, good and bad, between the U.S. and both England and France are a great focus of American history. What is often overlooked is that in the 75 years preceding the American Civil War, the United States and Russia formed a friendship that proved both valuable and successful. The two countries carried on a trading alliance, established regular communications, and exchanged emissaries. At the onset of the American Civil War, Russia offered the Union her diplomatic support. By examining letters, military dispatches, and American newspapers, this paper documents Russian-American relations during the Civil War. This paper finds that Russia and America made excellent natural allies because of tactful communication between the respective emissaries, similar expansionist ideals, and because of their shared concerns about powerful European nations intervening in their internal affairs.

Propaganda Posters and Literacy in Early Soviet Russia
Ribera, Loredana
Faculty Mentor(s): Roxanne Easley, History

Oral Presentation, Session # 31
1:50-2:10 in Room 202

During and immediately after the Russian Revolution of 1917, Lenin and the Bolsheviks used many forms of propaganda to foster support for their aims. Since their favored journalistic strategy was incomprehensible to most of the population, the political poster became an important vehicle for promotion of Bolshevik ideology. On the posters, creative pictures and very direct messages could also promote literacy itself. This paper argues that Soviet propaganda posters of the revolutionary period had the dual goal of promoting literacy and the Party’s agenda.

Peach Caviar
Rich, Angelina
Faculty Mentor(s): Andrea Eklund, Family and Consumer Sciences

Poster Presentation Session #2, Creative Works # 43
11:15-1:45 in Ballroom C/D

This garment was inspired by artwork featuring studded details that I created in a ceramics class. I loved the end result of this project, so I wanted to incorporate the use of hand-made ceramic studs in this garment. The glaze used on the studs is a rusty metallic silver color with peach highlights. After creating the studs, the other colors used in the garment were chosen to compliment and contrast the stud color. The name Peach Caviar came into mind representing something elegant and expensive. Process: I chose a beautiful shade of peach for both the bodice and the skirt portion of the dress to compliment the ceramic spikes to embellish the bodice. When making the ceramic spikes, I started by sculpting the base diameter to approximately half an inch, and the height to about three-fourths an inch. After awhile of doing this I decided that more character was necessary for the overall effect I wanted my dress to convey. Therefore, I started making the studs in different sizes. After this process I hollowed the spikes out and drilled 3 holes in each of the spikes, allowing the spikes to be sewn on the dress as buttons. Overall, I wanted my dress to scream “modern and expensive” with an overwhelming sense of couture craftsmanship. Techniques: I created my dress using draping and flat pattering techniques. The studs are individually hand crafted and glazed. Materials: 100% cotton, 100% polyester chiffon, cotton thread, invisible zipper, fusible interfacing, hand-made ceramic glazed studs.
Barrage Cellars
*Rinaldi, Sam; Ruth, Darlene; Richins, Martin*
*Faculty Mentor(s): Kun Liao, Operations & Supply Chain Management*

Lynnwood Center - Poster Presentation, Poster # 7

Barrage Cellars, a small production winemaking facility, plans to expand sales over the next five to ten years by implementing a mobile and comprehensive inventory tracking system. This paper focuses on the analysis and selection of two to three inventory-recording systems that will effectively reduce costs while increasing profits. Research has been conducted through survey and interviewing of internal sources (ownership) and external sources, and has provided information related to the challenges of inventory control within the winemaking industry. The process of implementation has divulged significant growth in three key areas: useable inventory data, sales forecasting information, and customer purchase records. Focusing on long-term expansion, the overall goal of this research is to suggest a suitable inventory system that remains within cost limitations while allowing for greater commercial production capabilities.

Health in Kittitas County
*Roberts, Taylor*
*Faculty Mentor(s): Dominic Klyve, Mathematics*

Oral Presentation, Session # 29
2:10-2:30 in Room 140

For my project I have analyzed data from the “Behavioral Risk Factor Surveillance System” (BRFSS). The BRFSS is the world’s largest, on-going telephone health survey system, tracking health conditions and risk behaviors in the United States yearly since 1984. Currently, data are collected monthly in all 50 states, the District of Columbia, Puerto Rico, the U.S. Virgin Islands, and Guam. BRFSS has enormous data sets. I am focusing my attention just on the data based in Washington, specifically, analyzing data from Kittitas County and comparing and contrasting the health practices to the neighboring counties across the state, primarily looking at what kind of impacts alcohol consumption may have on one’s health varying from county to county. Using statistical software, such as SPSS and Minitab, and using statistical concepts such as descriptive statistics, frequencies, regression analysis, and ANOVA testing I am able to find correlation and compare sample populations. Through the outcome of this specific project, places such as the Kittitas County health department may find this information to be very useful.
Baseball by the Numbers
Robertson, Brian
Faculty Mentor(s): Dominic Klyve, Mathematics

Oral Presentation, Session # 12
10:40-11:00 in Room 140

This study is an analysis of baseball statistics to find what will help each team reach the playoffs. Major League Baseball is a big business: last year the league brought in revenue of 7.2 billion dollars, and over 73 million fans attended games. Baseball is known as “America’s Pastime.” Each manager, coach, and scout’s job depends on whether they can take a team to the playoffs. The biggest goal for each team is to make the playoffs. Since 1995 there have been four teams from both the American and National league who enter the playoffs. Statistical analysis can be done to find what teams need to do to maximize the amount of wins they get each season. In 2012, a new rule has been implemented to now allow 5 teams from the two different leagues to enter the playoffs. How will this effect a team’s strategy going into the season? This study analyzed earned run average, hitting average, on base percentage and other statistics to find what is important to make a winning team. After those are analyzed, the study took a further look into other baseball statistics such as WHIP and WAR to see what makes a good pitcher, batter, or fielder.

“A Flirt with Death—My Adventure with Heat Stroke”
Roddy, Rachel
Faculty Mentor(s): Natalie Lupton

Oral Presentation, Session # 17
11:40-12:00 in Room 135

My short stories centers around an experience I experienced while at Central Washington University. Because this was my first time away from home, and in a different climate, I had to learn how to live on my own and adjust to my surroundings. The first summer quarter I spent in Eastern Washington was definitely an eye-opening experience for me. I got heat stroke and had it not been for a friend of mine, I’m not sure I would be here today. Thus, after a brief introduction of myself as an alumni of Central, and perhaps an overview of some other lessons I learned, I will read the story I wrote about my experience with heat stroke.

“Unspoken Chains - Releasing a Dark Secret and Breaking the Bond of Fear”
Roddy, Rachel
Faculty Mentor(s): Natalie Lupton

Oral Presentation, Session # 17
12:00-12:20 in Room 135

Holding in a dark secret can eat you alive. Such is what happened to me after an abusive relationship I was in during community college. For two years afterward, I was bound in secrecy, and I lived in fear of being discovered when I began to speak out. I was afraid that he would find me and hurt me like he threatened. The piece I will be sharing explores a little of what happened and the effect it had on me. Even though this is a more sensitive piece, it exists to help others know that they are not alone, and that they can speak out if they need help, too.
Otto Nicolai wrote the opera *The Merry Wives of Windsor* (1849) based on Shakespeare's original text, which places Sir John Falstaff in Windsor very short on money. The plot of the entire opera lies around his attempts to court two wealthy married women by sending them identical letters. One of the women is Mistress Page. Here, in Act II Scene II, three different men are trying to win the hand of Page's daughter, Mistress Anne Page. Mistress Page would like her daughter to marry Doctor Caius, a fiery French physician, whereas the girl's father would like her to marry Master Slender, a timid man. Anne herself is in love with Master Fenton, but Page had previously rejected Fenton as a suitor due to his having squandered his considerable fortune on high-class living. Scandal ensues as plots to steal the heart of Anne Page come and go. By the end of the scene, the young couple reaffirm their love for one another. At the end of opera, they marry happily, while Sir Falstaff's plans lead to ruin and embarrassment. Our cast of 4 music majors has been in rehearsals since the beginning of spring quarter, rehearsing the music, and eventually staging the production to prepare for the performance on May 11th and 12th.

Is There a Difference Between Soil and Tree Temperatures Throughout the School Year?
*Romero, Ozzyona; Jones, Katlynn; Parcel, Salena*
*Faculty Mentor(s): Trish Griswold, Other*

Poster Presentation Session #2, Poster # 21
11:15-1:45 in Ballroom C/D

Fostering a “Sense of Place” at Walter Strom Middle School, 7th grade students conducted inquiry based investigations in the outdoor classroom. Data was collected several times per month throughout the school year. We randomly selected data points to measure soil and tree temperatures over three seasons. We calculated the p-value that describes the chances of getting our data if the null hypothesis is true.

Independent Women in the Civil War Medical Field
*Roundtree, Alyssa*
*Faculty Mentor(s): Daniel Herman, History*

Oral Presentation, Session # 40
3:20-3:40 in Room 202

The United States Civil War affected all American citizens. Women were particularly impacted and attempted to use the situation to their advantage. During this war many women thought by leaving their homes on the plantation to work in hospitals, they would experience a new independence. What they encountered was a male dominated medical system not inclusive of women. Though the need for assistance was dire, the perceived limitations of women prevented their male superiors from placing them into medical positions. Female volunteers were required to meet strict standards, greatly limiting the number of women accepted into the medical field. This further restricted the opportunities for the independence women expected they would gain. When women were allowed into the medical field, it required strength, determination, and tenure to be empowered even remotely. Few women were able to use their experience in the Civil War medical arena to gain a greater independence. The hopes women had of gaining an independent life through wartime medical service were shattered upon encountering the harsh reality of the male driven medical society.

Rui, Huang

Faculty Mentor(s): Dominic Klyve, Mathematics

Poster Presentation Session #1, Poster # 44
8:30-11:00 in Ballroom C/D

Trends in household wealth dynamics comparing 2005-2007 with 2007-2009 Based on PSID Data for the 2005-2007 period and the previous researches that have been done on the topic of household wealth dynamics, the mean CPI-adjusted per family net worth increased, and at the same time, there was a modest increase in the median net worth between 2005-2007. After good performance over the past three years, however, the data started dropping from 2007, mostly due to the strong impact of the crashes in the housing bubbles in the United States and global economic recession. The effects of this drop are the primary subject of my study. I compare the trends in household wealth from 2005-2007 to the period from 2007-2009, based on the background of changing economic conditions. In my research, I not only compare the overall change in the trend of household wealth dynamic over the two time periods, but also look into the weight changes in the components of people’s assets portfolios investigated, and how people changed their behaviors in personal finance management in response to the economic conditions: what assets were bought or removed? Which stocks and bonds were bought or removed? Is there an increase in debt, or sales of home equities in exchange for cash? The data analysis consists of descriptive, inferential, and time series techniques.

What We Talk About When We Talk About Grammar: Integrating Grammar into the Writing Process

Ruppert, Amy

Faculty Mentor(s): Patsy Callaghan, English

Oral Presentation, Session # 26
1:50-2:10 in Room 135

Since the mid 1960s, explicit grammar instruction within the composition classroom has been a widely contested subject. This grammar debate and the effects of grammar instruction—or lack thereof—evidenced by various educational systems attempting to answer the questions surrounding grammar instruction and students’ needs, has bubbled upward; composition instruction at the university level faces the daunting task of amending curriculum to incorporate some form of sentence-level grammar instruction. This presentation—an abridged look at the forthcoming English Master’s Thesis “The Importance of Teaching and Contextualizing Grammar in Freshman Composition Instruction”—argues for the necessity of grammar instruction within college composition courses. Formalized instruction in sentence-level—syntactic—fluency has an integral role in developing college students’ ability to effectively communicate ideas and demonstrate writing proficiency. To say that grammar should be formally addressed in the composition classroom is only a part of the overall argument. This presentation addresses the need to integrate grammar instruction into the writing process. Ideally, freshmen composition students should understand grammatical concepts by recognizing how these concepts work within the context of their own writing. It is often difficult to develop strategies that help students integrate grammatical knowledge into their own drafts and demonstrate an overall proficiency in Standard English. Because of this, grammar is often taught in isolation and is far removed from the actual writing process. This presentation proposes a way to develop students’ overall grammatical proficiency with a new model relevant to Central Washington University’s current composition curricula.
Battle Bot Analysis
Rutherford, David
Faculty Mentor(s): Charles Pringle, Industrial & Engineering Technology

Poster Presentation Session #2, Poster # 18
11:15-1:45 in Ballroom C/D

The purpose of the poster presentation will be to describe the Battle Bot Club and the processes of designing, making and testing the bot Junkyard Dog’s drive system. The team has completed testing and the competition in California, Robogames “Combat Bot” division, and placing will be discussed. The method for testing the drive system was running the bot from one point to another on a timer and analyzing the data related to acceleration.

Assessing the Performance of a Stark Spectrometer
Saucedo, Nick
Faculty Mentor(s): Michael Jackson, Physics; Michael Braunstein, Physics

Oral Presentation, Session # 37
3:40-4:00 in Room 137B

With the discovery of the optically pumped far-infrared laser in 1970, over 5,000 far-infrared laser emissions have since been detected. The accurate measurement of their frequencies allows these lasers to serve as known, coherent, and stable sources of far-infrared radiation that are used in a variety of applications. At Central Washington University, we have constructed a Stark spectrometer to use with an optically pumped molecular laser for the investigation of stable molecules. The Stark spectrometer consists of two silvered glass plates with dimensions 7.62 cm by 15.24 cm and separated by 1 mm using quarter spacers. Electric fields up to 9,000 V/cm are used with the Stark spectrometer. To assess its performance, we have used a series RLC circuit to determine if there is any variation of the capacitance, and hence the electric field, as voltage is applied to the plates. This presentation will focus on discussing the experimental system and how the RLC circuit was used to assess the Stark spectrometer.

Never Too Old: Reading Aloud to Secondary Students
Savage, Alyson
Faculty Mentor(s): YiShan Lea, Education

Oral Presentation, Session # 7
9:10-9:30 in Room 271

Assessment results provided by the National Assessment of Adult Literacy have presented evidence of a literacy problem among young adults in the United States. In this thesis, I argue that reading aloud to students at the secondary level is one of the most effective solutions to this problem. This strategy is highly recommended at the elementary levels by experts such as Jim Trelease and Stephen Krashen, but many educators feel that this strategy has no place in a secondary classroom. Showing the importance of these strategies and bringing them into the middle and high schools will be a crucial step in reversing literacy deficiencies in young adults. Using previously conducted case studies and surveys of read-aloud practices, I show that the exposure of older students to varied and well-planned read-aloud strategies has a positive effect on developing and maintaining strong literacy skills. After observing secondary classrooms and reviewing teaching methods, I first will illustrate a number of methods that educators can use to implement these strategies. I then describe the various types of reading materials best suited for each activity. Reading aloud is not a difficult thing to incorporate in lesson planning, and even the smallest exposure will help our students become better readers.
Speaking Through Color: How Color Choices in Artwork Influence Our Thinking

Schlonga, Michelle

Faculty Mentor(s): Glen Bach, Art

Oral Presentation, Session #33
1:30-1:50 in Room 301

Artists use their artwork to communicate ideas to an audience. In the area of graphic design, it is especially important to communicate ideas effectively, using not only the content of the piece of artwork, but its color palette as well, considering that the goal of many design pieces is to sell a product or idea. It is already established that color influences human emotion, but how does that emotional response enhance the effective communication of artwork, and does that make color the most important aspect of a piece? My presentation will begin with an introduction to basic color theory so that basic concepts of color are understood. This will lay groundwork for the rest of my presentation, which will deal mostly with color in the context of psychology and art history. Classic posters from Jules Chéret and Henri de Toulouse-Lautrec as well as a painting created by Mark Rothko will be analyzed for the use of color in each piece. Finally, posters created by myself will be shown and a brief explanation of the process used to create the posters will also be given. These posters will illustrate how different color palettes affect human emotion and show that the element of color, alongside concept, should be considered first and foremost when creating a piece of artwork.

Spring Powered Assist Motor

Schmid, Brendan

Faculty Mentor(s): Charles Pringle, Industrial & Engineering Technology

Poster Presentation Session #3, Creative Works #38
2:00-4:30 in Ballroom C/D

MET Question: How to store energy lost during braking or downhill, and return it to the wheels when desired without the use of batteries or electronics, i.e., regenerative braking. Rationale: With the increased need of our busy lives, transportation demands, gadgetry and electronics, the production of electricity and storage is of rising concern. When consumer’s consider petroleum’s role in transportation, all too often “electric” is the preferred solution—the ultimate in “going green” and curbing our dependence on petroleum. In the realm of human-powered transportation, electric is the much sought after solution. However, little consideration is given to the source of that electricity and our true dependence on fossil fuels—from where does that electricity come? To break it down: 44.9% fossil fuels, 23.4% natural gas, 20.3% nuclear, and 10.2% renewables. Are we really going green? Electric transportation is increasing our demand for energy production as well as energy storage. Methods: The Spring Powered Assist Motor will be manufactured using machining technology and mechanical engineering principals. Results: The SPAM operates and propels a typical rider from stop. More testing is scheduled for spring quarter 2012. Principal Conclusions: The SPAM is sufficient to store adequate potential energy to the assist rider up 15 foot hills over typical size city blocks. The motor is operational and has potential to incite further iterations.
Impact of Illegal Immigration in the United States
Schmidt, Jenna; Mingming, Mark; Songsangcharntara, Vantanee; Richards, Jonathan
Faculty Mentor(s): Hideki Takei, ITAM

Oral Presentation, Session # 15
10:40-11:00 in Room 271

In the United States, the issue of illegal immigration has been a long-term debate. Every year, millions of people immigrate to the U.S. to seek better opportunities. Out of 370 million people in the U.S., 11.1 million are illegal immigrants. These people have either entered the country illegally, or entered the country legally, but stayed beyond their termination date. Illegal immigrants affect the United States in different areas such as the economy, work force, public services, and crime rate. Some economists say that we benefit from them by keeping wages of low-skilled workers down, but there are people who believe that they decrease job opportunities for Americans. Others say that illegal immigrants use a lot of public services, but do not contribute to our society as much as American citizens. And some say that crime rates are high because of illegal immigrants. However, these statements may not be true. Our goal is to give a fair and balance view of illegal immigrants, and to provide proper insights to this topic. To collect proper data, we did conduct any interviews. Instead, the way we collected information and statistics on illegal immigration was by going to the library and research scholarly sources, such as journals and books, as well as using the Internet to collect information from credible sources.

Religion, Culture and Conformity During the Cold War
Schmidt, Alec
Faculty Mentor(s): Matthew Altman, Philosophy and Religious Studies

Oral Presentation, Session # 42
3:00-3:20 in Room 301

This paper is an inquiry into one of the driving forces during the Cold War: religion. The 1950s were not only the dawning of the Cold War, but also the decade in which religiosity in America drastically increased. The Foucaultian principle of panopticism helps reveal the ways in which religion was used as a very insidious form of oppression. American’s were not oppressed during the Cold War in the sense that they were enslaved, but rather they were intellectually oppressed. Religion allowed political leaders to equate Communism with Satan. Mythology assisted politicians and public figures in inducing near culture-wide conformity against communism. Although the USSR was a threat, the issue was greatly exaggerated and there was a general lack of factual arguments. Speculation was allowed to take the place of claims supported by objective evidence. A perfect economy of power began to function. Public religious figures such as Fulton J. Sheen were prone to self-deception. They believed themselves to be doing God’s work when in reality they were serving the purpose of the political panopticon. American citizens began depicting communism as the greatest evil on earth. They fell victim to panopticism and began functioning as normalizing mechanisms throughout society. The focus of the paper is to elaborate on how religion served as the perfect and most insidious political panopticon because it allowed for culture-wide deception. This prompted citizens to set themselves against communism and allow for coerced and lasting conformity.
Quantification of the Inhibition of Calcineurin by Protein Phosphatase Assay

Schultz, Kaytlyn; Nelson, Joseph; Vu, Haong; Selski, Daniel
Faculty Mentor(s): Daniel Selski, Biological Sciences

Poster Presentation Session #1, Poster # 18
8:30-11:00 in Ballroom C/D

The nervous system is full of neurons, cellular data processors. These neurons send out processes called axons to make connections with other neurons called synapses in regions far away from their starting point. Axonal development is a major subject of current biological research today. Dr. Daniel Selski, of the CWU Biology Department, has developed a project testing the effects of Calcineurin (CaN) on axonal development. Dr. Selski’s project entails using the immunosuppressant FK506 to inhibit CaN, using a chicken model, and measuring the anatomical effects in the retina. However, our lab has not yet proven that FK506 significantly reduces the amount of active CaN within the chicken embryo. Our hypothesis is that FK506 is successfully inhibiting the target protein CaN. Testing and clearly demonstrating that FK506 inhibits CaN enzyme activity in our system will strengthen the interpretation of anatomical studies. This hypothesis is being tested by treating embryos on embryonic days 5-9 with FK506, then performing a protein phosphatase assay to determine how active CaN remains within retinal tissues. The assay data can be quantitated, using a visual wavelength spectrophotometer that measures the absorbance/amount of solution phosphorylated. The expected result is that treated retinas will show a measurable difference in CaN activity compared to control retinas. A significant difference in CaN activity between FK506 treated and control retinas would be evidence that our treatments with FK506 are inhibiting CaN.

Soil Nitrogen Effects on Black Cottonwood (Populus trichocarpa) Growth Rates in the Taneum Canyon Hyporheic Corridor

Seiler, Ian
Faculty Mentor(s): Tom Cottrell, Biological Sciences; Clay Arango, Biological Sciences

Poster Presentation Session #1, Poster # 6
8:30-11:00 in Ballroom C/D

River valleys with porous alluvium have preferential flowpaths called paleochannels that extend the influence of riparian ecosystems away from rivers, creating varying nutrient concentrations in a “hyporheic corridor” where riparian flora can thrive far from the surface influence of the river. Taneum Canyon, an alluvial valley in Kittitas County carved by Taneum Creek, has the characteristics of a hyporheic corridor. In order to identify how nutrient concentrations affected growth rates of Populus trichocarpa, we took ninety-five core samples across four paired sites that were either near or far from the creek within the Taneum Creek hyporheic corridor. Growth rates of each tree were determined by calculating the area of each ring on the tree core for the most recent twenty-two years. We found that growth rates in Populus trichocarpa were related to tree age (p < 0.001) in that older trees accumulated more total biomass when compared to younger trees. Then we related growth rates to nitrogen and phosphorus content of soil samples taken from the base of the tree using regression analysis. Nutrient availability alone was not significantly related to tree growth rate with the exception of one site. However, when tree age is considered as the primary contributing factor affecting growth rates, nutrient availability explains growth rates for the entire sample of Populus trichocarpa (p < 0.001) in the Taneum hyporheic corridor. Subsequent analyses will examine the spatial relationships between nutrient availability and growth rates along the hyporheic corridor.
Will There Be a Difference in Elk or Deer Sign in Cle Elum Roslyn School District Forest?
Selzer, Christina; Zabik, Sarah
Faculty Mentor(s): Trish Griswold, Other

Poster Presentation Session #2, Poster # 22
11:15-1:45 in Ballroom C/D

Fostering a “Sense of Place” at Walter Strom Middle School, 7th grade students conducted inquiry based investigations in the outdoor classroom. Data was collected several times per month throughout the school year. We recorded wildlife observations: specie, number and patterns. We used sight and sound to observe. We looked for sign in sky, dust, snow and mud. We used statistical test to decide if we thought that our hypothesis of more elk than deer was true.

Changing Religious Practices Among Young Women in Morocco
Shabazz, Basmah
Faculty Mentor(s): Lene Pedersen, Anthropology

Poster Presentation Session #1, Poster # 42
8:30-11:00 in Ballroom C/D

Morocco was founded on the basis of Islam, and this permeates local art, culture, law, and philosophy. During the past decades, however, the country has undergone significant socio-cultural change as a result of globalization within the region. Building on three weeks of focused ethnographic fieldwork in December 2011, and my background as an expatriate Moroccan native, this paper examines recent change in religious expression in Morocco, specifically changes related to the manner of dress among young women. The fieldwork incorporated a range of methods, including informal interviews, key informant interviews, and participant observation, to better understand how people experience the political and cultural changes in Morocco of the past decade. With a focus on women in the transformation of Islamism within Moroccan culture, my findings confirm an increase in female rights in Morocco, as well as a decrease in religious practices among the younger generations. The study probes the role of Western influences in altering the once prescriptive clothing choices for women in Morocco. This study contributes to our understanding of the relationship between veil wearing and Islam, and the impact of globalization in Morocco.
Versi Events  
**Shepherd, Kassidy**  
*Faculty Mentor(s): Amy Mumma, World Wine Studies*

Business Plan, Session # 8  
8:40-9:20 in Room 301

Versi Events is a new company that will provide customized and quality in-home wine tasting events. Research has shown that wine can be intimidating and Versi Events strives to break down the barriers to increase knowledge and consumption. This increase in wine consumption will help boost the local and regional wine economy. The emphasis is on educating consumers on the multiple aspects of wine, while providing an irreplaceable experience in a comfortable setting. The business proposal of Versi Events is modeled after in-home jewelry, cookware and clothing events that have proven extremely successful. The target market will be the greater Seattle area, but statewide events are available. Versi Events offers the client the personalization and customization of each event, including setting budget parameters and other factors to provide an experience that exceeds expectations and is tailored to the specific demographic. Extensive research has shown that there are no big competitors in the greater Seattle area that offer customized education and events in a home setting. Currently, there are wine tasting rooms, wineries, and wine education classes, but there is a void that combines all facets into one convenient and customized event. This type of event would apply to any type of lifestyle, whether it is for an upper-class couple, experienced wine drinker, amateurs interested in learning about wine, a work party, bachelorette party, dinner night for friends, birthday, anniversary, and many others.

Family is Family  
**Shields-Gravitt, Aly**  
*Faculty Mentor(s): Melissa Johnson, English*

Oral Presentation, Session # 35  
3:20-3:40 in Room 135

Society tends to portray happy families in commercials, television shows, and movies as a mom and dad together with their young children. However, this is not the normative portrait of family life for all families. There can be an assortment of familial structures such as single parents to couples that want to adopt a child. Families have different views on how to raise children and as time changes so do cultural morays in regard to raising children. As noted in one scholarly article, today's families are not going to raise their children the same way as generations past did. I argue there is no such thing as a “perfect family”; there are many structures and approaches to family life that result in satisfaction and happiness.
Effects of Victim Sex on Perceptions of Intimate Partner Violence Severity in Heterosexual Relationships

Shores, Alanna

Faculty Mentor(s): Marte Fallshore, Psychology

Oral Presentation, Session # 13
11:00-11:20 in Room 201

In the present study, the perception of the severity of intimate partner violence (IPV) in heterosexual relationships based on the sex of the perpetrator was investigated. Traditionally, IPV has been framed as an issue in which men are almost always the perpetrators and women are almost always the victims. It is often assumed that, more often than not, IPV occurs when a violent husband physically abuses his wife. National surveys estimate that between 20% and 25% of women and 5% to 7% of men in the United States have been victimized by IPV, implying substantially higher rates among women than men (U.S. Department of Justice, 2000). However, researchers have found inconsistencies in data collection, suggesting that past research on the issue has been gender-biased toward female victims (Hamel, 2009). In the present study, participants were presented with three hypothetical situations in which a crime occurred, one of which involved IPV perpetrated by either a man or a woman. Participants rated crime severity in comparison with a base crime. The base crime was the act of stealing a bicycle and was given a value of “10.” If, for instance, a participant viewed the target crime as 5 times worse than the base crime, they would have assigned the target crime a value of 50. It was found that people perceive male-perpetrated IPV as about twice as severe as female-perpetrated IPV. Implications for this finding are discussed.

Verbal Overshadowing and Humor Perception

Sigel, Erin

Faculty Mentor(s): Marte Fallshore, Psychology

Oral Presentation, Session # 13
10:20-10:40 in Room 201

This study examined the effects of verbal overshadowing on humor. Verbal overshadowing is a phenomenon which can occur when the act of verbally describing something a person has seen, tasted, or heard interferes with their actual perception of the event. Much research has been done on verbal overshadowing, and on its effects on other stimuli, such as face recognition and wine tasting. However, studies on its relation to perception of humor are lacking. The current study was performed in order to address this lack by exploring whether the phenomenon of verbal overshadowing applies to humor. The participants for this study were 100 students who registered for the study and received credit for their participation through Central Washington University’s Sona system. All participants read the same joke. The control group then performed a distractor task, listing the states in the United States of America. The experimental group explained, in writing, why the joke was or was not funny to them. Afterwards, both groups rated the funniness of the joke on a scale of 1 (not at all funny) to 7 (extremely funny). It was anticipated that the control group would find the joke to be funnier than the experimental group, because verbal overshadowing was expected to impair their perception of the joke. However, no significant difference was found between the two groups’ ratings of the joke. Reasons for this failure are discussed.
Synthesis of 5,6-Dihydropyran-2-ones as Potential Inhibitors of HIV-1 Protease

Sigurjonsson, Kristín; Nye, Jesse

Faculty Mentor(s): Levente Fabry-Asztalos, Chemistry

Oral Presentation, Session # 28
1:30-1:50 in Room 137B

Drug discovery and development for HIV/AIDS has led to groundbreaking anti-retroviral therapies including HIV-1 protease inhibitors. However, the rise in resistance to current treatments as well as issues regarding drug toxicity and affinity, generate a need for more effective inhibitory structures. This synthetic chemistry research builds on a previous research effort, in which HIV-1 protease inhibiting structures were designed using molecular modeling methods. Quantitative Structure-Activity Relationship (QSAR) was implemented using a fuzzy neural network to predict the biological activity for these compounds. We are synthesizing the novel structures through known methodologies. The inhibitory values of the target compounds will be determined and compared to the values predicted by the neural networks. We hope that the target compounds will possess better inhibitory properties, increased bioavailability and decreased toxicity compared to currently available inhibitors.

United States v. Jones

Siljeg, Ashley

Faculty Mentor(s): Teresa Francis, Law & Justice

Oral Presentation, Session # 10
10:00-11:20 in Room 137A

The Fourth Amendment was established to protect people from unreasonable searches and seizures. Advancements in technology, however, have blurred the definition of a search. The employment of technology by the government is forcing a review and redefinition of the borders and limits of an individual’s right to privacy. Through examination of the Supreme Court’s 2012 decision in United States v. Jones, I intend to show how technology has made more-complex the once-understood role of government in upholding privacy rights. United States v. Jones questioned the actions of federal agents who, without a warrant, placed a GPS tracking unit on Jones’ jeep as part of a drug trafficking investigation. After several appeals, the Supreme Court unanimously decided that the use of a GPS device without a warrant constitutes a search, thus the agents’ actions violated the Fourth Amendment. This presentation will also address how the Jones decision will affect the criminal justice system and how police can employ advancements in technology to reduce manpower and operating costs. Furthermore, I will explore how the Jones case is different from other vehicle cases and the precedent it sets.
Comparative Genetic Diversity of Captive-Born Gorillas
Simons, Noah; Wagner, Steven; Lorenz, Joseph;
Faculty Mentor(s): Steve Wagner, Biological Sciences

Oral Presentation, Session # 30
1:50-2:10 in Room 201

Genetic management of captive western lowland gorilla (*Gorilla gorilla gorilla*) populations represents an important component to the long-term conservation priorities of the species. Wild populations of western lowland gorillas are facing dramatically declining numbers as a result of habitat destruction, fragmentation, diseases (e.g., Ebola), and illegal bushmeat trade. While the captive collection of gorillas in North America began more than 100 years ago with imported wild individuals from Africa, there have been no new wild gorillas added since coming under protection of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) in 1975. In addition, they have been designated as critically endangered since 2007. We genotyped 28 individuals from the North American captive gorilla collection at 11 autosomal microsatellite loci in order to compare levels of genetic diversity to wild populations. Captive gorillas had significantly higher levels of expected heterozygosity and effective alleles than the wild population of Cross River gorillas ($z=2.56$, $P=0.011$; $z=2.73$, $P=0.006$, respectively). These results were unexpected because captive populations usually have a subset of genetic diversity of wild populations. This work was supported by NSF BCS0938969.

Clustering of GPS Sensor Network Data Streams Using Self-Organizing Maps For Automatic Seismic Event Recognition
Smigaj, Andrew
Faculty Mentor(s): Razvan Andonie, Computer Science; Tim Melbourne, Geological Sciences

Oral Presentation, Session # 5
8:50-9:10 in Room 201

Time series clustering of GPS sensor data in order to identify meaningful geological features and events remains a relatively unexplored field. Clustering of GPS data can potentially extract previously hidden features as well as assist in rapidly modeling geological events such as earthquakes. This is an essential task when doing things such as predicting the likelihood and location of a potential tsunami, which can be used to mitigate a disaster. In this study, we will train a classifier using a self-organizing map, an artificial neural network suitable for clustering, to identify if ground movement data coming from GPS sensors indicates the occurrence of an earthquake. Associated with earthquakes are unique patterns of tiny ground shifts over time, which can be used for classification. We will train the classifier to distinguish whether or not an earthquake is occurring as well as establish clustering that can be used to distinguish between different types of earthquakes. Once trained, the classifier can then be used with real-time data to classify seismic phenomenon on the fly. Artificial neural networks are noise tolerant so less preprocessing needs to occur, which means a rapid response. Correctly set up, they can extract very subtle information, which can often be overlooked using other approaches. Finally, they are adaptive and can perform under a variety of changing conditions. We will train and test the neural network using data coming from a GPS sensor network that spans the Pacific Northwest known as PANGA, which is headquartered at Central Washington University.
Optimization and Performance of a Template and Histogram-based Image Classifier  

**Smigaj, James**  
*Faculty Mentor(s): Boris Kovalerchuk, Computer Science*

Oral Presentation, Session # 5  
9:10-9:30 in Room 201

Within image classification tasks, many methods involve first extraction of low-level features and then use of these features to build a model that can be identified. This project evaluates one such classifier. The classifier uses the Harris Corner Detection algorithm to extract interest points within an image, and then uses these points to build a template that defines their spatial relationship. To provide additional information, multi-bin color and derivative histograms are used. This classifier contains several parameters that can be adjusted. The template uses a variable distance function; the histogram may vary in the number of bins, and these two components may be weighted differently in the final score. Therefore, appropriate methods are used to optimize these parameters. Finally, the optimized classifier is tested on images of different complexities.

Art and Science: Confronting the Need for Explication  

**Smith, Naomi**  
*Faculty Mentor(s): Gary Bartlett, Philosophy and Religious Studies*

Oral Presentation, Session # 14  
10:40-11:00 in Room 202

My essay traverses the way in which contemporary artists are utilizing scientific innovation to assess philosophical concepts regarding our current and future states of being. The endeavors of these artists are not only interdisciplinary, but are also dualistic in nature, since artists are capable in performing the roles of both creators and educators. Thus contemporary artists are actively appropriating scientific and technological research, ideas and materials, which enables them to produce artworks that can reach a wider and more diverse public than would have been possible had the work remained solely scientifically inclined. The significance of dualism in shaping the identity of an artist was explored scholarly through an analysis of the roles of artists working traditionally, contemporarily and futuristically. This research was informed by an interest in transhumanism (humanity in transition from one state of being to another) and posthumanism (the proposed next stage of humanity beyond our current state). Though both philosophical terms are critically considered by artists within contemporary art, these terms are also highly theoretical and, therefore, relatively inaccessible to the average Western citizen. Such notions function under the pretext of moderate elitism, much in the way that contemporary scientific and technological innovations operate above and beyond the general public’s awareness. My scholarly inquiry resulted in an informed recognition of the need for scientific, technological and philosophical explication to a general public that craves knowledge and accessibility. This desire is met with great passion and innovation by artists with dual roles as creators and educators.
UV-induced DNA damage in *Daphnia magna* from Ecologically Disparate Populations

Smith, Amanda  
*Faculty Mentor(s): Alison Scoville, Biological Sciences*

Poster Presentation Session #1, Poster # 10  
8:30-11:00 in Ballroom C/D

Every day we are exposed to carcinogens, including ultraviolet radiation (UVR). High levels of ultraviolet radiation are known to cause DNA damage. One of the most common forms of UVR-induced damage, the pyrimidine dimer, is repaired by an enzymatic reaction powered by visible light. We wanted to find out if there is variation in the level of UVR-induced DNA damage induced in two different clones of *Daphnia magna*, a model organism for ecotoxicology. One clone was derived from a mid-latitude deep reservoir, where escape from UVR is possible via vertical migration. The second clone was from a high-latitude shallow rock pool, where *D. magna* are exposed to high levels of UVR. Pregnant mothers from each clone line were subjected to ecologically relevant levels of UVR in the lab. Immediately afterwards, we extracted the embryos, suspended the cells in agarose, and performed a comet assay, which allows for quantification of DNA damage within individual cells. The slides were viewed under a fluorescent microscope and pictures were obtained for each cell. We then used the image analysis software CometScore to measure the amount of DNA damage. Our results indicated that the reservoir-derived clone had increased damage following UVR light, compared to controls that received no UVR. However, the pool-derived clone showed decreased DNA damage following UVR exposure. This may be due to a combination of DNA protection and efficient, light-powered DNA repair in UVR-adapted populations.

Lying Words

Spears, Charlie  
*Faculty Mentor(s): Danielle Polage, Psychology*

Poster Presentation Session #3, Poster # 26  
2:00-4:30 in Ballroom C/D

Lying is a common occurrence in everyday life. Everyone lies. In extreme cases, it is important to be able to determine if someone is lying or if they are telling the truth. With an increase in threats to national security, it is essential to investigate potential cues to deception. When people lie they are using more cognitive resources than compared to telling the truth and they are creating details, opinions, or an event that did not happen. As a result, false stories may differ qualitatively from true stories. The current research discriminates liars from truth tellers by the words they use. The hypothesis is that those telling a lie use fewer first person singular pronouns (e.g., I, me, my), more negative emotion words (e.g., hate, anger, enemy), fewer exclusive words (e.g., but, except, without) and more motion verbs (e.g., walk, move, go).
Monsanto: Controlling America's Food Supply
St.John, Jordan; Shepard, Kassidy; Flem, Levi; Carlson, Garrett
Faculty Mentor(s): Hideki Takei, ITAM

Oral Presentation, Session # 15
11:00-11:20 in Room 271

Monsanto is a well known genetically modified corn and soybean seed production company based out of St.Louis, Missouri. The company produces 90% of all corn and soybean in the United States as well as the well known pesticide, RoundUp. Throughout its history, Monsanto has faced strong opposition from both organic farmers and consumers surrounding the unethical practices used by the company to dominate the genetically modified seed industry. Their power over the seed industry has given them a distinct influence over politicians to support their issues and products as well. Consumers within the United States need to be aware of the unethical and deceptive business practices of this company. The American food supply is essentially controlled by this company’s genetically modified seed business. Our goal of this study is to present extensive data showing how Monsanto is controlling the American food supply with their genetically modified seeds. The secondary goal of our study is to display the relationship between Monsanto’s dominance in the genetically modified seed industry and the effects on American consumers at the dinner table.

GPS Cockpit
Stahl, Rosie; Kostick, Megan; Stockwell, Wendy; Kinkade, Kyle; Abundiz, Sergio
Faculty Mentor(s): Razvan Andonie, Computer Science; Tim Melbourne, Geological Sciences

Oral Presentation, Session # 5
8:30-8:50 in Room 201

The United States Geological Survey (USGS) and the Pacific Northwest Geodetic Array (PANGA) at Central Washington University monitor real-time GPS measurements along the Cascadia Subduction Zone. This data is critical for researching and monitoring earthquake activity. Hundreds of monitoring stations throughout the Pacific Northwest collect this data. Previously, only a few minutes’ worth of data was viewable at a time. Our team developed software for observing, virtually, shifts in the earth’s plates in up to 24-hour time intervals. This application provides a map of the GPS monitoring stations from which the PANGA team streams live data, along with a graph view to monitor the streaming movement. Additionally, the application runs independently on each user’s system while minimizing the amount of necessary memory space during its execution.

Is There a Difference in Wind Speed in Open Versus Forested Area on the Cle Elum Roslyn School District Campus?
Stanley, Emily; Bennett, Taryn
Faculty Mentor(s): Trish Griswold

Poster Presentation Session #2, Poster # 24
11:15-1:45 in Ballroom C/D

Fostering a “Sense of Place” at Walter Strom Middle School, 7th grade students conducted inquiry based investigations in the outdoor classroom. Data was collected several times per month throughout the school year. We measured wind speed with an anemometer in different cardinal directions from 2 permanent plots - one in the open and one in the forest. We used statistical test toe decide if we thought that our hypothesis or null hypothesis was true.
Amazonian Communities and Sense of Place
Steele, Rozsika
Faculty Mentor(s): Jennifer Lipton, Geography

Oral Presentation, Session # 41
3:00-3:20 in Room 271

This research took place at the Area de Conservacion Regional Comunal de Tamshiyacu Tahuayo (ACRCTT) located in Loreto, Peru. The ACRCTT is internationally recognized by conservationists as being able to conserve the unique biodiversity of the Amazon rainforest while maintaining the integrity of the livelihoods and customs of the resident communities. Using a photo-sorting activity, this research examined local peoples’ sense of place (place identity, place dependency, and place attachment). Thirty-three participants were given disposable cameras and asked to photograph what they consider most important in their life. After the photographs were developed participants were asked to describe the images and rank them according to relative importance in their life. Plants and palm trees of the Amazon were highly valued. The dichotomy between the values of the local people and the values of conservation or tourism will be discussed.

College Women’s Perceptions of Music Video Sexual Content
Stefani, Whitney; Greenwald, Ralf
Faculty Mentor(s): Ralf Greenwald, Psychology

Oral Presentation, Session # 21
12:40-1:00 in Room 201

Sexual content in the media is often viewed as a single, problematic entity, but it is possible that different types of sexual content exist and have different effects on viewers. In this study, 15 undergraduate women each watched seven randomly-assigned music videos from a set of 21 popular music videos. All videos featured female characters and/or a female performer. Participants rated the extent to which each video could be described as being non-sexual, sexually objectifying, or equating sex with power. Participants also rated the extent to which female characters were passive and active and the overall intensity of the video’s sexual content. The findings suggest that different styles of displayed female sex appeal communicate different messages about women. The results of this study are being used in ongoing research to determine the effects of music video sexual content type on women. *(Editor’s Note: This presentation may contain adult themes, content or imagery.)*
Central Washington Anthropological Survey Data Recovery & Analysis at the Powerhouse Bridge Lithic Scatter (45Sa00444), Skamania County, Washington
Steinkraus, Mark; Ferry, Joy
Faculty Mentor(s): Shane Scott, Anthropology; Steven Hackenberger, Anthropology

Poster Presentation Session #1, Poster # 40
8:30-11:00 in Ballroom C/D

Excavation of the previously established Powerhouse Bridge Lithic Scatter site (45SA00444) was undertaken near Northwestern Lake in May 2011. The purpose of this excavation, which was carried out by the Central Washington University Anthropological Survey (CWAS), was to recover data prior to potential damage of the site by outwash from Northwestern Lake after breach of the Condit dam. In order to recover the archaeological data, CWAS archaeologists excavated 0.8325 m³ of sediment in 10 cm arbitrary levels, from two test units. The excavated sediment was screened through 1/8-inch hardware cloth. Through screening, 840 pieces of lithicdebitage and bifacial tools were recovered as well as fire modified rock, and 383 fragmented faunal remains. Three features were also identified, and were excavated and screened separately. The lithic assemblage was analyzed using the CWAS paradigmatic classification system. The results of this analysis indicate that the assemblage represents core-reduction activities from small pieces of parent material, as well as the use and maintenance of bifacial tools at the site. Seven pieces of obsidian from the assemblage were sourced through being submitted for x-ray fluorescence, and were identified as originating from sources in central Oregon. Faunal analysis revealed that salmon bones from the genus Oncorhynchus exhibited signs of having been cooked. Two samples of charcoal from a hearth or hearth cleanout pile were submitted for radiocarbon dating and returned ages of approximately 120 years before present. Through this investigation, the site has also been dated to range from about 2,500 BP to 120BP.

Attention Restoration: The Effects of Elevated Vibrancy on the Perceived Environment
Stirret, Jason
Faculty Mentor(s): Terrance Schwartz, Psychology

Poster Presentation Session #3, Poster # 27
2:00-4:30 in Ballroom C/D

The attention restoration theory states that attentional fatigue may be restored by environments which contain the following criteria: fascination, extent, compatibility, and ‘being away’. The present study hypothesizes pictures of natural environments will have a greater restorative effect than pictures of urban environments. It is also hypothesized that environments with an elevated level of brightness and contrast, together called “vibrancy”, provide higher fascination, greater extent, and further compatibility with the viewer. This elevation may provide the crucial elements necessary for the restoration of attention. The dependent variable measured was attention by the level of restorative effect brought by the experiments manipulations. Two independent variables consisted of the type of environment (natural or urban) and the level of vibrancy (high or low). Using a repeated measures design subjects completed five conditions each on separate days including a high and low vibrancy natural environment condition, a high and a low vibrancy urban environment condition, and a control condition using a neutral stimulus. Preliminary results indicate the absence of significant main effects for the IVs of environment and vibrancy. Analysis of the data indicates the scope of variables being measured is too broad. Revising the study to investigate only levels of vibrancy would potentially remove individual subject preferences unaccounted for by the studies current design. Further revision could also include measurements of personality and emotional state, better facilitating subject compatibility with the type of environment used.
Mountain Building in the Greater Himalayan Range, India: Insight from Metamorphic, Kinematic, and Deformation Temperature Studies
Stordahl, Jon
Faculty Mentor(s): Jeffrey Lee, Geological Sciences

Poster Presentation Session #3, Poster # 4
2:00-4:30 in Ballroom C/D

My research tests two different hypotheses to explain the unusual processes of extensional faulting, during continent-continent collision, and mountain building in the Zanskar Valley, Greater Himalayan Range, India. Exposures of mid-crust rocks (up to 30 km deep) are exhumed to the surface by either channel flow (ductile) or gravitational collapse (brittle) mechanisms beneath the Zanskar normal fault (ZNF). The former mechanism predicts high temperatures (~350-650°C) and ductile deformation of rocks, whereas the latter predicts relatively low temperatures (≤300°C) and brittle deformation. Rocks exposed beneath the ZNF display diagnostic metamorphic minerals garnet, kyanite, and sillimanite, indicating these rocks were at temperatures and pressures as high as ~650°C and 6-8 kbars. Most rocks possess kinematic (sense of displacement) deformation features, such as shear bands, indicating regional extensional exhumation to the southwest from beneath the ZNF. Quartz microstructures in samples record a temperature range from ~375°C at the fault surface, increasing to ~650°C at the deepest structural levels sampled (~10km beneath the fault). Microscopic analyses of samples documents the coeval relationship between the formation of metamorphic minerals, kinematic indicators, and quartz microstructures, indicating high-temperature ductile deformation during exhumation. This research provides evidence for the presence of a compressed geothermal gradient of approximately 100°C/km beneath the ZNF, well in excess of a normal gradient of ~30°C/km. A geothermal gradient of this magnitude cannot be associated with gravitational collapse, but provides evidence that ductile thinning of the hot mid-crustal rocks and exhumation, via channel flow, are responsible for mountain building processes in the region.

Genome-wide Demethylation Affects Epigenetic Inheritance of a Defensive Trait in Mimulus guttatus
Stout, Amanda; Scoville, Alison
Faculty Mentor(s): Alison Scoville, Biological Sciences

Oral Presentation, Session # 45
4:10-4:30 in Room 137A

Damage to leaves of Mimulus guttatus (yellow monkeyflower) results in increased density of trichomes, which are hair-like structures that can help defend against insect herbivores. Damage can also result in alteration of flowering time. Remarkably, these phenotypic changes are inherited by offspring even though they do not involve a change in DNA sequence. This phenomenon is known as epigenetic inheritance. In other organisms, epigenetic inheritance is associated with heritable patterns of methylation in the promotor region of particular genes. Here I investigated whether methylation is involved in epigenetic inheritance of damage-induced phenotypes in two recombinant inbred lines of M. guttatus. For each line, I grew seeds derived from multiple damaged and undamaged parents, both with and without treatment with the genome-wide demethylating agent, 5-azacytidine. I measured trichome density and flowering time for all progeny. In line 94, genome-wide demethylation erased differences in trichome density between the progeny of damaged and undamaged plants, as expected. However, in line 85, genome-wide demethylation reversed the effect of parental damage on trichome density. In both lines, genome-wide demethylation exposed otherwise unexpressed differences in flowering time between the progeny of damaged and undamaged plants. My results suggest that mechanisms other than methylation are involved in epigenetic inheritance of these traits, and that methylation can mask as well as create inherited differences in the progeny of damaged vs. undamaged plants. Further investigation of this system will lead to increased understanding of the complex mechanisms, ecological significance, and evolution of epigenetic inheritance of environmentally induced traits.
Is a life sentence without the possibility of parole for a non-homicidal crime a constitutional violation of a juvenile’s Eighth Amendment rights? Yes, according to the U.S. Supreme Court in the 2010 case, *Graham v. Florida*. The Eighth Amendment protects citizens from cruel and unusual punishments. Since this amendment, like others, is subject to ambiguity and state-to-state interpretation, the Supreme Court continues to define it by ruling on different cases. Although the topic of sentencing juveniles has come before the Supreme Court in cases such as *Roper v. Simmons* (2005), in which the Supreme Court ruled juveniles cannot face the death penalty, there are still issues being raised. In this case, *Graham v. Florida*, a 17 year old boy was found guilty of multiple felonies and sentenced to 12 months jail time and probation. However, while on probation he committed more felonies and was then sentenced to life in prison. Since Florida does not have a parole system this meant he had no chance of getting out. The justices came to a 6-3 ruling supporting the petitioner. Will juveniles become less deterred from crime? Will parole boards now examine juveniles on their schedule different or does this ruling simply reiterate a societal viewpoint that is already in place? My presentation will discuss the deeper facts of this case, but most importantly the impact because this ruling from the high court has an inevitable effect downward on all citizens as it becomes real practice in the system.

The Ship of Life

*Sutherland, Camille*

*Faculty Mentor(s): Therese Young, Physical Education, School and Public Health*

The creative dance expression work I am submitting for SOURCE is entitled *The Ship of Life*. I was given the opportunity to choreograph this piece in one of my dance minor classes, which I later presented and performed at the Winter Choreography Showcase. On February 6th of last year, my great friend Erin passed away. It was an incredibly hard time for me, as I had to figure out how to keep moving in my own life while dealing with the heavy burden of a loss and many unanswered questions. There are still unanswered questions, but when I found a poem entitled “The Ship of Life”, it eased the pain just a little. The theme of my dance quickly became “losing a friend,” with Erin in mind during the entire creative process. I then found a picture entitled *Loneliness* by an unknown artist that fit the poem and my concept perfectly. The piece is lyrical style and explores the dynamics of connecting with someone and then having them slip away. In the beginning of the piece my partner and I dance in unison, but by the end, the audience should notice us parting ways as she peacefully goes to heaven.
Remote Control Aerial Inspection Vehicle
_Sweeney, Edward; Grist, Christopher; Smith, Zachary_

Faculty Mentor(s): Roger Beardsley, Industrial & Engineering Technology

Poster Presentation Session #3, Creative Works # 39
2:00-4:30 in Ballroom C/D

Background: The current method for inspection of the wind turbines is to use a lift to place a technician up in the air and to manually and physically inspect the turbines for damage due to bird or lightning strikes. This is very costly and dangerous for both the technician and the wind turbines. Goal: For Mechanical Engineering, a senior culminating project is required for graduation, which involves creating or modifying a device to solve a problem. My team’s goal was to construct a device that would allow the technician to safely inspect the turbines from the ground. The device would be self contained and would not cause any additional damage to what it is inspecting. The device would be capable of carrying a camera that would either live transmit images to the operator or record the data for later viewing. Method of Construction: Our device was primarily constructed with the new three dimensional printers located in the new Hogue building. We designed these components in a 3D program called SolidWorks and then literally printed out our digital designs. The printed material is ABS plastic that the printers extrude in tenth of an inch string that melt together to form the shapes.

Happiness and Beyond the Happiness: Buddhism Viewpoint
_Takei, Hideki; ITAM_

Oral Presentation, Session # 6
8:30-8:50 in Room 202

Please see this faculty member’s expanded peer review abstract on 196.

Univar Chemicals
_Tang, Bich; Ta, Linh; Starkenburg, Tyler_

Faculty Mentor(s): Kun Liao, Operations & Supply Chain Management

Lynnwood Center - Poster Presentation, Poster # 8

Univar is a worldwide chemical distributing company. It first started in 1924 in Seattle, Washington. Today, Univar has an extensive network over 300 facilities in Europe, Asia, and America. Univar offers over 110,000 different products and 11,000 different chemicals. Our group came up with a research project about the process of distributing chemical to different countries. The research questions are: 1) What are the regulations for importing chemicals? 2) What supply chain aspects need to be established to trade/export chemicals to a specific country (eg., China, Vietnam, India, etc.)? 3) What are the regulations for exporting chemicals to that country? 4) After the chemicals are in that country, what are the challenges of distribution, and how will the challenges be handled?
Silvercup Coffee
*Tang, Pingping; Vlasenko, Maria; Vo, Duc*
*Faculty Mentor(s): Kun Liao, Finance*

Lynnwood Center - Poster Presentation, Poster # 9

Silvercup Coffee is a boutique coffee roaster who are headquartered in the Seattle area. They were founded in 1995 and were the winners of seven awards at the McCormick & Schmick’s coffee competition, “Indulging Best Cup.” They are dedicated to helping small coffee businesses succeed. They provide award-winning coffee along with all of the equipment, service, and supplies that are necessary for independent coffee businesses. We will focus on Silvercup’s purchasing process for the entire company. This will include any purchasing done such as equipment, any purchasing for their service department, and all the supplies they provide to their customers. We will interview the purchasing manager to get a better understanding of the areas that might be in need for improvement.

The Juxtaposition of Divine and Physical Love
*Thompson, Ruby Lynn*
*Faculty Mentor(s): Cynthia Coe, Other*

Oral Presentation, Session # 6
8:50-9:10 in Room 202

In my research project, I argue that the nature of a monotheistic god in combination with the rejection of polytheistic beliefs creates an ironclad separation between physical/mortal and divine/immortal aspects of love. For my presentation I will be taking a small sample of this project and expanding on it. In particular, I will be examining the duality of Dianne Sylvan’s perspective as compared to Augustine’s perspective. Dianne Sylvan is the author of *A Circle Within: Creating a Wiccan Spiritual Tradition* and Augustine is a renowned early Christian philosopher. So both Dianne Sylvan and Augustine provide an interesting perspective as in both cases they originally conformed to paganism and later converted to Christianity. This allows for a comparison of Christian and pagan ideals, in particular the perspectives they have on love. The Christian concept of love emphasizes love of god over love of family, neighbor, material objects, and so on, setting up a “ladder of love.” To contrast, the pagan perception states that divine love is by nature earthly; and, therefore, one type of love is not inherently better than the other. The two concepts could not be any more different, and while each party believes wholeheartedly in their concepts while they are in that sect, the two religions, having been historically linked for so long, swap adherents quite often, as is the case of both Augustine and Sylvan. Therefore, comparing and contrasting their views provides an interesting perspective of why these two ideals have such strong opposing viewpoints.
Geospatial Information System Use: The Results of a Survey

Thompson, Marc

Faculty Mentor(s): Bob Hickey, Geography

Poster Presentation Session #3, Poster # 14
2:00-4:30 in Ballroom C/D

The rapid spread of Geographical Information Systems (GIS) into commercial, academic, and personal spheres through the last decade is indicative of the increasing demand for the utility GIS provides. Questions arise as to what users need and how different users are applying GIS tools and techniques daily. The answers to these questions will both answer critical questions in the researcher’s thesis question and guide the researcher in deciding which software coding solutions to utilize in crafting his thesis project. The results will better define the parameters used for testing the utility of Google Earth and open-source GIS platforms for small scale resource management. Positive outcomes include minimizing costs to these organizations while increasing access to geospatial data. This presentation represents a synopsis of results gathered through an online survey conducted by the researcher. The survey gathered answers related to the market sector (professional, academic, personal), spatial tool usage, cartographic use, geospatial-programming knowledge, web-map familiarity, and the types of maps created. Survey results from a more comprehensive survey, undertaken by the Urban and Regional Information System Association (URISA), will also be examined. The results from these two surveys will be used to select open source program libraries for use in developing a lightweight desktop GIS application within a Google Earth environment. Initial results indicate that a large percentage of respondents selected elementary GIS tools, like spatial query, in their everyday GIS activity, indicating that simpler tools are more ubiquitously used by a significant cross section of GIS users.

DNA Repair of Daphnia magna in Response to Ultraviolet Radiation

Tompkins, Amanda; Smith, Amanda

Faculty Mentor(s): Alison Scoville, Biological Sciences

Poster Presentation Session #1, Poster # 11
8:30-11:00 in Ballroom C/D

Ultraviolet radiation (UVR) is a necessity for life. However, reduction in stratospheric ozone has resulted in increased levels of UVR at the Earth’s surface. This radiation causes potentially lethal DNA damage, including formation of cyclobutane pyrimidine dimers. Organisms have evolved a number of enzymes to repair such damage, some of which are powered by visible light. Here we investigated UVB-induced DNA damage and subsequent DNA repair in Daphnia magna, a planktonic crustacean and model organism for toxicology. We wanted to find out if Daphnia magna sustain DNA damage at ecologically relevant doses of UVR, and whether or not they can repair this damage. We exposed pregnant D. magna to UVR and used a comet assay to assess DNA damage of embryos either immediately after exposure or after a subsequent 24-hour repair period. To perform the comet assay, we extracted early stage embryos, suspended the cells in agarose, lysed them, and pulled the damaged DNA out of the nuclei via electrophoresis. We used a fluorescent microscope to take pictures of the DNA and quantified levels of DNA damage using CometScore Software. Comparison with appropriate controls revealed highly significant damage due to UVR exposure and a marginally significant signature of DNA repair. Future research will focus on quantifying population-level variation in damage and on identifying the mechanism of repair.
Effective Mathematics Instruction for Children with Learning Problems  
Tsai, Shu-Fei

Oral Presentation, Session # 20
12:00-12:20 in Room 140

Please see this faculty member’s expanded peer review abstract on page 197.

Using LiDAR to unravel the Mystery Behind Neo-tectonics  
Turnley, Aaron  
Faculty Mentor(s): Carrie Whitehill, Geological Sciences

Poster Presentation Session #3, Poster # 7
2:00-4:30 in Ballroom C/D

The San Andreas fault (SAF), a ~1,000 mile long, right lateral strike-slip fault system, accommodates > 50% of the North American-Pacific plate boundary strain. In 1989, the 7.1 Mw Loma Prieta earthquake (LPEQ) occurred along a bend in the SAF and shook the entire San Francisco Bay area. The earthquake was responsible for 63 deaths, 12,000 homeless and more than $6 billion in damages. Mapping surface features, such as fault rupture traces, allows geologists to constrain the amount and recurrence of fault-slip events. The Loma Prieta earthquake produced no such ruptures, making it difficult to accurately quantify the amount of strain released in the LPEQ event or a probable recurrence interval for this portion of the fault. Our approach to this problem is to use new, light detection and ranging (LiDAR), technology, that utilizes airborne laser altimetry to produce high resolution maps of surface features “stripped” of vegetation. My research is focused on a ~20 mile, strike-parallel transect along the SAF that stretches from the central Santa Cruz mountains southeast to the Gabilan Range. Through digitization and comparison of mapping of fault related features done pre- and post LPEQ, overlain on LiDAR digital elevation models, I was able to detect and quantify neo-tectonic features such as growing landslides, offset streams, sag ponds, and benches, that will aid future seismic hazard plans for this portion of the San Andreas fault system.

Sticks & Stones  
Tyler, Kelsey  
Faculty Mentor(s): Andrea Eklund, Family and Consumer Sciences

Poster Presentation Session #2, Creative Works # 44
11:15-1:45 in Ballroom C/D

The purpose was to further my design skills and create a garment that makes the wearer feel elegant and like she is the center of attention. Creating a sophisticated and semi-casual look was an essential component to this garment. Process: I was inspired by a recent trend of asymmetrical front-to-back skirts, where the skirt is significantly shorter in the front than the back. I wanted to use this trend while creating something new and unique. The basic idea of the trend was used, and I added my own touches to it for an exciting new look and style. I gathered images for inspiration of different variations of this trend from multiple locations, most from style-focused websites and blogs as well as a few print fashion magazines. Techniques: This dress was created through the draping technique on a dress form that was padded to equal the models measurements. Padding out the dress form was essential to get an accurate garment fit with minimal alterations post draping. The details of the garment were marked on the fabric, and once the fabric was removed from the form the fabric pieces were trued and transferred to paper to create my final patterns. A sample garment was fitted to the model and changes to the pattern were made. The fully lined final garment was then constructed and features a contrasting sash and bodice front. Materials: 100% polyester crepe, 100% polyester chiffon, 100% acetate plain weave lining, polyester zipper, 100% polyester thread.
Hispanic’s Political Behavior: A Case Study of the Hispanic Community in the City of Yakima, Washington

Valencia, Marisela

Faculty Mentor(s): Gilberto Garcia, Political Science

Oral Presentation, Session # 4
8:50-9:10 in Room 140

This paper looks at the political behavior of Hispanics in the city of Yakima, Washington. The city of Yakima, Washington is an area of opportunity to explore the low levels of political representation between Hispanics and non-Hispanic whites. The Hispanic population has been increasing in the city of Yakima but the voting registration is low compared to non-Hispanic whites. This paper examines the low-levels of political representation between Hispanics and non-Hispanic whites. The study uses a survey, demographic data, and library research.

A Heroine Whom No-one Will Much Like: The Redemption of Emma Woodhouse

Van Mersbergen, Jessica

Faculty Mentor(s): Christine Sutphin, English

Oral Presentation, Session # 1
8:30-8:50 in Room 135

Of all the heroines of all of the celebrated novels of Jane Austen, Emma Woodhouse is arguably the most controversial; the majority of readers either loves or hates the eponymous young belle of Jane Austen’s Emma, with no small fraction of them tending toward the side of animosity. “A Heroine Whom No-one Will Much Like: The Redemption of Emma Woodhouse” aims to prove that, although Miss Woodhouse initially seems manipulative and inconsiderate, her generally flawed nature serves a purpose in terms of Austen’s ability to tell the story, and to further illustrate that there is more to Emma Woodhouse than meets the eye. After studying in-depth the heroine’s negatively portrayed character, the essay argues for the acknowledgement of Emma’s redeeming qualities and evidence of reformation by the end of the novel.

Examining the Learning Methods of Coaches: Implications for Sport Leaders

Van Mullem, Pete; Physical Education, School and Public Health

Oral Presentation, Session # 12
10:20-10:40 in Room 140

As accountability and the responsibilities of a coach continue to increase, the need to provide effective and quality coaching education continues to grow (Hoch, 2004). Although multiple programs exist at the state level, the National Standard for Sport Coaches (NSSC) created by the National Association for Sport and Physical Education (NASPE) is commonly adopted by state high school associations and youth sport programs (Blom, Wininger, Zakrjsek, and Kirkpatrick, 2010). Do programs built on the standards outlined by the NSSC meet the needs of the coaching profession in training future coaches? The purpose of this study was to examine the educational methods coaches in the United States utilize to develop their coaching knowledge (coaching strategies) and coaching philosophy (the standards by which they teach). The results from a 20-item survey instrument indicate that the learning process desired by coaches (N=1,096) does not necessarily match the current structure of formal coaching education. A t-test was used to determine difference between the groups (gender, winning percentage, # of championships, and type of sport). In sport organizations that provide training for coaches, the sport leader may have the responsibility of creating and developing a coaching education program. What methods will they use to effectively reach the coach? This session will 1) Discuss the educational methods coaches use to improve coaching knowledge and coaching philosophy based on a nationwide study, and 2) Examine the challenges for sport leaders in creating education opportunities for coaches that meet the needs of the coach as a learner.
House Settlement and Food Procurement Strategies at Archaeological Sites 45KT12 and 45KT13

Vargas, Estanislado
Faculty Mentor(s): Steven Hackenberger, Anthropology

Oral Presentation, Session # 41
3:40-4:00 in Room 271

Studies of house settlement along the Columbia River began in the early 1900s and continued through the 1960s. Re-examination of collections and documents from the 1950s and 60s, combined with new radiocarbon dates on bone samples, will improve explanations of settlement patterns. When placed in the context of models of resource trends, human population growth, and economic strategies, analysis of faunal remains from both house and pre-house assemblages from 45KT12 and 45KT13 may support the hypothesis that house occupations resumed by 1700 or 1900 BP, following the end of a warm-dry period between 2500 and 2000 BP.

Tent Cities are Normal before Black Friday

Velasquez, Charles

Video Presentation, Session # 50
4:10-5:30 in Ballroom A

It’s okay for groups of people to squat in public areas outside retail stores before a big sales event, but it is not okay for people to squat in any one place for too long if they do not have a place to live. It is ironic that those with intentions of shopping based on their economic ability to do so also get the benefit of the doubt when allowed to squat outside. In this piece, I point out how similar different types of people could look when they all spend a little time camping on the streets. The homeless man gets mistaken for an extremely dedicated bargain shopper. Despite his uniquely weird situation, he has found interesting ways to capitalize. The homeless man finds different things important than those in his social proximity. Food and shelter are much more important than a position in line, but judging by the evolution of acceptable competitive shopping in our society one might begin to question it. Couple this with competitive shopper advertisement and encouragement, and we get hysterical behavior by all those who attend. The idea that this could be possible brings a slightly reluctant smile to my face. It is kind of funny!

Literacy in Washington State

Vickrey, Taylor
Faculty Mentor(s): Michael Harrod, Sociology

Oral Presentation, Session # 23
12:00-12:20 in Room 271

The purpose of my research is to investigate the status of adult literacy in Washington State. Working from existing literature I intend to develop an interview guide to answer questions not currently addressed within the existing literature. Specifically, I intend to interview librarians, teachers and nonprofit organization personnel that are striving to increase adult literacy rates in the greater Seattle area. I will contact librarians, teachers, and nonprofit organization personnel that are linked to adult literacy in the greater Seattle area. Sample recruitment will occur from a combination of cold calling appropriate libraries and nonprofits to secure an initial interview. Once I have secured initial interviews, I will ask my respondents for names and contact information for others that are also involved in adult literacy. In this way, I will be utilizing a snowball sample.
Study of Host-to-Activator Energy Transfer Efficiency of YBO₃:Pr³⁺

Wallace, Max
Faculty Mentor(s): Anthony Diaz, Chemistry

Oral Presentation, Session # 37
3:00-3:20 in Room 137B

Inorganic solid-state luminescent materials (phosphors) are used in a variety of technologies, including plasma display panels, Hg- free lamps, and computer monitors. Understanding the trapping efficiency of electron transport in phosphors is the focus of this research. Host to activator transfer efficiency and photoluminescence properties were studied for Pr³⁺ doped YBO₃ phosphor under VUV excitation. Transfer efficiencies were traditionally calculated using a proportional kinetic model in which only one trap state exists. However, Pr³⁺ activated YBO₃ particles exhibit an energy relationship in which two trap states exist. A hybrid of the original anticipated kinetic based model is proposed in which multiple trap states can be evaluated.

Analysis of CWU Foundation Data: Pre-processing and Data Mining

Wang, Ying
Faculty Mentor(s): Boris Kovalerchuk, Computer Science

Oral Presentation, Session # 5
9:30-9:50 in Room 201

The CWU Foundation is an organization which works with donors, alumni, and friends to raise private funds to support CWU students, faculty, and programs. It has accumulated more than 20 year’s data, up to the year 2000, about its members and donations. The CWU Foundation hopes to find predictive patterns from that data and to use them as guidelines to raise more funds. In this project, various data preparation methods and mining algorithms were used to accomplish the task. Based on the independent quality of the data, a naïve Bayes classifier was chosen because of its simplicity and performance. A confusion matrix was used to evaluate the performance of the classifier. Half of the data was used to build a model of probability distribution; the other half was used to test the model. The results show that two types of members are more likely to donate to CWU. One is married members with double income; the other is members who work in educational areas. A future step is to gather more data after the year 2000 and find more behavioral patterns of donors with time series analysis.

United States Supreme Court Case Missouri v. Frye

Wassall, Alison
Faculty Mentor(s): Dr. Charles Reasons, Law & Justice

Oral Presentation, Session # 10
10:00-11:20 in Room 137A

In the case of Missouri v. Galin E. Frye, Frye was charged with a felony carrying a four year maximum prison term for driving with a revoked license on four separate occasions under Missouri law. Frye, unbeknownst to him, had been given two plea bargain deals by the prosecutor to his attorney that would reduce his sentence if he would plead guilty to his crimes. This would have allowed him to plead guilty for his crimes but only serve a ninety day sentence. His counsel did not communicate these offers to Frye and he was sentenced to a three year prison term for a class D felony. After conviction, Frye went back to the court to seek relief and was denied but the Missouri Appellate Court reversed his conviction. Strickland v. Washington 466 U.S. 668 stated that there are certain guidelines that must be followed to prove a Sixth Amendment violation. The case proceeded to the United Stated Supreme Court which ruled on March 21, 2012, that Galin E. Frye’s case would be vacated and remanded since his constitutional rights were violated. This presentation will discuss the fundamentals of plea bargaining as well as the rights given to defendants under the Sixth Amendment.
Scene from L'etoile Written by Emmanuel Chabrier
Waywell, Brittany; Deenin, Alix; Woyvodich, Taylor
Faculty Mentor(s): Gayla Blaisdell, Music

Creative Expression Presentation, Session # 24
11:40-12:00 in Ballroom A

Woyvodich Emmanuel Chabrier wrote L'etoile (The Star), a satirical opera bouffe, in 1877. The opera was originally in the French language, but we will be performing it in English so the audience can better understand the comedy taking place. This scene takes place at the beginning of the opera when a party of diplomats from a neighboring kingdom, including Princess Laoula (Taylor Woyvodich) and Aloes, the Ambassador’s wife (Brittany Waywell), arrive to celebrate King Ouf I’s birthday. Lazuli, a traveling salesman (Alix Deenin), spots the Princess from down the road and instantly falls in love. He then asks the star what his fate will be and falls asleep in the road. Aloes decides to wake him and Laoula reluctantly joins in the fun. The creative process started with auditions in late November. Students had to prepare an opera aria or art song to perform for a panel of voice faculty. The faculty then cast the students and we received our music. We had winter quarter to prepare our music with our private voice teachers. Musical rehearsals started in the beginning of spring quarter. Right now we are in the process of staging the scene. After that is perfected, we will polish the scene to make it fun and interesting to the audience. The final touch will be the costumes and set which we also have a voice in creating.

Rock Glaciers in the Eastern Cascades, Washington
Weidenaar, Mark
Faculty Mentor(s): Karl Lillquist, Geography

Oral Presentation, Session # 11
10:20-10:40 in Room 137B

Rock glaciers are important landforms in alpine environments, forming debris transport systems, providing indices of past climate, and showing past evolution of landscapes. Additionally, rock glaciers provide habitat for alpine flora and fauna, and serve as water-storage capacity. The eastern portion of Washington State’s Cascade Range is a place not previously examined for its rock glaciers, due to its proximity to the Pacific Ocean and its associated marine-influenced climate. The objectives of this study were to determine spatial, activity, and genesis patterns of Eastern Cascade rock glaciers. Using Google Earth, I found 103 rock glaciers in the study area. Rock glaciers are more common further east of the crest and more north, with the largest concentrations occurring east of Lake Chelan (22) and in the Pasayten Wilderness (28); none were found south of the Goat Rocks. Rock glaciers generally face north to northeast. Rock glacier sizes were also correlated to location—i.e., length and width increase farther east and north. Activity levels rise with elevation, with 31 active rock glaciers above 2000m, 55 inactive between 1600-2200m, and 18 relict below 1900m. Genesis types include 72 debris, 23 gelification, and 8 glaciogenic. Glaciogenic-type rock glaciers occur north of 48°N and < 40km from the crest. Gelification-types also generally occur north of 48°N, and range from 25-45km east of the crest. Debris-types occur throughout the range and from 20-70km east of the crest. These patterns suggest a strong past and present climatic role in determining Eastern Cascade rock glacier distribution.
A Healthy Hot Lunch at School  
**Weigt Taylor, Katie; Walker, Whitney**  
*Faculty Mentor(s): Ethan Bergman, Nutrition, Exercise, and Health Science*

Poster Presentation Session #2, Poster # 10  
11:15-1:45 in Ballroom C/D

In July of 2012, major changes in National School Lunch Program and National School Breakfast Program will go into effect under the Healthy Hunger-Free Kids Act. These changes have been prompted by programs under the USDA, the Healthier US Schools Challenge, and School Nutrition Dietary Assessment studies. School meals have been identified as the prime target to improve the nutrition of United States children. Past improvements to school meals have reduced calories and fat. The new changes focus on increasing fruits, the variety of vegetables, as well as increasing servings of whole grains while decreasing sodium. This poster illustrates the changes that have been made to the National School Lunch Program and School Breakfast Program. The new standards that seek to improve the nutritional quality of foods served to the school children in the United States are highlighted.

Does the Amount of Forest Canopy Closure Affect the Amount of Precipitation on the Ground—Rain and Snow?  
**Weis, Lydia; Montague, Lauren**  
*Faculty Mentor(s): Trish Griswold*

Poster Presentation Session #2, Poster # 23  
11:15-1:45 in Ballroom C/D

Fostering a “Sense of Place” at Walter Strom Middle School, 7th grade students conducted inquiry based investigations in the outdoor classroom. Data was collected several times per month throughout the school year. We measured rain in a rain gauge and snow depth with a meter stick throughout the seasons. We calculated the p-value that describes the chances of getting our data if the null hypothesis is true.

Gender Issues Brought Up in James Bond Movies  
**Wemhoff, Jennifer**  
*Faculty Mentor(s): Melissa Johnson, English*

Oral Presentation, Session # 44  
4:50-5:10 in Room 135

In my essay I address the gender issues and stereotypes brought up in the movie, *Casino Royale*. Using scholarly research and the film itself, I am able to better discuss how this movie refers to women as objects as well as how the men in this movie tend to see women as a subordinant gender. With the help of my sources, I argue that this movie wrongfully portrays gender.
Lind Hall Foucault Pendulum Repair
Wenger, Addison; Minton, Rolf; Ingham, Matthew; Corbin, Ryan
Faculty Mentor(s): Michael Braunstein, Physics

Poster Presentation Session #2, Poster # 4
11:15-1:45 in Ballroom C/D

Lind Hall is one of the older buildings on campus and was built with a Foucault pendulum as the centerpiece feature. A Foucault pendulum demonstrates the earth’s rotation by its constantly changing apparent direction of swing. The Foucault pendulum in Lind Hall has not been operating since 2004. A group from the CWU Society of Physics Students has been attempting to fix the pendulum over the past two years. The effort has encountered multiple problems which we have attempted to address. Originally it was believed that the only issue was a malfunctioning drive circuit, but once the electronics for the drive were repaired it became apparent that there are other underlying issues. The pendulum has a tendency to develop an elliptical swing and does not precess as predicted due to the earth’s rotation. We will report on our efforts and the documentation.

Bare Ambition
West, Megan
Faculty Mentor(s): Andrea Eklund, Family and Consumer Sciences

Poster Presentation Session #2, Creative Works # 45
11:15-1:45 in Ballroom C/D

In creating this piece I wanted to portray an edgy style that pushes the envelope and strays from the norm. There are many types of women, and I feel it is my duty to construct their personalities through the silent yet bold ripples of fabric, giving them the confidence and making them feel unique and audacious. By keeping track of material cost as well as time spent draping, pattern making and sewing the final garment, this dress would sell for $225.00. This allows me to sell a sensibly priced dress while still managing to turn a profit and making it affordable for clients who want a one of a kind experience in a dress designed for them. Through extensive research and communication with Kristine Eikenbary, head designer of Shimmer formal wear dresses, I began creating this dress not by sketching but by focusing on who my customer is and what I want to bring to her. While sketching, I took into account my customer and how she behaves, reacts, looks and feels and wanted to create a short and spunky dress adding elements of surprise with every fold and line of the silhouette. This is a daring piece, one with a rock stars’ edge, a sassy confidence, an elegant tone and a feminine touch. This is one of five garments; the entire line can be seen at the Fashion Merchandising spring fashion show, Wild and Free, June 2nd at 3 p.m. and 7 p.m. in Milo Smith Theater in McConnell Hall.
Untouched
Westendorf, Amy
Faculty Mentor(s): Andrea Eklund, Family and Consumer Sciences

Poster Presentation Session #2, Creative Works # 46
11:15-1:45 in Ballroom C/D

Inspiration for this garment came from my love of the beach. The goal was to create a cascading effect with tiers on the dress that look like the untouched sand after an ebb and flow. This piece was made to show the beauty that comes from things that are natural with its falling ruffles on the skirt and more structured bodice. Process: Dresses with the maxi length, wide tiers and low necklines were an identified trend. To achieve these looks I made the neckline very low, added a sash that hits at the natural waistline to emphasize the feminine figure, and included color block details to the shoulders. I also used a unique ruffled tier detail, which included approximately fifteen separate tears that are five inches wide. The fabric chosen has a soft flowing drape and when worn mimics the ripple effect left in the sand after a wave subsides. Techniques: I draped the bodice and the base of my dress so that I would have structure when I had to add the extra pieces. I had to take each tier and baste stitch them so that they had the perfect amount of volume needed. I then trued the pieces that I draped. After that I made patterns for each piece that I added to a sample. After that I fit the model that is wearing the dress at least twice to make sure that the dress fit properly. Materials: Crepe silkies, chiffon, zipper, thread.

RSA: Keeping Your Secrets Secret
Wheel, Derek; Livinston, Ben; Chappelle, Candace; Dean, Raven; David, George
Faculty Mentor(s): Stuart Boersma, Mathematics

Oral Presentation, Session # 38
Part 1: 3:20-3:40 in Room 140
Part 2: 3:40-4:00 in Room 140

Public key cryptography has become essential for modern communications, being used for everything from credit card transactions to top secret military communiqués. In this presentation, we will discuss a popular public key cryptosystem, first described in the late seventies by Ron Rivest, Adi Shamir, and Leonard Adleman, called RSA. In particular, we will discuss its major strengths and weaknesses along with the basic encryption and decryption algorithms. We will also discuss a simple factoring algorithm used to break RSA in special cases known as Pollard’s p-1 attack. Naturally, finding a way to protect against such an attack is important, so we will introduce strong primes, and a method for generating them which turns out to be extraordinarily useful in defending against Pollard’s p-1 and similar attacks.

Manastash Showcase
Whitcomb, Katharine; Hasseries, Patrick; Cawley, Nick; Borst, Erick; Sauby, Crystal; Degon, Ashley
Faculty Mentor(s): Katharine Whitcomb, English; Lee Honeycutt, English; Lisa Norris, English; Terry Martin, English

Oral Presentation, Session # 9
10:00-11:20 in Room 135

The English Department Writing Specialization would like to showcase CWU’s student-edited, student-produced literary arts annual magazine, Manastash. We present a series of short readings of creative pieces by the editors of and authors featured in the new 2012 issue of Manastash. Mentor Katharine Whitcomb will introduce the presentation with a few words about the magazine and the readers.
Constructing the Creative Castle 2011: Student Experiences from Study Abroad in Medieval France

*Whitcomb, Katharine; Degon, Ashley; Blons, Suzanne; Gatlin, Alexander; Ottenad, Daniel; Antilla, Lindsey*

*Faculty Mentor(s): Katharine Whitcomb, English*

Oral Presentation, Session # 17
12:20-12:40 in Room 135

Constructing the Creative Castle 2011—Creative Writing and Photography in Medieval France: An Oral Presentation of Student Experiences from Study Abroad. Students in this faculty-led study abroad program (ENG 263/ART 226) engaged in the creation of inter-disciplinary responses to a unique, historically significant environment, namely the ancient stronghold of the Cathar Resistance in southern France. This area of France is sparsely populated with small villages which date back to the Middle Ages—the students created digital photographs, creative writing projects, collaborative works, and blogs. Students participated in blog construction training, photography basics instruction and photo/writing workshops. Major sites important to Cathar history were visited including Lastours, Carcassonne and Albi. This presentation will feature an introduction by faculty mentor Katharine Whitcomb describing the design of the course, students from The Creative Castle study abroad class relating narratives of their experiences, readings from the creative work the students produced while on the program and visual images from the photographic and collaborative projects produced.

Audible Communication Comparison of Western Lowland Gorillas (*Gorilla gorilla gorilla*) and Virunga Mountain Gorillas (*Gorilla beringei beringei*)

*Wilding, Lisa*

*Faculty Mentor(s): Mary Lee Jensvold, Primate Behavior*

Oral Presentation, Session # 30
1:30-1:50 in Room 201

Genetics has revealed that western and eastern gorilla species physically split somewhere between 0.9 and 1.6 million years ago, with a separation of 1,000 km in their present ranges. Variations in communication most likely have developed between these two species over this time period. While gorilla gesturing has been studied, it is complicated and not fully understood, and very little research has been conducted on gorilla vocalizations. The purpose of this study compares audible communication between western lowland gorillas (*Gorilla gorilla gorilla*) and Virunga Mountain gorillas (*Gorilla beringei beringei*). Fifty-one western lowland gorillas were observed and recorded at nine different zoos. The dataset of the Virunga Mountain gorilla came from recordings made at Karisoke Research Center, Rwanda. Using Raven and Comparisonics applications, isolated similar audibles of western lowland and Virunga Mountain gorillas were compared in measurements of duration and frequency range correlation. One of seven distinct audible categories revealed significant difference in duration. Overall, the Virunga Mountain gorilla audibles were notably higher in frequency, which could be attributed to recording equipment, ecological factors of the habitat acoustics, and morphology. As a direct result of the bushmeat crisis and poaching, different species of gorilla orphans currently inhabit African sanctuaries. After a separation of a million years, gorilla subspecies live together once again in captive environments. For purposes of possible reintroduction, comparative studies of natural gorilla communication help to not only provide a less stressful environment for incoming gorilla orphans but also expands our understanding of the evolutionary paths of each species.
The Effects Of Campaign Finance Reform On Donation Rates
Williams, Andrew
Faculty Mentor(s): Rex Wirth, Political Science

Oral Presentation, Session # 4
8:30-8:50 in Room 140

The campaign finance laws of the United States play a major role in deciding who will win elections. How much impact do campaign finance laws have on the rate of donations, does this rate change in relation to the implementation of campaign finance laws. I will compare the rate of donations with the time line of campaign finance laws. I will also make a check for correlation between rates of donations and government spending rates as a percentage of GDP, and other metrics to give context. The goal of this study is determine if donations rates are affected at all by stricter limits on donations.

An Experiment in Integrated Learning: Baseball in American Life and Culture
Wood, Natasha; Taylor, Cody; Armstrong, Liahna; Quirk, Wayne
Faculty Mentor(s): Liahna Armstrong, Wayne Quirk, Graduate Studies and Research

Panel Presentation, Session # 49
4:10-5:30 in Room 301

This session will look at a course created for and taught in the William O. Douglas Honors College. “Baseball in American Life and Culture” was designed to incorporate learning from a wide range of disciplines into a cohesively focused topic. Using baseball as the matrix subject, the course, team-taught by two faculty from very different academic backgrounds (Dr. Liahna Armstrong, whose expertise is in film and literature, and Dr. Wayne Quirk, whose discipline is biology) examined the historical, artistic, political, economic, legal, literary, cinematic, sociological, and scientific facets of the game. We addressed how it has been shaped by and shapes American culture; how it stands as a mythic centerpiece to American life; how it brings people together or divides them; how it reinforces and at the same time challenges standard gender roles, class status, and racial attitudes; how it illuminates scientific principles involving human physiology, the physics of motion, and the mathematics of statistics; how it underscores and offers insight into historical and cultural trends in American life. Presenters (both the instructors and the student participants) will discuss pedagogy of the course (teaching and learning strategies), content, and student engagement.
Innovation and Necessity: The Evolution of Military Vehicles from Vietnam to the GWOT

Woodard, Elizabeth

Faculty Mentor(s): Brian Carroll, History; Matthew Wilson, Aerospace Studies

Oral Presentation, Session # 22
12:00-12:20 in Room 202

This presentation will show how important military history is in developing current military doctrine and procedure. By examining its history the military is able to improve upon its doctrine, tactics and even equipment to better fit the needs of contemporary conflicts and decrease casualties. Even without the proper equipment for the battle environment an operation may be doomed to failure from the start. This presentation will look at the development of armored military vehicles and the application to their appropriate theater of operations. Taking an example from history first will give a perspective on where military vehicles began. The presentation will explore the creation of the “Gun Truck” due to the innovation of the soldiers of the Vietnam War and their need for a defensive vehicle. It will then show how the military, as an institution, learned from this previous occasion and applied the new knowledge to current conflicts. The presentation will then examine how the creation of a new defensive vehicle in the Iraq conflict was originated by the senior officers of the military due to necessity. Their understanding of the need for a vehicle that suited the theater and circumstances gave rise to the fabrication of the Mine Repelling Ambush Protected (MRAP) vehicles. The presentation will compare the creation of these vehicles and examine their features for effectiveness in each conflict.

An Analysis of U.S. Energy Consumption, Pricing Forecasts, and Consumer Impact

Wright II, Michael R.

Faculty Mentor(s): Dominic Klyve, Mathematics

Oral Presentation, Session # 47
4:50-5:10 in Room 140

Using data gathered from the U.S. Energy Information Administration (EIA), we look at local and global energy consumption, with an emphasis on petroleum. Contrasted with various other sources of energy (wind, hydro, nuclear, etc.), we examine world consumption rates and consumption growth rates, how crude oil stocks are affected, and the state of global inventories. The historical pricing information forms the basis for our models predicting gas prices, with an emphasis on the State of Washington. We examine ANOVA analyses of the average fuel prices and consumption rates of different nations, and then discuss the implications. Using these outputs, we paint a fairly accurate picture of how the U.S. stacks up in global energy consumption. We examine solar power, geothermal, wind power, liquid bio-fuels, wood biomass, and hydropower in context of the total U.S. energy supply. Within the United States, we investigate energy consumption on a state level, with an emphasis on petroleum. These results help shed light on Washington’s current energy consumption efficiency and, perhaps, give insight into future expenditures on various energy sources. These results will form the basis of local price predictions, and well allow us to test our hypothesis that we can expect to see an increase in alternative energy sources as the prices of liquid fuels and the costs of hydroelectric and nuclear power infrastructure continue to rise.
Lafler v. Cooper
Wynne, John; Klein, Matthew
Faculty Mentor(s): Charles Reasons, Law & Justice

Oral Presentation, Session # 10
10:00-11:20 in Room 137A

In the United States, about 90% of court cases utilize some form of plea bargaining system. Therefore, the rights and protections for individuals who utilize plea bargains cannot be ignored. In the case of Lafler v. Cooper, the United States Supreme Court held that in the event of ineffective counsel, previously offered plea agreements must be reoffered. Then it is up to the court’s discretion to vacate the convictions and resentence using the reoffered pleas agreement; vacate only some of the convictions and resentence accordingly; or leave the convictions and sentence undisturbed. This case expands on the ruling of Strickland v. Washington, giving the states a mandate to follow if Strickland is invoked. In this presentation the facts of Lafer v. Cooper will be discussed, as well as the delving into the decision of the court and the dissenting opinion of several of the justices. In addition, the possible policy implications and the ramifications of this case’s decision on future court decisions regarding ineffective counsel will be examined.

Correlation of Environmental Temperature and Ice Content During Freezing in Pseudacris regilla
Yeabsley, Jeff
Faculty Mentor(s): Jason Irwin, Biological Sciences

Poster Presentation Session #1, Poster # 19
11:15-1:45 in Ballroom C/D

The correlation of environmental temperature and ice content during freezing was studied in the pacific tree frog (Pseudacris regilla), a species that demonstrates freeze-tolerance, and overwinters on the forest floor under organic detritus. While freeze-tolerance has been studied and observed, no data regarding the ice content of the frogs as they freeze has been published. This data is important, as it will supplement other research in the study of cryoprotectants, which in the future may allow for preservation of organs longer than 24 hours. Frogs were cooled in a jacketed beaker from room temperature to below their freezing point, and then thawed. Temperature inside the vessel, and subcutaneous electrical resistance of the frog were measured. The electrical resistance was used to determine extracellular ice content.
Central Washington University (CWU), in partnership with the City of Ellensburg, is participating in a $178 million Department of Energy (DOE) regional smart-grid demonstration project. The smart-grid demonstration project is led by Battelle, the world’s largest independent research and development organization, and encompasses five Northwest states, a dozen utilities, and the Bonneville Power Administration. As part of this project, more than 60,000 homes will be metered in Washington, Oregon, Idaho, Montana, and Wyoming to determine energy usage associated with residential demand over a two-year period.

For the Ellensburg portion of this project, CWU will analyze electrical energy output from state-of-the-art residential wind and solar energy systems currently in place, or soon to be installed, at the Ellensburg Renewable Energy Park. The Energy Park, located in southwest Ellensburg along Interstate 90, will contain at least two photovoltaic solar technologies and seven residential wind turbines. The photovoltaic solar technologies are categorized as Polycrystalline or Thin Film, reflecting the manufacturing process used, while the wind turbines are categorized by manufacturer, and include models from Sky Stream, Home Energy, Windspire, Honeywell, and Bergy. Data analysis will compare actual energy output levels to manufacturer’s rated capacities, as well as meteorological and physical parameters such as wind velocities, sunlight intensities, and height above the ground. The data will be collected and stored by the City of Ellensburg at their data storage facility, and transmitted to CWU for analysis.

The analysis will summarize load curve information, output and efficiency of each energy source, and economic feasibility associated with long-term operation. In addition, comparative performance results between the Ellensburg site and other similar sites, between the various physical configurations and differing manufacturers, and between differing technologies will be determined. Finally, results from this project will be formatted such that, when combined with results throughout Battelle’s regional smart-grid demonstration project, material will be available for incorporation in K-12 educational materials related to renewable energy and smart-grid course work.
In the context of a United States’ history class that examines the controversial American-led invasion of Iraq, how can teachers know that their students are meeting the learning targets? How can teachers ensure that their students are participating in knowledge construction? As the moves toward greater accountability in teaching and evidence-based student learning are gaining prominence in standard-driven education, this paper provides an effective model, based on inquiry teaching. This model shows that it is possible to teach content knowledge, as well as civility and higher order thinking skills, in a lesson that deals with a controversial topic.

In an inquiry lesson about the Iraq War, students learn to distinguish between a hypothesis and a thesis. They learn to warrant their claims based on reliable evidence, question their sources of information, and recognize their assumptions about the reasons for the United States invasion of Iraq in March 2003. Various informal and formal assessment strategies are used to assess student engagement and student learning in this lesson.

Students learn to revise their hypotheses several times and eventually come up with a tentative conclusion based on all the evidence that they have examined, up to a given point in the lesson. The open-ended nature of the inquiry question, “Why did the United States invade Iraq in 2003?” allows the students to dig deeper into an important foreign policy matter that has ramifications for the people in both countries and future United States’ policy in the Middle East. Students learn about the various causes that are constructed from manageable chunks of information (data sets) that come from primary and secondary sources. Students learn to consider a wide range of perspectives on this issue, similar to what happens in a court of law where evidence is presented to the jury and the attorneys cross-examine the claims. Ultimately, it is the jury that deliberates and makes a decision based on the evidence. Similarly, it is the students in a classroom that will interrogate the evidence and construct a thesis.

Therefore, in this presentation, the audience learns about this inquiry process and learns about the fifteen various data sets that are used to present a wide range of perspectives on an important issue that continues to be discussed in history classes. The sources include excerpts from statements made by the United States’ government officials, scholars, and news sources. The idea is that all verifiable information used to formulate a thesis should be sufficiently strong in order to avoid a hasty generalization or a long, tedious argument.

REFERENCES AVAILABLE UPON REQUEST
HAPPINESS AND BEYOND HAPPINESS: BUDDHISM VIEWPOINT

Hideki Takei, Information Technology and Administrative Management

After the death of Buddha, his fellow followers got together to collect information about his philosophy and made suggestions about the Buddhist bible. The bible was brought by several monks to Japan and Japanese Buddhism begun spreading widely. However, over time, Japanese Buddhists started developing and adding various philosophies and practices which were not really from Buddha. Rather, these new philosophies and practices were based on self-centered thinking and spiritual materialism.

These new additions gave many Buddhists powerful beliefs that spiritual advancement would bring us happiness here and salvation after death. For example, the famous Vajrayana Buddhism (Shingon Mikkyo) developed its secret bible and practices to cure illness or maintain wealth and power. Pure Land Buddhism (Jodo Shu) developed “the simplified practice” which says that one will be immediately saved by the Amida Buddha once he/she calls the name of Amida Buddha. In other words, Pure Land introduced the concept of pure reliance upon the Compassionate Power of Amida Buddha to be saved or happy without requiring any effort or spiritual advancement. Sodo Zen Buddhism simplified process of spiritual advancement by teaching that Zen Meditation was the main practice for full enlightenment.

The only problem here is that Buddha did not mention such happiness and salvation in his philosophy. Of course, Buddha did not suggest any practice that we mentioned above. Instead, Buddha’s suggestions were to (1) understand causes of suffering in life, (2) find ways (practices) to eliminate such causes, (3) continue the right practices, and (4) obtain selflessness. These suggestions have been precisely stated as the concept of Four Noble Truths. We can also find these suggestions in a short sentence, “Shoken Gounaiku Doissaikuyaku,” in one of generally accepted Buddhist bibles, Hannya-Shinkyo.

This presentation will show the reason why happiness is not relevant in Buddha’s philosophy. Then, we will describe something more than happiness based on the Buddha’s philosophy. Our basic argument is that Buddhists are supposed to seek Nirvana or selflessness instead of happiness. This is reasonable because happiness exists only when we recognize sense of unhappiness. The unhappiness is caused by suffering in life. Therefore, if we eliminate the suffering as Buddha suggested, we will lose the sense of unhappiness. Since the concept of happiness exists as the opposite concept of unhappiness, happiness will not exist once we lose the sense of unhappiness. This is why we do not find happiness in original Buddha’s philosophy. Then, because of non existence of happiness in the ultimate spiritual condition, Buddha created the word Nirvana to conceptualize something beyond the happiness. We will also describe the concept of Nirvana as well as selflessness.
Mathematics is an essential component of school and life success. However, not every child learns how to communicate mathematical ideas in real life. According to the National Assessment of Educational Progress (NAEP, 2011), almost one fifth of students in 4th and 8th grades are below a basic level of mathematics achievement. The situation is even worse for students with special needs (Wagner & Blackorby, 1996). To raise students’ performance, we need to emphasize effective mathematics instruction.

One effective strategy is concrete-representational-abstract instruction (CRA). It is explicit instruction in mathematics and helps students understand “mathematics concepts before learning rules” (Access Center, n.d.). CRA instruction is built on the work of Bruner and consists of three parts, each building on the previous step to promote student learning and retention (Witzel, Riccomini, & Schneider, 2008). A body of research demonstrated that CRA instruction can help students learn a variety of mathematical concepts, including subtraction with regrouping (Flores, 2009), math facts (Mercer & Miller, 1992), and basic algebra (Maccini & Ruhl, 2000). CRA instruction is also effective in teaching students with disabilities or at risk for math difficulties (Witzel, Mercer, & Miller, 2003).

The first stage of CRA is concrete instruction. Manipulatives, such as based-ten blocks, number lines, and fraction bars, are used to enhance students’ conceptual understanding and attainment. Teachers use concrete materials to display mathematical concepts with verbal explanations, and students are provided with the opportunities of using the manipulatives (Maccini & Gagnon, 2000). Research showed that concrete materials and manipulative objectives could enhance students’ comprehensive understanding of various mathematical concepts and greatly increase students’ motivation (Allsopp, 1999; Cass, Cates, Smith, & Jackson, 2003). When students master the concrete level, pictorial representations of the same mathematical concept are introduced. In this representational stage, two-dimensional drawings are used, such as pictures, circles and tallies. It is a stage of transition from concrete to semi-concrete representation (Maccini & Gagnon, 2000). Witzel and colleagues (2003) suggested that pictorial representations are very practical because students do not need to carry concrete materials all the time to solve problems. In the last stage, teachers explain the same mathematical concept with mathematical symbols (Morin & Miller, 1998; Witzel et al., 2003). In the first and second stages, students learn mathematical concepts by doing and seeing. In the abstract stage, students use symbols, numbers and rules to solve problems (Access Center, n.d.). These three stages need to be taught explicitly.

This presentation will cover the following: (1) describing major characteristics of students who struggle with mathematics; (2) introducing CRA instruction; (3) discussing key issues related to the design of CRA instruction.

REFERENCES AVAILABLE UPON REQUEST
ACKNOWLEDGMENTS

SOURCE EXECUTIVE COMMITTEE
Natalie Lupton (Chair), Kara Gabriel (Incoming Chair), Kun Liao (Lynnwood Center Coordinator), Mary Ellen Reimund (Des Moines Center Coordinator), Alena Yastchenko (Eastside Centers Coordinator), Glen Bach, Christina Barrigan, Michael Braunstein, Eric Cheney, Jason Irwin, Brian Jacobson, Jackie Johnson, Robert Lowery, Robert Pritchett, Bret Smith, Steve Wenger, Therese Young, and Teresa Youngren

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Winston Norrish, Steve Scellick, Robert Lowery, Robert Lupton

VOLUNTEERS
We would also like to thank all of the people who have volunteered their time, energy, and expertise in the myriad of ways necessary to make this event a success. Special thanks for all those assisting with the planning, organization, scheduling, judging, and chairing of sessions.
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### SESSION CHAIRS

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See you at next year’s

SOURCE:
May 15, 2013