illuminating minds

Thursday
May 21, 2009

Program & Abstracts

SOURCE 09

symposium on university research and creative expression
PROGRAM AND ABSTRACTS

SYMPOSIUM ON UNIVERSITY RESEARCH AND CREATIVE EXPRESSION

14TH ANNUAL CONFERENCE

CENTRAL WASHINGTON UNIVERSITY
ELLENSBURG, WASHINGTON

MAY 21, 2009

STUDENT UNION AND RECREATION CENTER

SPONSORED BY:
Office of the President
Office of the Provost
Office of Undergraduate Studies
Office of Graduate Studies and Research
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Student Affairs and Enrollment Management
Len Thayer Small Grants Programs
The Wildcat Shop
University Relations
Dining Services
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HISTORY AND GOALS OF THE SYMPOSIUM

This year represents the 14th year of annual multidisciplinary conferences dedicated to student scholarship at Central Washington University. In 1996, CWU sponsored the first Undergraduate Research Symposium, a showcase of faculty-mentored undergraduate student research. This event was an innovative forum for developing student scholarship that gained attention far beyond CWU. Since 1996, the undergraduate symposium expanded to include other student scholarly activity, and the broader scope was reflected in a new name in 1998, the Symposium on Undergraduate Research and Creative Expression, commonly referred to as SOURCE.

Building on the success of SOURCE, a new conference was initiated in 2002 to provide a forum for graduate students and faculty to share their scholarly work with the campus community. Originally named the First Conference of Faculty and Graduate Students Research and Scholarly Achievements, the new conference was renamed the Conference of Graduate Student and Faculty Scholarship and referred to as GSFS.

In 2005, the conferences combined to initiate the Symposium on University Research and Creative Expression, which aims to include an even wider community than either of those two previous events. The intent was to provide a forum to celebrate and share scholarship at CWU with all of the university, as well as the outside community. This is the fifth year of the Symposium on University Research and Creative Expression, which encourages students, faculty, and staff from all departments and units to participate. Contributions are collaborative or solo works involving any CWU student, faculty, or staff member. All forms of presentation of scholarly work are welcome, including oral presentations, posters, artwork, performances, and others.

Participation in the CWU conferences on scholarship has been growing. In 1996, the original Undergraduate Research Symposium had 23 presentations. This year, 279 presentations by 238 undergraduate students, 88 graduate students, and 50 faculty/staff are scheduled, including approximately 112 oral presentations, 7 mixed-media/live performances, 108 poster presentations including 5 at satellite campuses, 50 in art displays, and a fashion show. Forty-one academic units are participating in this year’s symposium: American Sign Language; Anthropology and Museum Studies; Art; Biological Sciences; Chemistry; Chimpanzee and Human Communication Institute; Communication; Computer Science; Douglas Honors College; Economics; Education; English; Environmental Ethics; Family and Consumer Sciences; Film and Video Studies; Finance and Operations and Supply Chain Management; Foreign Languages; Geography; Geological Sciences; Health, Human Performance and Nutrition; History; Industrial and Engineering Technology; Information Technology and Administrative Management; Law and Justice; Management; Mathematics; Music; Philosophy; Physics; Political Science; Psychology; Religious Studies; Resource Management; Safety and Health Management; Science Education; Science Honors Program; Social Sciences; Sociology; Theatre Arts; and Women’s Studies.

We continue to welcome additional growth in numbers of presenters and participants, as well as an expanded roster of participating colleges, departments, and programs. Our vision continues to be one of creating an event showcasing all realms of scholarly work at CWU, and sharing them across disciplines and with the outside community.
STUDENT FASHION SHOW

For the first time, we are proud to have the student-produced and directed Annual Student Fashion Show at SOURCE. This year’s show, called SatisFashion, explores the fashions that satisfy you and features eight student designers. The fashion show will be formally presented on Saturday, May 30 at 7:00 p.m. in the Milo Smith Theatre in McConnell Hall.

STUDENT ART SHOW

While you are attending SOURCE today, please plan on visiting the 2009 Student Art Show in the Sarah Spurgeon Gallery, Randall Hall. This year’s show features work from all of the disciplines in the visual arts taught at Central Washington University including photography, graphic design, ceramics, wood design, jewelry and metalsmithing, sculpture, painting, and drawing. The annual student art show celebrates the achievements of CWU’s student artists. All work in the show has been juried by a professional in the field as meritorious and worthy of the public’s attention. All Sarah Spurgeon Gallery activities are funded by the Associated Students of Central Washington University.

CONCERTO COMPETITION

After SOURCE, please visit the Music Building Concert Hall for the annual Concerto Competition beginning at 6:00 p.m. The concerto is a solo instrumental performance with orchestra, and is one of the most demanding aspects of a performer’s art. A faculty jury will chose top performers to appear with the CWU Symphony in the 2009-2010 concert season.

MUSICAL INTERLUDES

During this year’s symposium, musical interludes will be provided on the second floor mezzanine during inter-sessional breaks by the following performers:

Paul Walk and Amy Edwards performing “Jetzt, schätzchen, jetzt sind wir allein” from Fidelio, by Beethoven and “Sull’aria,” Act 3 Duet from Le Nozze di Figaro, by Mozart during the morning intersession break.

Carrie Rehkopf, John Michel, Heather Netz, and Tim Betts performing Four for Tango by Astor Piazzolla; and Carrie Rehkopf, John Michel, and Isaac Castillo performing College Hornpipe by Mark O’Connor during the banquet.

J.R. Maxwell and Andrea Hansen performing Act 1 Finale, Duet and Sextet from Cosi fan tutte, by Mozart during the afternoon intersession break.

PROGRAM COVER DESIGN

This year’s SOURCE program cover and artistic theme, Illuminating Minds, was designed by Andrew Saxton and members of the American Institute of Graphic Arts (AIGA) club, under the mentorship of Glen Bach. The mission of the AIGA club is to provide an outlet of professionalism, encourage creative thinking, and prepare students for a career in graphic design by advancing design skills beyond the classroom, providing client-based projects, and connecting with the professional realm of graphic design both locally and in larger cities.
21 May 2009

Welcome to the 14th annual SOURCE—the Symposium on University Research and Creative Expression. This year’s theme, *Illuminating Minds*, captures the essence of CWU ingenuity as we meet to recognize the scholarly and creative activities initiated by our faculty, students, and staff. The presentations we see and hear today enlighten and inspire us not only through theory and ideology but also artistry and creativity. Indeed, we have a lot to celebrate.

CWU is home to many dedicated and talented faculty and students. This year, we offer the most diverse representation of our university community to date, with over 40 departments participating in approximately 270 student and faculty presentations. We are pleased that some departments are presenting for the first time this year, and we are also excited that the CWU-Des Moines and CWU-Lynnwood Centers are participating with poster presentations at the satellite campuses.

As we celebrate, we applaud our university-wide efforts which make this event possible. We acknowledge the faculty mentors who work to make a difference in students’ lives and the many faculty, staff, and administrators who volunteer their time as session judges, chairs, or facilitators. Furthermore, colleges and departmental units provide financial contributions which provide a foundation for success. Sponsors include the Offices of the President, Provost, Undergraduate Studies, Graduate Studies and Research, and Continuing Education; the Central Washington University Foundation; the Colleges of Arts and Humanities, Education and Professional Studies, and the Sciences; Student Affairs and Enrollment Management; the Len Thayer Small Grants Programs; the Wildcat Shop; University Relations; and Dining Services. The positive impact of these endeavors is realized in the culmination of this event.

SOURCE provides us with a glimpse of extraordinary collaboration between colleagues and among faculty mentors and students. To those of you presenting today, I encourage you to illuminate your mind beyond your own SOURCE presentation by attending presentations outside of your immediate field of interest. To our guests, I encourage you to use this day to sample the best Central Washington University has to offer.

Thank you for your support of SOURCE.

Sincerely,

Wayne S. Quirk, PhD
Provost and Senior Vice President for Academic Affairs
KEYNOTE ADDRESS
12:25-1:10 p.m.
All are welcome for the Keynote Address in the SURC Ballroom

Ron Dotzauer
“Creating an Environment for Success”

Political strategist
Co-founder and CEO of Strategies 360
Central Washington University Alumnus

“One of the most successful political operatives in Washington history.”
Seattle Times, September 4, 2006

With sharply honed instincts in political strategy and a winning track record, Ron Dotzauer is a highly sought political strategist. At Strategies 360, Ron provides strategic counsel to a vast array of regional and international clients. Under Ron’s direction, the company—which he started in 1985 as Northwest Strategies—has rocketed to the forefront of public relations/public affairs firms in the Pacific Northwest.

Ron’s more than 30-year career in politics started in 1974, when he became the youngest elected county official in the state of Washington. He won the job of Clark County Auditor just two years out of college, defeating five people in a primary for the open seat.

After successfully directing Henry “Scoop” Jackson’s re-election campaign for the U.S. Senate in 1982, Ron worked as Jackson’s state director. In 1984, Ron ran Booth Gardner’s successful gubernatorial campaign, winning a three-person Democratic primary and then unseating incumbent Gov. John Spellman. In 2000, Ron stunned national political observers by leading Maria Cantwell to a victory in the U.S. Senate over a three-term incumbent.

With an unbeatable track record for winning campaigns, Ron shares his insight and skills at campaign workshops all over the United States and beyond. In 1989, he traveled to the Baltic States to help prepare candidates for the region’s first free elections. And in 2008, he spent time in Mongolia helping first-time female candidates campaign for office.

Ron was an integral part of four national presidential conventions—both Democratic and Republican. He provided around-the-clock political analysis for several media outlets. Ron is the person the media turn to for quick-witted and accurate commentary on politics at all levels.

A gregarious and warm speaker, Ron is well-known throughout the state for his signature cowboy hat. (He owns and operates a quarter-horse ranch north of Seattle). Even news headlines make reference to his image, including an Associated Press story that said: “Political cowboy notches third big win.”

Ron got an early start in politics. In college, he was named “Outstanding Student in Political Science.” He also served as president of the Young Democrats and produced a TV show called “Politics and Personalities.”

An Everett, Washington native, Ron attended Lewis & Clark College for advanced graduate work and received a BA from Central Washington University. Ron can be reached at rond@strategies360.com.
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<th>Room 202</th>
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<td>Film Studies</td>
<td>ITAM &amp; Management</td>
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<td>Concerto Competition 6:00-9:00 p.m.</td>
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SHOWING: MAY 5-22  ⇒  RECEPTION: May 22, 6 - 8 P.M.  ⇒  AWARDS: May 22, 7 P.M.

LOCATION:
Sarah Spurgeon Gallery
CWU Department of Art
Randall Hall, Ellensburg, WA

HOURS:
Monday-Friday 10 a.m. - 3 p.m.
Saturday-Sunday 1 p.m. - 4 p.m.

AWARDS: May 22, 7 P.M.

ART IS CENTRAL
CWU is an EEO/AA/Title IX Institution.
Persons with disabilities may request reasonable accommodation by calling the Center for Disability Services at 509-963-2171 or TDD 509-963-2143.

6th ANNUAL JURIED STUDENT ART EXHIBIT

Sponsored by
the Student Artist Collective (SAC)
ORAL PRESENTATION SCHEDULE

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

MORNING ORAL PRESENTATION SESSIONS

SESSION 1: MATHEMATICS/ECONOMICS
ROOM: SURC 135

8:15 ANALYZING CONDITIONAL PROBABILITIES THAT ARE COMMONLY COUNTER-INTUITIVE: WHY YOUR DOCTOR MAY BE WRONG AND HOW TO WIN ON GAME SHOWS
St. Brown, Max

8:30 OPTIMIZING TRAFFIC CIRCLES
Belieu, Branden; Hess, Russ; Mitchell, Kyle

8:45 A STATISTICALLY MADE MARCH MADNESS BRACKET
Richards, Corey; Ness, Daniel; Blakeway, Levi

SESSION 2/3: INTERIOR DESIGN/FASHION SHOW
ROOM: SURC 137A/137B

8:15 INTERIOR DESIGN CLUB’S SPRING BREAK
Zakhary, Christina; Maurer, Meaghan; Aromin, Gabby; Duncan, Gavin; Frazier, Alyssa

8:30 FASHION: AVANT-GARDE TO EVERYDAY
Eklund, Andrea

SESSION 4: DOUGLAS HONORS COLLEGE/PHILOSOPHY/LAW & JUSTICE
ROOM: SURC 140

8:15 THE PATH TO PROGRESS
Sanford, Janna

8:30 BALANCE OF CLASS
Griffin, Pearl

8:45 THE MISCONCEPTIONS OF THE WESTERN WORLD ON ISLAMIC WOMEN
Harlan, Justine

9:00 CONQUERING THE NEW WORLD: HEGEL AND BLUMENBACH’S CONTRIBUTION TO THE RACIST MISTREATMENT OF NATIVE AND AFRICAN AMERICANS
Goo, Ashley

9:15 THE LAST ACCEPTABLE PREJUDICE: SOCIAL AND CRIMINAL JUSTICE ISSUES IN THE LGBTQ COMMUNITY
Peacock, Derrick; Reasons, Charles
SESSION 5: ANTHROPOLOGY/GEOGRAPHY/RESOURCE MANAGEMENT
ROOM: SURC 135

10:00 WENAS CREEK MAMMOTH CASTING PROJECT
   Keller, Alfred

10:15 THE ORIGIN OF THE NABATAEANS AND THE CAUSE FOR THEIR SHIFT INTO A SEDENTARY LIFESTYLE
   Lewis, Jason

10:30 SOCIO-ECONOMIC IMPACTS OF HYDRO POWER DAMS: THE BUI DAM PROJECT, GHANA (WEST AFRICA)
   Otu-Tei, Clement

10:45 SUSTAINABLE TOURISM IN OLYMPIC NATIONAL PARK, WASHINGTON STATE
   Greve, Jake; Dunleavy, Casie

11:00 SUSTAINABILITY AND INSATIABILITY: VALUES AND PERCEPTIONS ASSOCIATED WITH CONSUMPTION
   Bestvina, Bodarc

11:15 ANTHROPOGENIC EFFECTS ON FLOODPLAIN GEOMORPHOLOGY, NACHES RIVER, WASHINGTON
   Bishop, Tiffany

SESSION 6: BIOLOGY I
ROOM: SURC 137A

10:00 TERRESTRIAL AND MARINE FOOD SUBSIDY TO SALMONID DIET: A STABLE ISOTOPE STUDY ON THE YAKIMA RIVER
   Johnson, Allison

10:15 LEAF DECOMPOSITION IN URBAN STREAMS OF ELLENSBURG, WA
   Vashist, Radha; Arango, Clay

10:30 NUTRIENT LIMITATION IN SWAUK CREEK RIVER BASIN
   Lamb, Tanya

10:45 TRACKING AMPHIBIAN DISEASE IN NEPAL
   Ault, Kori; Johnson, Allison; Wagner, R. Steven; Johnson, James

11:00 EFFECTS OF SALVAGE LOGGING AND SUCCESSION ON AN EASTERN CASCADE BIRD COMMUNITY 14 YEARS POST WILDFIRE
   Woodrow, Aja

SESSION 7: MANASTASH
ROOM: SURC 137B

10:00 MANASTASH SHOWCASE
   Whitcomb, Katharine; Enders, Del; Cavazos, Pedro; Mayer, Chris; Dunning, Sonya; Dykes, Ashley

10:15 MANASTASH SHOWCASE
   Whitcomb, Katharine; Enders, Del; Cavazos, Pedro; Mayer, Chris; Dunning, Sonya; Dykes, Ashley

10:30 MANASTASH SHOWCASE
   Whitcomb, Katharine; Enders, Del; Cavazos, Pedro; Mayer, Chris; Dunning, Sonya; Dykes, Ashley

10:45 MANASTASH SHOWCASE
   Whitcomb, Katharine; Enders, Del; Cavazos, Pedro; Mayer, Chris; Dunning, Sonya; Dykes, Ashley

11:00 MANASTASH SHOWCASE
   Whitcomb, Katharine; Enders, Del; Cavazos, Pedro; Mayer, Chris; Dunning, Sonya; Dykes, Ashley

11:15 MANASTASH SHOWCASE
   Whitcomb, Katharine; Enders, Del; Cavazos, Pedro; Mayer, Chris; Dunning, Sonya; Dykes, Ashley
SESSION 8: DOUGLAS HONORS COLLEGE/ENGLISH  
ROOM: SURC 140

10:00  HOMER'S CRITIQUE OF ANCIENT GREEK VALUES  
Hill, Davis

10:15  CHAUCER AND THE TRUE VALUE OF ORDINARY EXPERIENCE  
Wildes, Sheena

10:30  THE WIFE OF BATH: A WOMAN AHEAD OF HER TIME  
Lehrman, Nathan

10:45  THE INADEQUACIES OF DANTE ALIGHIERI'S PARADISE: A NON-CHRISTIAN HEAVEN  
Thomas, Nathan

11:00  SELF-KNOWLEDGE IS ONLY THE BEGINNING  
Linder, Jessica

11:15  THE VALUE MODERN NATIVE AMERICAN MEN PLACE ON AGGRESSION AND HOW THEIR AGGRESSION BENEFITS CURRENT TRIBAL SOCIETY  
Baker, Kiley

SESSION 9: COMPUTER SCIENCE  
ROOM: SURC 201

10:00  CONSTRUCTION OF A DISTRIBUTED COMPUTING CLUSTER  
Abdul-Wahid, Badi'

10:15  PARALLEL GENETIC ALGORITHM: MESSAGE PASSING ASYNCHRONOUS COMPUTATIONS IN F#  
Abdul-Wahid, Badi'

10:30  AN ADAPTIVE REPLICATION ALGORITHM IN P2P FILE SYSTEMS WITH UNRELIABLE NODES  
Wysocki, Brandon; Sisson, Ben

10:45  MAPPING WITH THE GENETIC ALGORITHM: FINDING A SAFE PATH THROUGH A FLOOD ZONE USING A GENETIC ALGORITHM  
Curtis, Steven

11:00  INTEGRATING CWU CHESS IN THE ARENA CHESS GUI  
Littlefield, Kyle

11:15  VISUAL SIMULATION OF MOVING OBJECTS  
Emery, Leif

SESSION 10: SOCIOLOGY/PSYCHOLOGY  
ROOM: SURC 202

10:00  PERCEPTION OF HUTTERITES IN LOCAL FARMING COMMUNITY  
Jenkins, Jaron

10:15  REINFORCEMENT OF GENDER IN PRESCHOOL CHILDREN  
Cruz, Elys

10:30  WATERGATE SOCIOMATRIX  
Patterson, Darrin

10:45  RACE AND PERCEPTIONS OF INJUSTICE: EVIDENCE FROM ATTITUDES ON THE DEATH PENALTY SURVEY  
Johnson, Michele

11:00  EFFECT OF SEX, LATENCY, AND STIMULI TYPE ON DELAYED MATCH-TO-SAMPLE AND NON MATCH-TO-SAMPLE PERFORMANCE  
Rutledge, Brook
SESSION 11: EDUCATION/CHCI/MUSIC
ROOM: SURC 271

10:00  ACCOUNTABILITY IN HIGHER EDUCATION: A STUDY OF THE PERCEPTIONS OF UNIVERSITY AND STATE GOVERNMENT LEADERS IN THE STATE OF WASHINGTON
Ballou, Gary

10:15  ENHANCING ACADEMIC PERFORMANCE THROUGH THE ADOPTION OF THE SCHOOL UNIFORM IN PUBLIC SCHOOLS
Jones, Kim

10:30  PRACTICUM/VISITATIONS HIGHLY EFFECT VISUAL ARTS TEACHER CANDIDATES
Donahoe, Susan; Taylor, Kristen; Richter, Constance; Dennegehey, Kathryn; York, Natalia

10:45  CONTROVERSY, BALANCED INSTRUCTION, AND CIVIC ENGAGEMENT
Kaviani, Khodadad

11:00  THE EFFECTS OF THE CHIMPSUIM EDUCATIONAL PROGRAM ON VISITOR KNOWLEDGE AND ATTITUDES
McCarthy, Maureen; Brown, Hannah; Gray, Amanda; Lee, Kevin; Steele, Rozsika; Jensvold, Mary Lee; Fouts, Deborah

11:15  ADULT BEGINNERS PIANO WORKSHOP: RESEARCH AND IMPLEMENTATION OF SKILL-BUILDING TECHNIQUES AND MATERIALS FOR LIFE-LONG LEARNING AND ENJOYMENT
Jaffe, Jan

SESSION 12: MUSIC PERFORMANCE
ROOM: SURC THEATRE

10:00  2009 NATIONAL TRUMPET COMPETITION ENSEMBLE AND SOLOISTS
Pickard, Stephen; Henderson (Wans), Christi; Fukuyama, Timothy; Anderson, Paige; Lede, Dana; Whitfield, Daniel

10:15  A STUDY OF CHAMBER MUSIC FROM THE 17TH AND 18TH CENTURIES THAT FEATURES VIOLA AS A PRIMARY VOICE
Solano, E. Angeline

10:30  MEI
Ogawa, Emi

10:45  A DEMONSTRATION OF VOCAL STYLES WITHIN A SINGLE COMPOSITION
Rawlinson, Alexandra

11:00  REFRESHING EARLY JAZZ: THE POTENTIAL OF RETROSPECT
Smith, Bret; Peacock, Curtis

11:15  PIANO TRIO NO.2 IN E, OPUS 92
Brown, Brandi; Rodgers, Emily; Flaten, Erik
ORAL PRESENTATION SCHEDULE

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

AFTERNOON ORAL PRESENTATION SESSIONS

SESSION 13: ENGLISH
ROOM: SURC 135

1:15  PUNNING THE PUDENDUM: VIOLENCE, LOVE, AND LEARNING IN CHAUCER’S MILLER’S & WIFE OF BATH’S TALES
      Sander, Dustin

1:30  CAPABILITY AND CULPABILITY: RECOVERING MEANING IN JOHN STEINBECK’S THE GRAPES OF WRATH
      Nelson, Jessica

1:45  LOVE CAN’T MOVE MOUNTAINS: ALEJANDRA AND JOHN GRADY’S FAILURE TO CROSS COMMUNICATION BORDERS IN COMAC MCCARTHY’S ALL THE PRETTY HORSES
      La Paz, Ana

2:00  LA MAESTRA: HYBRID LESSONS AND WESTERN PERSPECTIVES IN ALEJANDRO MORALES’ THE RAG DOLL PLAGUES
      Enders, Del

2:15  SOPHROSYNE AND OLOLYGA: LAW AND FREEDOM IN ANNE CARSON’S GLASS, IRONY, AND GOD
      Sander, Dustin

2:30  THE BALLPLAYER—SPORTS AND DISABILITY
      Vetter, Jeremy

SESSION 14: BIOLOGY II
ROOM: SURC 137A

1:15  PREVALENCE OF THE AMPHIBIAN PATHOGEN BATRACHOCHYTIRIUM DENDROBATIDIS AT THREE MONTANE SITES IN CENTRAL WASHINGTON STATE AND IN BIOLOGICAL-SUPPLY FROGS
      Gaulke, Christopher; Johnson, Jim; Wagner, Steven

1:30  FORENSIC ENTOMOLOGY: INSECT ACTIVITY AND DECAY RATES OF PORCINE REMAINS IN FOUR CENTRAL WASHINGTON BIOMES, LOCATED ALONG AN ALTITUDINAL GRADIENT
      Rogers, Devon

1:45  FACTORS AFFECTING SUPERCOOLING OF THE NORTHERN SCORPION
      Lessig, Zach

2:00  FROGS IN SPRING ALL WINTER: OVERWINTERING OF CASCADES FROGS IN WASHINGTON STATE
      Barreca, April; Irwin, Jason

2:15  MECHANISMS CONTROLLING FREEZE TOLERANCE IN PACIFIC TREEFROGS (PSEUDACRIS REGILLA)
      Pense, James; Reynolds, David

2:30  BABY FROGS DYING IN BOGS
      Ault, Kori; Wagner, R. Stever; Pinkart, Holly; Johnson, James
SESSION 15: CHEMISTRY I
ROOM: SURC 137B

1:15 INVESTIGATING THE FUNCTION OF GD$^{3+}$ IN (Y,GD)BO$_3$:EU$^{3+}$ THROUGH MEASUREMENTS OF HOST-TO-ACTIVATOR TRANSFER EFFICIENCY CALCULATIONS
Rabinovitz, Rosa

1:30 SYNTHESIS AND CHARACTERIZATION OF ZINC-BASED QUANTUM DOT MATERIALS
Durkee, Heather

1:45 PARTICLE SIZE DEPENDENT SURFACE LOSS AND ITS EFFECT ON NON-RADIATIVE HOST-TO-ACTIVATOR TRANSFER EFFICIENCY IN YBO$_3$:EU$^{3+}$ NANOPARTICLES
Olsen, Kris

2:00 STUDYING THE TOXICITY OF C60
Rosario, Sara

2:15 QUANTITATIVELY MODELING SURFACE TRAPPING IN NANO-SCALE YTTRIUM OXIDE DOPED WITH EUROPIUM
Mann, Rusty

SESSION 16: RELIGIOUS STUDIES
ROOM: SURC 140

1:15 JEWISH CHILDREN IN THE HOLOCAUST: THEY LIVED, THEY DIED, THEY PLAYED, THEY SURVIVED
Allocca, Courtney

1:30 THE USE OF CHILDREN WITHIN POLITICS: THE HITLER YOUTH
Othoudt, Kelsi

1:45 MARY, LILITH OR EVE: WOMEN’S ROLES WITHIN NAZI GERMANY
Geise, Sasha

2:00 THE LESBIAN EXPERIENCE IN THE THIRD REICH
Sheldon, Kathleen

SESSION 17: POLITICAL SCIENCE
ROOM: SURC 201

1:15 QUESTIONING SUSTAINABILITY RHETORIC: WHEN CULTURAL PRACTICES SUSTAIN DEPLETION OF NATURAL RESOURCES (AN EXAMINATION OF LAS VEGAS CITY OFFICIALS’ SUSTAIN LAS VEGAS POLICY #CM-302)
Zimmerman, Kathryn

1:30 ENVIRONMENTAL SUSTAINABILITY AT CENTRAL WASHINGTON UNIVERSITY
Ormberg, Justin

1:45 CIVIL LITERACY
Cannon, Craig

2:00 THE DEBT PROBLEM: WHAT DOES THE TREASURY DEPARTMENT DO?
Trautman, Seth

2:15 THE EFFECTS OF WASHINGTON STATE’S TOP-2 PRIMARY ON VOTER BALLOT BEHAVIOR AND THIRD PARTY TURNOUT
Turner, Meghan

2:30 ANALYSIS OF POLITICAL INSTITUTIONS AND POLITICAL ACTORS: ECONOMIC DEVELOPMENT MODELS OF KOREA AND JAPAN
Hwang, Sook
SESSION 18: HUMANITIES
ROOM: SURC 202

1:15 MODERN SKIING IN PRE-REVOLUTIONARY RUSSIA
   Frank, William

1:30 PAUSING IN NON-NATIVE SPEAKERS’ ENGLISH: A CONTRASTIVE ANALYSIS
   Hardt, Brad; Liu, Yuanyxia; Jendro, Bethany; Al Ghannam, Aziz; Ho, My-anh; Kjeldgaard, Marie

1:45 PEOPLE, PEOPLE, EVERYBODY PEOPLE: POSTMODERN POLITICAL MUSIC AND THE GORILLAZ
   Mecham, Christian

2:00 NO CAUSE FOR ALARM: A NARRATIVE VIDEO ESSAY
   Iiyama, Brian; Allum, Kyle; Brown, Nick

2:15 LED TECHNOLOGIES FOR THEATRE AND THEIR BENEFITS
   Rogers, Christopher

SESSION 19: ONE BOOK, ONE CAMPUS (THIS I BELIEVE): STUDENT VOICES
ROOM: SURC 271

1:15-2:45 ONE BOOK, ONE CAMPUS SHOWCASE
   Mack, Virginia; Gray, Loretta; Lupton, Natalie

SESSION 20: DANCE
ROOM: SURC THEATRE

1:15 DIES IRAE (MODERN DANCE PERFORMANCE)
   McLain, Tyler Elizabeth

SESSION 21: GEOLOGICAL SCIENCES
ROOM: SURC 135

3:00 SEDIMENTOLOGY AND FATE OF THE 2004 INDIAN OCEAN TSUNAMI DEPOSITS IN SOUTHEASTERN INDIA
   Johnston, Patrick; Ely, Lisa; Achyuthan, Hema; Srinivasalu, S.

3:15 PROCESSES CONTROLLING SPESSARTITE GENERATION BEneath MT. RAINIER, WASHINGTON
   Scott, Sean; Bohrson, Wendy

3:30 USE OF MELTS MODELING AND DETAILED TEXTURAL AND CHEMICAL CRYSTAL POPULATION STUDIES TO DOCUMENT MAGMA CHAMBER PROCESSES AT MT. ETNA, SICILY
   Moses, Maureen; Bohrson, Wendy

SESSION 22: BIOLOGY III
ROOM: SURC 137A

3:00 MORE EVIDENCE THAT MUTATION RATE IN THE CHLOROPLAST GENOME DEPENDS ON COPY NUMBER
   Dutton, Ashley

3:15 ANALYSIS OF ELECTROTAXIS BEHAVIOR IN THE ROUNDWORM, C. ELEGANS
   Chrisman, Steven

3:30 EFFECT OF SEROTONIN ON LOCOMOTORY BEHAVIOR IN THE ROUNDWORM, C. ELEGANS
   Foss, Eric

3:45 MAPPING A MUTATION IN THE ROUNDWORM, C. ELEGANS: A TWO-YEAR CLASS PROJECT
   Walsworth, Austen; Willauer, Patrick

4:00 VISUAL LOCALIZATION OF TWO PARAFLAGELLAR ROD-LIKE PROTEINS IN TRYPANOSOMA CRUZI
   Neumann, Evan
SESSION 23: CHEMISTRY II/COMPUTER SCIENCE/HHPN
ROOM: SURC 137B

3:00 APPLICATIONS OF GRAPH MATCHING FOR CHEMICAL STRUCTURES
Abdul-Wahid, Badi'; Roseberry, Gene; Thompson, Zacharias; Lopez, Branden

3:15 FUZZY ARTMAP RULE EXTRACTION IN COMPUTATIONAL CHEMISTRY
Abdul-Wahid, Badi'; Crivat, Bogdan; Abdul-Wahid, Sarah

3:30 THE DETECTION OF SULFONAMIDE ANTIBIOTICS USING A FUNCTIONALIZED SILICA GEL SURFACE
Jensen, Robert

3:45 THE EFFECT OF A HIGH-FAT DIET ON MITOCHONDRIAL FUNCTION IN THE ROUNDWORM, CAENORHABDITIS ELEGANS
Bryner, Stephanie; Thomas, Carin; Carnell, Lucinda

4:00 CHEMICAL CHARACTERIZATION OF SOUTH ATLANTIC OCEAN AEROSOLS
Johnson, Jacob

4:15 EFFECTS OF EPIGALLO CATECHIN GALLATE IN GREEN TEA EXTRACT ON ENERGY EXPENDITURE AND RESPIRATORY QUOTIENT IN FEMALES
Rust, Bret; Gee, David

SESSION 24: PHILOSOPHY
ROOM: SURC 140

3:00 THE BALANCE OF POWER
Anderson, Tyler

3:15 THE TRANSCENDENCE OF VIRTUAL MINDS
Moceri, Mike

3:30 DESCARTES’ CRACKED FOUNDATION
Keeney, Joe

3:45 COERCION IN THE PATIENT-DRUG COMPANIES RELATIONSHIP: WHY PHARMACEUTICALS “EDUCATIONAL” TOOLS ARE IMMORAL
Downes, Phillip

4:00 CLEAR AND DIRECTIVE: VALUE CLARIFICATION AS A TOOL FOR ADVANCE DIRECTIVES
Blesi, Lauren

4:15 GUARDIANS OF MINORS AND INFORMED CONSENT: WHY ABORTION CASES SHOULD BE THE EXCEPTION
Dunleavy, Casie

SESSION 25: FILM STUDIES
ROOM: SURC 201

3:00 DES FEMMES ET DES FILMS: A FEMINIST CRITIQUE OF THE FRENCH FILMS “CESAR ET ROSALIE” AND “MADAME BOVARY”
Harder, Erika

3:15 CHARLIE CHAPLIN AND MASCULINE CRISIS
McCorkindale, Donald

3:30 THE PROGRESSIVE PORTRAYAL OF WOMEN IN THE FILMS OF STANLEY KUBRICK
True, Duncan

3:45 INCORPORATING FILM INTO THE WOMEN’S STUDIES CLASSROOM
Johnson, Melissa
SESSION 26: ITAM/MANAGEMENT
ROOM: SURC 202

3:00  SOCIAL NETWORKING: A CRITICAL ISSUE FOR RETAILERS AND CONSUMERS TODAY
      Baldwin, Patrick; Mesina, Hector; Thompson, Megan; Mackie, Sammy Jo; Meza, Guillermo

3:15  GOING GREEN: THE CHANGES IN THE RETAIL ENVIRONMENT INVOLVED IN SUPPORTING THE SUSTAINABILITY OF THE ENVIRONMENT
      Davis, Melinda; Dwyer, David; Cowles, Kirsten; Rudolph, Ashley

3:30  HOW M-COMMERCE AFFECTS CONSUMERS AND RETAILERS ON MOBILE DEVICES
      Ingles, Stephanie; Stebens, Ashley; Carey, Andrea; Martin, Amy; Martini, Jenni

3:45  RETAILERS GOING GREEN: FACT OR FRAUD?
      Huston, Matthew; Carter, Michael; Brown, Annie; Petosa, John; Hoiness, Kyle

4:00  INTEGRATED MARKETING COMMUNICATIONS PLAN FOR HABITAT FOR HUMANITY
      Sundborg, Susanna; Reinhardt, Ian; Wohlfarth, Stephanie; Peck, Michael

SESSION 27: PHYSICS/IET
ROOM: SURC 271

3:00  FREQUENCIES AND WAVELENGTHS FROM A NEW FAR-INFRARED LASING GAS: $^{13}$CH$_2$OH
      Petersen, Travis

3:15  BINARY STARS AND THEIR LIGHT CURVES: USING MODELS TO DETERMINE THE SENSITIVITY OF CWU EQUIPMENT
      Magenis, Marilyn

3:30  SCATTERING OF PLANE LIGHT WAVES
      Houk, Adam

3:45  A COMPUTATIONAL STUDY OF TSUNAMI RUNUP AS A FUNCTION OF COASTLINE MORPHOLOGY
      Ewell, Kevin

4:00  SELF-DRIVING CAR
      Fedotov, Michael
POSTER PRESENTATION SCHEDULE

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

UNIVERSITY CENTERS

Posters on display May 20 at CWU-Des Moines
Posters on display May 21 at CWU-Lynnwood

CWU-DES MOINES

1. EARTHQUAKE VALVES: A SIMPLE SOLUTION TO A SERIOUS FIRE HAZARD
   Lerner, Iris

2. SAFETY BY DESIGN: A SCENARIO ILLUSTRATING THE IMPORTANCE OF HAZARD INVESTIGATION AND ANALYSIS TO IMPROVE WORKPLACE SAFETY AND MANAGE RISK
   Lerner, Iris; Matheus, Robin; Jess, Brian; Le, Thuy-Linh

3. LIFE SAFETY AT HIGHLINE COMMUNITY COLLEGE
   Matheus, Robin; Lerner, Iris; Jess, Brian; Le, Thuy-Linh; Olsen, Ryan; Atnafu, Mahlet

4. THE SLIPPERY SLOPE: A CONNECTION BETWEEN SMOKING AND DRUG ATTITUDES
   Scalf, Natalie; Engel, Cynthia

CWU-LYNNWOOD

1. GEOTHERMAL ENERGY: A MORE EFFICIENT, ECOLOGICALLY FRIENDLY ENERGY SOURCE
   Free, Rachel

2. CRIME RATES AND THE STATE OF THE ECONOMY
   Layher, Reed
POSTER PRESENTATION SCHEDULE

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

MORNING POSTER PRESENTATIONS, SESSION 28
MEZZANINE

Posters on display from 8:15-11:30 a.m.
Presenters must be by posters during judging from 10:00-11:30 a.m.

WATERS
( NSF-FUNDED GRANT: WATERSHED ACTIVITIES TO ENHANCE RESEARCH IN SCHOOLS)

1. PATTERN-BASED ENVIRONMENTAL SCIENCE: AN INTERDISCIPLINARY APPROACH TO 8TH GRADE SCIENCE WITHIN THE YAKIMA RIVER WATERSHED
   Ketsdever, Amanda; Dwight, Kevin

2. ELEMENT CONCENTRATIONS IN DRINKING WATER FROM A.C. DAVIS HIGH SCHOOL, YAKIMA, WA
   Orem, Caitlin; Kendrick, Casey

3. HYDROELECTRIC LEARNING: MODELING OF POTENTIAL DAM SITES AT A.C. DAVIS HIGH SCHOOL
   Orem, Caitlin

4. COMMUNITY-BASED CONSERVATION AND DEVELOPMENT: A GLIMPSE INTO THE ANNAPURNA CONSERVATION AREA PROJECT, NEPAL
   Proszek, Kristina; Wickwire, Eric; Chand, Rachana

5. LOOKING AT THE WATERSHED IN A WHOLE NEW WAY: YAKIMA WATERS IN CLE ELUM/ROSLYN HIGH SCHOOL
   Larkins, Clayton; Gazis, Carey; Ryan, Brit; Wickwire, Eric

6. CHEMICAL CHARACTERIZATION OF PRECIPITATION AND SURFACE WATERS FROM THE ANNAPURNA CONSERVATION DISTRICT, NEPAL
   Johnson, Jacob; Hodges, Dave; Gazis, Carey

7. USE OF VISIBLE SPECTROSCOPY TO MONITOR THE REMOVAL OF BROMOTHYMOL BLUE FROM WATER USING A POLYELECTROLYTE/SURFACTANT/TIO2 SYSTEM
   Best, Brittany; Tasker, Adam; Hodges, Dave

8. A JOINT PARTNERSHIP: EHS AND CWU WORKING TOGETHER TO INVESTIGATE PHOSPHATE AND SULFATE LEVELS IN THE ELLENSBURG AREA
   Best, Brittany; Miller-Rubin, Harper; Hodges, Dave

9. A JOINT PARTNERSHIP: EHS & CWU WORKING TOGETHER TO INVESTIGATE AIR POLLUTION AS A RESULT OF OCCULT DEPOSITION IN THE ELLENSBURG AREA
   Best, Brittany; Walker, Alexander; Mancinelli, Frankie; Hodges, Dave

10. A JOINT PARTNERSHIP: EHS & CWU WORKING TOGETHER TO INVESTIGATE NITRATE POLLUTION IN THE ELLENSBURG AREA
    Best, Brittany; Thorpe, Haley; McNamee, Sarah; Hodges, Dave

11. YAKIMA WATERS: STUDENTS INVESTIGATING AMPHIBIAN DECLINE
    Brady, Susan; Arlt, John; Carolan, Lana; Quitadamo, Ian; Johnson, Jim

12. IONS, NITRATES, AND BUGS OH MY!: WATER CHEMISTRY AT WHITE SWAN HIGH SCHOOL
    Barreca, April; Rice, Tyler; Irwin, Jason

13. SCIENCE RESEARCH IN THE K-12 CLASSROOM: USING WATERSHED CONCEPTS TO INCREASE SCIENTIFIC LITERACY
    Lamperth, Jamie; Hennessey, Kelly; James, Paul
14. ARE BULL TROUT PRESENT IN COWICHE CREEK, WA?: A SPATIAL MODEL PREDICTING SUITABLE HABITAT  
   Lamperth, Jamie

15. SEXUAL DIMORPHISM OF RECOMBINATION RATES AS A CONSEQUENCE OF SEXUAL CONFLICT  
   Buxel-Florenzen, Stefanie

16. THE EFFECTS OF TEMPERATURE ON METABOLIC RATE, VENOM SYNTHESIS, AND POTENCY IN *PEUCETIA VIRIDANS* (ARANEAE: OXYOPIDAE)  
   Galindo, Joanna; Irwin, Jason; Carnell, Lucinda; Galindo, Gracie

17. EVALUATION OF SURVEY AND TRAPPING METHODS FOR AMPHIBIAN SPECIES ALONG THE I-90 CORRIDOR  
   Hill, Brenna; Lester, Michelle; Brady, Susan

18. ISOLATION OF PFR-5 AND PFR-6 PROTEINS IN *TRYPANOSOMA CRUZI*  
   O’Neill, Susan

19. AMPHIBIAN POPULATIONS AND ECOLOGICAL CONNECTIVITY: RESPONSES TO ROADWAYS IN A CASCADES MOUNTAIN CORRIDOR OF WASHINGTON  
   Lester, Michelle; Barreca, April; Brady, Susan; Hill, Brenna

20. TIME-DEPENDENT EFFECTS OF CALCINEURIN ON VISUAL SYSTEM DEVELOPMENT  
   Wessel, Erich; Kramer, Joshua

21. CHARACTERIZATION OF BACTERIAL VIRUSES FROM SOAP LAKE, WASHINGTON  
   De Rosa, Antonio

22. POTENTIAL HUMAN BRAIN RESPONSE TO CRITICAL THINKING STIMULI USING COMMUNITY-BASED INQUIRY  
   Gao, Miao; Greenwald, Ralf; DePaepe, James

23. SER-7, A SEROTONIN RECEPTOR, IS INVOLVED IN WITHDRAWAL EFFECTS FROM LONG-TERM EXPOSURE TO SEROTONIN IN THE ROUNDWORM, *C. ELEGANS*  
   Sudduth, Brandon

24. PHARMACOLOGICAL EFFECTS OF CYCLOSPORIN AS A CALCINEURIN INHIBITOR ON CHICK NEURONAL AXON OUTGROWTH  
   Quisenberry, Jennae; Landis, Brandi

25. TOXIC EFFECTS OF URBAN PARTICULATE MATTER OF VARIOUS SIZE FRACTIONS ON AN IN VITRO MODEL OF *SACCHAROMYCES CEREVISIAE*  
   Nieber, Annika

26. CULTIVATION OF BACTERIA FROM THE SOAP LAKE MONIMOLIMNION  
   Inman, Emily
CHEMISTRY

27. POLYCHROMATIC EMISSION AND LIMITATIONS TO BEER’S LAW
   Christensen, Amanda

28. PREDICTION OF BIOLOGICAL EFFICACY FOR POTENTIAL PLASMODIUM FALCIPARUM PLASMEPSIN IV INHIBITORS
   Abdul-Wahid, Badi’

29. PREDICTIVE SOFTWARE AS A RAPID SCREENING TOOL FOR POTENTIAL DRUG CANDIDATES
   Abdul-Wahid, Badi’; Barker, Grant

30. REAL-TIME COMPARISON POLARIMETER FOR DATA ACQUISITION IN DETERMINATION OF 0TH, 1ST, AND 2ND ORDER RATE CONSTANTS
   Pereze, Edgar

31. IN SITU ATTENUATED TOTAL INTERNAL REFLECTION FOURIER TRANSFORM INFRARED (ATR-FTIR) SPECTROSCOPY COUPLED WITH MULTIVARIATE LEAST SQUARES ANALYSIS FOR THE STUDY OF POLYECTROLYTE/SURFACTANT SYSTEMS AT THE TiO2/WATER INTERFACE
   Hayden, Sarah

32. AN EXPLORATORY STUDY OF THE PROPARGYLATION OF AROMATICS IN IONIC LIQUIDS EMPLOYING YTTERBIUM TRIFLATE AS A CATALYST
   Kellar, Casey; Brown, Kelley; Laali, Kenneth

33. SYNTHESIS OF CYCLIC BORINIC ACIDS AS POTENTIAL NOVEL HIV-1 PROTEASE INHIBITORS
   Nye, Jesse; Chen, Pei-Mien; Nicolaeva, Elizabeth; Clayton, Donald; Heer, Tajinder; Blackmore, Amanda

GEOLOGY

34. TIMING AND CAUSES OF MULTIPLE CYCLES OF CHANNEL INCISION IN THE LAST 3,000 YEARS ON THE YAKIMA TRAINING CENTER, SOUTH CENTRAL WASHINGTON
   Durkee, Matthew; Ely, Lisa

35. GEOCHEMICAL ANALYSIS OF SURFACE AND GROUNDWATERS AROUND CLE ELUM, WA: IMPLICATIONS FOR THE PROPOSED EXEMPT WELL MORATORIUM
   Hickey, David; Opitz, Ryan

36. CONTROLS ON THE OXYGEN ISOTOPE COMPOSITION OF SOIL CARBON DIOXIDE FLUX TO THE ATMOSPHERE ACROSS A PRECIPITATION GRADIENT IN CENTRAL WASHINGTON
   Larkins, Clayton; Gazis, Carey

37. A STABLE ISOTOPE STUDY OF SOIL WATER BUDGETS ALONG A CLIMATE TRANSECT IN A SNOWMELT-DOMINATED SYSTEM
   Hammond, Travis; Gazis, Carey

38. KINEMATICS AND VORTICITY IN KANGMAR DOME, SOUTHERN TIBET: TESTING PATTERNS OF MID-CRUSTAL DUCTILE DEFORMATION DURING THE HIMALAYAN OROGENY
   Wagner, Tom

39. UTILIZING IN SITU GEOCHEMICAL DATA COUPLED WITH TEXTURAL FEATURES OF PLAGIOCLASE CRYSTALS TO DECIPHER THE GEOMETRY OF THE POSTCALDERA MAGMATIC SYSTEM, CRATER LAKE, OREGON
   Tebbe, Michelle

40. GEODETIC TRANSECT IN CENTRAL NEPAL TO TEST FOR CLIMATE-TECTONIC INTERACTION
   Parker, Emily; Pratt-Sitaula, Beth; Uperti, Bishal Nath; Miner, Andrew; Melbourne, Timothy
41. COMPARISONS OF POST-EXERCISE CHOCOLATE MILK AND A COMMERCIAL RECOVERY BEVERAGE CONSUMPTION BETWEEN ENDURANCE CYCLING WORKOUTS ON RECOVERY AND PERFORMANCE
   Katica, Charlie; Pritchett, Kelly; Pritchett, Robert; Bishop, Philip; Green, Matt; Jager, Johnna

42. FIELD TEST VALIDATION OF THE BORG 15-POINT RPE SCALE FOR TETRAPLEGIC ATHLETES
   Del Pozzi, Andrew; Pritchett, Robert; Katica, Charlie; Crosson, Chad; Pritchett, Kelly; Peters, Jamey

43. PHYSIOLOGICAL COMPARISON OF MALE AND FEMALE COLLEGIATE RUNNERS
   Green, Amber; Perkins, Ryan; Brown, Justin; D’Acquisto, Leo

44. SCHOOLS MEETING SMI BREAKFAST CALORIE STANDARDS TEND TO BE LARGER AND HAVE LOWER COMMUNITY POVERTY RATES THAN SCHOOLS THAT DO NOT MEET CALORIE STANDARDS
   Tibay, Joseph; Oakley, Charlotte; Elkins, Ann; Aragon, Maria

45. NUTRIENT INTAKE COMPARISON OF MALE AND FEMALE COMPETITIVE COLLEGE CROSS COUNTRY RUNNERS SHOWS HIGHER NUTRIENT DENSITY OF VITAMIN B2 AND VITAMIN E IN FEMALE RUNNERS
   Aragon, Maria; Rust, Bret

46. Açai Puree Performance as a Fat Replacer in Fudge Brownies
   Sconce, Michael; Rust, Bret; Walton, Michelle

47. REDESIGNING A UNIVERSITY DEPARTMENT’S WEB SITE: MEETING THE NEED FOR A VIABLE, MAINTAINABLE, AND USER-FRIENDLY WEB SITE
   Zones, Austin; Seelye, Logan

48. CROSS-CULTURAL COMPARISON OF ATTITUDES, PERCEPTIONS, BELIEFS, AND TENDENCIES OF CENTRAL WASHINGTON UNIVERSITY AND PU KYONG NATIONAL UNIVERSITY STUDENTS ON RECYCLING
   Lemus-Luna, Hernan; Rios, Brenda; Park, Hee Jung

49. OPERATING CHARACTERISTICS AND RESEARCH APPLICATIONS OF THE CARBON DIOXIDE LASER
   Leiseth, Jeff

50. A SPECTROSCOPIC STUDY OF THE ND RADICAL BY FAR-INFRARED LASER MAGNETIC RESONANCE
   Groves, Jen

51. USING THE FORCE CONCEPT INVENTORY TO IMPROVE STUDENT UNDERSTANDING OF FRICTIONAL FORCES
   Sizemore, William

52. SLIPS AND FALLS
   Nichols, Sean

53. END GAME AND TEMPEST COSTUME DESIGNS
   Bakeman, Mary
POSTER PRESENTATION SCHEDULE

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

AFTERNOON POSTER PRESENTATIONS, SESSION 29
MEZZANINE

Posters on display from 1:15-4:30 p.m.
Presenters must be by posters during judging from 3:00-4:30 p.m.

ANTHROPOLOGY

1. AGE AND POTENTIAL SOCIAL PARTNERS IN TIBETAN MACAQUES (MACACA THIBETANA)
   Sheeran, Lori; Matheson, Megan; Li, Jinhua; Wagner, R. Steven

2. GENDER, POWER, AND CULTURE: LEARNING FROM TLINGIT WOMEN’S ROLES TO MOVE BEYOND EUROAMERICAN ASSUMPTIONS
   Fredericks, Rose

3. FROM THE PAST INTO THE FUTURE: FLATHEAD AND PEND D’OREILLE CULTURAL MAINTENANCE AND ADAPTATION
   Judy, Krystal; Smith, Talitha

4. VOCABULARY USE OF FOUR CROSS-FOSTERED SIGNING CHIMPANZEES
   O’Rahilly, Kathleen; Leake, Madeleine; Potosky, Robin; Wallin, Jason; Jensvold, Mary Lee; Fouts, Deborah; Fouts, Roger

5. BONE GREASE RENDERING AND FRESHNESS OF BONE
   Vickers, Sara; Barrett, Carrie

6. BREAKAGE PATTERNS AND USE-WEAR FROM THE SANDERS SITE 45-KT-315
   Hocking, Sara

7. FAUNAL ANALYSIS OF SANDERS SITE, 45-KT-315
   Dice, Laura; Nauer, Christian; Black, Jill

8. ANALYSIS OF THE FRESHWATER MUSSEL (MARGARITIFERA FALCATA) FROM 45-KT-315, KITTITAS COUNTY, WA
   VanTine, Launi

EDUCATION

9. ADDRESSING STUDENT PRECONCEPTIONS THROUGH FORMATIVE ASSESSMENT
   Remington, Tera; Weller, Katie; Johnson, Diana

10. THE CWU PREPARATORY STRING PROGRAM
    Smith, Bret
11. THE ACQUISITION OF NEW SIGNS IN ADULT CROSS-FOSTERED CHIMPANZEES  
Metzler, Deborah; Jensvold, Mary Lee; Fouts, Roger; Fouts, Deborah

12. IDENTITY STYLE, ATTITUDES ABOUT SEX, AND RELATIONSHIP STATUS AS PREDICTORS OF ADOLESCENT RISKY SEXUAL BEHAVIOR  
Paulk, Amber; Zayac, Ryan

13. DUAL CREDIT COURSE FACILITATES EDUCATION PARTNERSHIPS  
Bowers, Jan

14. EFFICIENCY ANALYSIS OF PUBLIC EDUCATION IN WASHINGTON STATE  
Johnson, Krista

15. “ENGRISH” IN JAPAN: THE USE AND MISUSE OF ENGLISH IN JAPANESE MEDIA  
Kjeldgaard, Marie

16. HIS ‘N’ HER LOVE STORIES: THE EFFECTS OF GENDER ON THE RETELLING OF COURTSHIP STORIES  
McGraw, Kelly

17. ARROYOS IN CENTRAL WASHINGTON  
Joslin, Michael

18. WEATHER IN EVERYDAY LIFE  
Kosters, Kolten

19. STEREOPHOTOGRAPHY: A VIRTUAL 3D METHOD FOR RECORDING ARCHAEOLOGICAL SITES  
Schroeder, William

20. ARCHAEOLOGICAL SITE MONITORING IN HELL’S CANYON, ID, MARCH 2009  
Shea, Holly; Fredrickson, Carl; Oosahwee-Voss, Eric

21. CULTURAL RESOURCE SURVEY, HIGH BAR, HELL’S CANYON, ID  
Stanley, Stacy; Volkenand, Todd; Nauer, Christian

22. LANDFORM MORPHOGENESIS: HIGH BAR, HELL’S CANYON, ID  
Brown, Genevieve; Frank, Harold; Volkenand, Todd; Nauer, Christian

23. 2009 HELL’S CANYON RESEARCH OVERVIEW  
Shapley, Helen
MATHEMATICS

24. A STUDY OF HIGH RISK BEHAVIORS RELATED TO GENERAL AND MENTAL HEALTH
   Conaway, Linda; Harris, Heather

25. CHANGES IN THE HEIGHT AND WEIGHT OF PROFESSIONAL ATHLETES OVER THE DECADES
   Gilbertsen, Kim; Te Velde, Laken

POLITICAL SCIENCE

26. LATINO POLITICAL PARTICIPATION AND REPRESENTATION IN THE STATE OF WASHINGTON
   Wilson, Jana; Alvarado, Pamela

27. IMPORTANT ELEMENTS OF WESTERN DEMOCRATIC GOVERNMENTAL SYSTEMS
   Hamblet, Michael; Dorn, Brandy

PSYCHOLOGY

28. THE RESEARCH EXPERIENCE: REQUIREMENTS AND OPPORTUNITIES IN UNDERGRADUATE
   PSYCHOLOGY CURRICULUMS
   Haghighi, Meisam; Biddle, Ryan; Gabriel, Kara

29. IMPACT OF THE ALCOHOLWISE PROGRAM ON DRINKING IN RESIDENCE HALLS
   Biddle, Ryan; Gabriel, Kara

30. SOCIAL STRUCTURE IN THREE CAPTIVE CHIMPANZEES
   Leeds, C. Austin; McCarthy, Maureen; Bismanovsky, Daniella; Denton, Tanya; Jensvold, Mary Lee; Fouts, Deborah

31. THE EFFECTS OF TIME DELAY EXERCISE ON STRESS LEVELS FOLLOWING A STRESSFUL EVENT
   Washington, Anthony

32. THE CHANGING ROLE OF PSYCHOLOGICAL ACCREDITATION
   Brammer, Robert; West, Rondale

33. A CULTURAL AUDIT AT CENTRAL WASHINGTON UNIVERSITY
   Cole, Melissa; Sleigh-Layman, Staci
RESOURCE MANAGEMENT

34. UNDERSTANDING CHANGING LAND USE ON IRRIGATED ACREAGE IN THE KITTITAS VALLEY OF CENTRAL WASHINGTON STATE
   Hackett, Jennifer

35. SOIL CRUST LICHEN HUNTING AND IDENTIFICATION ON THE WILD HORSE WIND FARM AND WHISKEY DICK WILDLIFE AREA OF KITTITAS COUNTY, WASHINGTON
   Jensen, Dawn-Marie

36. LANDSCAPE APPROACH IN CULTURAL RESOURCE MANAGEMENT: GEOMORPHIC CONTEXT OF ARTIFACT DISTRIBUTION IN THE LOWER WHYCHUS CREEK WATERSHED CROOKED RIVER NATIONAL GRASSLAND JEFFERSON COUNTY OREGON
   Volkenand, Todd

37. ENVIRONMENTAL CONTROLS OF INVASIVE AQUATIC WEEDS IN WASHINGTON STATE LAKES
   Gray, Jeff; Gabriel, Anthony

38. SHORELINE INVENTORY PROCESS FOR PARK PLANNING AT DECEPTION PASS STATE PARK, WASHINGTON
   Merrill, Adam; O’Brien, Meghan; Gabriel, Anthony

39. THE ARCHAEOLOGY OF THE DAVIS LAKE AREA, DESCHUTES AND KLAMATH COUNTIES, OREGON
   Nauer, Christian

40. A WATER MANAGEMENT PLAN FOR BIRIM VALLEY, GHANA: INCORPORATING TRADITIONAL ECOLOGICAL KNOWLEDGE (TEK)
   Adjepong, Godfried

SOCIOLOGY

41. THE SOCIALIZATION OF GUILT ANALYSIS
   Gomez, Cornelio

FASHION DESIGN EXHIBITION

42. FASHION LINE CALLED MENAGE, BY DAVID MICHAEL
   Reimer, David

43. FLAUTESE
   Hammer, Emily

44. ELEGANCE TO ITS LIMIT
   Martini, Jenni

45. SPRING FEVER
   Birklid, Samantha

46. STRYCHNINE & KEROSENE LIPS
   Redmann, Loui

47. KJ DESIGNS
   Andersen, Kristen

48. DOWN TOWN CHIC
   Trosper, Ashley

49. PANTONE PANDEMONIUM
   Triber, Melissa
CREATIVE ACTIVITY SCHEDULE

Only presenters are listed for each creative activity.
A more complete description of each work is provided in the ABSTRACT portion of this program.

SESSION 2/3: FASHION SHOW
ROOM: SURC 137A/137B
(For more information, please refer to session 2/3 in the oral presentation schedule)

SESSION 12: MUSIC
ROOM: SURC THEATRE
(For more information, please refer to session 12 in the oral presentation schedule)

SESSION 20: DANCE
ROOM: SURC THEATRE
(For more information, please refer to session 20 in the oral presentation schedule)

6TH ANNUAL JURIED ART SHOW
SARAH SPURGEON GALLERY
8:00 a.m. - 5:00 p.m.
(See map on page 12 for directions)

CONCERTO COMPETITION
MUSIC BUILDING CONCERT HALL
6:00-9:00 p.m.
(See map on page 12 for directions)

OPERA SCENES
2ND FLOOR MEZZANINE
9:45-10:00 a.m.
“JETZT, SCHÄTZCHEN, JETZT SIND WIR ALLEIN”, FIDELIO, Beethoven
“SULL’ARIA,” ACT 3 DUET, LE NOZZE DI FIGARO, Mozart
Paul Walk and Amy Edwards

CHAMBER MUSIC
BALLROOM
NOON-12:15 p.m.
FOUR FOR TANGO, Piazzolla
Carrie Rehkof, John Michel, Heather Netz, and Tim Betts
COLLEGE HORNPIPE, O’Connor
Carrie Rehkof, John Michel, and Isaac Castillo

OPERA SCENE
2ND FLOOR MEZZANINE
2:45-3:00 p.m.
ACT 1 FINALE, DUET AND SEXTET, COSI FAN TUTTE, Mozart
J.R. Maxwell and Andrea Hansen
CONSTRUCTION OF A DISTRIBUTED COMPUTING CLUSTER  
*Abdul-Wahid, Badi’*  
*Faculty Mentor(s): James Schwing, Computer Science*  

*Session: 9 (Oral Session 10:00-11:30 in 201)*

The purpose of this project is to build an interconnected cluster of compute nodes and will serve as a basis for research into distributed and parallel computing. The cluster consists of several headless nodes controlled by a master node and is built using the Debian “Lenny” Linux distribution. It currently offers two main distribution options: applications can be managed by the Condor platform or their own runtime environment. By providing the basis of further experimentation using various distributed computing environments, such as MPI, Erlang, and the possibility of a heterogeneous architecture, the cluster is intended be used to further research into distributed algorithms as well as their application.

PREDICTION OF BIOLOGICAL EFFICACY FOR POTENTIAL *Plasmodium falciparum* Plasmepsin IV INHIBITORS  
*Abdul-Wahid, Badi’*  
*Faculty Mentor(s): Levente Fabry-Asztalos, Chemistry; Razvan Andonie, Computer Science*  

*Session: 28 (Morning Poster Session 8:15-11:30 Mezzanine)*

Malaria is a major challenge facing the world. However, FDA approval of one drug can require more than 10 years and over a billion dollars. Many thousands of potential drug candidates are synthesized and discarded during the search for a lead compound. We use computational tools in an attempt to reduce both discovery time and cost. We use two variants of artificial neural networks: a feed forward fuzzy neural network (FNN) and a fuzzy ARTMap with Relevancies (FAMR). The FNN uses a genetic algorithm-based feature selection to select the descriptors relevant for the enzyme model. The FAMR assigns a relevance factor to the input data. We apply these two neural network models to known inhibitors of *Plasmodium falciparum* Plasmepsin IV in order to predict the inhibitory efficacy of novel potential inhibitors.

APPLICATIONS OF GRAPH MATCHING FOR CHEMICAL STRUCTURES  
*Abdul-Wahid, Badi’; Roseberry, Gene; Thompson, Zacharias; Lopez, Branden*  
*Faculty Mentor(s): Razvan Andonie, Computer Science; Levente Fabry-Asztalos, Chemistry*  

*Session: 23 (Oral Session 3:00-4:30 in 137B)*

Recent work has utilized several machine learning algorithms to infer the properties of inhibitors of various enzyme models. We have used a feed forward fuzzy neural network and a fuzzy adaptive resonance theory map to approximate the relationship between descriptors to the HIV-1 protease and *Plasmodium falciparum* Plasmepsin IV. The current methods are limited by the dimensionality of the descriptors: they fail to incorporate the structural information of the molecules they represent. This project is an exploration of potential solutions to this problem. We discuss the nature of the problem, known solutions and their limitations, as well as some preliminary data.
FUZZY ARTMAP RULE EXTRACTION IN COMPUTATIONAL CHEMISTRY  
Abdul-Wahid, Badi'; Crivat, Bogdan; Abdul-Wahid, Sarah  
Faculty Mentor(s): Razvan Andonie, Computer Science; Levente Fabry-Asztalos, Chemistry  

Session: 23 (Oral Session 3:00-4:30 in 137B)  

We focus on extracting rules from a trained FAMR model. The FAMR is a Fuzzy ARTMAP (FAM) incremental learning system used for classification, probability estimation, and function approximation. The set of rules generated is post-processed in order to improve its generalization capability. Our method is suitable for small training sets. We compare our method with another neuro-fuzzy algorithm, and two standard decision tree algorithms: CART trees and Microsoft Decision Trees. Our goal is to improve efficiency of drug discovery by providing medicinal chemists with a predictive tool for bioactivity of HIV-1 protease inhibitors.

PARALLEL GENETIC ALGORITHM: MESSAGE PASSING ASYNCHRONOUS COMPUTATIONS IN F#  
Abdul-Wahid, Badi'  
Faculty Mentor(s): Razvan Andonie, Computer Science  

Session: 9 (Oral Session 10:00-11:30 in 201)  

The potential of parallel and distributed programs is well appreciated in high performance and scientific computing applications. As multicore computers become increasingly prevalent, there is an increasing need and desire to take advantage of these added computational resources. However, the traditional means by which concurrency is achieved can be tedious and bug-prone. The immutability-by-default paradigm of functional programming languages provides one way of solving some of these problems. As a means of exploring these capabilities, a parallel genetic algorithm has been implemented using the F# programming language.

PREDICTIVE SOFTWARE AS A RAPID SCREENING TOOL FOR POTENTIAL DRUG CANDIDATES  
Abdul-Wahid, Badi'; Barker, Grant  
Faculty Mentor(s): Levente Fabry-Asztalos, Chemistry; Razvan Andonie, Computer Science  

Session: 28 (Morning Poster Session 8:15-11:30 Mezzanine)  

HIV/AIDS is a major challenge facing the world. However, FDA approval of one drug can require more than 10 years and over a billion dollars. Many thousands of potential drug candidates are synthesized and discarded during the search for a lead compound. We present a tool to reduce both discovery time and cost. The predictive abilities of Artificial Neural Networks (ANN) are well documented. We use two ANN variants to predict the biological activities of potential drugs. Our models incorporate Fuzzy Logic, Feature Selection, Rule Extraction, and Evolutionary Methods. The experiments include two major phases: 1) training and optimization and 2) prediction. The ANNs are trained with a set of drug candidates whose biological activities are known. The fuzzy rules are extracted from the network and used to deepen our understanding of the relationship between molecular descriptors and activity. New candidates are then designed and screened. The best performants are then chosen for chemical synthesis. Our target enzyme is HIV-1: evidence indicates that its inhibition leads to reduced viral replication. These tools are general and applicable to other enzyme models. We are applying our predictive models towards Beta Secretase (associated with Alzheimer’s disease), Cathepsin D (associated with breast cancer) and Plasmepsin IV (associated with malaria).
A WATER MANAGEMENT PLAN FOR BIRIM VALLEY, GHANA: INCORPORATING TRADITIONAL ECOLOGICAL KNOWLEDGE (TEK)

Adjepong, Godfried
Faculty Mentor(s): Kathleen Barlow, Resource Management; Lene Pedersen, Resource Management

Session: 29 (Afternoon Poster Session 1:15-4:30 Mezzanine)

As a result of the global search for effective sustainable development practices, Traditional Ecological Knowledge (TEK) in Resource Management is gaining wide acceptance. At the same time, there is much concern about the failure of top-down water resource management policies in the developing world. This research focuses on the Birim Valley, which is a traditional area in southeastern Ghana, rich in natural and cultural resources, but faces major water resource challenges. The study aims to: 1) identify and examine the various forms of water problems, 2) identify and examine the traditional institutions, belief systems and social practices that have relevance to water resource management policies, 3) critically examine Ghanaian Environmental and Social Impact Assessment requirements, and 4) make suggestions for policy revisions that include use of TEK to address local water resource problems. This research will provide realistic alternative strategies to the Environmental Protection Agency (EPA) based on greater community involvement in environmental conservation. Local and international successful models provide a theoretical framework and basis for analysis. The study employs focus group discussion, in-depth semi-structured interviews, and photographic methods to gather data.

JEWSCHILDREN IN THE HOLOCAUST: THEY LIVED, THEY DIED, THEY PLAYED, THEY SURVIVED

Allocca, Courtney
Faculty Mentor(s): Heidi Szpek, Philosophy and Religious Studies

Session: 16 (Oral Session 1:15-2:45 in 140)

Despite living under the Third Reich’s oppression, many imprisoned Jewish communities sought to create an environment of normalcy for the children in their midst. Because of efforts made by parents and caring individuals alike, these children were able to experience a few fleeting moments of childhood during their short lives. Attempts to create toys and find ways to play were especially significant, and, consequently, served as a means of uniting the repressed people. By doing what they could to ensure the continuation of their children, the adults were able to feel as if they were doing something to control their own lives—and the promise for future generations of Judaism. In this presentation, I will highlight such cases from the ghettos of Eastern European and the death camps of Auschwitz. Additionally, I will briefly explore the memoirs of child survivors from Auschwitz and the ghettos.

KJ DESIGNS

Andersen, Kristen
Faculty Mentor(s): Andrea Eklund, Family & Consumer Sciences

Session: 29 (Afternoon Poster Session 1:15-4:30 Mezzanine)

My garments for KJ Designs are all inspired by the draping and manipulation of fabric. All three of my garments have an element of manipulation to add dimension to the fabric. I will be showcasing one of my three designs, and my entire line can be seen at the Fashion Merchandising spring fashion show, Satisfashion, May 30 at the Milo Smith Tower Theatre in McConnell Hall.
I will present arguments that Sartre's view of individuals as wholly self produced is less supported than the view that one is the product of oneself and one's environment. An action's meaning emerges only in relation to the circumstances in which it occurred. Defining one by his or her choices then implies the environments surrounding those choices if the essential meaning of those choices is to be unaltered. This results in the person being defined not by choice alone, but by the relationship between one's choices and one's environment. In addition to purely philosophical objections, empirical data from the fields of psychology and physics will be presented as counterexamples to the claim that one is entirely self-made. Psychological experiments have found that changes in environment produce significant statistical trends in human action despite researchers' inability to predetermine a participant's behavior. The uncertainty principle will be presented as a model for the position that human consciousness exists in merely observing that a conscious being effects its actions, yet not even extreme measures allow its actions to be predetermined. The theme overlaying all of these is that environment effects but does not determine a person's choices. Sartre seems to be working with a lopsided dualism in which subjectivity and objectivity exist in a one way relationship, and which ignores the influence of circumstance on human behavior. The simple solution is to view the complete system as neutral monad with no part completely independent of the others.

NUTRIENT INTAKE COMPARISON OF MALE AND FEMALE COMPETITIVE COLLEGE CROSS COUNTRY RUNNERS SHOWS HIGHER NUTRIENT DENSITY OF VITAMIN B2 AND VITAMIN E IN FEMALE RUNNERS

Aragon, Maria; Rust, Bret
Faculty Mentor(s): David Gee, Health, Human Performance & Nutrition; Leo D'Aquisto, Health, Human Performance & Nutrition

Session: 28 (Morning Poster Session 8:15-11:30 Mezzanine)

Many nutrients are important for endurance performance. Macronutrients provide energy during endurance events while many micronutrients play important roles as cofactors and antioxidants in energy metabolism. Adequate nutrient intake during training may be important in performance for competitive college cross-country runners. Nutrient needs differ among males and females; therefore, nutrient intakes may vary across gender among competitive runners. The purpose of the present study was to compare preseason macronutrient and micronutrient intakes between male and female cross-country runners aged 18-23. Among the 18 cross-country runners studied, three-day diet records were compared between males (n=8) and females (n=10) using ESHA Research Food Processor Software Version 8.0 (Salem, Oregon). Daily training mileage, lean body mass, and body weight were significantly higher in the male group (p<0.05). Nutrient density of the runners' diets was evaluated by comparing the intake of each nutrient per 1,000 kilocalories. Nutrient intake was compared per kilogram body mass and kilogram lean body mass. The diets of female cross-country runners showed a significantly higher nutrient density of vitamin B₆ (p=0.05) and vitamin E (p=0.03). Results showed higher intake of vitamin E per kilogram of lean body mass in the female group (p=0.03). Further comparisons showed a trend towards higher vitamin B₆ density (p=0.06) and dietary intake of vitamin C (p=0.06) among female runners. These results may show that overall dietary micronutrient density and intake may be higher in female cross-country runners when compared to males.
TRACKING AMPHIBIAN DISEASE IN NEPAL
Ault, Kori; Johnson, Allison; Wagner, R. Steven; Johnson, James
Faculty Mentor(s): James Johnson, Biological Sciences; Beth Pratt-Sitaula, Geological Sciences

Session: 6 (Oral Session 10:00-11:30 in 137A)

Amphibian populations around the globe are experiencing declines, and at least one third of amphibians are threatened with extinction. Given that this is the most extensive extinction event since the dinosaurs, it is critical to monitor the prevalence and distribution of factors that contribute to declines. Habitat and climate changes, environmental degradation, competition, predation, and disease all contribute to amphibian declines. One disease in particular, chytridiomycosis (chytrid) is credited with the declines and extirpations of many amphibian populations worldwide. Ongoing efforts to monitor for chytrid are in progress in 43 countries in all six continents where amphibians are found, including throughout Asia. Our study represents the first effort to test for the presence of chytrid in Nepal. We investigated the diversity and distribution of frogs in the Annapurna region on Nepal, and we used molecular polymerase chain reaction technique to test for the presence of chytrid DNA among the various frogs we encountered. Furthermore, we established a collaboration with Nepali biologists at Tribhuvan University to continue testing for chytrid throughout the country. Chytrid was not detected among these amphibians, but we recommend this area continue to be included in chytrid monitoring efforts. Documenting the occurrence and non-occurrence of the disease is important for developing management control strategies as we track the progression and impact of the disease as it continues to spread throughout the world.

BABY FROGS DYING IN BOGS
Ault, Kori; Wagner, R. Steven; Pinkart, Holly; Johnson, James
Faculty Mentor(s): James Johnson, Biological Sciences

Session: 14 (Oral Session 1:15-2:45 in 137A)

Water molds, primarily in the genus *Saprolegnia*, have been implicated in large-scale mortality of amphibian eggs under a variety of environmental conditions. Although a number of water mold species infect amphibian eggs, the pathogens involved in die-offs or utilized in ecological studies often remain unidentified or identified as only one of three species (*S. ferax*, *S. parasitica* or *S. diclina*). Lack of adequate identification makes it difficult to assess factors of the host-parasite interaction that contribute to saprolegniasis in amphibians. Furthermore, recent work indicates that the diversity of *Saprolegnia* infecting amphibian embryos may be significantly higher than what was previously known. We used Denaturing Gradient Gel Electrophoresis (DGGE) to assess the diversity of *Saprolegnia* on amphibian eggs from a single pond in central Washington. Unlike traditional morphological methods of identification, which have proven ineffective, and isolation methods, which often recover only the fastest growing taxa, DGGE allows us to quickly identify all the different potentially pathogenic organisms associated with a single embryo using small fragments of DNA. In this study, we found that most infected eggs contain multiple bands representing different species of water molds. These fragments will be sequenced and identified to species using a DNA barcoding procedure. This method is advantageous over simple DNA barcoding because it assures that we capture all the taxa growing on an individual egg. Based on these results, we strongly recommend that ecological studies of amphibian saprolegniasis take into account the diversity of and potential interactions between these pathogenic water molds.

END GAME AND TEMPEST COSTUME DESIGNS
Bakeman, Mary
Faculty Mentor(s): Scott Robinson, Theatre Arts

Session: 28 (Morning Poster Session 8:15-11:30 Mezzanine)

These costume designs are from the plays *End Game* by Samuel Beckett, and Shakespeare’s *The Tempest*. The costume designs required me to do extensive research in history, mythology, and culture which will also be available in addition to the posters. I used different mediums for each design; acrylic paint and tissue paper was used for *End Game* and water color for *The Tempest*. 
THE VALUE MODERN NATIVE AMERICAN MEN PLACE ON AGGRESSION AND HOW THEIR AGGRESSION BENEFITS CURRENT TRIBAL SOCIETY

Baker, Kiley
Faculty Mentor(s): Laila Abdalla, English; Matthew Altman, Douglas Honors College

Session: 8 (Oral Session 10:00-11:30 in 140)

In deliberate efforts to preserve both their ancestors' memories and their cultural values, Native American men often engage in violence or describe situations with words that support violent behaviors. This violence is negatively viewed as stereotypical behavior, but the men are simply doing their best to follow in the footsteps of tribal men before them, while wrestling with the challenges of living in both a traditional as well as modernized culture. Through his writing, Sherman Alexie, author of *The Lone Ranger and Tonto Fistfight in Heaven*, proves that although there are negative connotations attached to the violence, it is necessary and important for Indians, specifically the men, to engage in aggressive behavior for several reasons. The Indian characters engage in aggression because it is a bonding experience that brings them closer, it resurrects a proud role that does not currently exist, and it supports traditionally valued male roles that are slowly being overshadowed by popular culture. Because the traditional Native American characters are expertly placed in modern society, their values stand at a stark contrast, further proving that their violent nature is necessary for the retention of their past cultural values.

SOCIAL NETWORKING: A CRITICAL ISSUE FOR RETAILERS AND CONSUMERS TODAY

Baldwin, Patrick; Mesina, Hector; Thompson, Megan; Mackie, Sammy Jo; Meza, Guillermo
Faculty Mentor(s): Natalie Lupton, Information Technology & Administrative Management

Session: 26 (Oral Session 3:00-4:30 in 202)

This white paper discusses the critical issues concerning social networking that affect retailers and consumers in our globalized marketplace. Social networking includes internet-based tools that allow users to share personal and professional data through mediums such as Facebook, MySpace, Twitter, YouTube, blogs, and many others. Our presentation will cover two of the major critical issues within social networking that retailers and consumers are facing: 1) the benefits and disadvantages of conducting business and advertising within social networking sites, and 2) an overview of what business regulations may be needed as social networking quickly expands. Businesses have always relied on advertising to reach their customers in order to increase sales. As social networking grows, it will certainly be a medium worth exploring. However, more advertising via social networking will bring up more issues of privacy and fraud and more regulations may have to be enacted. We will propose suggestions to retailers on how to approach social retailing from a proactive viewpoint. By examining benefits and disadvantages, we will be able to present our arguments for why the benefits outweigh the disadvantages for a retailer to get involved with social networking. We will present our ideas on how to deal with the issues of privacy and fraud by discussing what regulations are currently in place, what regulations may be needed, and what some social networks are doing to protect customer data.

ACCOUNTABILITY IN HIGHER EDUCATION: A STUDY OF THE PERCEPTIONS OF UNIVERSITY AND STATE GOVERNMENT LEADERS IN THE STATE OF WASHINGTON

Ballou, Gary
Department: Education

Session: 11 (Oral Session 10:00-11:30 in 271)

This session explores the perceptions of leadership accountability in education programs in Washington across three different stakeholder groups: university deans, legislators, and executive staff members (Governor). This session presents insights from three rounds of interviews: 1) individual open-ended interviews with legislators, executive staff members, and university deans, 2) individual follow-up interviews with 5 participants from the preliminary interviews, and 3) focus group data from these same 5 participants, which reveals deeper insights. This session provides previously unavailable data and new insights about stakeholders' perceptions of leadership accountability in education programs. It provides valuable data to both current and future leaders in education programs and state government as they enact accountability policies and programs. This session provides other stakeholder groups, such as accrediting agencies, educational governing boards and the general public the opportunity to examine the perceptions of Washington university and government leaders with regards to leadership accountability. This session discusses recommendations leading to policy improvement and program enhancement. It explores various ways the audience can become involved in discussions surrounding educational reform.
FROGS IN SPRING ALL WINTER: OVERWINTERING OF CASCADES FROGS IN WASHINGTON STATE

Barreca, April; Irwin, Jason
Faculty Mentor(s): Jason Irwin, Biological Sciences

Session: 14 (Oral Session 1:15-2:45 in 137A)

Cascades Frog (*Rana cascadae*) are found only in montane ecosystems from Washington to Northern California. They are declining in parts of their range and are listed as “near threatened” by the World Conservation Union and are a U. S. Fish and Wildlife “species of concern.” An understanding of the basic ecology and biology of this species is urgently needed for preventing their decline in the Pacific Northwest. It is unknown where Cascades Frogs survive long mountain winters and what physiological adaptations they have to survive winter. Some species of frogs overwinter on the bottom of ponds to avoid freezing completely, but other frogs like the Wood Frog (*Rana sylvatica*) hibernate terrestrially. Radiotracking was used to monitor overwintering Cascades frogs at a high elevation wetland on Table Mt., near Ellensburg, WA. Temperature, dissolved oxygen, and snow depth were monitored because they are all important habitat components that may influence habitat selection by the frogs. Two seasons of data indicate that Cascades Frogs are not freeze tolerant and spend the entire winter in a spring that does not freeze (1-4°C) even as air temperatures fell to below -15°C. Dissolved oxygen in the spring was moderate at 6.4-8.2 mg/L and maximum snow depth was 3.2 meters. We conclude that Cascades frogs may have very specific habitat requirements to survive winter at high elevations, knowledge that will aid future conservation efforts.

IONS, NITRATES, AND BUGS OH MY!: WATER CHEMISTRY AT WHITE SWAN HIGH SCHOOL

Barreca, April; Rice, Tyler; Irwin, Jason
Faculty Mentor(s): Jason Irwin, Biological Sciences

Session: 28 (Morning Poster Session 8:15-11:30 Mezzanine)

The Watershed Activities to Enhance Research in Schools (WATERS) program is a National Science Foundation grant that pairs a graduate student in the sciences with a K-12 classroom. Local watershed science is incorporated throughout the year using inquiry based, hands-on learning. At White Swan High School, students studied the chemistry of water quality, gathered data, and designed their own research projects. Students learned to use probes to measure dissolved oxygen, pH, temperature, conductivity, and concentrations of nitrate, calcium, and ammonium. Students tested their own drinking water, then local stream water, and analyzed the compiled data. Next, they researched local water quality issues and debated them during a Socratic seminar. Based on the seminar, they designed research projects on water quality issues that interested them. Students examined water quality upstream and downstream from disturbed areas, tested the effectiveness of water filters, built devices that filter out pollution, measured the accuracy of calibration among water testing kits, and monitored effects of nitrates on plants and invertebrates. Some students attended a city council meeting where they explained their concerns about water quality in the lower Yakima Valley and volunteered to test well water in the local community. Students compiled their research into a written lab report, presented a power point about their project to the class, and some students will discuss their findings in this poster session.

OPTIMIZING TRAFFIC CIRCLES

Belieu, Branden; Hess, Russ; Mitchell, Kyle
Faculty Mentor(s): James Bisgard, Mathematics; Stuart Boersma, Mathematics

Session: 1 (Oral Session 8:15-9:45 in 135)

We will present our solution to the 2009 MCM Problem A: Designing a Traffic Circle. We designed our traffic circles as perfect circles in order to simplify the calculations of trip length and time in circle. After taking into account safe driver rules we used the “two-second rule” to find the most efficient and safe density. This maximizes the traffic flow a given circle can handle. Our single and double lane models choose a flow controller that best fits the actual flow. We extrapolated the basic ideas from the single and double lane models in order to take into account better real world situations such as traffic circles containing any number of lanes and the probability of each trip combination going through such a circle. These models are particularly strong since we have many different models, and they can be made as complex as the engineer (or user) requires them to be. We found that in most cases yield signs would be sufficient. But, when taking into account traffic flows exceeding a circle’s capacity, stop signs, and traffic lights are used to increase a circle’s capacity for traffic flow.
USE OF VISIBLE SPECTROSCOPY TO MONITOR THE REMOVAL OF BROMOTHYMOL BLUE FROM WATER USING A POLYELECTROLYTE/SURFACTANT/TIO₂ SYSTEM

Best, Brittany; Tasker, Adam; Hodges, Dave
Faculty Mentor(s): Dion Rivera, Chemistry

Session: 28 (Morning Poster Session 8:15-11:30 Mezzanine)

Water contamination as a result of water-soluble pharmaceuticals and other chemicals is increasing. Currently, there are no reliable methods that can remove these pollutants from the aqueous environment. Central Washington University and Ellensburg High School (EHS), in a National Science Foundation-funded partnership called Yakima WATERS, are working to investigate a potential method for effectively removing these chemical pollutants from the aqueous environment. The method under investigation utilizes a micellar polyelectrolyte/surfactant/TiO₂ system to enhance a current ultra-filtration method. Bromothymol blue (BB), a water-soluble organic dye, was chosen as a model compound for these studies. A suspension of BB, titanium dioxide (base of micelle), and polyelectrolyte sodium styrene sulfonate (PSSS) was made and incremental additions of surfactant cetylpyridinium bromide monohydrate (CBMD) were added. After each addition the mixture was separated using a centrifuge. The supernatant was then measured at 430nm, the primary wavelength for BB absorption, using a Thermo UV-Visible Spectrophotometer to determine the mole ratio of CBMD to PSSS at which BB is fully adsorbed into the micelle domain. Preliminary results indicate a more linear relationship between the amount of BB in solution and CBMD to PSSS mole ratio as CBMD concentration approaches the critical micelle concentration at around 1.6024×10⁻⁵ M.

A JOINT PARTNERSHIP: EHS AND CWU WORKING TOGETHER TO INVESTIGATE PHOSPHATE AND SULFATE LEVELS IN THE ELLENSBURG AREA

Best, Brittany; Miller-Rubin, Harper; Hodges, Dave
Faculty Mentor(s): Dion Rivera, Chemistry

Session: 28 (Morning Poster Session 8:15-11:30 Mezzanine)

Air quality in the Kittitas Valley, specifically around Ellensburg, varies according to seasonal changes and human activities. Central Washington University and Ellensburg High School (EHS), in a National Science Foundation-funded partnership called Yakima WATERS, are working to investigate air quality in the Ellensburg area of the Yakima watershed. Sulfate is one of the primary products of internal combustion engines. The main source of sulfate is exhaust from the heavily traveled Interstate 90 that runs through the valley. Phosphate, a major component of commercial fertilizer, is widely used across the Kittitas Valley, which is known for its strong agricultural presence. These two chemicals are of concern because they are key precursors to acid rain. Preliminary results collected by WATERS fellows and EHS science teachers and students indicate that air quality is predominantly worse in winter months than at any other time of the year, as a result of frequent thermal inversions that trap pollutants. Briefly, samples of particulates in the air were collected from the roof and analyzed for sulfate and phosphate using standard UV-Visible methods at EHS. Currently, EHS students and WATERS fellows are performing sample analysis. Kittitas Valley currently does not have a program to monitor these chemical pollutants, thus the need for a long-term sulfate and phosphate monitoring program to be initiated and continued at EHS.
A JOINT PARTNERSHIP: EHS & CWU WORKING TOGETHER TO INVESTIGATE AIR POLLUTION AS A RESULT OF OCCULT DEPOSITION IN THE ELLENSBURG AREA
Best, Brittany; Walker, Alexander; Mancinelli, Frankie; Hodges, Dave
Faculty Mentor(s): Dion Rivera, Chemistry
Session: 28 (Morning Poster Session 8:15-11:30 Mezzanine)

In the Kittitas Valley, the air quality in winter months is prevalently worse than at any other time of the year. Central Washington University and Ellensburg High School (EHS), in a National Science Foundation-funded partnership called Yakima WATERS, are working to investigate this seasonal variability in air quality in the Ellensburg area of the Yakima watershed. Changes in air quality during winter months can be attributed to thermal inversions that frequently occur during that time of year. If there is sufficient humidity in the air, occult deposition (fog) is typically present just below the top of thermal inversions. This effectively traps pollution closer to the ground, deteriorating air quality to levels where adverse health effects are observed. To date there is no fog monitoring program set up in the Kittitas Valley. Therefore a method for the detection and collection of fog was designed and implemented by EHS students, teachers, and WATERS fellows. In short, samples were collected and analyzed using standard UV-visible methods at EHS; currently EHS students are performing analyses on collected samples. The results obtained will assist future groups at EHS continuing to develop an effective and reliable fog collection method.

A JOINT PARTNERSHIP: EHS & CWU WORKING TOGETHER TO INVESTIGATE NITRATE POLLUTION IN THE ELLENSBURG AREA
Best, Brittany; Thorpe, Haley; McNamee, Sarah; Hodges, Dave
Faculty Mentor(s): Dion Rivera, Chemistry
Session: 28 (Morning Poster Session 8:15-11:30 Mezzanine)

Central Washington University and Ellensburg High School (EHS), in a National Science Foundation-funded partnership called Yakima WATERS, are working to investigate air quality in the Ellensburg area of the Yakima Watershed (YW). A recurrent pollutant in the YW is nitrate (NO$_3^-$), the primary product of internal combustion engines, and a major component of commercial fertilizer. The level of NO$_3^-$ pollution in the YW is of concern as it is one of the key precursors to acid rain. The main sources of NO$_3^-$ pollution in the Kittitas Valley is exhaust from the heavily traveled Interstate 90 and commercial fertilizer that is widely used across the valley, which is known for its strong agricultural presence. In summary, samples of particulates in the air and wet precipitation were collected from the roof and analyzed at EHS using standard UV-Visible methods to determine the level of NO$_3^-$ contamination in Ellensburg air. Currently, EHS students and WATERS fellows are analyzing the collected samples. Results from last year showed that NO$_3^-$ levels in Ellensburg air exceed the minimum contaminant level (MCL) set at 10ppm. Adverse health effects at this concentration include methemoglobinemia in infants and long-term exposure results in dieresis and hemorrhaging of the spleen. In order to determine if nitrate levels are on the rise in YW the inputs need to be assessed on a long-term basis, thus the need for this area of research to be implemented in a long-term monitoring program.

SUSTAINABILITY AND INSATIABILITY: VALUES AND PERCEPTIONS ASSOCIATED WITH CONSUMPTION
Bestvina, Bodarc
Faculty Mentor(s): Loran Cutsinger, Anthropology & Museum Studies
Session: 5 (Oral Session 10:00-11:30 in 135)

This paper presents the results of interviews with college students about the commodities they value. The research is aimed at understanding cultural factors behind the perception that acquiring certain material goods contributes to well-being. A qualitative analysis of the interviews is presented in an attempt to discover conceptual trends among participants. The desire for material goods in modern capitalist society may be a perpetual thought process, one which has manifested itself into a cultural construct. The justifications individuals have for valuing commodities, the criteria they have for defining quality of life, and their efforts to reduce human impact on the environment are interrelated issues. The opinions of participants can aid those who are attempting to create community education programs about environmental problems caused by consumption, as well as anthropologists who want to further understand the association of material wealth with identity and well-being.
IMPACT OF THE ALCOHOLWISE PROGRAM ON DRINKING IN RESIDENCE HALLS

*Biddle, Ryan; Gabriel, Kara*

Faculty Mentor(s): Kara Gabriel, Psychology

Session: 29 (Afternoon Poster Session 1:15-4:30 Mezzanine)

Use of online interventions to educate students on the effects of alcohol and other drugs of abuse is increasingly commonplace. Programs such as e-CHUG where students are made aware of their drinking behaviors have been shown to be effective at reducing the amount of alcohol consumed under some circumstances. In general, online interventions appear to increase the participants’ knowledge of alcohol and drug effects as well as reduce the number of negative consequences of heavy and binge drinking. The current study was designed to assess the effectiveness of mandatory participation of incoming freshman in Alcoholwise. In order to investigate the effectiveness of the Alcoholwise program, the number of weekly alcohol and drug citations issued on campus was compared over a five-year period, beginning in 2004 and culminating in 2008, the year in which the Alcoholwise program was made mandatory. Of particular interest was whether alcohol citations would decrease in the weeks after the program was made a requirement as compared to similar time periods from 2004-2007. Interestingly, the results of this study do not follow what previous research suggests or what was hypothesized, indicating that there was no overall reduction in alcohol citations in the fall quarter (2008) following mandatory participation in Alcoholwise. However, as expected, males received more citations than females and more citations were issued to students living in dorms with a high freshmen population compared to a low freshmen population in each year examined.

SPRING FEVER

*Birklid, Samantha*

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

Session: 29 (Afternoon Poster Session 1:15-4:30 Mezzanine)

“It’s spring fever. That is what the name of it is. And when you’ve got it, you want - oh, you don’t quite know what it is you do want, but it just fairly makes your heart ache, you want it so!” said Mark Twain. As cliché as a spring theme is for a spring fashion show, I have always been inspired by the sights and sounds of this my favorite season of the year. Spring is the time of year when there are new beginnings, from new flowers exposing us to their beautiful and colorful secrets they’ve been hiding all winter long to new life learning the ins and outs of their environment. With this being my first attempt at my own fashion line, this is also part of my new beginning, so I thought it would be an appropriate theme. My design process began with this inspiration in mind, and I designed a line that would glorify this time of year through its shapes and colors. I believe this dress gives a good example of the feeling I am trying to convey with my line: the colors are vivacious and beautiful and the shape of the garment allows for free flowing movement, which is a necessity when the warm weather we all long for finally comes. I chose this dress to represent my line of three garments that can be seen at the Fashion Merchandising spring fashion show, SatisFashion, May 30 at Milo Smith Tower Theatre in McConnell Hall.
ANTHROPOGENIC EFFECTS ON FLOODPLAIN GEOMORPHOLOGY, NACHES RIVER, WASHINGTON
Bishop, Tiffany
Faculty Mentor(s): Karl Lillquist, Geography

Session: 5 (Oral Session 10:00-11:30 in 135)

Floodplains are unique ecosystems, adjusting with greatly varying flows, while still sustaining through periods of drought or flood. The occurrences and disturbances that happen to the rivers inhabiting these floodplains directly affect their geomorphology. Mountain-based rivers, such as the Naches River of Washington’s Eastern Cascades Range, historically received higher pulses of runoff during the spring freshet due to snowmelt runoff. This paper examines the possible effects of decreasing or eliminating those pulses through their retention in reservoir lakes, and how these changes may affect floodplain geomorphology. Air photos, topographic maps, climgographs, and hydrographs of the Little Naches and Bumping Rivers, which are tributaries to the Naches River, were analyzed in an effort to identify the possible effects of snowmelt retention. Preliminary results indicate a relationship between river discharge regulation and floodplain width – i.e., the floodplain of the unregulated Little Naches River appears to be wider than that of the Bumping River. River restoration is becoming an increasingly important issue as we continue to learn the effects of anthropogenic changes to the riverine ecosystem. In the Pacific Northwest, salmon populations have been severely affected by these many effects on the ecosystem. As we move forward in attempting to recover these areas, floodplain function is one of many factors that must be investigated and rehabilitated if we hope to restore the ecosystem.

OPERA SCENES BY MOZART AND BEETHOVEN
Blaisdell, Gayla
Faculty Mentor(s): Gayla Blaisdell, Music; Nikolas Caoile, Music; Mia Spencer, Music

Session: Morning and Afternoon Intersession (9:45-10:00 and 2:45-3:00 Mezzanine)

Students from the Music Department’s Opera Workshop will perform some of opera’s favorite moments by Mozart and Beethoven. The students performed these scenes in the opera production on April 3 and 4 fully staged with sets, costumes, and lights. The performances in the SURC for the symposium will be semi-staged with minimal costumes and props. Student performers include: Amy Edwards, Paul Walk, J.R. Maxwell, Andrea Hansen, Jenny Ohrstrom, Courtney VanWinkle, Jared Ice, Elissa Cortright, Michael Connolly, and Micah Parker. The Beethoven scene will be sung in the original German, and the two Mozart scenes will be sung in the original Italian. The program includes: 1) “Jetzt, schätzchen, jetzt sind wir allein” from Fidelio, Beethoven; 2) “Sull’aria” Act 3 Duet from Le Nozze di Figaro, Mozart; and 3) Act 1 Finale Duet and Sextet from Cosi fan tutte, Mozart.

CLEAR AND DIRECTIVE: VALUE CLARIFICATION AS A TOOL FOR ADVANCE DIRECTIVES
Blesi, Lauren
Faculty Mentor(s): Matthew Altman, Philosophy

Session: 24 (Oral Session 3:00-4:30 in 140)

The progress made in modern medicine has resulted in the ability to sustain fragile life with the aid of advanced technology. A patient’s individual autonomy has become one of the chief concerns of medical professionals as treatment options increase. Every patient has the right to make medical treatment decisions regarding his or her personal health, and this principle of health care has posed challenges to the current policy practices. Advance directives such as the Physician Orders for Life Sustaining Treatment form used in Washington State affirm autonomy by effectively communicating an individual’s decisions in the event he or she is unable to. Since the implementation of the POLST, clear communication about personal decisions of life-sustaining treatment has improved significantly. Although the POLST form has shown to be advantageous in health care, some objections such as patient confusion or reluctance to complete the form have been raised. Further, questions of life-sustaining treatment can be particularly challenging in that the details used to make such decisions are often unimaginable to a patient in somewhat good health. The benefits of the POLST form, however, are great. In order to resolve the objections confronting advance directive implementation, a value clarification exercise should be offered to supplement the POLST form. Providing a values clarification tool will improve the ability of a patient to appropriately gauge decisions made in completing the POLST form, illustrate the crucial aspects of the specific care involved, and provide clarity of individual life values as they relate to end-of-life issues.
DUAL CREDIT COURSE FACILITATES EDUCATION PARTNERSHIPS
Bowers, Jan
Department: Family & Consumer Sciences

Session: 29 (Afternoon Poster Session 1:15-4:30 Mezzanine)

Central Washington University (CWU) is using the UNIV 109, Introduction to Civic Engagement course to facilitate a dual credit program between secondary schools and the university. Secondary schools apply to CWU for permission to offer UNIV 109 as a dual credit course. The secondary teacher must meet university teaching requirements and must provide evidence that the district course is equal to the university course. The two credit course includes learning outcomes for leadership development, career exploration, and civic engagement in the student’s career interest area. A university department chair and a college dean review the school district’s application to teach the course. A faculty member conducts an annual site visit at the school to assess the course quality and facilitates an annual in-service program for all district UNIV 109 partnerships. Secondary schools are using the course to meet the culminating project graduation requirement for their districts. CWU is using the course to build education partnerships with districts and to recruit students to CWU. The partnership between CWU and the state’s school districts enables highly capable secondary students to experience the challenge of college course work in their high school setting. CWU assessment data on dual credit programs indicates that dual credit courses are providing an effective means for: 1) offering place bound students a university course, 2) introducing secondary students to college-level course expectations and requirements, 3) predicting student success at CWU, 4) recruiting students to CWU, and 5) building education partnerships.

YAKIMA WATERS: STUDENTS INVESTIGATING AMPHIBIAN DECLINE
Brady, Susan; Arlt, John; Carolan, Lana; Quitadamo, Ian; Johnson, Jim
Faculty Mentor(s): Jim Johnson, Biological Sciences

Session: 28 (Morning Poster Session 8:15-11:30 Mezzanine)

Yakima WATERS is a National Science Foundation sponsored, regional program designed to promote integration of interdisciplinary science research into K-12 public school classrooms. Each WATERS team includes a Central Washington University graduate student fellow, a faculty mentor, and a local K-12 teacher. The goal of this collaboration is to encourage the incorporation of relevant watershed-based research into the science classroom. The WATERS team at Ellensburg High School has implemented immersive, research-focused field trips and inquiry-based classroom activities and labs that emphasize topics related to amphibian disease research and decline. Students assessed potential causes of amphibian declines such as habitat degradation and disease. Students discussed the importance of wetlands and wetland restoration for declining amphibian populations. A wetland restoration project on the high school grounds will provide future students an opportunity to be involved in a long-term interdisciplinary monitoring project. Tenth grade biology students also designed and conducted their own research. A number of fungi and fungus-like organisms including the water molds, particularly in the genus, Saprolegnia, have been implicated in causing amphibian disease and mass mortality events. Students investigated a variety of topics including: the effects of different isolation conditions on the recovery of water mold biodiversity; growth rates with respect to different environmental conditions such as nutrient type and concentration, temperatures, and pH; and factors influencing chemotaxis and electrotaxis of zoospores. Students collected and analyzed data, drew appropriate conclusions based on their data, and evaluated their findings in the broader context of amphibian decline.
THE CHANGING ROLE OF PSYCHOLOGICAL ACCREDITATION

Brammer, Robert; West, Rondale
Department: Psychology

Session: 29 (Afternoon Poster Session 1:15-4:30 Mezzanine)

Historically, two accreditation frameworks dominated psychology. The model born out of the Boulder Conference in the 1950s, emphasized training psychology graduate students as both scientists and practitioners. The Vail Model, born 25 years later, toned down the scientist training and emphasized the “mutuality of science and practice.” No new framework has been advanced since the Vail model, and some schools include either the Boulder or Vail wording in their mission statement. In this study, 258 psychology programs across the country were surveyed about which model they preferred. Given the movement toward practitioner-based training, the Boulder and Vail models were also contrasted with a third model (referred to as the Washington Model). In the Washington Model, training centers are regionally accredited, evidence based, able to accredit masters programs for psychological associates, and emphasized professional identity. Participants identified preferences for where programs should be housed, definitions of the “scientist practitioner,” the type of degree APA should accredit, the role of accreditation teams, and the goal of accreditation. Results indicated a movement away from the Boulder model. The Washington Model found some support but still lags behind the others. A discussion of the history and changing direction of psychological accreditation is included in the poster.

LANDFORM MORPHOGENESIS: HIGH BAR, HELLS CANYON

Brown, Genevieve; Frank, Harold; Volkenand, Todd; Nauer, Christian
Faculty Mentor(s): Morris Uebelacker, Geography

Session: 29 (Afternoon Poster Session 1:15-4:30 Mezzanine)

The geologic history of docking, deformation, and erosion of the Wallowa exotic terrain with the North American continental plate resulted in the formation of Hell’s Canyon, the deepest canyon in North America. The steepness of the Canyon walls presents a landscape subject to mass wasting events and colluvial, fluvial, and aeolian erosional and depositional processes. Within this context the subject location, High Bar, and its associated hillslope were evaluated using literature and published maps, remotely sensed data, field survey, and topographic mapping. High Bar belongs to a complex of gigantic flood bars and terraces attributable to the Bonneville Flood that occurred 17,000 years ago. High Bar is unique among these bar and terrace forms because of its direct association with a massive boulder field upslope. The resulting landscape reveals a complex mosaic of massive landslide and catastrophic flood events commingled with continuous and episodic alluvial, colluvial, and aeolian processes. It is our conclusion that the evidence resulting from the land sliding and catastrophic flooding does not clearly support a landslide that significantly blocked the Snake River, but rather indicates interaction between the high volume and high velocity flood event with the landslide toe as it encroached on the Snake River’s established thoroughfare.

PIANO TRIO

Brown, Brandi; Rodgers, Emily; Flaten, Erik
Faculty Mentor(s): John Michel, Music; Carrie Rehkopf, Music

Session: 12 (Performance 10:00-11:30 Theatre)

THE EFFECT OF A HIGH-FAT DIET ON MITOCHONDRIAL FUNCTION IN THE ROUNDWORM, *CAENORHABDITIS ELEGANS*

*Bryner, Stephanie; Thomas, Carin; Carnell, Lucinda*

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

Session: 23 (Oral Session 3:00-4:30 in 137B)

Type II diabetes is a worldwide epidemic affecting over 246 million people, but the cellular mechanism that initiates the disease is still unclear. Recent research shows a link between mitochondrial function and type II diabetes. The aim of this research is to investigate one specific aspect of that link. In particular, we will investigate the role of a mitochondrial enzyme, Nicotinamide Nucleotide Transhydrogenase (NNT), and its impact on maintaining mitochondrial function in animals exposed to a high-fat diet. The experimental plan is to grow three genetically distinct populations of the roundworm *Caenorhabditis elegans* (wild type and two mutants that lack nnt gene) on high-fat and normal diets and compare the mitochondrial function of these animals using several biochemical techniques. The results will either highlight or refute the importance of NNT in maintaining mitochondrial function in animals on a high-fat diet.

SEXUAL DIMORPHISM OF RECOMBINATION RATES AS A CONSEQUENCE OF SEXUAL CONFLICT

*Buxel-Florenzen, Stefanie*

*Faculty Mentor(s): Lixing Sun, Biological Sciences*

Session: 28 (Morning Poster Session 8:15-11:30 Mezzanine)

In previous studies, it has been shown that females tend to have higher rates of recombination. It is believed that females will gain long-term fitness by increasing their recombination rate in highly polygynous mating systems. Recombination is an important evolutionary process that contributes to genetic variability. My study is in conjunction with research conducted by Dr. Lixing Sun and Dr. Yvonne Chueh. They have developed a mathematical model to describe this sexual conflict. However, computer simulation is required to verify their model. I will be using GeneTracker, created by Dr. Sun and Dr. Razvan Andonie. I will manipulate four evolutionary conditions to explore the fates of genes carried by both sexes. These conditions include mating system (polygynous and monogamous), population size (100), social structure (randomly assigned, 50 percent assigned, 100 percent assigned), and sex ratio (0.5:1, 1:1, 1:2). I will replicate each treatment level 100 times. I will record gene frequencies from both sexes in the initial population and the rate of evolution. Dr. Sun and Dr. Chueh’s mathematical model will be used to analyze and compare my data. As a graduate student, I will continue to test this hypothesis with live models.

CIVIL LITERACY

*Cannon, Craig*

*Faculty Mentor(s): Rex Wirth, Political Science*

Session: 17 (Oral Session 1:15-2:45 in 201)

I seek to addresses concerns about Civil Literacy and present a trial for the State of Washington that could be used to remedy the low civil literacy problem with very minimal costs. The proposed program would be implemented in Skamania County of southwestern Washington. At this location there are already minimal programs in place but without any uniformity. Programs for educating our children about civil literacy require some oversight so that we can ensure that civics is taught to each student. The program, as a trial, requires only a minimum of funding as certain measures have already been taken to educate teachers in the instruction of civics. This new proposal would expand the teaching of civics from being an optional class to a required one in order to ensure that the next generation of United States citizens is well educated about their rights and responsibilities as citizens.
ANALYSIS OF ELECTROTAXIS BEHAVIOR IN THE ROUNDWORM, *C. ELEGANS*

*Chrisman, Steven*

*Faculty Mentor(s): Lucinda Carnell, Biological Sciences*

*Session: 22 (Oral Session 3:00-4:30 in 137A)*

The roundworm, *Caenorhabditis elegans* (*C. elegans*), is widely used to study the genetic basis for behavior and is an excellent choice for a sensory study because they have a nervous system of 302 neurons whose connections are all known (White et al., 1986). *C. elegans* sense both polarity and amplitude of an electric field by uninterrupted crawling toward the negative pole, a behavior referred to as electrotaxis (Sukul and Croll, 1978). To examine the sensory mechanism responsible for electrotaxis, we have tested known chemosensory-defective mutant worms and performed a genetic screen to isolate worms defective in the sensing of the electric field. We have isolated mutants into two general classes: those that taxis to lower field strengths (hypersensitive) and those that respond to higher field strengths (resistant). We are in the process of characterizing these mutants further by recording their response and measuring velocity using the automated tracking software, WormTracker (Ramot et al. 2008). To determine and quantify the animals’ sensitivity to an electric field, we are measuring velocity at different field strengths over time. The long-term goal of this research is to determine the genes and protein/s responsible for electrotaxis by identifying the location of the genetic mutations in these mutant worms.

POLYCHROMATIC EMISSION AND LIMITATIONS TO BEER’S LAW

*Christensen, Amanda*

*Faculty Mentor(s): Tim Sorey, Chemistry; Robert Rittenhouse, Chemistry*

*Session: 28 (Morning Poster Session 8:15-11:30 Mezzanine)*

Traditionally chemists use Beer’s Law to express linearity of absorbance versus concentration at the analytical wavelength, \( \lambda_{\text{max}} \). The goals of this project are to find a repeatable non-linear graph at non-\( \lambda_{\text{max}} \) wavelengths for four different colored solutions, apply a mathematical equation that best fits these data, and propose a theoretical basis for said mathematical model that explains this nonlinear trend. In order to attain these goals, the colored solutions are going to be analyzed with a monochromatic (1nm resolution) UV-VIS spectrometer and a Light Emitting Diode (LED) spectrometer between 350-700nm. If non-\( \lambda_{\text{max}} \) wavelengths have a repeatable non linear graph then a calibration (mathematical model) can be formed to fit this graph. This mathematical model can be used by anyone, teachers in particular, who may not have access to monochromatic spectrometers but wish to make mathematical corrections to polychromatic analytical wavelengths to obtain research grade results.

A CULTURAL AUDIT AT CENTRAL WASHINGTON UNIVERSITY

*Cole, Melissa; Sleigh-Layman, Staci*

*Faculty Mentor(s): Elizabeth Street, Psychology; Kathleen Barlow, Anthropology & Museum Studies*

*Session: 29 (Afternoon Poster Session 1:15-4:30 Mezzanine)*

From an institutional perspective, Central Washington University questions its day-to-day ability to provide for, and respond to, the needs of a diverse workforce and student body. In order to address, proactively, these needs and to educate our community in ways that will benefit the university in the long term, a meaningful cultural audit is needed, is supported by President Gaudino, and will be conducted. University leaders will be challenged to move beyond compliance efforts to reaffirm diversity and inclusion as core elements of the learning environment and essential to academic excellence. In the words of Dr. Ann Austin, Michigan State University: “If we can gather data, it lets us highlight what the problems are. And we can use this data as a catalyst for why we need change.” A study will be done to investigate climate-related experiences and perceptions of employees and students at Central Washington University. During spring quarter 2009, focus groups will be conducted to examine demographic variables, attitudinal responses, satisfaction levels, and retention in relation to race, sex, and other demographic factors. Focus group data will then be used to construct a survey for all employees and students to be conducted during fall quarter 2009. Data will be examined, again, in relation to race, sex, and other demographic factors. Recommendations to improve the working and learning life for all employees and students will be suggested. Relevant literature, research progress, and details of the plan of study will be shared.
A STUDY OF HIGH RISK BEHAVIORS RELATED TO GENERAL AND MENTAL HEALTH
Conaway, Linda; Harris, Heather
Faculty Mentor(s): Yvonne Chueh, Mathematics

Session: 29 (Afternoon Poster Session 1:15-4:30 Mezzanine)

How is engaging in high risk behavior related to general and mental health? This is the question that our study hopes to answer. The National College Health Association provides the data needed to analyze this question. The sample includes 551 college students from Central Washington University in 2007. The data was collected through a series of questions related to drinking habits, sexual activity, general health, academic standings, mental health, and other interesting general college practices. To study the relationship between general and mental health and high risk behavior, such as drug and alcohol abuse and sexual activity, multiple regression models will be used to fit the data and see if any discoveries can be made about correlations between high risk behaviors and general and mental health. Multiple regression models will also be used to learn if high risk behaviors can explain mental health problems such as depression and anxiety in college students. The study will be given to officials within the university with hopes that programming can be implemented to help control high risk behaviors and help general and mental health.

REINFORCEMENT OF GENDER IN PRESCHOOL CHILDREN
Cruz, Epsy
Faculty Mentor(s): Laura Appleton, Sociology

Session: 10 (Oral Session 10:00-11:30 in 202)

Recent research on Middle and High School age children shows that teachers pay a significantly greater amount of attention to male students—for both positive and negative behaviors—than female students and that this results in a higher rate of confidence and success for males in our society. During a period of three months, five days a week, working as a Family Service Worker for Kittitas County Head Start, I systematically observed two classrooms, consisting of 37 children and nine staff members. My hypothesis was that teacher-child interactions affect the confidence as well as success levels of children at the early preschool age. I found that teachers’ interactions were a function of whether they were dealing with boys or girls, who were praised or criticized for different behaviors. Females were praised for being quiet, helpful, friendly, and motherly towards other children. Males were praised for being aggressive, energetic, independent, throwing tantrums, and being physically adept at athletic activities. I also observed differences in behaviors among males, with Hispanic males adhering to more stringent gender norms of “machismo.” In a standardized tool for measuring and predicting educational success used by KCHS, it is the case that males were rated as further advanced in areas such as physical ability, cognitive development, and language development than their female counterparts.

MAPPING WITH THE GENETIC ALGORITHM: FINDING A SAFE PATH THROUGH A FLOOD ZONE USING A GENETIC ALGORITHM
Curtis, Steven
Faculty Mentor(s): Razvan Andonie, Computer Science

Session: 9 (Oral Session 10:00-11:30 in 201)

In coastal regions with low altitude, flooding is common. I have created a program to take in a simple map and, using the genetic algorithm, find an optimal route through a digital representation of a given hazard map. This program takes a portion of information from a given map and uses that to come up with the safest route possible. The only information it accepts is road connections, road and intersection altitudes, the water level altitude, and the starting and goal intersections. Based on the connections of each road and the altitude of each position on the road (beginning, middle, and end) it will determine a path that is the shortest path above or below the water elevation (depending on an existing path above water). Ideally, a more advanced program of this type should help to make safe escape routes through hazard zones that includes even more than just flooding. Also, this program should be able to take a scan of a road map and user input on that road map and determine a safe route through the given area for printout and review. Currently, the program relies entirely on user-input data for the map, connections, hazards, and all other necessary data.
GOING GREEN: THE CHANGES IN THE RETAIL ENVIRONMENT INVOLVED IN SUPPORTING THE SUSTAINABILITY OF THE ENVIRONMENT

Davis, Melinda; Dwyer, David; Cowles, Kirsten; Rudolph, Ashley
Faculty Mentor(s): Natalie Lupton, Information Technology & Administrative Management

Session: 26 (Oral Session 3:00-4:30 in 202)

Going green represents the idea of conserving and improving the environment. This presentation explores the idea of converting retail practices to promote an environmentally friendly impact. The focus of this presentation inspired the development of an industry-specific white paper. Main issues we will cover are: 1) the initial implementation of an overall greener retail facility, 2) green product merchandising, and 3) the financial benefits of going green. The initial implementation of an overall greener facility is the idea that businesses will focus the design of their retail facility to decrease the waste of energy, water, and materials. An example of this would be using energy efficient light bulbs and installing solar panels to provide heat and hot water. This would greatly impact the electricity power needed at that location. The issue of green product merchandising is the idea that retail stores are offering green products to their consumers. With so many consumers switching to greener habits, this can increase a company’s business by providing customers with what they want. Some examples of products the store could carry would be reusable bags for purchased products, organic foods, and non-toxic and chemical free cleaners. The last issue, the financial benefits of going green, explores the idea of how much retailers will be saving in the long run by converting to a greener strategy.

CHARACTERIZATION OF BACTERIAL VIRUSES FROM SOAP LAKE, WASHINGTON

De Rosa, Antonio
Faculty Mentor(s): Holly Pinkart, Biological Sciences

Session: 28 (Morning Poster Session 8:15-11:30 Mezzanine)

Soap Lake (Grant Co., WA) is a permanently stratified lake characterized by high pH and high concentrations of carbonate, sulfate, and sulfide. The unusual chemistry has resulted in the evolution of microbial species unique to Soap Lake. Bacterial viruses can also drive microbial evolution. It is likely that bacteria adapted to the conditions of Soap Lake will harbor equally distinctive viruses. The goal of this project was to isolate bacterial viruses (bacteriophage) from Soap Lake and characterize them in terms of their host range and molecular biology. Water samples from the upper layer (mixolimnion) of Soap Lake served as the source of both host bacteria and viruses. Using culture media that simulated Soap Lake chemistry, 21 bacterial strains were isolated to serve as potential hosts for viruses. To isolate viruses, Soap Lake water was subjected to a series of filtration steps to remove cells and to concentrate virus-sized particles. All bacterial isolates were then treated with the virus-enriched concentrate. Bacteriophages were isolated using plaque assays, a standard microbiological technique. Of the 21 bacterial strains treated, only one developed plaques, though there were three distinct plaque morphologies observed. These were termed plaque Type I, II, and III. Treatment of the other 20 bacterial isolates with viruses obtained from plaque type I did not result in infection, suggesting that the host range for plaque type I is limited. Future work will include analysis of plaque types II and III, and sequencing of the viral genomes of the viruses isolated in this study.

FIELD TEST VALIDATION OF THE BORG 15-POINT RPE SCALE FOR TETRAPLEGIC ATHLETES

Del Pozzi, Andrew; Pritchett, Robert; Katica, Charlie; Crosson, Chad; Pritchett, Kelly; Peters, Jamey
Faculty Mentor(s): Robert Pritchett, Health, Human Performance & Nutrition

Session: 28 (Morning Poster Session 8:15-11:30 Mezzanine)

The purpose of this investigation was to determine the efficacy of the Borg Ratings of Perceived Exertion scale on physiological parameters; heart rate (HR) and blood lactate (LA) for highly trained tetraplegic athletes. Participants (n=5) were males with a cervical spine lesion ranging from C4- C7. Participants underwent four field testing sessions. Testing Session one and three captured subjective ratings associated with the established Borg RPE scale. Sessions two and four validated the reproduction of physiological measures. A Pearson’s correlation indicated that RPE had a moderate, yet significant ($P < 0.01$) correlation with HR ($r = .474$) and LA ($r = .624$). A, 1 X 3 repeated measures ANOVA indicated no significant difference between trials for HR, LA and RPE. The results of this study indicate that RPE is an effective method of subjectively quantifying intensity for tetraplegic athletes.
FAUNAL ANALYSIS OF SANDERS SITE, 45KT315  
Dice, Laura; Nauer, Christian; Black, Jill  
Faculty Mentor(s): Steven Hackenberger, Anthropology & Museum Studies

Session: 29 (Afternoon Poster Session 1:15-4:30 Mezzanine)

The collection from the Sanders site in Central Washington University contains tens of thousands of artifacts and other cultural remains that were excavated 30 years ago and represent occupations at least 9,000 years old. The collection has recently been revived as an important focus of research for the CWU Anthropology Department. The faunal remains from the Sanders site are substantial and provide opportunities for the training of students in zooarchaeological methods and data analysis. This study looks at a strategic sample of the faunal remains to assess morphological variability and taphonomic effects. Data is systematically recorded and entered into a database that allows for many angles of statistical analysis. Data gleaned from the faunal remains will compliment other current investigations into lithic and shellfish analysis, and will contribute significantly to the comprehensive understanding of food procurement strategies and pre-contact lifeways in this part of the world.

PRACTICUM/VISITATIONS HIGHLY EFFECT VISUAL ARTS TEACHER CANDIDATES  
Donahoe, Susan; Taylor, Kristen; Richter, Constance; Denneghey, Kathryn; York, Natalia  
Department: Education

Session: 11 (Oral Session 10:00-11:30 in 271)

Teacher-candidates majoring in Visual Arts Education expressed the desire to see actual art classrooms. The state law, WAC 181-78A-270 (Standard V) and state standards require contact with K-12 students by teacher candidates going through training. Winter quarter contact increased by adding 6 Practicum/Visitations to curriculum of ART 495. Several sources of support made these changes happen. First, two students were able to fully attend and participate as members of the Washington Art Education Association’s Annual Conference in Richland with funding support from Charlotte Tullos’ Office of Vice President of Student Affairs. Faculty from K-12 invited them to classrooms. These teachers are leaders who have gotten their National Certification credentials and work hard to keep quality programs in an array of highly diverse settings. Secondly, Dr. Susan Donahoe, Past-President of the Washington Art Education Association, arranged and led visits to the six sites: Cle Elum, Ellensburg, and two in both Yakima and on the Westside. The students were able to spend quality time with K-12 students and talk with the teachers in depth. Thanks to Liahna Armstrong, Art Department Chair, for supplying the transportation to Cle Elum and the Westside, and Margo Selski for accompanying the group. Two additional students attended ArtsTime, the Bi-Annual state conference for all the arts and again network with teachers. The teacher candidates' words of reflection are touching and clearly give adequate appreciation for these awakening experiences. These results of learning are phenomenal.

COERCION IN THE PATIENT-DRUG COMPANIES RELATIONSHIP: WHY PHARMACEUTICALS “EDUCATIONAL” TOOLS ARE IMMORAL  
Downes, Phillip  
Faculty Mentor(s): Matthew Altman, Philosophy

Session: 24 (Oral Session 3:00-4:30 in 140)

As patients, many of us go into physicians’ offices and experience many “educational tools,” such as posters, props, and videos, to advertise the pharmaceutical companies’ products. The use of these devices is often thought of as a means of informing patients. Unfortunately, the effects of these educational props on patients have been largely ignored, which is extremely problematic since patients are given more control over their own healthcare, and these decisions are manipulated by their exposure to product advertisement in the physicians’ offices. By using basic physiological concepts about marketing to elucidate the effectiveness of educational tools, this paper demonstrates that educational tools can create a biased education, and this biased education removes patients’ capacity to deliberate—hence, it hinders autonomy. With this conclusion, I suggest that educational tools ought to be used differently, so that physicians can protect patients’ autonomy by preserving a balanced education.
GUARDIANS OF MINORS AND INFORMED CONSENT: WHY ABORTION CASES SHOULD BE THE EXCEPTION

Dunleavy, Casie
Faculty Mentor(s): Matthew Altman, Philosophy

Session: 24 (Oral Session 3:00-4:30 in 140)

As it stands now, most minors must appeal to the permission from either a parent or a court of law to be granted consent to an abortion. I provide seven arguments for why minors should have the freedom to choose for themselves whether or not to abort their fetus. My arguments are defined as follows: the possibility of forgery, incest, a right to privacy, the potential of teenage school dropouts, psychological studies that prove the minor’s maturity, the prejudice of a marriage contract, and the argument that hostile communication from the parent harms the minor. Through these arguments, I demonstrate that requiring consent from a guardian can harm the pregnant minor and is morally wrong.

TIMING AND CAUSES OF MULTIPLE CYCLES OF CHANNEL INCISION IN THE LAST 3000 YEARS ON THE YAKIMA TRAINING CENTER, SOUTH CENTRAL WASHINGTON

Durkee, Matthew; Ely, Lisa
Faculty Mentor(s): Lisa Ely, Geological Sciences; Beth Pratt-Sitaula, Geological Sciences; Allen Sullivan, Geography

Session: 28 (Morning Poster Session 8:15-11:30 Mezzanine)

Small intermittent streams have cut deeply incised channels (arroyos) into consolidated sediments within the Yakima Training Center (YTC) military reservation, South Central Washington. This study intends to determine if, when, and why similar channel incision occurred during prehistoric times as there is debate about what processes, natural or human related, may have contributed to present day arroyos. Current incision of sediments along Selah Creek is primarily attributed to multiple failures of an irrigation reservoir dam during the winters of 1909 and 1910. This incision exposed evidence of at least one previous episode of arroyo incision and refilling, which had cut a channel through ~6 m of massive silt layers, before filling with fine- to coarse-grained thinly bedded sands. Initial ages from radiocarbon dating, optically stimulated luminescence (OSL), and volcanic ash chronologies from two sites bracket the most recent prehistoric arroyo incision between 3140±40 and 1000±40 years before present (BP). Filling of the paleo-arroyo ceased between 520±60 BP and 110±40 BP, where a distinct 0.5-1 m thick thinly bedded silt unit caps the fill. Changes in sediment supply, climate, flooding characteristics, or a combination may have contributed to past cycle(s) of cutting and filling of the Selah Creek channel. Additional dating will allow further investigation of the possibilities of synchronous timing of arroyo incision on multiple channels within the local region, as well as the initial indications of negative correlations with similar alluvial cycles in the southwestern USA, which often experiences opposite climatic trends to those in the Northwest.

SYNTHESIS AND CHARACTERIZATION OF ZINC-BASED QUANTUM DOT MATERIALS

Durkee, Heather
Faculty Mentor(s): Dion Rivera, Chemistry

Session: 15 (Oral Session 1:15-2:45 in 137B)

Blue to green fluorescence is exhibited by zinc-based quantum dot (QD) materials capped with sodium polyphosphate and L-cysteine. The factors governing this final fluorescence and intensity were explored using kinetic studies. Fluorescence and absorption spectroscopy were used to monitor relative size of QDs and fluorescence intensity as a function of time. Fluorescence data shows gradual formation of an emission peak at 520 nm, and shows shifting of this emission peak to 480 nm over a 24 hr time period. Fluorescence results suggest that zinc oxide is forming on the surface of the ZnS nanocrystals and during early heating stages may be acting as a dopant within the zinc-based nanoparticles. As the nanocrystalline material is heated over a 24 hr period spectroscopic data suggests that a shell of ZnO is forming around the nanocrystal. Position of the fluorescence band can be roughly tuned between ~470 and 520 nm depending on the experimental conditions. Our preliminary studies suggest that the nanoparticles serve as a scaffold for the ZnO to grow on. Synthesis of ZnO nanoparticles under similar conditions without the presence of ZnS has not been successful.
MORE EVIDENCE THAT MUTATION RATE IN THE CHLOROPLAST GENOME DEPENDS ON COPY NUMBER  
Dutton, Ashley  
Faculty Mentor(s): Linda Raubeson, Biological Sciences  
Session: 22 (Oral Session 3:00-4:30 in 137A)

The conservative nature of the copy variable region (CV) of the chloroplast genome is well established; however, the basis for the lower mutation rate has been debated. Two ideas have been proposed to explain the reduced rate: 1) genes in the region are inherently slow to evolve, or 2) the presence of two copies reduces rate via copy correction. Comparisons of 83 genes and 20 introns were made estimating mutation rates, from both the CV region and single copy (SC) regions in legumes and gymnosperms. In gene and intron comparisons, CV and SC rates from genomes containing two CV copies and genomes containing one CV copy were compared. Synonymous and nonsynonymous substitution rates, average distances, and Tajima’s relative rate test support the conclusion that reduced IR mutation rate is due to the presence of two copies. Copy correction between copies is the most likely mechanism for the sequence conservation observed in the CV when two copies are present.

FASHION: AVANT-GARDE TO EVERYDAY  
Eklund, Andrea  
Department: Family & Consumer Sciences  
Session: 2,3 (Oral Session 8:15-9:45 in 137A/B)

The SOURCE fashion show is a preview of student designs from FCSA 488 Fashion Line Development and eco-friendly designs from the Forever Green Affair. Students in FCSA 488 produce an apparel line of three original garments from conceptualization to completion. Design concepts are executed through storyboards, identification of a target market, merchandising strategies, draping and flat patterning techniques, and completion of samples to the finished garment. For the SOURCE fashion show the students selected their favorite and most representative garment from their line. The final project of three original designs will be showcased at the Fashion Merchandising annual fashion show, SatisFashion, May 30 at Milo Smith Tower Theatre in McConnell Hall. Students in FCSA 388 Apparel Construction 2 and the Fashion Club created and showcased eco-friendly designs at the Forever Green Affair celebrating the new Museum of Culture and Environment in Dean Hall. The students used various items from wedding dresses, grocery bags, old suits, and magazines to create original designs. The designs ranged from avant-garde art pieces to elegant evening attire showing the diverse possibilities of eco-friendly clothing.

VISUAL SIMULATION OF MOVING OBJECTS  
Emery, Leif  
Faculty Mentor(s): Boris Kovalerchuk, Computer Science  
Session: 9 (Oral Session 10:00-11:30 in 201)

The goal of the project is to find out how to intercept an incoming object based on images of the object from multiple locations over a brief period of time using an algorithm and adding an amount of uncertainty that needs to be overcome. This task is common for developing intelligent computer games as well as realistic simulation of moving objects, such as rockets, using 3D computer graphics. This system incorporates a 3D model of a rocket that travels from the left side of the screen to the right while another 3D model representing an anti-rocket travels from the right side with the goal of intercepting the rocket. The only means of calculating the trajectory of the rocket to intercept it is through the placements of a few cameras that records images of the rocket as it passes by them at a given time. From these images a trajectory is derived and an intercept course for the anti-rocket is set. To add a level of uncertainty, the rocket is encased in a semi-transparent cloud and is maneuverable via user input. With the added uncertainty, the anti-rocket then utilizes an algorithm to constantly adjust its trajectory and intercept the rocket.
This critical essay focuses on Alejandro Morales’ border fiction, *The Rag Doll Plagues*. In the second section of his novel, set in the “Delhi” barrio of 1970s Los Angeles, Morales creates a semi-fictional world in which Western and Chicano cultures collide, for better or worse. Readers witness Chicano perspectives of Anglo America and Anglo perspectives of Chicano America. However, Morales introduces a third perspective in the character of Sandra Spear, a Jewish actress who battles hemophilia and AIDS. I argue that her perspective is the crux of this border narrative, as it represents Guillermo Gomez-Peña’s theory of the hybrid artist—an influential actor or writer who is able to traverse cultural borders to spread ideologies of understanding and peace. As a close reading of the text shows, Sandra emerges as a cultural ambassador, navigating transcultural contact zones filled with racial politics and prejudice and using her acting skills to evoke cross-cultural understanding amongst an unlikely group—Santa Ana gang members. However, Morales does not deify his version of the hybrid artist, as Gomez-Peña arguably does; instead, Morales introduces malignant Western ideologies, surrounding the onset of AIDS in America that compromise Sandra’s ability to function as a hybrid artist. Indeed, Sandra would fall victim to the power of prejudice and myth in the novel, if not for the more powerful concept of hybridity.

Tsunamis are surface waves with wavelengths on the order of tens to hundreds of kilometers. Modeling the propagation of a tsunami as it approaches shore requires detailed knowledge of bathymetry in order to correctly capture the evolution of the wave as it slows down. Most published studies of terminal tsunami behavior (such as wave height and runup) are done for specific sites, often comparing model “postdictions” to recorded events. The goal of the present study is to understand in a general way how coastline indentations (such as bays and inlets) affect tsunami runup and wave height. The COMCOT tsunami propagation code developed at Cornell University is used to simulate a standard tsunami-like wave as it approaches a set of model coastlines whose shape is determined by two curvature parameters; the shapes range from wide bays to narrow inlets. In all cases, a linear bathymetry gradient is assumed. For each trial, the maximum runup and wave height are recorded. The final result is an empirical scaling law relating these quantities to shoreline curvature.

A car that can move on its own through an environment while steering clear of objects is the basis for my senior project. The car consists of six main parts: servomotor, drive motor, car body, PIC microcontroller, H-bridge, and infrared sensors. The body used for the car was salvaged from a small remote control toy. Thus the car has the standard front turning wheels and rear drive wheels. Both the servomotor and the drive motor are also the original motors from the car. The motors are operated by two H-bridges, one for each motor. The H-bridge allows a microcontroller to run a motor and allows for pulse width modulation to control the speed of the motors. The PIC microcontroller is the brain of the car. The microcontroller holds all the logic that decides what choice to make depending on the predicament the car may get into. The microcontroller uses the infrared sensors as its eyes. By processing the information that is sent from the sensors the microcontroller will take the correct action by changing direction of the servomotor and drive motor to avoid a collision.
EFFECT OF SEROTONIN ON LOCOMOTORY BEHAVIOR IN THE ROUNDWORM, C. ELEGANS
Foss, Eric
Faculty Mentor(s): Lucinda Carnell, Biological Sciences

Session: 22 (Oral Session 3:00-4:30 in 137A)

Serotonin (5-HT) is a neurotransmitter that regulates food-associated behaviors in both vertebrates and invertebrates. In humans, changes of behavioral states involved in hunger, mood, and sleep patterns are modified by 5-HT in many areas of the body. Depression related mood disorders are often treated with medications, such as fluoxetine (Prozac©), that increase 5-HT levels in the brain. We are using a well-developed model organism, the roundworm, Caenorhabditis elegans, to understand the genetic and cellular mechanisms underlying the acute and long-term effects of 5-HT on behavior. In C. elegans exposure to 5-HT, in addition to producing other changes in behavior, causes the worms to slow their rate of locomotion. Three mutant worm strains (mod-1, ser-4, and ser-1) with defective 5-HT receptors have previously been implicated in mediating this 5-HT-dependent decrease of locomotion rates. As opposed to manually counting body-bends of individual worms to measure their speeds, we are using the automated tracking software WormTracker (Ramot et al. 2008) to measure the average velocity of a population of worms over time. All three reported 5-HT receptor mutants show partial resistance to the slowing effect. In addition, a fourth 5-HT receptor mutant, ser-7, which has not previously been implicated in locomotion, shows partial slowing as well. We have begun to measure speed over longer time periods in order to identify an adaptation response, where the worms recover after time from the inhibitory effects of 5-HT. This model will help us understand the behavioral consequences of long term use of drugs like fluoxetine.

MODERN SKIING IN PRE-REVOLUTIONARY RUSSIA
Frank, William
Department: History

Session: 18 (Oral Session 1:15-2:45 in 202)

This paper represents the initial effort of the author to present a comprehensive history of skiing in Russia. Utilizing contemporaneous reports from Moscow and St. Petersburg newspapers and journals as well as Soviet-era memoirs, the author focuses on two particular events from the Pre-Revolutionary period: the first ski race held in Russia on 30 January 1894; and the participation of two representatives from the Moscow Club of Skiers at the Nordiska Spelen in 1913. The latter was especially important to the development of skiing in Russia, representing a transfer of new ski techniques from Scandinavia to the east. These innovations were crucial to the proliferation of skiing during the Soviet era and formed the basis for the USSR’s eventual return to international ski competition 43 years later at Cortina d’Ampezzo.

GENDER, POWER, AND CULTURE: LEARNING FROM TLINGIT WOMEN’S ROLES TO MOVE BEYOND EUROAMERICAN ASSUMPTIONS
Fredericks, Rose
Faculty Mentor(s): Tracy Andrews, Anthropology & Museum Studies

Session: 29 (Afternoon Poster Session 1:15-4:30 Mezzanine)

Although early non-native descriptions of the Tlingit emphasized the roles of men, this study reveals that women of this tribe were powerful and respected. Tlingit Indian ancestral lands extended along what is now the Southeastern coast of Alaska and northwestern British Columbia. The availability of food and natural resources allowed the Tlingit to settle in villages with seasonal hunting and gathering, expand their population, and develop a culture with a complex social structure. Tlingit women provide an excellent example of complex gender roles that characterized Native American societies. Western European cultural and religious perspectives often judged the gender roles and marriage practices of Native societies to be inappropriate or “heathen.” In fact, many missionaries regarded the women in these societies as “haughty and independent.” For example, it was considered inappropriate when Indian women were able to purchase horses for themselves, obtain and control valued food and trade resources, and even direct their husbands away if annoyed by them. The Tlingit, like many other Native American groups, bestowed power and honor on their members (women and men) who demonstrated effective leadership and the ability to access resources for the good of the whole tribe. Specific examples are found through analyzing Tlingit women’s roles in, and contributions to, the tribe’s economic and socio-political systems, as well as the impacts of non-native influences. This study emphasizes that an understanding of any culture requires careful consideration of all gender roles.
GEOTHERMAL ENERGY: A MORE EFFICIENT, ECOLOGICALLY FRIENDLY ENERGY SOURCE

Free, Rachel  
Faculty Mentor(s): John O’Neill, Industrial & Engineering Technology  
Session: Poster Session, CWU-Lynwood

Alternative “green” energy sources become more vital as the economy shifts further into a recession and fossil fuels increase in cost. There are several types of “green” energy sources that do not need fossil fuel to create electrical or heating and cooling power. These include solar, wind, hydro, and geothermal technologies. As these fairly new technologies are replacing past types of energy sources, the question is, are they truly “greener,” more efficient, and safer electrical power alternatives? This paper discusses the potential hazards associated with the use of confined space, pressurized piping, and electricity production, as identified by the Energy Trace Barrier Analysis and Operating and Support Hazard Analysis methodology.

THE EFFECTS OF TEMPERATURE ON METABOLIC RATE, VENOM SYNTHESIS, AND POTENCY IN PEUCETIA VIRIDANS (ARANEAE: OXYOPIDAE)

Galindo, Joanna; Irwin, Jason; Carnell, Lucinda; Galindo, Gracie  
Faculty Mentor(s): Jason Irwin, Biological Sciences; Dr. Lucinda Carnell, Biological Sciences  
Session: 28 (Morning Poster Session 8:15-11:30 Mezzanine)

We examined the effects of temperature on metabolic rate, venom synthesis, and potency in the green lynx spider, Peucetia viridans from Yavapai County. After acclimation, 7-12 d, at 10, 20, or 30°C, metabolic rates were measured using flow-through respirometry (n=14/group). Venom was extracted every 6 d using electrical stimulation (n=20/group, n=19/group and n= 16/group). Potency was tested by injecting 0.5 µL of crude venom into crickets (Acheta domesticus), and recording the time from initial injection to loss of the righting response and to death (no visible heartbeat). The results of the experiment suggest temperature has a significant influence on metabolic rates (10°C- 0.0362 ± 0.004; 20°C- 0.1069 ± 0.018; 30°C- 0.2877 ± 0.061 µL CO2 mg⁻¹ h⁻¹). Also, there were notable differences in venom synthesis. Spiders held at 20°C produced more venom (mg/spider) at day 6 (3.409 mg/spider) and day 12 (1.634 mg/spider) then those at 10 (d-6: 0.478 mg/spider, d-12: 0.098 mg/spider) and 30°C (d-6: 1.002 mg/spider, d-12: 1.039 mg/spider). Spiders at 10°C produced very little or no venom. On the day 18, spiders from 20 and 30°C produced similar amounts of venom (20°C: 1.042 mg/spider, 30°C: 1.028 mg/spider). The results for potency test showed that the venom collected from the spiders at 20°C (n=21) had a faster collapse time than the venom collected from spiders held at 30°C. Electrophoretic banding patterns show eight individual proteins ranging in size from 45.7 kDa to 78 kDa to have commonality at all temperatures but staining intensity differed slightly. These results show that temperature does not affect protein composition. Densitometry will be conducted to see if temperature affects protein concentration.
POTENTIAL HUMAN BRAIN RESPONSE TO CRITICAL THINKING STIMULI USING COMMUNITY-BASED INQUIRY
Gao, Miao; Greenwald, Ralf; DePaepe, James
Faculty Mentor(s): Ian Quitadamo, Biological Sciences Science Education; James Johnson, Biological Sciences; Martha Kurtz, Chemistry

Session: 28 (Morning Poster Session 8:15-11:30 Mezzanine)

International competitiveness of United States students largely depends on their ability to problem-solve and critically think. Research shows that, while both faculty and students deem critical thinking to be essential, only 6 percent of students nationwide can actually demonstrate the thinking skills necessary for academic and professional success. Recently, a national focus on conducting authentic inquiry in science courses and developing a “sense of place” that helps students meaningfully connect their learning to the greater community has emerged. So-called community-based inquiry (CBI) teaching methods are thought to be effective because they promote student discovery by addressing real community problems. The process of bringing structure to ill-defined problems, choosing suitable investigative methods, collecting and analyzing data, and drawing conclusions is thought to promote critical thinking. Limited research connecting inquiry-based teaching methods to critical thinking has been done; however, little is known about the underlying neurobiological basis of critical thinking. Preliminary work is underway to compare gains in critical thinking and content knowledge between CBI and traditional teaching methods; however, no research has investigated how human brainwave patterns change in accordance with critical thinking. This poster summarizes recent CBI and critical thinking research and outlines how event-related potentials (ERPs) will be used to identify human brain markers for critical thinking, whether these markers correspond with critical thinking test gains, and how they might differ between CBI and traditional science courses. Results of this study will inform how to best teach science courses and improve critical thinking.

PREVALENCE OF THE AMPHIBIAN PATHOGEN BATRACHOCYTRIUM DENDROBATIDIS AT THREE MONTANE SITES IN CENTRAL WASHINGTON STATE AND IN BIOLOGICAL-SUPPLY FROGS
Gaulke, Christopher; Johnson, Jim; Wagner, Steven
Faculty Mentor(s): Jason Irwin, Biological Sciences

Session: 14 (Oral Session 1:15-2:45 in 137A)

The fungus *Batrachochytrium dendrobatidis* (Bd) has been linked to mass mortality events and population declines in amphibians worldwide. To describe the prevalence of *Bd* in central Washington State, we sampled three montane ponds between June and September 2008 (1430-1550m). Each anuran was swabbed with a sterile, cotton-tipped swab to dislodge epithelial cells. The cells were then visualized using differential interference contrast microscopy for the presence of zoosporangia. *Batrachochytrium dendrobatidis* was found at all sample locations with a total prevalence of 49 percent. Species-specific infection rates were not significantly different: 52 percent in the Columbia Spotted Frog (*Rana luteiventris*) (n=15), 53 percent in the Cascade Frog (*Rana cascadae*) (n=67), and 40 percent in the Pacific Chorus Frog (*Pseudacris regilla*) (n=10). There were also no significant differences in infection rates between sites and all frogs appeared healthy. In addition, Northern Leopard Frogs (*Rana pipiens*) shipped to Central Washington University in October 2006 and July 2007 were screened for *Bd*. All frogs tested positive for *Bd* (n=38). These data confirm the presence of *Bd* in central Washington and in the amphibian trade. We urge the use of proper sterilization techniques when handling and disposing of amphibian wastes to reduce the risk of accidental spread of the pathogen.
MARY, LILITH, OR EVE: WOMEN’S ROLES WITHIN NAZI GERMANY

Geise, Sasha
Faculty Mentor(s): Heidi Szpek, Philosophy and Religious Studies

Session: 16 (Oral Session 1:15-2:45 in 140)

Even though it has been over 50 years since the end of the Holocaust, there are still areas that are in need of further exploration. The role that non-Jewish German women held within Nazi Germany is one such part of the Holocaust that calls for more in depth research. It is crucial to understand how these women functioned within Nazi Germany at the time, especially in light of the fact that many women were forced into nontraditional roles in order to further the war effort. There are two groups of women that, while social and economic opposites, still had essential roles within the Third Reich. The wives of higher ranking officers in the SS were more traditional in how they contributed to the war, as well as their role in bringing the Nazi party to fruition. Many of these women were from well-off families and were often the people who were attributed with introducing Hitler to many of his political allies. The second group of women came from rural farming families and had little to no education. Female camp guards, or auxiliaries, were often forced into service for one reason or another. Even though these two groups of women were most assuredly complicit in the crimes committed against over six million people, it has been suggested that the role of these women is closer to partner than perpetrator. Such an idea deserves further research in order to obtain a deeper understanding of the human condition when combined with an environment.

CHANGES IN THE HEIGHT AND WEIGHT OF PROFESSIONAL ATHLETES OVER THE DECADES

Gilbertsen, Kim; Te Velde, Laken
Faculty Mentor(s): Yvonne Chueh, Mathematics

Session: 29 (Afternoon Poster Session 1:15-4:30 Mezzanine)

In this project we will analyze the physical growth of the general population, as well as that of professional basketball and football athletes. Historical height and weight data for professional athletes are available from online resources, and we will randomly select 30 players from each sport from each selected year. The years we will analyze are 1960, 1970, 1980, 1990, 2000, and 2009. Statistical data showing the changes in average height and weight of the general population of the United States over each decade will be used to demonstrate the contrast between the population as a whole and the professional athlete population.

THE SOCIALIZATION OF GUILT ANALYSIS

Gomez, Cornelio
Faculty Mentor(s): Eric Cheney, Sociology

Session: 29 (Afternoon Poster Session 1:15-4:30 Mezzanine)

The ability to assess guilt has been shown to be developed in an early age based upon the socialization process a child experiences through schooling and family life, especially as core concepts from his or her environment become internalized within the individual. This paper reports on a vignette study in which 160 Central Washington University students from four different academic disciplines (Art, Economics, Sociology, Psychology) assess the level of guilt of the characters presented in short stories, or vignettes. The students then rate each of the characters in the story, or vignettes, based upon how guilty they feel the character is for the situation. This vignette analysis shows how the socialization process the student has been exposed to through their academic discipline has structured their views of guilt, and how their responses compare to other students in the same discipline, as well as students in different disciplines. The findings in this research are consistent with past research that has been able to show the effects of socialization on individuals in their actions and opinions.
CONQUERING THE NEW WORLD: HEGEL AND BLUMENBACH'S CONTRIBUTION TO THE RACIST MISTREATMENT OF NATIVE AND AFRICAN AMERICANS

Goo, Ashley
Faculty Mentor(s): Cynthia Coe, Philosophy

Session: 4 (Oral Session 8:15-9:45 in 140)

The issues surrounding racial hierarchy constantly creep up within American society. The question remains why? This paper examines Hegel and Blumenbach's foundational ideas that contributed to the foundation of racist mistreatment of Native Americans and African Americans. Hegel and Blumenbach implant and examine concepts of racial hierarchy and supremacy while trying to skirt the issues under the guise of science and objective observations. However, as we now can see, the way that both philosophers speak of the different races is not unbiased at all. Also, this paper focuses on the way that these racist ideals ultimately lead to the denial of societal acceptance of these groups in our current society. This begs the question where does this leave us in society? How are we to get away from these foundational ideas that have become so engrained in our society?

ENVIRONMENTAL CONTROLS OF INVASIVE AQUATIC WEEDS IN WASHINGTON STATE LAKES

Gray, Jeff; Gabriel, Anthony
Faculty Mentor(s): Anthony Gabriel, Resource Management

Session: 29 (Afternoon Poster Session 1:15-4:30 Mezzanine)

Nonnative, invasive freshwater weeds pose a serious threat to the healthy ecology of freshwater lakes in Washington State. These nonnative plant species often have few biological controls in their new habitat, and thus spread rapidly, damaging native plant and animal habitat, reducing recreational opportunities, lowering property values, and clogging waterways. The plants' ability to reproduce in lakes and spread to other lakes is a source of concern for the Washington State resource management agencies. Understanding which type of lake environments are favorable to plant growth and identifying potential causes of dispersion across the state can help in the ongoing struggle to combat further invasions. This pilot study examines the distribution of freshwater weed species in Washington State lakes, focusing on curly leaf pondweed and Eurasian milfoil. Using distribution data collected by the Washington Department of Ecology, as well as a variety of other geospatial data sets, the study statistically analyzes the distribution of these two species with regards to a variety of environmental characteristics and controls, including lake characteristics such as type, hydrology, morphology (e.g. size, perimeter, perimeter-area ratios, depth), and elevation, as well as anthropogenic characteristics, such as presence of boat launches, proximity to cities, and other estimates of human use, such as county densities and number of licensed boats in the lake's county. Suggestions for further variables to be considered in future studies are also discussed.

PHYSIOLOGICAL COMPARISON OF MALE AND FEMALE COLLEGIATE RUNNERS

Green, Amber; Perkins, Ryan; Brown, Justin; D’Acquisto, Leo
Faculty Mentor(s): Leo D’Acquisto, Health, Human Performance & Nutrition; Robert Pritchett, Health, Human Performance & Nutrition; Kevin Adkisson, Athletic Department

Session: 28 (Morning Poster Session 8:15-11:30 Mezzanine)

The purpose of this study was to examine the physiological responses to submaximal and maximal running in 10 female (19.7 ± 1.3 yr) and 9 male (21.0 ± 2.7 yr) collegiate runners. Runners performed a series of submaximal treadmill runs and one maximal run to voluntary exhaustion. Metabolic (open-circuit spirometry), heart rate (Polar, Inc.), and blood lactate response (YSI Analyzer, Inc.) were measured. Compared to the female runners, the male runners had a greater maximal oxygen uptake (61.4 ± 3.0, 49.5 ± 3.1 mL/kg/min) and time to running voluntary exhaustion (461.6 ± 49.9, 397.2 ± 72.6 s) (P < 0.05). Oxygen uptake was similar for the male and female runners at a common submaximal speed of 8 mph (P > 0.05). At the same relative intensity, the female runners had a lower oxygen uptake than the male runners (P < 0.05). At a blood lactate of 4 millimolar, the males had a greater running speed compared to the females (9.9 ± 0.6, 8.4 ± 0.7 mph) (P < 0.05). This study suggests that the gender difference in maximal oxygen uptake is the primary reason male runners are able to outperform female runners.
SUSTAINABLE TOURISM IN OLYMPIC NATIONAL PARK, WASHINGTON STATE

Greve, Jake; Dunleavy, Casie
Faculty Mentor(s): Matthew Altman, Douglas Honors College; Kenneth Cohen, Family & Consumer Sciences

Session: 5 (Oral Session 10:00-11:30 in 135)

It has been a more prevalent debate in recent years regarding how to ethically implement tourism practices into our national park system. We will provide slides that demonstrate our research on sustainable tourism in national parks, specifically, Olympic National Park in Washington State, while also observing the “Leave No Trace” principles. Given that humans are a part of nature and enjoy touring pristine natural environments, it is hard to draw the line in limiting human interaction in these pristine environments. However, it may be the case that we are too anthropocentric, or “human-centered,” in our perspective on environmental ethics, and our goal in presenting this slide show is to provide the general academic populace with visual data on the our observation of tourism on wilderness.

BALANCE OF CLASS

Griffin, Pearl
Faculty Mentor(s): Laila Abdalla, Douglas Honors College

Session: 4 (Oral Session 8:15-9:45 in 140)

Security and adventure, simplicity and intellect, and realism and romanticism are all personality traits that work together to form balance in humanity. All of these traits need to be possessed equally and used according to the circumstances because when they are separated from each other, extreme personalities result. In Cervantes’ masterpiece *Don Quixote*, the characters of Sancho Panza and Don Quixote represent the calamities that befall people when their personalities become imbalanced. These two men are extreme opposites, both falling into folly because they lack balance within those three aspects of personality. Sancho and Don Quixote’s polar characters should complement each other, but they fail to do so because of the class division between them. Each has a place and is expected to act according to rank; Don Quixote is the master, and Sancho is the servant. By putting these two characters together, Cervantes illustrates that severe class structures, like those in Renaissance Spain, force two drastically different kinds of people to live side by side, accomplishing nothing.

A SPECTROSCOPIC STUDY OF THE ND RADICAL BY FAR-INFRARED LASER MAGNETIC RESONANCE

Groves, Jen
Faculty Mentor(s): Michael Jackson, Physics

Session: 28 (Morning Poster Session 8:15-11:30 Mezzanine)

The fine structure of molecular free radicals is one of the key components in understanding their structure and formation. Studies of these molecules using microwave spectroscopy are typically incomplete because they fail to provide a complete picture of the molecule by inaccurately predicting their spectra in higher energy (infrared and far-infrared) regions. This project involves the investigation of the ND radical using laser magnetic resonance (LMR) spectroscopy, a technique that has emerged as one of the most sensitive ways for investigating these species in the infrared and far-infrared regions. The LMR spectrometer at the University of Wisconsin-La Crosse uses an optically pumped molecular laser system with a 15-inch variable electromagnet, capable of producing homogenous magnetic fields with strengths up to two Tesla (20,000 Gauss). With this system, the radical under investigation is tuned into resonance with a fixed laser frequency by the external magnetic field. In this investigation, hundreds of absorption signals were observed from ND and other radicals (such as ND₂). Currently, an attempt is being made to fit the observed spectra to the ground (ν = 0) and vibrationally excited levels (ν = 1 and 2) of the ND radical. The results of this research will be combined with the available microwave investigations to significantly improve the overall picture of its geometric structures, as well as gain a better understanding of the chemistry behind the generation of this radical.
UNDERSTANDING CHANGING LAND USE ON IRRIGATED ACREAGE IN THE KITTITAS VALLEY OF CENTRAL WASHINGTON STATE

Hackett, Jennifer
Faculty Mentor(s): Nancy Hultquist, Resource Management

Session: 29 (Afternoon Poster Session 1:15-4:30 Mezzanine)

Water use in the Kittitas Valley is based on century old legal and physical infrastructures. Land use, technology, and social values have changed, but the system remains optimized for the needs of the early 20th century. It is configured to deliver water to 160-acre flood irrigated farms, leaving little or no water instream. It is not designed for rural homes, small farms, or sprinkler irrigation. Many efforts are underway to address problems caused by competition between different uses. Salmon populations need more water instream, irrigators need help in droughts, and the water management system needs greater flexibility. Improving the current system requires understanding how land and water use has changed. This study focused on land that is eligible to receive water from the south branch of the Kittitas Reclamation District (KRD) and from Manastash and Taneum Creeks. Geographic analysis software was used to overlay data on water rights and tax parcels to determine contemporary land use on irrigated land and to see how well the KRD irrigation infrastructure is able to deliver water to land within its system. The analysis showed that 40 percent of the irrigated acreage was on parcels under 20 acres, 73 percent was on parcels that are classed as farms, and 59 percent of the KRD land was more than 500 feet from the nearest canal.

THE RESEARCH EXPERIENCE: REQUIREMENTS AND OPPORTUNITIES IN UNDERGRADUATE PSYCHOLOGY CURRICULUMS

Haghighi, Meisam; Biddle, Ryan; Gabriel, Kara
Faculty Mentor(s): Kara Gabriel, Psychology

Session: 29 (Afternoon Poster Session 1:15-4:30 Mezzanine)

The goal of this study was to survey undergraduate psychology departments in the Northwest to determine the type and number of research methodology courses programs required, as well as the number of opportunities for hands-on experimentation they provide. Based on a pilot study of 28 universities and colleges in the Northwest, specific categories were chosen for further categorization. In this study information from 60 universities and colleges were coded into two major categories: 1) research courses required for undergraduate degrees, and 2) courses that provide research opportunities to psychology students. Some of the sub-categories used in this phase were number of required research methodology courses, number of required statistics courses, and number of research/laboratory opportunities. Preliminary results of the universities indicate that the majority of universities surveyed show a preference in offering research methodology courses separate from statistics courses. Furthermore, the number of the universities that offer laboratory courses (courses that are predominantly laboratory based) are few relative to the number of universities offering courses that have laboratory components. Among the universities surveyed, the number of required research courses ranged from zero to three, the number of research opportunities from zero to seven, and the number of total possible research experience from one to 13. These findings indicate wide variability in the breadth of research training and experience provided to undergraduate psychology students.
IMPORTANT ELEMENTS OF WESTERN DEMOCRATIC GOVERNMENTAL SYSTEMS

Hamblet, Michael; Dorn, Brandy
Faculty Mentor(s): Rex Wirth, Political Science

Session: 29 (Afternoon Poster Session 1:15-4:30 Mezzanine)

The democracies of Europe, although different in terms of contexts and institutions, maintain a high degree of stability. It is safe, therefore, to assume that there are key match ups within the various dimensions in each which create their stability. These matching structures form a matrix of congruence within each society. Three European democracies and the United States were used to develop a series of matrices. The matrices generated for each of several ecological, societal, and governmental dimensions were brought together to create a summary matrix of democracy at the highest level of abstraction (Public-Private and Centralized-Decentralized), disassociated from any one democratic theory. A summary typology was generated by labeling the cells Great-Britain, France, United States, and Germany and their corresponding types: Elitist, Statist, Pluralist, and Corporatist. This poster deals with alternance in power and the distribution of power between the executive and the legislature. It focuses on the specifics inherent in these dimensions. The distinctive patterns of elections, parties, civil society and decision-making are linked with the respective alternance and distribution patterns to produce an overview of the similarities and differences among the different types of democracy.

FLAUTESE

Hammer, Emily
Faculty Mentor(s): Andrea Eklund, Family & Consumer Sciences

Session: 29 (Afternoon Poster Session 1:15-4:30 Mezzanine)

My garment is a silk cocktail dress with green, yellow, and dark pink flowers all over. My inspiration to make this dress was from seeing the floral dresses on the runway for spring and summer. The other dresses in my line Flautese are all the different colors within the floral dress that you will be seeing at SOURCE. I made the dress by draping it onto a mannequin first, then transferred the draped pieces onto paper to make a pattern, then made a muslin dress, fitted the dress to my model, and finally made the final product with the actual floral fabric. This is one of a line of three garments and the entire line can be seen at the Fashion Merchandising spring fashion show, SatisFashion, May 30 at Milo Smith Tower Theatre in McConnell Hall.

A STABLE ISOTOPE STUDY OF SOIL WATER BUDGETS ALONG A CLIMATE TRANSECT IN A SNOWMELT DOMINATED SYSTEM

Hammond, Travis; Gazis, Carey
Faculty Mentor(s): Carey Gazis, Geological Sciences

Session: 28 (Morning Poster Session 8:15-11:30 Mezzanine)

The soil water budget is an integral part of the overall water budget of a watershed and/or groundwater basin. Studies characterizing soil water residence times, and style and rates of downward flow can give insight into aquifer recharge rates and estimates of evapotranspirative losses. In this study, oxygen and hydrogen stable isotope data in combination with a mass balance approach was used to track inputs, flux between soil water compartments, and outputs in order to understand climatic influence on the soil water budget in a snowmelt-dominated hydrologic system in central Washington. Preliminary isotopic data along with precipitation amounts from the driest site demonstrated that water moves through the soil column by both piston flow and by preferential flow along conduits to the lower soil water compartments. Piston flow appeared to predominate after smaller rainfall events as evidenced by deep total soil water isotope values that retain an isotopic signature from evaporative losses at a shallower level. After significant recharge events, isotope values from both shallow and deep samples of total soil water and mobile soil water (water not hygroscopically bound to soil particles) demonstrated mixing of pre-existing soil water with newly added recharge water. During these periods, rapid isotopic changes in deep soil water in response to recharge are an indication of preferential flow to the lower soil water compartment.
This paper examines the roles of women in two 20th-century French films: Claude Sautet's *Cesar et Rosalie* (1973) and Claude Chabrol's *Madame Bovary* (1991). Though the two films represent different time periods in French history, both undertake to document the spurious lives of their respective heroines who struggle against the status quo to try to attain some level of autonomy and self-awareness despite the restrictions placed on them by their communities. This paper analyzes the historical contexts of the films, the cinematographic techniques employed in the presentation of their female characters, and the story-lines to demonstrate how in many respects women are still treated unequally in today’s society. Thus, this paper undertakes to reiterate the continuing relevance of self-awareness and feminism in a world that is constantly changing yet still imposing roles on individuals.

*PAUSING IN NON-NATIVE SPEAKERS’ ENGLISH: A CONTRASTIVE ANALYSIS*

**Hardt, Brad; Liu, Yuanxia; Jendro, Bethany; Al Ghannam, Aziz; Ho, My-anh; Kjeldgaard, Marie**

Faculty Mentor(s): Xingzhong Li, English

Session: 18 (Oral Session 1:15-2:45 in 202)

Intonation is an important feature of spoken language. Incorrect use of intonation by non-native speakers can have a significant effect on the intelligibility and the perceived fluency of their speech. Despite this, intonation is rarely addressed in any detail in the classroom. This study examines intonational features of six non-native English speakers, focusing on pauses both within and between intonational phrases (IP). Results showed four major types of pausing: filled, unfilled, IP-medial, and IP-final. Major linguistic triggers of pauses appear to be nouns and other content words as opposed to function words because all four types of pausing tended to occur most commonly after content words, especially after nouns. Further instruction would help these subjects to improve their English intonation, appropriate pausing patterns in particular.

*THE MISCONCEPTIONS OF THE WESTERN WORLD ON ISLAMIC WOMEN*

**Harlan, Justine**

Faculty Mentor(s): Laila Abdalla, Douglas Honors College

Session: 4 (Oral Session 8:15-9:45 in 140)

Women, particularly in the context of religion, have traditionally drawn the proverbial short straw. Generally, the major religions of the world view women as inferior and disposable. However, the Western world has recently begun to take a much more progressive stance on the role of women in society. The discrimination women have faced, especially in the West, stems in large part from the historical religious marginalization of women. Preconceived notions about women’s inferior intelligence were developed by traditions in religious canon. Just as preconceived notions have hindered the progress of women in the Western world, preconceptions of the Islamic culture have also lead Westerners to believe that Islam is a sexist religion. The United States is considered a “melting pot” for all cultures, and although this country has a large population of Muslim citizens, Americans still fail to see that the assumptions they make about Islam are based on fiction. Western preconceptions may lead one to believe that the Islamic text, the Koran, hinders the status of women in society. However, when this text is compared to other religious canons, such as the Old Testament and *The Analects of Confucius*, the status of women in the Koran emerges as far more progressive than these other texts. The Koran is more open-minded towards women than the Jewish and Confucian texts in the areas of property rights, independence, and women’s role in society.
Polyelectrolytes and surfactants are commonly used by the paint, ink, and coating industry to facilitate reactions and emulsions. Found in nature, these molecules transport pollutants and nutrients through soil. We hope to utilize polyelectrolytes and surfactants as filtration systems for large organic molecules in water. This study examined, in situ, the adsorption kinetics of the polyelectrolyte poly(sodium-4-styrene) sulfonate (PSS) and the surfactant oxyphenonium bromide (OPB) using Attenuated Total Internal Reflection Fourier Transform Infrared (ATR-FTIR) spectroscopy to a titanium dioxide ($\text{TiO}_2$) surface. ATR was used to measures the relative surface coverage of adsorbed molecules and details about the aggregated structures formed as well as OPB/$\text{TiO}_2$ or PSS/$\text{TiO}_2$ interactions. Collected data was then analyzed using multivariate data analysis strategies. Multivariate data analysis allowed for the whole IR spectra to be used, making it possible to separate the spectra into individual pure component spectra for interfacial species and OPB/$\text{TiO}_2$ or PSS/$\text{TiO}_2$ interactions at the surface. With these data, information about interfacial interactions and structure of the adsorbate was deduced. The surfactant, OPB, differed from the one previously studied, cetylpyridinium bromide monohydrate (CPBM), in that it contains a carbonyl group whereas CPBM was unsubstituted. We expected the carbonyl peak of OPB to provide clearer insight into the interactions of the surfactant and polyelectrolyte. It was concluded that absorbances that appeared on the spectrum that were not previously seen with other surfactants indicated new interactions occurring in the system and that the intensity and location of these also produce clearer indications of interactions as expected.

GEOCHEMICAL ANALYSIS OF SURFACE AND GROUNDWATERS AROUND CLE ELUM, WA: IMPLICATIONS FOR THE PROPOSED EXEMPT WELL MORATORIUM

Hickey, David; Opitz, Ryan
Faculty Mentor(s): Carey Gazis, Geological Sciences

Session: 28 (Morning Poster Session 8:15-11:30 Mezzanine)

The Yakima River drainage is one of the most heavily irrigated regions in the state, and water use has been much contested and litigated. Due to this water demand and the increase in drilling of domestic wells, a moratorium on exempt well drilling was proposed in 2007. In this study, geochemical data is used to evaluate the surface-groundwater interaction in the area around Cle Elum, WA. The hydrogeology of this area is poorly understood due to the complex stratigraphy where the valley floor meets the bedrock of the Cascades Range. It is important to understand the relationship between groundwater and surface water because all of the surface water in the Yakima drainage is appropriated and many water rights holders depend on this water for their livelihood. This study was begun as a class project for an Environmental Geochemistry class at Central Washington University. Students collected samples from over 30 domestic wells and nearby surface water sources in the Cle Elum/Roslyn area. Trace element and major ion data will be presented for these samples and will be used along with statistical analysis to draw conclusions regarding the different sub-surface water bearing units, as well as the relationship between the surface and ground waters.
In this paper, I argue that in *The Iliad* and *The Odyssey* Homer characterizes and presents Achaean heroes, women, and culture in ways that show his disapproval of ancient Greek cultural values. In *The Iliad*, most of the heroes are presented as automatons that care only about fame and glory, and Homer shows how this behavior only gets them killed. On the other side are *The Iliad*’s women, whose expressive behavior contrasts their humanity with the heroes’ total lack thereof. Homer refutes the ancient Greek inferior view of women in *The Odyssey* by showing how women can be more powerful than men. He also criticizes aresteia and xenia, two pillars of ancient Greek culture. By showing the reader the attitudes of Achaean heroes, the consequences of ingrained cultural beliefs, and the emotions, perceived value, and power of women, Homer shows how the values of his society are trivial and foolhardy.

**EVALUATION OF SURVEY AND TRAPPING METHODS FOR AMPHIBIAN SPECIES ALONG THE I-90 CORRIDOR**

*Hill, Brenna; Lester, Michelle; Brady, Susan*

Faculty Mentor(s): Jason Irwin, Biological Sciences; R. Steven Wagner, Biological Sciences

Session: 28 (Morning Poster Session 8:15-11:30 Mezzanine)

High-traffic roadways may isolate amphibian populations, compromising habitat connectivity for these low mobility species. The Snoqualmie East Pass Project, funded through WSDOT, has given us a chance to evaluate the effectiveness of various survey and trapping methods for detecting species presence and monitoring diversity and occurrence along the I-90 corridor. In this study, we compared results from surveys and trap captures according to the environment type, lentic versus lotic. We focused on investigating trends within these two categories that would indicate which survey and trap methods maximized captures of seven native amphibian species: *Ambystoma gracile,* *Dicamptodon tenebrosus,* *Rana cascadae,* *Hyla regilla,* *Ascaphus truei,* *Bufo boreas,* and *Ambystoma macrodactylum.* Age group was taken into account because of lifestyle and habitat differences between adults and juveniles of some amphibian species. Results show that habitat type, as well as focal age group, are important factors in determining which survey and trapping method maximize captures for the various local amphibian species.

**BREAKAGE PATTERNS AND USE-WEAR FROM THE SANDERS SITE 45-KT-315**

*Hocking, Sara*

Faculty Mentor(s): Steve Hackenberger, Anthropology & Museum Studies

Session: 29 (Afternoon Poster Session 1:15-4:30 Mezzanine)

Breakage and use wear patterns are analyzed for a sample of 190 stone tools from the Saunders site 45-KT-315. Results permit an assessment of prehistoric tool damage and discard versus damage caused by excavation or use of the collection in the laboratory. Patterns of prehistoric tool breakage aid reconstruction of site activities. Breakage data will provide information on possible techniques used in tool production and re-manufacture. Different excavation levels and associated time periods have more or less tool breakage caused during tool manufacturing versus tool utilization. Patterns of use-wear provide information on subsistence activities at the site. I hypothesize that: 1) tools are used more intensively, and/or are more often re-manufactured, within earlier occupations of the site, and 2) relatively more breakage occurs during tool manufacturing within later occupation of the site.
SCATTERING OF PLANE LIGHT WAVES

Houk, Adam
Faculty Mentor(s): Michael Braunstein, Physics

Session: 27 (Oral Session 3:00-4:30 in 271)

The differential cross-section formulation is commonly used to characterize interactions in both classical particle and quantum mechanical models. This method is used much less frequently in characterizing the interactions of classical wave mechanics. As an example of the differential cross-section formulation for plane electromagnetic wave interactions, we investigated the well known problem of diffraction of a plane electromagnetic wave incident on a small circular plane obstruction. Starting with Babinet’s principle and diffraction theory we transformed a standard representation of this system into the differential cross-section formulation. The result illustrates some interesting physical features of the system that are not apparent in the usual formulation. We will present and interpret our results for the differential cross-section and total cross section of this system.

RETAILERS GOING GREEN: FACT OR FRAUD?

Huston, Matthew; Carter, Michael; Brown, Annie; Petosa, John; Hoiness, Kyle
Faculty Mentor(s): Natalie Lupton, Information Technology & Administrative Management

Session: 26 (Oral Session 3:00-4:30 in 202)

“Going Green” can be defined from a retailer’s standpoint as methods to decrease the amount of environmental damage that are caused by their day to day business practices. This may be done by decreasing the amount of energy consumption; marketing “green” friendly products and promotions; and designing and redesigning buildings to fit the “green” friendly model. This session will explore some of the issues of fraud within the “going green” trend. The term fraud in the context of this paper is defined as when a company or individual promote their products or services as environmentally friendly. Many companies use the terms “green friendly” or “going green” for their own financial gains, which is also known as greenwashing. This session will discuss two issues. The first issue we will be examining is eco-fraud and its effects on the business and retail environment. Eco-fraud is when examples, products, concepts or data are misrepresented as environmentally friendly in an effort to get positive public perceptions and sell more of their products. The second issue we will examine is organic fraud and how it affects the consumer. Organic fraud is when a company may mislabel their products as organic to increase their sales. This may be something as small as saying a fruit is organic when in fact it has many different chemicals in it.

ANALYSIS OF POLITICAL INSTITUTIONS AND POLITICAL ACTORS: ECONOMIC DEVELOPMENT MODELS OF KOREA AND JAPAN

Hwang, Sook
Faculty Mentor(s): Gilberto Garcia, Political Science

Session: 17 (Oral Session 1:15-2:45 in 201)

The South Korean economy ranked as the fourth largest in Asia and the 13th-largest in the world as of 2007. It has achieved phenomenal double-digit growth for many decades, which earned it the reputation as one of the “four East Asian Tigers,” along with Hong Kong, Singapore, and Taiwan. The nation’s GDP per capita has grown from only $100 in 1963 to a record-breaking $10,000 in 1995 and $24,600 in 2007. This is also referred to as the “Miracle on the Han River.” Today, South Korea is classified as a high-income economy by the World Bank and an advanced economy by the IMF and CIA. On the other hand, Korea’s near-by neighbor, Japan, has always retained a high reputation as the world’s second largest economy. The economic success of these two Asian countries triggers the curiosity of knowing whether their political institutions, political actors, and models of economic development are alike. There is also the question of whether the fast paced economic growth of Korea and Japan were motivated by governmental roles. To reveal the answers to these questions, the first part of the presentation will examine the political institutions of Japan and Korea, covering the executive, legislative, and judicial branch and political actors that influence their decision-making processes. This will be followed by a comparison and contrast of the processes and actors that were involved in Japan’s and Korea’s economic development.
I will be presenting a short video essay entitled “No Cause for Alarm.” The project is a 2-minute, 39-second narrative piece about a man who plans, carries out, and covers up a murder. The project was designed to illustrate the practical application of 2D and 3D space, as well as sound design to a fictional film and how these elements can be used to tell a story without any dialogue. Modern audiences are very accustomed to exposition in order to understand a story. My goal is to suggest that technical components can also tell a story. It just takes a different set of eyes to comprehend the plot. We will begin the presentation by viewing the film, after which specific elements within the film will be noted. We will explore the reasons behind the composition of a scene from camera angles to character placement and sound. I will explain how each element impacts the themes of evil and righteousness presented within the film.

Mobile commerce, or M-commerce, is the buying and selling of goods and services through wireless handheld devices such as cellular telephones and personal digital assistants. Known as next-generation e-commerce, new mobile technologies are enabling users to access the Internet without needing to find a place to plug in. The researchers will present an industry-specific white paper discussing the growing trend of mobile commerce and its effects on advertising and the privacy of the consumer. The purpose of this session is to raise awareness of mobile commerce and how it affects both consumers and retailers. Mobile advertising is defined as a form of advertising via mobile phones or other mobile devices. Companies are advertising on devices such as the iPhone or Smart Phone through SMS and multi-media messages. One of the main questions retailers have is if mobile advertising is going to be a trend or a long term business model. With mobile phones now allowing access to the Internet, consumers are being subjected to more advertising on these devices. Even corporate companies such as Microsoft are working with new mobile advertising companies to support programs offered for iPhones. Consumer privacy is a growing concern as consumers’ personal information is accessed through mobile devices. A major concern through mobile commerce is the unsecured transfer of information from a consumer’s phone to the retailer’s mobile commerce site. As a result, there are many questions relating to the consumer’s privacy.

The focus of this research was to discover new species of bacterial organisms that occupy the alkaline (pH ~10), hypersaline, and extremely sulfidic (>100 mM sulfide) environment of the monimolimnion layer of Soap Lake (Grant Co., WA). The monimolimnion layer is the bottom-most layer of the lake, and both the monimolimnion water, and the underlying sediment, were studied. The organisms were cultured on media that was created using mixolimnion (surface) water from Soap Lake and additional NaCl to mimic the chemistry of the natural environment. Isolated organisms were characterized using staining and microscopy techniques. Several of the colonies grown in culture had unique colony morphology. The cellular morphology of all cultured organisms were determined to be bacilli. Only a few of the isolates were determined to be Gram–positive by analysis of Gram stained slides, and the rest of the organisms were Gram-negative. Gram stain results were further verified using the String test. The DNA of the isolated bacteria has been extracted, and the 16S ribosomal RNA genes will be sequenced. Once the 16S rRNA genes have been sequenced, they will be compared to an online database to determine if the sequences are unique, which will help determine if the bacteria isolated in this project are new species. While this project has not yet verified that the 12 isolates are new species, several new species and genera have recently been discovered at this site, so it is possible that some of the new isolates are novel organisms.
ADULT BEGINNERS PIANO WORKSHOP: RESEARCH AND IMPLEMENTATION OF SKILL-BUILDING TECHNIQUES AND MATERIALS FOR LIFE-LONG LEARNING AND ENJOYMENT

Jaffe, Jan
Faculty Mentor(s): Bret Smith, Music

Session: 11 (Oral Session 10:00-11:30 in 271)

Central Washington University has long offered a single year-long piano class, intended to help music students pass a standard piano proficiency test. As a Graduate Teaching Assistant for this course, I felt it did not meet the needs of non-music students who were interested in learning the instrument. After many hopeful student inquiries and with support from the Office of Continuing Education and Department of Music, I offered the Beginners Piano Workshop as “Music 198” in Winter Quarter, 2009. Specifically designed for adults with little to no musical experience, this highly successful course gave motivated adults the knowledge and skills necessary to enjoy playing the piano as a life-long hobby. This presentation will give audience members a taste of what the students in this pilot project learned, their responses to the course, and the benefits of adult music education.

PERCEPTION OF HUTTERITES IN LOCAL FARMING COMMUNITY

Jenkins, Jaron
Faculty Mentor(s): Laura Appleton, Sociology

Session: 10 (Oral Session 10:00-11:30 in 202)

This is a study of the social construction of reality by a small rural Washington farming community in relation to two colonies of Hutterites living in the area. The Hutterites broke off from the Mennonites during the Reformation, and have retained their traditional beliefs and lifestyle, except for using modern farming equipment to make them more productive but avoiding modern technology to ease their lives. Their history and succeeding generations of offspring shows that Hutterites are able to keep their traditions by distancing themselves from the larger society. They accomplish this by having minimal interaction with neighbors, schooling their children on the colony, and relying on agriculture in isolated, lightly populated areas for economic support. My research focuses on the perceptions of local area farmers in close proximity to the Hutterites, and how their perceptions create an In-group/Out-group situation. As defined by sociologist Robert Merton, an In-group/Out-group occurs when a group of individuals identify with the in-group and assign the group with positive characteristics, while denigrating the out-group and assigning it negative characteristics. This creates mutual antagonism, which is essential in minimizing friendly relationships and preventing the adoption of a definition of reality that is mutual between the farming community and the Hutterites. These dissimilar definitions mitigate against the eventual mainstreaming of the Hutterite sect into the larger society. This data comes from 25 interviews of local men and women in the farming community about their experiences, perceptions, and context of interactions with the Hutterites.

THE DETECTION OF SULFONAMIDE ANTIBIOTICS USING A FUNCTIONALIZED SILICA GEL SURFACE

Jensen, Robert
Faculty Mentor(s): JoAnn Peters, Chemistry

Session: 23 (Oral Session 3:00-4:30 in 137B)

Sulfonamide antibiotics are widely used in both veterinary and human medicine and are therefore found commonly in the environment. As with all drugs, their use carries unwanted side-effects, including allergic reactions in humans and the evolution of bacterial resistances to the drugs. These implications necessitate a quick and inexpensive means of testing food and water that may contain traces of the drugs. The molecular structures of sulfonamides lead to strong intermolecular interactions, thus a silica gel surface that is functionalized to interact specifically with sulfonamides has been developed and tested as a first step in the development of a detection method. Characterization methods have been improved and quantitative data has been obtained for this system; molecular specificity testing will follow.
SOIL CRUST LICHEN HUNTING AND IDENTIFICATION ON THE WILD HORSE WIND FARM AND WHISKEY DICK WILDLIFE AREA OF KITTITAS COUNTY, WASHINGTON

Jensen, Dawn-Marie
Faculty Mentor(s): Nancy Hultquist, Resource Management; Jennifer Lipton, Resource Management

Session: 29 (Afternoon Poster Session 1:15-4:30 Mezzanine)

With an interest in comparing effects of differing management regimes on lichen and moss species diversity of biological soil crust (BSC), over 500 samples were collected from 105 sample points. Two thirds of the collection was processed, yielding 37 species identified, seven to genera and 13 species unknown with a total of 57 species recognized. A major component of the methodology was the spatially derived selection of sample points, sampling methods, the process of identification and finally preserving, mounting and storage of the individual specimens. ArcMap was used to geographically stratify the study area into 40 unique sets of variables. The variables include four aspects, two management regimes, and five plant communities (derived from soil composition). Then ArcMap selected five random points for each of the unique variable sets. Three of the five plant communities were sampled, due to time and resource constraints. Sampling methods included point-line intercepts in five quadrats along a 10-meter transect (a total of 180 intercepts per sample point). Samples were collected for each pin-point, where the content of the sample was unknown and placed in a numbered paper bag. Samples were stored in large plastic bags labeled with the sample point number. The data sheets include UTM coordinates and elevation for each sample point. So far, there appears to be a higher species diversity within the wildlife area. Statistical analysis and completion of the sample processing are necessary for confirmation.

INCORPORATING FILM INTO THE WOMEN’S STUDIES CLASSROOM

Johnson, Melissa
Department: English

Session: 25 (Oral Session 3:00-4:30 in 201)

Hollywood films present, and often construct, cultural ideologies. They tend to normalize societal gender and sexual identities, such as patriarchal and heterosexual relationships between males and females. Considering this tendency, I integrate film into the theoretical, historical, sociological, and anthropological discussion in my Introduction to Women’s Studies curriculum. As a dominant cultural institution, film captures—in a very clear and visual way—elements of society that students witness in their own lives, and bridges the gap between theory and reality. In general, film is an accessible medium for students. This provides a starting point for students to engage with the concepts of women’s studies through a platform with which they are already familiar. I will explore the benefits of this approach to teaching women’s studies, the materials and resources I find useful, and the challenges I face in using this method.

EFFICIENCY ANALYSIS OF PUBLIC EDUCATION IN WASHINGTON STATE

Johnson, Krista
Faculty Mentor(s): Yong Lee, Finance & OSC; Kun Liao, Finance & OSC

Session: 29 (Afternoon Poster Session 1:15-4:30 Mezzanine)

Quality improvement in non-profit organizations, such as hospitals and schools, has been an on-going concern to both academicians and industry practitioners. This report utilizes data envelopment analysis to measure the relative efficiency of public school districts, grouped by county in the state of Washington, based on data from the 2006-2007 school years. The analysis focuses on important factors affecting education. Teacher per student ratio is introduced as an efficiency measure, for lower class sizes are thought to facilitate learning better than crowded classrooms. On-time graduation is also used as an efficiency measure, as efficient school district counties will typically have a higher rate of students graduating on time. WASL scores are also used as an efficiency measure, as the WASL is a nationwide standardized test. All information was gathered by school district, and then computed to find county figures. Surprisingly, there are many differences in the efficiency of education from county to county, while some counties share similarities. Lower efficiencies may suggest possible need of changes in the factors, which affect efficiency most among school districts within counties, or may indicate a need to look over school policies.
TERRESTRIAL AND MARINE FOOD SUBSIDY TO SALMONID DIET: A STABLE ISOTOPE STUDY ON THE YAKIMA RIVER

Johnson, Allison
Faculty Mentor(s): Paul James, Biological Sciences

Session: 6 (Oral Session 10:00-11:30 in 137A)

It has been well documented that Pacific salmon contribute essential nutrients and energy for both aquatic and terrestrial ecosystems in coastal areas of the Pacific Northwest. After spawning, carcasses enriched with marine-derived nutrients from the Pacific Ocean spiral through freshwater aquatic and riparian communities. However, transfers of these nutrients are not well studied in streams and rivers throughout the interior Northwest. The objective of this study is to quantify what proportion of chinook salmon diet in the upper Yakima Basin originates from terrestrial and stream food sources, and how their diet may shift when salmon carcass and egg material are available for predation in the fall. To determine salmonid diet, 60 spring chinook salmon were collected by snorkeling, angling and electroshocking methods in two stream reaches on the Upper Yakima and the North Fork of the Teanaway River. To establish potential food sources, 15 replicate inventories of aquatic macroinvertebrates were conducted. Sampling also included aquatic and terrestrial plant material, as well as carcass material to determine levels of marine-derived nutrients. I will use carbon and nitrogen stable isotopes for dietary analysis because isotopes provide an understanding of food partitioning over many months. Examining the dietary needs of these fish, may further reveal the importance of marine nutrients in maintaining salmonid populations in the Yakima watershed.

CHEMICAL CHARACTERIZATION OF PRECIPITATION AND SURFACE WATERS FROM THE ANNAPURNA CONSERVATION DISTRICT, NEPAL

Johnson, Jacob; Hodges, Dave; Gazis, Carey
Faculty Mentor(s): Carey Gazis, Geological Sciences

Session: 28 (Morning Poster Session 8:15-11:30 Mezzanine)

Precipitation and surface water samples were collected in the Annapurna Conservation District, Nepal, as part of the NSF WATERS Nepal program. These samples were collected in August of 2008 to characterize the water chemistry of that region of Nepal during the monsoon season and to compare precipitation and surface water chemistry. Field analysis was performed for pH, dissolved oxygen, titratable alkalinity, conductivity, and ammonia. Samples were also transported back to Central Washington University for a complete chemical analysis. Field analysis of precipitation indicated that acid rain may be common during the monsoon region: in 11 out of the 14 days sampled, bulk precipitation had pH values between 4.1 and 4.8. Interestingly, the rain water was buffered to a higher pH almost immediately after it had interacted with soils to a pH of 6.8 or higher, similar to the pH of precipitation between the acid rain events. Complete chemical analysis for trace metals, anions, and cations will help advance the understanding of the water chemistry in this region of Nepal, both in terms of its suitability for human consumption, and also for describing the biogeochemical cycles that might be occurring in the ever developing Himalayan Mountains.

CHEMICAL CHARACTERIZATION OF SOUTH ATLANTIC OCEAN AEROSOLS

Johnson, Jacob
Faculty Mentor(s): Anne Johansen, Chemistry

Session: 23 (Oral Session 3:00-4:30 in 137B)

Aerosol samples were collected during the months of January, February, and March 2005 on a cruise around the southern tip of South America and onto Barbados. Size fractionated High Volume Cascade Impactor samples (large, coarse, fine, and ultra fine) were analyzed for trace metals, soluble iron, total iron, anions and cations in the atmospheric chemistry laboratory at Central Washington University. Results from this study serve to shed light on the atmospheric role of micronutrient input into remote parts of the open ocean, where phytoplankton productivity is controlled by this atmospheric source. Because phytoplankton are responsible for 50 percent of Earth’s photosynthesis, an increased understanding of the processes that control productivity is essential in predicting global climate and human impact on it.
RACE AND PERCEPTIONS OF INJUSTICE: EVIDENCE FROM ATTITUDES ON THE DEATH PENALTY SURVEY

Johnson, Michele
Faculty Mentor(s): Eric Cheney, Sociology; Sarah Britto, Law & Justice

Session: 10 (Oral Session 10:00-11:30 in 202)

Past research has shown that race is related to individual's perception of the equity of the application of the death penalty. However, the majority of previous research in this area has been conducted in southern states, where the history of slavery continues to cast a shadow of racism and oppression and undoubtedly heavily influences attitudes towards criminal behavior and punitive measures. Few studies have explored this relationship outside of the South, and few studies have included Hispanics. For this study, data was gathered by surveying 360 individuals living in the Northwest. Quantitative analysis explores relationships between social class, race/ethnicity, and perceptions of inequality in the application of the death penalty, while controlling for a number of demographic and theoretically relevant variables. The results of the research show a relationship between an individual's race/ethnicity and his or her perception of inequality in the application of the death penalty.

SEDIMENTOLOGY AND FATE OF THE 2004 INDIAN OCEAN TSUNAMI DEPOSITS IN SOUTHEASTERN INDIA

Johnston, Patrick; Ely, Lisa; Achyuthan, Hema; Srinivasalu, S.
Faculty Mentor(s): Lisa Ely, Geological Sciences

Session: 21 (Oral Session 3:00-4:30 in 135)

Recent investigations in Thailand and Sumatra indicate that large tsunamis have occurred in the eastern Indian Ocean in the last 3,000 years. The largest of these could have traversed the northern Indian Ocean to the southeastern coast of India, which is a potential repository of catastrophic ocean-wide events. Sites where tsunami deposits dependably survive are not yet well defined in India and other tropical environments. Thus, the purpose of this project was to identify the settings conducive to long-term preservation of tsunami deposits in tropical India and develop criteria for distinguishing them in the stratigraphic record. We documented the fate of tsunami deposits from the 2004 Sumatra-Andaman earthquake in various geomorphic environments along the southeastern coast of India. Deposits from the 2004 tsunami were mapped, described, and surveyed at locations where they had been described immediately after the event, as well as at previously unstudied sites. At many sites, the tsunami sand deposits were recognizable in the stratigraphic column. However, only three years after the event, deposits in some locations had been altered significantly rendering them unrecognizable. No conclusive evidence of pre-historic tsunami deposits has been found at the sites included in this study, but the results will guide the search for settings in India and other tropical regions that preserve deposits from past tsunami events similar to the catastrophic tsunami in 2004.

ENHANCING ACADEMIC PERFORMANCE THROUGH THE ADOPTION OF THE SCHOOL UNIFORM IN PUBLIC SCHOOLS

Jones, Kim
Department: Education

Session: 11 (Oral Session 10:00-11:30 in 271)

In response to growing levels of violence in American schools as well as other concerns, numerous communities are adopting strict dress codes and/or school uniform policies as part of an overall program to improve school safety and discipline. In urban schools with high crime rates, a strong dress code can become a desperate attempt to save lives. Students who wear flashy jewelry and designer clothing pose as tempting targets for violent thieves. Furthermore, uniforms can help school officials recognize intruders on school campuses. In some districts, safety is not the only reason for uniform policy adoption. Students wear uniforms as a source of pride and affiliation, or to establish a calm, businesslike atmosphere at school in which academic performance is enhanced (Loesch, 1995). Many schools are adopting school uniforms to alleviate parents' expenditure on clothing as well. If schools want to successfully adopt uniform-wearing policies, several recommendations exist in the literature. These recommendations include: considering adopting voluntary uniform policies, addressing an "option out" clause in the uniform policy in order to avoid legal challenges, considering the costs and availability of certain uniform choices, understanding possible "religious expression entanglement" of policy adoption, and involving parents in uniform policy formation beginning at the grass-roots stage. (Loesch, 1995). A school uniform program that works. Principal, 74(4), 28.
ARROYOS IN CENTRAL WASHINGTON
Joslin, Michael
Faculty Mentor(s): Karl Lillquist, Geography

Session: 29 (Afternoon Poster Session 1:15-4:30 Mezzanine)

In many of the semiarid and arid regions of the world, soil erosion has caused problems for land use management. Arroyos are landforms created from soil erosion along a drainage channel. They create steep-sided gullies incised into the landscape. These landforms cause drastic changes to the hydrology, vegetation growth, and land use potential of an area. Previous research has identified arroyos in semiarid central Washington. Examination of the spatial extent of arroyos can help to give insight into the causes of these landforms. Arroyos were identified in Douglas, Grant, and Adams counties, using 2005 digital orthophotos. Analysis of the spatial extent of these landforms shows a relationship with the Channeled Scablands that were formed as a result of the Missoula Floods during the late Pleistocene. These floods created several narrow channels filled with glacier deposited material where much of the incision has occurred. Arroyos also show a spatial relationship with agriculture. Arroyos tend to be identified in areas of predominately dryland wheat agriculture while they were not present in areas of irrigated agriculture. Research of arroyo incision in this area is important in determining why they form and what areas will likely experience further incision in the future.

FROM THE PAST INTO THE FUTURE: FLATHEAD AND PEND D’OREILLE CULTURAL MAINTENANCE AND ADAPTATION
Judy, Krystal; Smith, Talitha
Faculty Mentor(s): Tracy Andrews, Anthropology & Museum Studies

Session: 29 (Afternoon Poster Session 1:15-4:30 Mezzanine)

This study assesses Flathead and Pend d’Oreille cultural maintenance and adaptation in the face of non-Native influence. Their traditional territory extended from northeastern Washington and northern Idaho along the Rocky Mountains, into western Montana and to the Continental Divide. Prior to Western European contact, the Flathead and Pend d’Oreille were self-sufficient hunters and gatherers who relied mainly on buffalo, deer, moose, large waterfowl, salmon, and native edible plants that were available throughout their traditional homeland. American governmental policies and settlement histories have forced these groups to become confederated onto a single reservation located in northwestern Montana, and the reservation is now called the home of the Confederated Salish and Kootenai Tribes. Beginning with early Euroamerican contact, we examine how the Lewis and Clark expedition, Jesuit missionaries, and traders have impacted these Native American tribes’ language, economic options, and cultural practices. After decades of non-Native efforts to eradicate their culture, the Flathead and Pend d’Oreille are reviving their language and creating unique educational opportunities for their members. The tribes’ self-determination rights, established through treaties, have resulted in a governmental structure that is working to improve economic opportunities on the reservation and ensure a strong cultural framework for future generations.

COMPARISONS OF POST-EXERCISE CHOCOLATE MILK AND A COMMERCIAL RECOVERY BEVERAGE CONSUMPTION BETWEEN ENDURANCE CYCLING WORKOUTS ON RECOVERY AND PERFORMANCE
Katica, Charlie; Pritchett, Kelly; Pritchett, Robert; Bishop, Philip; Green, Matt; Jager, Johnna
Faculty Mentor(s): Kelly Pritchett, Health, Human Performance & Nutrition

Session: 28 (Morning Poster Session 8:15-11:30 Mezzanine)

Purpose: This study compared a CHO:PRO beverage (choc milk, CHOC) to a commercial recovery beverage (Endurox, CRB) ingested daily over a one-week period in 10 trained cyclists. Methods: Cyclists twice maintained their training regimen over a three-week period in which they received either the CHOC, or CRB treatment post workout in a counterbalanced design. Cycling performance at 85 percent of VO2max was compared between the two beverages. CK (creatine kinase) levels were assessed at baseline, and again before the performance trial. Results: A repeated measures ANOVA indicated that CKpre significantly (p <0.05) increased by 64 percent (+220 UL-1) to CKpost for both trials; however, there was no significant difference (p =.95) for CKpost between the two trials (CHOC 570 ±336 UL-1, CRB 579 ±383 UL-1). There was no significant difference (p = .73) between trials for cycling time to exhaustion at 85 percent of VO2max (CHOC 17.4 ±13.1 min, CRB 15.5 ±9.9 min). Conclusions: This study suggests that chocolate milk is just as effective as CRB as a recovery aid.
CONTROVERSY, BALANCED INSTRUCTION, AND CIVIC ENGAGEMENT
Kaviani, Khodadad
Department: Education

Session: 11 (Oral Session 10:00-11:30 in 271)

In a democratic society, what do teacher candidates think about the purpose of education, controversy and balanced instruction? Can civic engagement be implemented in and out of the classroom? This article highlights the result of a qualitative study that argues training new teachers should include an explicit goal of preparing for a type of citizenship that goes beyond mastering content knowledge and should emphasize skills and attitudes that are essential for maintaining and promoting a vibrant democratic society. After all, students in North Korea and other non-democratic regimes do receive an education and those countries produce teachers, engineers, and doctors too. Teacher candidates can develop the dispositions necessary for valuing and safeguarding democratic ideals by being explicit about the importance of socialization and counter socialization in democratic citizenship education. Furthermore, what makes this approach to teacher training worthwhile is the application of theory into practice by teacher candidates leading discussions on important public issues with various community members. I will present the lessons my students have learned in their civic engagement experiment (leading discussions on the Pledge) and show the compatibility of discussion with the notion of diversity.

DESCARTES’ CRACKED FOUNDATION
Keeney, Joe
Faculty Mentor(s): Gary Bartlett, Philosophy

Session: 24 (Oral Session 3:00-4:30 in 140)

Rationalists believe that knowledge can be obtained and/or justified through reasoning, while denying that all knowledge is based on experience of the senses. Rene Descartes believes the senses to be deceptive and argues for the rationalist perspective in his Meditations by attempting to establish a foundation of unquestionable knowledge. This epistemological grounding avoids deceptive, sensory based information while including (what he considers to be) indubitable, non-sensory disciplines, such as mathematics and geometry. Upon this “sound” epistemological foundation, he then commences to form the structure of his beliefs through clear and distinct thinking. Using a rather simple thought experiment that I created about a fellow with no senses named Bean, I will proceed to illustrate how it is that mathematics and geometry are indeed based on experience. If the senses cannot be trusted as sources of indubitable knowledge, then math and geometry cannot be trusted. If Descartes’ foundation of knowledge consists of doubtable assumptions, then his resulting belief structure continues to remain unstable. Through opposition to Descartes’ assertion, I will argue for the empiricist perspective that knowledge is rooted in sensory experience and thus argue against rationalism, for whether or not knowledge of mathematics is a priori, a posteriori knowledge of numbers is required for its recognition.

AN EXPLORATORY STUDY OF THE PROPARGYLATION OF AROMATICS IN IONIC LIQUIDS EMPLOYING YTTERBIUM TRIFLATE AS A CATALYST
Kellar, Casey; Brown, Kelley; Laali, Kenneth
Faculty Mentor(s): Viorel Sarca, Chemistry; Levente Fabry-Asztalos, Chemistry

Session: 28 (Morning Poster Session 8:15-11:30 Mezzanine)

Green chemistry, also known as sustainable chemistry, refers to the design and use of chemicals and processes that reduce or eliminate substances that are hazardous to humans and the environment. In this relatively new approach to chemistry, emphasis is also placed on maintaining economic viability while minimizing energy use and waste production. Many traditional organic solvents have been implicated as environmental contaminants and are often toxic, volatile, and difficult to work with. The search for replacements for these solvents is currently the subject of intense research and is an important agenda for green chemistry. Room temperature ionic liquids have attracted a great deal of worldwide interest for use as “green” solvents because they have a low melting point, minimal vapor pressure, low toxicity, and can be recycled. The aim of this project was to develop a mild and selective synthetic method for the propargylation of aromatics with propargylic alcohols in imidazolium ILs. We employed a readily available metallic triflate, ytterbium triflate Yb(OTf)₃, as a catalyst. The propargylic products of these reactions are useful and versatile building blocks in organic synthesis. We are currently performing these reactions under mild conditions using common synthetic methods and the ionic liquid solvent is recovered and reused in subsequent reactions.
WENAS CREEK MAMMOTH CASTING PROJECT  
*Keller, Alfred*  
*Faculty Mentor(s): Patrick Lubinski, Anthropology & Museum Studies*

Session: 5 (Oral Session 10:00-11:30 in 135)

The project I have been working on over the past year has been to research and develop processes for the manufacture of cast reproductions of the mammoth bones recovered from the Wenas Creek Mammoth Site, near Selah, Washington. Based on my own prior experience with sculpture and cast making, and working in conjunction with Dr. Patrick Lubinski, I have been researching and using processes for making silicone rubber molds and urethane foam casts of mammoth bones from the site. These reproductions are then painted to resemble as closely as possible the original mammoth bones. When finished these casts provide durable, accurate reproductions of the fragile and irreplaceable original bones. The silicone molding process lends itself easily to the production of multiple copies of the bones (budget permitting) that will be available for use in CWU classrooms and for a wide variety of presentations to the community. I have already used these reproduction bones in presentation of the Wenas Creek Mammoth project to Head-Start, Ellensburg School District, and Discovery Middle School students, as well as the general public at Higher Education Days in Olympia.

PATTERN-BASED ENVIRONMENTAL SCIENCE: AN INTERDISCIPLINARY APPROACH TO 8TH GRADE SCIENCE WITHIN THE YAKIMA RIVER WATERSHED  
*Ketsdever, Amanda; Dwight, Kevin*  
*Faculty Mentor(s): Karl Lillquist, Resource Management*

Session: 28 (Morning Poster Session 8:15-11:30 Mezzanine)

The Yakima WATERS project is a National Science Foundation program funded at Central Washington University. This program is designed to introduce interdisciplinary watershed research into existing K-12 curriculum. Under the guidance of a faculty mentor, a graduate fellow conducts watershed-related research into a participating K-12 teacher’s curriculum. All schools participating in Yakima WATERS are part of the Yakima River watershed. Working under the guidance of Dr. Karl Lillquist, WATERS has successfully integrated watershed research into Kevin Dwight’s 8th grade science curriculum at Morgan Middle School, Ellensburg, Washington. WATERS has focused on integrating practical environmental science topics and field methods related to the Yakima watershed. Students have investigated interactions between pedology, geomorphology, climate, vegetation, and human patterns throughout their 8th grade science semester. Students organized their own research projects for a field trip within walking distance of the school, analyzed their data, and looked for associations between different variables. The semester culminated with a poster session displaying each group’s data and conclusions from the field trip. The 8th grade scientists have the ability to describe and interpret relationships between natural and social interactions and test them using the scientific method as it relates to their environment within the Yakima River watershed.

“ENGRISH” IN JAPAN: THE USE AND MISUSE OF ENGLISH IN JAPANESE MEDIA  
*Kjeldgaard, Marie*  
*Faculty Mentor(s): Natalie Lefkowitz, Foreign Languages*

Session: 29 (Afternoon Poster Session 1:15-4:30 Mezzanine)

English is commonly used in Japanese media and advertisements. This use of English is generally meant to bring forth positive, international associations in the mind of the Japanese consumer, conveying little referential information. Many English advertisements in Japan contain what a native English speaker would consider errors. They are sometimes humorously referred to as “Engrish.” This study investigated the use of English in Japanese billboard advertisements to determine how prevalent these errors are. English advertising samples were divided into four categories: those containing no errors, those containing contextual errors, those containing grammar or spelling errors, and those containing English loanwords with a different Japanese meaning. The samples without errors were found to comprise over half of the total samples. Samples containing contextual or grammatical errors may still be effective in conveying the intended message to the Japanese consumer.
WEATHER IN EVERYDAY LIFE

Kosters, Kolten
Faculty Mentor(s): Robert Hickey, Geography

Session: 29 (Afternoon Poster Session 1:15-4:30 Mezzanine)

Weather plays a significant role in the daily activities of humans around the world. Every moment of the day weather patterns and conditions influence travel, agriculture, health, and economics. Although we can choose where we live, the climate has a substantial control over our daily interactions. In addition to the obvious extremes such as tornados, hurricanes, and monsoons, weather has been shown to have a considerable influence over our physical and mental health. Seasonal depression, for example, has been experienced in higher rates in higher latitudes, which receive less solar radiation, than in lower latitudes, which receive a more constant rate of solar radiation. Although weather influences are researched, several aspects of weather still remain a mystery to the scientific community and the general public. The purpose of this project is to provide a well organized, informative website that will facilitate the education of human-climate interrelations. This website will bring together the massive, cross-disciplinary study of weather science and provide a well organized quick reference system. Information will be provided about how weather influences human health and psychology, weather’s influence on the world’s economy, weather’s influence on travel and recreation, and weather’s influence on current scientific studies of climate. Once completed, this website will provide substantial insight to the involvement of weather in everyday human life.

LOVE CAN’T MOVE MOUNTAINS: ALEJANDRA AND JOHN GRADY’S FAILURE TO CROSS COMMUNICATION BORDERS IN COMAC MCCARTHY’S ALL THE PRETTY HORSES

La Paz, Ana
Faculty Mentor(s): Christopher Schedler, English

Session: 13 (Oral Session 1:15-2:45 in 135)

Communication between two people, according to George H. Shames and Elisabeth H. Wiig, is “the transmission of information . . . encompass[ing] almost all personal interactions, including those which involve verbal symbolism and those which are entirely nonverbal” (Human Communication Disorders: An Introduction 21). Robert G. King, author of Fundamentals of Human Communication, adds to this description of communication by saying, “To be effective, the receiver of the message must give the response that the sender desired. That desired response is the test of effectiveness in communication” (10). Of the many borders people must cross in communication, which can range from nationality to ethnic background, one of the most common divides is gender. The problem with effective communication between men and women is evident in the relationship between John Grady and Alejandra in Cormac McCarthy’s novel All the Pretty Horses. John Grady has a tendency towards kinesis, or communicating non-verbally. His predilection for kinesic communication grew in part because he received negative reinforcement for conversation from his mother in conjunction with receiving positive reinforcement for his nonverbal interactions with horses. Alejandra, on the other hand, developed, through interactions with her family, a diplomatic brand of almost completely verbal communication, in which she may say one thing and do another. Although John Grady and Alejandra vow that they love each other extraordinarily, they prevent their own relationship through an inability to effectively break down, or cross over, the borders of communication which stand between them.
NUTRIENT LIMITATION IN SWAUK CREEK RIVER BASIN

Lamb, Tanya
Faculty Mentor(s): Clay Arango, Geography
Session: 6 (Oral Session 10:00-11:30 in 137A)

Historically, salmon subsidized Pacific Northwest streams with marine-derived nitrogen and phosphorus, important nutrients that control stream food web productivity. With regional salmon decline, many streams have become nutrient limited. Swauk Creek, in the upper Yakima River basin, holds promise for salmon restoration because it currently supports a small run of steelhead, and coho salmon will be reintroduced within the decade. However, decades of curtailed nutrient subsidies may have decreased food web productivity, which could impede salmon restoration. I studied three headwater streams in Swauk basin in summer and autumn using nutrient diffusing substrata to measure nutrient limitation. In this method, nitrogen, phosphorus, or both diffuse from agar through a glass disk or a cellulose sponge that select for autotrophic or heterotrophic biofilms respectively. Although Iron and Hovey creeks responded significantly to nutrient treatments, Swauk Creek did not, although a larger sample size may have detected a significant response. Autotrophic and heterotrophic biofilms were co-limited by nitrogen and phosphorus in the summer and the fall in Iron Creek, but only heterotrophic biofilms were co-limited in the summer and fall in Hovey Creek. Importantly, nitrogen or phosphorous alone did not induce a significant response in any creek. Co-limitation by nitrogen and phosphorus in Iron and Hovey Creek is consistent with patterns in other streams with long-term salmon decline. Despite having no baseline to compare historic and current nutrient limitation patterns in Swauk basin, food web productivity would likely increase if salmon runs are successfully recovered.

SCIENCE RESEARCH IN THE K-12 CLASSROOM: USING WATERSHED CONCEPTS TO INCREASE SCIENTIFIC LITERACY

Lamperth, Jamie; Hennessey, Kelly; James, Paul
Faculty Mentor(s): Paul James, Biological Sciences
Session: 28 (Morning Poster Session 8:15-11:30 Mezzanine)

Yakima WATERS, a National Science Foundation (NSF)-funded project to infuse local watershed concepts and research in K-12 schools, was implemented into a 9th grade honors biology curriculum at A.C. Davis High School in Yakima, WA. An inquiry-based approach was used to strengthen students’ data analysis and interpretation skills, and to help students broadly apply their knowledge and skills using watershed-relevant data. Students initially conducted Internet queries to determine their knowledge of the biology and ecology of bull trout Salvelinus confluentus, a threatened fish species found in the Yakima River watershed. Using a seminar approach, students orally discussed their findings with the author. Special focus was given to habitat requirements and radio telemetry techniques of bull trout. The author then provided a data subset from a bull trout migration study that included radio-tagged fish length, weight, fish locations over a seven month time period, river discharge, and capture effort. Students were required to analyze and summarize the raw data by creating tables and graphs in Microsoft Excel. Socratic questioning was used to help students discover answers and troubleshoot their own scientific questions. Finally, students used their results to describe migratory behaviors and temporal habitat uses of bull trout, and to infer the effect watershed management practices may have on bull trout populations.
ARE BULL TROUT PRESENT IN COWICHE CREEK, WA?: A SPATIAL MODEL PREDICTING SUITABLE HABITAT

Lamperth, Jamie
Faculty Mentor(s): Paul James, Biological Sciences

Session: 28 (Morning Poster Session 8:15-11:30 Mezzanine)

Bull trout, *Salvelinus confluentus*, are listed as threatened under the Endangered Species Act requiring managing agencies to monitor population status. Bull trout often occur in remote, high elevation areas, making monitoring activities logistically difficult. Models identifying suitable habitat patches can help focus monitoring efforts. Although the locations of most bull trout populations are known throughout the Yakima River basin, uncertainty remains regarding its occurrence in some streams, particularly Cowiche Creek. The objective of this study was to identify the amount of suitable habitat in Cowiche Creek using tools available in ArcGIS 9.3 to infer the probability of bull trout occurrence in this catchment. Maximum daily stream temperature (MDST), stream gradient, and percent stream canopy cover were selected as predictive suitable habitat characteristics. ArcHydro 9.0 and Spatial Analyst tools were used to identify stream gradient and canopy cover values at the pixel resolution along the length of the study stream. MDST was estimated for each pixel by entering a linear regression equation into Map Algebra. The equation was derived from stream temperature data collected at a nearby stream with elevation as the predictor variable. Habitat variables were reclassified to suitability ranks based on published literature, and the ranked data sets were summed to determine suitable habitat. This model identified approximately 9.3 km of high quality suitable bull trout habitat in the Cowiche Creek watershed, less than the minimum habitat necessary to support a bull trout population.

CONTROLS ON THE OXYGEN ISOTOPE COMPOSITION OF SOIL CARBON DIOXIDE FLUX TO THE ATMOSPHERE ACROSS A PRECIPITATION GRADIENT IN CENTRAL WASHINGTON

Larkins, Clayton; Gazis, Carey
Faculty Mentor(s): Carey Gazis, Geological Sciences; Holly Pinkart, Biological Sciences; Jennifer Lipton, Geography

Session: 28 (Morning Poster Session 8:15-11:30 Mezzanine)

The isotopic composition of oxygen in CO₂ can be used to monitor carbon exchange at both ecosystem and global scales. The study of oxygen isotope composition in different CO₂ fluxes is, therefore, integral to monitoring anthropogenic influence on the global carbon budget. To utilize oxygen isotopes in CO₂, the oxygen isotopic composition of the major CO₂ fluxes to the atmosphere must be defined. Of the major CO₂ fluxes to the atmosphere, soil CO₂ has the least well defined oxygen isotope composition. Numerous laboratory and modeling studies directed at this issue have defined a set of environmental factors that influence the oxygen isotopic composition of the soil CO₂ flux. However, to accurately model the isotopic composition of soil flux, the influence of natural variation in environmental conditions on this flux must be better defined. In this study, the isotopic composition of oxygen in soil CO₂ flux is measured across a precipitation gradient in central Washington. In addition to soil flux measurements, soil water, soil temperature, air temperature, and soil composition data are collected at each sample site. The oxygen isotope composition of soil CO₂ flux will be analyzed with respect to environmental parameters to identify natural variation in the isotopic flux resulting from precipitation input.
LOOKING AT THE WATERSHED IN A WHOLE NEW WAY: YAKIMA WATERS IN CLE ELUM/ROSLYN HIGH SCHOOL
Larkins, Clayton; Gazis, Carey; Ryan, Brit; Wickwire, Eric
Faculty Mentor(s): Carey Gazis, Geological Sciences; Holly Pinkart, Biological Sciences; Jennifer Lipton, Geography
Session: 28 (Morning Poster Session 8:15-11:30 Mezzanine)

Watershed Activities to Enhance Research in Schools (WATERS) is a National Science Foundation (NSF)-funded GK-12 program that infuses watershed research into secondary school science classrooms in the Yakima River Watershed. At Cle-Elum/Roslyn High School (CERHS), a team consisting of a graduate fellow, a science teacher, a social science teacher, and a CWU researcher is working to integrate learning across physical and social science classrooms by engaging students in local environmental and social issues. This year WATERS has worked with upperclassmen in Chemistry and Contemporary World Problems (CWP) classes. In Chemistry, students have investigated controls on local water quality and availability through field- and lab-based projects. In CWP, students have researched and debated water rights issues in the Yakima River watershed in a town hall format. The WATERS team also works with the 9th grade Discovery Institute at CERHS to emphasize how integrating physical and social science concepts help inform policy making. For this, the curriculum of an Environmental Science class is being aligned with that of a Pacific Northwest History class to provide an interdisciplinary overview of social evolution and its relationship to the environment in the Pacific Northwest. The WATERS fellow will help students develop environmental science projects based on research within the watershed. Concomitant to their science research, students will produce a literature review on a related component of Pacific Northwest history to integrate social and physical science issues within the watershed.

CRIME RATES AND THE STATE OF THE ECONOMY
Layher, Reed
Faculty Mentor(s): Krystal Noga-Styron, Law & Justice
Session: Poster Session, CWU-Lynnwood

Do people engage in more criminal behavior when economic times are difficult? Conventional wisdom is that crime would go up as the economy goes down. For my research project, I ventured out to determine if there was indeed a correlation between the state of the economy and the crime rate. I created the hypothesis that people do engage in more criminal behavior when economic times are difficult. Before conducting my own research into this topic, I accumulated five scholarly articles that discussed this issue. Of the five scholarly articles I found, four of them determined that unemployment was the key economic factor in relation to the crime rate. I distributed a questionnaire to my neighbors and CWU students. My questionnaire sought to assess the behavior of my respondents over the past six months, as well as their attitudes and beliefs about crime and the state of the economy. After compiling and analyzing the data from the questionnaires, my sample group shows strong indications that the economy has indeed affected criminal behavior. Considering the narrow time frame of my study, that being the last six months, and the assumption that the vast majority of people are law-abiding, I conclude that people do indeed engage in more criminal behavior when economic times are difficult.

SOCIAL STRUCTURE IN THREE CAPTIVE CHIMPANZEES
Leeds, C. Austin; McCarthy, Maureen; Bismanovsky, Daniella; Denton, Tanya; Jensvold, Mary Lee; Fouts, Deborah
Faculty Mentor(s): Maureen S. McCarthy, Psychology; Mary Lee Jensvold, Anthropology & Museum Studies; Deborah H. Fouts, Chimpanzee and Human Communication Institute
Session: 29 (Afternoon Poster Session 1:15-4:30 Mezzanine)

In October of 2007 the group of chimpanzees at the Chimpanzee and Human Communication Institute (CHCI) suffered the loss of its alpha female, Washoe. This presentation is a systematic examination of the social hierarchy in the subsequent summer among the remaining chimpanzees. Researchers collected live data on dominance indices across 11 different behavioral contexts, such as grooming, threat and feeding, over a 20-day period. Dominance indices indicated which individual was dominant and subordinate in each interaction in a particular behavioral context. Of the three chimpanzees, Tatu ranked most dominant in five contexts, Loulis ranked most dominant in three contexts, and Dar ranked most dominant in two contexts. Two previous studies of the social structure at CHCI demonstrated similar results for Tatu, Dar, and Loulis’s dominance rankings. Thus, the chimpanzees’ social structure remains relatively stable despite the social group’s loss of Washoe and, in 2002, Moja.
THE WIFE OF BATH: A WOMAN AHEAD OF HER TIME
Lehrman, Nathan
Faculty Mentor(s): Laila Abdalla, Douglas Honors College

Session: 8 (Oral Session 10:00-11:30 in 140)

In the 21st century, the idea of an independent dominant woman is common and highly encouraged. She is someone who knows what she wants and is not afraid to take charge. She is also the type of woman who does not like to wait. Yet in the time of Chaucer, this type of woman was generally atypical and unapproved. At the end of the Middle Ages, and at the brink of the Renaissance, new ideas were rising around Europe, and old ideas were fading. Chaucer’s *The Canterbury Tales* pursues some of these new notions, including women’s rise in their society. The tale entitled “The Wife of Bath” introduces and explores some of these developing cultural ideas. The “Wife of Bath” representation is of a dominant, independent and sexual woman. Chaucer uses the portrayal of these traits in *The Canterbury Tales* to challenge old social expectations and introduce the changes that are developing in Europe.

OPERATING CHARACTERISTICS AND RESEARCH APPLICATIONS OF THE CARBON DIOXIDE LASER
Leiseth, Jeff
Faculty Mentor(s): Michael Jackson, Physics

Session: 28 (Morning Poster Session 8:15-11:30 Mezzanine)

Since its invention in 1964, the carbon dioxide (CO₂) laser has proved useful in numerous settings, from industrial applications to advancing activities in fundamental research and development. In this work, we have investigated the operation of a 1.5 m long CO₂ laser. This particular laser uses about 600 W of electrical power distributed with a dual-cathode design to excite a low-pressure gas mixture of carbon dioxide, nitrogen, and helium. A 150 line/mm grating is used to couple individual laser emissions out of the laser cavity. In all, over 80 laser emissions in the 9 and 10 micron region were observed having powers up to approximately 25 W. A CO₂ spectrum analyzer was used to identify the spectroscopic transitions of individual laser emissions. A piezo-electric transducer, connected to the laser’s end mirror, allowed each laser transition’s frequency to be tuned slightly by adjusting its position within the gain curve of the laser. At Central Washington University, this CO₂ laser serves as an infrared source of coherent radiation for use in an optically pumped molecular laser system. In this presentation, the properties and operating characteristics of this particular CO₂ laser will be discussed along with its use in generating the 118 micron line from optically pumped methanol (CH₃OH).

CROSS-CULTURAL COMPARISON OF ATTITUDES, PERCEPTIONS, BELIEFS, AND TENDENCIES OF CENTRAL WASHINGTON UNIVERSITY AND PU KYONG NATIONAL UNIVERSITY STUDENTS ON RECYCLING
Lemus-Luna, Hernan; Rios, Brenda; Park, Hee Jung
Faculty Mentor(s): Robert Lupton, Information Technology & Administrative Management

Session: 28 (Morning Poster Session 8:15-11:30 Mezzanine)

As our society continues to devour natural resources, many people are looking at recycling as a means to preserve the earth for future generations. Research indicates a person’s attitude toward recycling has a significant effect on waste recycling and recycling shopping behaviors. This study investigates the attitudes, perceptions, beliefs, and tendencies of recycling by students at Pukyong National University in South Korea, where recycling is required by law, in comparison to students at Central Washington University in Washington state where recycling is optional. Questionnaires were administered in classes throughout both universities. A total of 549 usable surveys were collected in the U.S. and 545 in South Korea. Of those surveyed, 66 percent of Americans recycle to help the environment while only 34 percent of South Koreans recycle for this reason. Eighty-nine percent of South Koreans said that they recycle because it is the law. When it came to the influence of family and friends as a reason for recycling, 53 percent of Americans said that they were influenced by family and friends, while 47 percent of South Koreans responded the same. Seventy-nine percent of the Americans said that they were too busy to recycle, while 20.6 percent of South Koreans reported being too busy as their reason for not recycling. These results and others will be presented as well as implications for recycling efforts and education in the United States.
EARTHQUAKE VALVES: A SIMPLE SOLUTION TO A SERIOUS FIRE HAZARD

Lerner, Iris
Faculty Mentor(s): John O'Neill, Industrial & Engineering Technology
Session: Poster Session, CWU-Des Moines

This report identifies the current risk posed to the citizens of Washington State by earthquake related fires from natural gas lines broken during seismic activity. Earthquake related fires have claimed thousands of lives and destroyed entire communities around the world. Broken gas lines are the usual source of fire, while broken water mains and the inability of fire services to respond to numerous simultaneous calls for help, contribute to the overall destruction. Earthquake related fires can be minimized or even prevented by the installation of seismically activated shut-off valves on business and residential natural gas supply lines. A retrofit program should be designed and adopted in cooperation with the gas suppliers and state, county and local agencies, including emergency service providers and property insurers. Priority of installation should include consideration of propensity for conflagration and population density, and the protection of human life should always take priority over protection of property.

SAFETY BY DESIGN: A SCENARIO ILLUSTRATING THE IMPORTANCE OF HAZARD INVESTIGATION AND ANALYSIS TO IMPROVE WORKPLACE SAFETY AND MANAGE RISK

Lerner, Iris; Matheus, Robin; Jess, Brian; Le, Thuy-Linh
Faculty Mentor(s): John O'Neill, Industrial & Engineering Technology
Session: Poster Session, CWU-Des Moines

This paper utilizes actual accidents related to construction heater fires to demonstrate the consequences of failure to adequately investigate workplace accidents and near-misses. Our fictitious construction company, Heritage Renovations, is faced with potential damages in excess of $5,000,000, legal action regarding damage to a neighboring home and injury to its occupants, a 50 percent increase on liability insurance premiums or cancellation of the policy, increased Labor and Industries (LNI) rates, and potential fines and sanctions from LNI. In this scenario, the safety analysis identifies standardization (of portable heating equipment, fuel, procedures, training and supervisory responsibility) as the most important method to prevent and control the hazards associated with portable construction heaters and demonstrates the importance of routine reporting and evaluation of near-miss incidents as a primary tool in hazard identification, reduction, accident prevention, and risk management.

FACTORS AFFECTING SUPERCOOLING OF THE NORTHERN SCORPION

Lessig, Zach
Faculty Mentor(s): Jason Irwin, Biological Sciences; Audrey Huerta, Geological Sciences
Session: 14 (Oral Session 1:15-2:45 in 137A)

The northern scorpion (Paruroctonus boreus) has the northernmost range of any scorpion in North America but the major factors contributing to its ability to supercool are not well understood. When an organism is supercooled, its body temperature is below where it would normally freeze and yet the body fluids are not frozen. This is crucial for winter survival of organisms that cannot withstand freezing. Many factors contribute to the ability of an organism to supercool, including the ingestion of food. Previous studies looking at seasonal differences in supercooling ability in scorpions have suggested that the ingestion of food raises the supercooling point due to the ice nucleating properties of food. In my study, scorpions were fed, and then I measured the supercooling points of a sample at one week intervals. Mean supercooling points were between −12°C and −14°C. They were significantly affected (P=0.05); however, this accounted for only 8.1 percent of the variation observed over the 6 week experiment, suggesting that feeding may not be as influential on supercooling ability as previously thought.
AMPHIBIAN POPULATIONS AND ECOLOGICAL CONNECTIVITY: RESPONSES TO ROADWAYS IN A CASCADES MOUNTAIN CORRIDOR OF WASHINGTON

Lester, Michelle; Barreca, April; Brady, Susan; Hill, Brenna
Faculty Mentor(s): R. Steven Wagner, Biological Sciences; Jason Irwin, Biological Sciences

Session: 28 (Morning Poster Session 8:15-11:30 Mezzanine)

High-traffic roads often isolate local animal populations, especially low-mobility organisms like amphibians with limited dispersal ability, increasing their susceptibility to extinction. In order to map diversity and occurrence and evaluate the road effect on amphibian populations in the East Cascades, funnel traps, minnow traps, visual encounter surveys, rubble rousing, dip nets and pitfall traps with drift fences were used to capture amphibians throughout a 15 mile stretch of Interstate 90 between June and October, 2008. Encountered individuals of seven species at four sites were marked using elastomer tags, toe clipping and radio transmitters in attempt to access efficiency of each monitoring method as well as effectiveness of current crossing structures by monitoring amphibian movement across the highway. Of the 627 amphibians encountered and marked, funnel traps provided the most captures with 268 followed by dipnetting with 201 and visual encounter surveys 130. There were six recaptures at three sites, all Cascades frogs (Rana cascadae), and all located south of I-90 during initial and subsequent capture. Results indicate that current crossing structures are insufficient in connecting amphibian populations north and south of I-90 and a less labor intensive monitoring method, such as PIT tags, may be more efficient in examining movement.

THE ORIGIN OF THE NABATAEANS AND THE CAUSE FOR THEIR SHIFT INTO A SEDENTARY LIFESTYLE

Lewis, Jason
Faculty Mentor(s): Steve Hackenberger, Anthropology & Museum Studies

Session: 5 (Oral Session 10:00-11:30 in 135)

The origin of the Nabataeans and how trade allowed them to transform from a nomadic, pastoral society into a sedentary, trade-based society is explored in this research. The origin of the Nabataeans is still speculative and little research has been conducted on how trade allowed this culture to transform into a sedentary society. This work explores available literary sources (Jane Taylor, Avraham Negev, A. Forder, etc.) that have documented and researched various cultural concepts of the Nabataeans. Trade is the catalyst that allowed the Nabataeans to grow and expand their “empire” over the ages. However, archaeological data for the Nabataeans early history is missing, small or non-existent, possibly because they were nomadic or because we have yet to find new sites. The results indicate more research needs to be conducted and/or accessible for the village hilltop of Selah and its connection to the Edomites and the Nabataeans. This site possibly is the first settlement of the Nabataeans. The links between the line of Nebaioth, Ishmael’s son, and the tribe of Nabatu are other important research related questions that are raised. Finally, the association of trade and a strategic location along the Incense Road that initiates the eventual change into a highly sedentary Nabataean society is thoroughly investigated.

SELF-KNOWLEDGE IS ONLY THE BEGINNING

Linder, Jessica
Faculty Mentor(s): Laila Abdalla, English; Matthew Altman, Douglas Honors College

Session: 8 (Oral Session 10:00-11:30 in 140)

The journey to self-knowledge is typically the focus of literature, but what a person does with this knowledge is even more crucial. If people understand their flaws and strengths and do nothing to improve them, they will stagnate and it will cause their downfalls. The Pearl Poet and Ben Jonson illustrate the importance of acting on self-knowledge through their respective characters of Gawain in Sir Gawain and the Green Knight and Volpone in the play Volpone. Both characters discover that they misconstrue key life concepts, display pride, and have detrimental psychological desires that drive them. However, Gawain tries to learn from these realizations while Volpone relishes in his faults and refuses to change. Because of this fundamental difference, Gawain is praised by his society, while Volpone is punished and shunned.
INTEGRATING CWU CHESS IN THE ARENA CHESS GUI

Littlefield, Kyle
Faculty Mentor(s): Razvan Andonie, Computer Science
Session: 9 (Oral Session 10:00-11:30 in 201)

The CWU-Chess program is an adaptive learning program that is designed to increase in playing skill with each set of 10 games. It uses a feed forward neural network trained by a genetic algorithm that sets the priority of 10 weights. Each of these weights corresponds to a testing criterion that is used to control the pruning and stopping of the Alpha-Beta search algorithm. This allows for the CWU-Chess program to learn with each generation of the genetic algorithm, eventually leading to the optimum. The presentation will be covering how the UCI protocol was integrated into the CWU-Chess engine and how the learning structure had to be modified to compensate for this.

STUDENT VOICES: THIS I BELIEVE ESSAY SHOWCASE

Mack, Virginia; Gray, Loretta; Lupton, Natalie
Faculty Mentor(s): Natalie Lupton, Information Technology & Administrative Management
Session: 19 (Oral Session 1:15-2:45 in 271)

The One Book One Campus Implementation Committee will showcase a number of This I Believe essays written by Central Washington University students. The students will read their essays and reflect upon the process of how they wrote them. Following the readings, Dr. Natalie Lupton, ITAM Department, and Dr. Virginia Mack, English Department, will integrate further discussion about This I Believe, the One Book One Campus selection, with the general audience. Dr. Loretta Gray, English Department, will preface the readings with a few words about her experiences of integrating This I Believe into English 101 and introduce the student readers. Student readers and their mentors are: Mehjabeen Khan and Tara Ray – Mentor: Tye Robinson; Rachel George & Andrew Rhome – Mentor: Loretta Gray; Mikhael Burt – Mentor: Amanda Burt; Brittany Olsen – Mentor: Karen Bicchieri.

BINARY STARS AND THEIR LIGHT CURVES: USING MODELS TO DETERMINE THE SENSITIVITY OF CWU EQUIPMENT

Magenis, Marilyn
Faculty Mentor(s): Michael Braunstein, Physics
Session: 27 (Oral Session 3:00-4:30 in 271)

The light curves of eclipsing binary stars are useful to study because they can provide knowledge of physical characteristics of the two stars such as their mass ratio, temperature, and radius. These characteristics are part of the foundation of our understanding of cosmological parameters and cosmology. For instance, the knowledge of these characteristics is important in understanding the formation of stars. Light curve data for SV Cam obtained with the Central Washington University (CWU) 0.3 meter telescope was used to find its resolution of the mass ratio parameter. Mathematica was used to vary the light curves within the measurement uncertainties of the CWU equipment. Then, Binary Maker 3.0 was used to determine the mass ratio corresponding to the best fit of the varied light curve. The information gained from this binary system was used to characterize the relative sensitivity of the CWU 0.3m telescope to the mass ratio parameter and our findings will be reported.
QUANTITATIVELY MODELING SURFACE TRAPPING IN NANO-SCALE YTTRIUM OXIDE DOPED WITH EUROPIUM

Mann, Rusty
Faculty Mentor(s): Anthony Diaz, Chemistry

Session: 15 (Oral Session 1:15-2:45 in 137B)

This study is the beginning of a project that is aimed at quantitatively modeling energy losses due to crystalline surface defects in nanometer sized yttrium oxide doped with europium (Y$_2$O$_3$:Eu$^{3+}$). Information gained from this study will be useful to lighting and display industries as well as to the nano-tech community as we are investigating the behavior of matter at the interface between bulk and molecular properties. Five different particle diameters, ranging from 112 to 37 nm, of Y$_2$O$_3$:Eu$^{3+}$ were synthesized at both 5 percent and 10 percent concentrations of Eu$^{3+}$ by controlled synthetic methods. With the exception of the smallest particle sizes within both series, the expected trend of decreasing transfer efficiency, from the Y$_2$O$_3$ host lattice to the Eu$^{3+}$ activator, was observed with decreasing particle diameter. The completed project will require the synthesis of four more Eu$^{3+}$ concentration series, each at five different particle sizes in order to fully quantify surface loss as a function of particle size.

ELEGANCE TO ITS LIMIT

Martini, Jenni
Faculty Mentor(s): Andrea Eklund, Family & Consumer Sciences

Session: 29 (Afternoon Poster Session 1:15-4:30 Mezzanine)

My design, Elegance To Its Limit, was inspired from the 1930s era of glam and elegance. Throughout the years, glam of wearing gloves, hats, and formal attire has disappeared in history. My question is why and where did it go? Being a college student, it is hard to see over half the students wearing sweats or pajamas as their daily attire, and our high school girls going to prom are wearing shorter and shorter dresses instead of formal ones. This dress that I have created shows the passion I have for keeping women looking their best and feeling beautiful every day. The name “elegance to its limit” also has significance to the design of the dress. I wanted to create a formal glam look without completely going back in time. Instead I "pushed it to the limit" with a high style slit in front and a low coil neck in front. The red color of the dress put the final touch with its vibrant color that every girl needs in her wardrobe for that special occasion. This dress has inspired so much that my line for the Spring Fashion Show of 2009 will be to create a day wardrobe of outfits to wear. From morning to night, she will be dressed in a world of glam and elegance that every girl today will want to wear. From this dress I have created a whole new side of the 1930s into the age of 2009.

LIFE SAFETY AT HIGHLINE COMMUNITY COLLEGE

Matheus, Robin; Lerner, Iris; Jess, Brian; Le, Thuy-Linh; Olsen, Ryan; Atnafu, Mahlet
Faculty Mentor(s): Patrick O'Brien, Industrial & Engineering Technology

Session: Poster Session, CWU-Des Moines

One of Central Washington’s Westside University Centers is located at Highline Community College in Des Moines, Washington. This presentation discusses the history of life safety systems and the Emergency Action Plan used at Highline Community College, and analyzes the equipment and processes for fire prevention, detection and suppression for compliance with state, county, and city regulations.
THE EFFECTS OF THE CHIMPOSUM EDUCATIONAL PROGRAM ON VISITOR KNOWLEDGE AND ATTITUDES

McCarthy, Maureen; Brown, Hannah; Gray, Amanda; Lee, Kevin; Steele, Rozsika; Jensvold, Mary Lee
Faculty Mentor(s): Maureen McCarthy, Chimpanzee and Human Communication Institute

Session: 11 (Oral Session 10:00-11:30 in 271)

This study examined the effects of the Chimpanzee and Human Communication Institute’s (CHCI) Chimposium educational program on visitor knowledge and attitudes regarding chimpanzees. Researchers used a repeated measures design to examine the knowledge and attitudes of 119 visitors before and after attendance to one-hour Chimposium educational workshops from June through August 2008. Visitors showed significant increases in knowledge following Chimposium attendance ($t = 18.544$, $p < .001$). Post-test scores for a post-test-only group were similar to post-test scores for participants who also took pre-tests, indicating that pre-test exposure did not sensitize participants and bias them toward knowledge gains for specific test material ($t = 0.248$, $p > .05$, NS). Attitude scores did not demonstrate dramatic changes, perhaps partly because participants typically held strong attitudes regarding chimpanzees prior to Chimposium attendance. Knowledge and attitudes showed some variation with regard to demographic variables such as age, gender, and education level. Results provide general information on the public’s knowledge and attitudes toward chimpanzees and demonstrate the effectiveness of the CHCI’s educational program.

CHARLIE CHAPLIN AND MASCULINE CRISIS

McCorkindale, Donald
Faculty Mentor(s): Liahna Armstrong, English

Session: 25 (Oral Session 3:00-4:30 in 201)

As with femininity, conventional American concepts of masculinity are constructed within a patriarchal society, and the Hollywood film industry has had a significant influence in shaping our notion of masculinity. For instance, the western, gangster, and war film genres have all helped create, within our popular culture, a rigorously enforced ideology of what it means to be a man. Because of his discomfort with those paradigms, and for various other reasons, filmmaker and actor Charlie Chaplin experienced a type of psychological crisis that can be witnessed in his films and also seems apparent in his personal life. In those films, Chaplin’s male characters are seen as flawed men: they have personae that often become the butt end of jokes and face ridicule. These characters, particularly his iconic Tramp character, are thus emasculated, kicked around by many, and seldom get the girl. To compensate, perhaps, for the flawed manhood of the male protagonists, the diegetic women in these films are often very young, lack sophistication, seem vulnerable, are easy to manipulate, and are usually physically small. The women in Chaplin’s cinematic worlds also appear in his personal life. Chaplin was married to, or in relationships with, women significantly his junior in age. His four wives were on average 22 years younger than he. Because he felt implicitly inadequate in the face of the conventional construction of American masculinity, especially as depicted in Hollywood narrative cinema, Chaplin likely endured an abiding crisis of low self-esteem.

HIS ‘N’ HER LOVE STORIES: THE EFFECTS OF GENDER ON THE RETELLING OF COURTSHIP STORIES

McGraw, Kelly
Faculty Mentor(s): Natalie Lefkowitz, Foreign Languages

Session: 29 (Afternoon Poster Session 1:15-4:30 Mezzanine)

Every married couple has a courtship story that reveals how they met, when they fell in love, and when they knew they wanted to get married. A couple may share the same story, but how they retell that story can vary greatly. This study examines how men and women tell their courtship stories from memory. The participants included nine heterosexual married couples, ranging from 21 to 67 years old, and married for a period ranging from 6 months to 28 years. All participants completed a questionnaire on the CWU campus with questions aimed at eliciting memories about how they had met their spouses and fallen in love. In addition, the couples were asked to share specific feelings regarding what they remembered about their relationships before they had been married. The research seeks to identify gender-specific differences in the amount of detail and the types of memories recalled by men and women. Language features that each gender uses are also analyzed for similarities and differences. Preliminary results show differences in the number of words used, as well as the use of adjectives, and feminine speech characteristics. Some differences were also found in the types of memories recalled.
“DIES IRAE” (MODERN DANCE PERFORMANCE)
McLain, Tyler Elizabeth
Faculty Mentor(s): Therese Young, Health, Human Performance & Nutrition

Session: 20 (Performance 1:15-2:45 in SURC Theatre)

The choreographic journey of “Dies Irae” began in Fall Quarter 2008 in Dance Choreography class. The first part of the assignment was to search for a poem, and I chose “Fragmentary Blue” by Robert Frost. Next, we visited local art museums in search of a piece which was connected through its use of structural imagery or somehow appealed to us through its emotional content. I chose a picture of the Seattle sky, bright blue and broken up by clouds. It was emphasized that our assignment was not to simply act out our poems and artwork, but rather abstract from them a theme for our dance. For this class I originally developed a one and a half minute solo piece to Chopin’s “Raindrops.” The solo dance illustrated a young girl’s thoughts and worries about the decline of religion in society. Since then I have further developed it into a six and a half minute piece, for five dancers, to selections from Mozart’s “Requiem.” The solo girl’s thoughts are now brought to life by adding in her religious family and her friends who no longer take their faith as seriously. “Dies Irae” illustrates the balance between these two parts of her life. This presentation will follow my thought process through this integrated arts project as I began the artistic journey which resulted in a significant piece of choreography. “Dies Irae” will also be performed by members of the Orchesis Dance Company.

PEOPLE, PEOPLE, EVERYBODY PEOPLE: POSTMODERN POLITICAL MUSIC AND THE GORILLAZ
Mecham, Christian
Faculty Mentor(s): Cynthia Coe, Philosophy

Session: 18 (Oral Session 1:15-2:45 in 202)

The Gorillaz, a contemporary, animated, alternative rock band, has increasingly made their music more and more politically oriented, but in a way that is different from how political music has traditionally been defined. Drawing on Jacques Derrida’s ideas of différance and the frame, as well as Michel Foucault’s conception of the author-function, I argue (in this excerpt from my thesis) that the Gorillaz embrace a postmodern understanding of how political music can engage us in ways previously unexplored by musicians and how their own music and performance draws upon these postmodern understandings. In particular I will focus on the interaction between the musical artist, the animated character, and live and music video performances within the Gorillaz.

SHORELINE INVENTORY PROCESS FOR PARK PLANNING AT DECEPTION PASS STATE PARK, WASHINGTON
Merrill, Adam; O’Brien, Meghan; Gabriel, Anthony
Faculty Mentor(s): Anthony Gabriel, Resource Management

Session: 29 (Afternoon Poster Session 1:15-4:30 Mezzanine)

The development of effective park plans that protect coastal systems requires a comprehensive inventory and assessment of physical processes, biological features, and land use alterations. However, many local park planners are overwhelmed by the sheer mass of information available and confounded by the inconsistent formats and spatial scales of the data. As a case study, Deception Pass State Park was assessed using a modified inventory approach developed by the Geo-ecology Research Group to conduct shoreline inventories and analyses in Washington State. After determining reach boundaries based on drift cells, assessment of the ecological and geomorphic function of 26 separate reaches was conducted by overlaying biological features and critical physical areas. Possible impacts to ecological functions were determined by overlaying shoreline modifications, including structures, facilities cutting across the shoreline, and land uses and cover. The results of these map overlays are provided in narrative summaries and tables describing existing shoreline functions as evidenced by the mapped physical, biological and modification features. Finally, cultural resources, public access, and regulatory designations that define and/or constrain future uses were also mapped and summarized. To provide final synthesis maps at appropriate viewing scales, a customized electronic map portfolio was developed through ESRI ArcReader. The baseline inventories and associated narratives, tables and digital maps of abiotic, biological, and cultural conditions for each drift cell provide characterizations that identify existing conditions, determine functions and values of shoreline resources, and explore opportunities for conservation and restoration of ecological functions along the 29.2 km long park shoreline.
THE ACQUISITION OF NEW SIGNS IN ADULT CROSS-FOSTERED CHIMPANZEEs

Metzler, Deborah; Jensvold, Mary Lee; Fouts, Roger; Fouts, Deborah
Faculty Mentor(s): Mary Lee Jensvold, Chimpanzee and Human Communication Institute

Session: 29 (Afternoon Poster Session 1:15-4:30 Mezzanine)

Cross-fostered infant chimpanzees, Washoe, Moja, Tatu, and Dar, acquired the signs of American Sign Language (ASL) through their daily interactions with human caregivers. As adults, they continue to sign to humans and each other. Before a sign is included in a chimpanzee’s vocabulary, it must be seen and recorded by three different human observers on three separate occasions. Only those signs observed in a well-formed and appropriate manner are considered. This poster presents the 26 signs that have been added to the chimpanzees’ vocabularies since 2005. This demonstrates that as adults, chimpanzees continue to acquire new signs.

THE TRANSCENDENCE OF VIRTUAL MINDS

Moceri, Mike
Faculty Mentor(s): Gary Bartlett, Philosophy; Matt Altman, Douglas Honors College

Session: 24 (Oral Session 3:00-4:30 in 140)

With regard to artificial intelligence, John Searle was on the right track when he conceived his “Chinese Room” analogy. This analogy illustrates that a person could conceivably “fake” a knowledge of Chinese without actually knowing the language by following a strict response system. However, Searle was only half right in his conclusion. He was correct in asserting that machines that merely manipulate symbols will never have the ability to understand semantic data. However, the jump from this conclusion to the claim that no machine will be able to understand meaning is based on the false assumption that all “thinking machines” will be symbol manipulation machines. By analyzing the difference between symbol manipulation machines and modern connectionist networks, this research shows that machines will be able to think, to understand, and to react in the same ways that humans do.

USE OF MELTS MODELING AND DETAILED TEXTURAL AND CHEMICAL CRYSTAL POPULATION STUDIES TO DOCUMENT MAGMA CHAMBER PROCESSES AT MT. ETNA, SICILY

Moses, Maureen; Bohrson, Wendy
Faculty Mentor(s): Wendy Bohrson, Geological Sciences; Christopher Mattinson, Geological Sciences

Session: 21 (Oral Session 3:00-4:30 in 135)

Mt. Etna is one of the most continuously active and historically well documented volcanoes on Earth, periodically threatening the towns established on its flanks. Basaltic lavas reflect a complex history involving magmatic processes such as crystal fractionation, devolatilization and magma recharge that occur in the subvolcanic plumbing system. The AD 1669 eruption, one of the largest recorded eruptions, may have been triggered by magmatic recharge. The goal of this project is to quantify the effects that magmatic processes had on the melt chemistry and the crystal compositions and textures for the 1646, 1651, the residing 1669, and the 1669 recharge magmas. Phase equilibria models predict that the melts are hydrous (1-3wt. percent water) and crystal fractionation occurred along a shallow (0.5-5km) polybaric crystallization path; the fO₂ conditions probably changed during magma ascent. Using the electron microprobe, plagioclase, olivine and pyroxene cores and rims were analyzed for major and trace element chemistry revealing complex histories that do not follow normal petrologic trends. Photomicrographs show varied crystal populations; all but the 1669 recharge magma are plagioclase enriched. Analysis using Nomarski Differential Interference Contrast imaging reveals complex plagioclase textures that reflect an array of magma chamber processes as the crystal grows. The implications of this work are that these melts began to crystallize olivine and pyroxene at deeper levels in the crust; plagioclase crystallized as the melts ascended to and were stored at shallower crustal levels. Degassing promoted plagioclase growth and was possibly related to the change in fO₂.
THE ARCHAEOLOGY OF THE DAVIS LAKE AREA, DESCHUTES AND KLAMATH COUNTIES, OREGON

Nauer, Christian
Faculty Mentor(s): Steven Hackenberger, Resource Management

Session: 29 (Afternoon Poster Session 1:15-4:30 Mezzanine)

The mixed-conifer forest around the shores of Davis Lake burned in a wildfire in 2003, exposing many pre-contact artifacts and features that were subsequently recorded and collected by the USFS. This analysis of the Davis Lake archaeological collection will center on the hafted bifaces (generally, projectile points) within the collection which have an acceptable degree of completeness. These will be rigorously measured for all metrics and angles that will allow for reasonable designations of temporal assignment based on several existing typologies. The most representative, time-sensitive specimens will be submitted to the Northwest Obsidian Research Laboratory for XRF obsidian sourcing, to reveal the specific quarry location from which the artifact was obtained. Source information will allow for a regional geographical analysis of obsidian procurement patterns through time. The remainder of the collection will be inventoried and characterized in the light of the other archaeological features present around the lake.

CAPABILITY AND CULPABILITY: RECOVERING MEANING IN JOHN STEINBECK'S THE GRAPES OF WRATH

Nelson, Jessica
Faculty Mentor(s): Steve Olson, English

Session: 13 (Oral Session 1:15-2:45 in 135)

While The Grapes of Wrath was an important novel for the political and social climate of its time, this paper will argue that John Steinbeck did not merely create a political story—or soapbox—specific to the Great Depression. Instead, the paper will maintain, Steinbeck crafted realistic and compelling characters, an effective intercalary chapter scheme, and a philosophical argument that speaks not to a specific culture or time period but to the larger human experience. Such a reading may have been possible 70 or even 40 years ago, but times have changed in the world of literary criticism—and critical reception of the novel over the years proves it. In criticism’s recent efforts to recover marginalized peoples, cultures, and texts, it may have itself marginalized this important American novel, limiting its scope and ways of meaning. This paper will also explore other ways in which the novel is limited and reduced, including the constraints of fiction and its intertextuality with American culture. Ultimately the author hopes to show that the text should not be limited by critical trends. Doing so alters the novel’s effectiveness and meaning, especially through its characterization and in its dramatic final scene. Though authorial intent is impossible to argue, this paper will attempt to recover a sympathetic reading of the book, its characters, and its timeless philosophical message.

VISUAL LOCALIZATION OF TWO PARAFLAGELLAR ROD-LIKE PROTEINS IN TRYANOSOMA CRUZI

Neumann, Evan
Faculty Mentor(s): Gabrielle Stryker, Biological Sciences; Holly Pinkart, Biological Sciences; Daniel Selski, Biological Sciences; Blaise Dondji, Biological Sciences

Session: 22 (Oral Session 3:00-4:30 in 137A)

Chagas' disease causes significant morbidity and mortality throughout much of South and Central America. The disease is caused by a single-celled flagellated parasite named Trypanosoma cruzi. The paraflagellar rod (PFR) is a unique and complex structure critical for cell motility and attachment, though little is known about its molecular assembly. To date, only four PFR proteins have been described, but all four proteins have been experimentally shown to protect mice against an otherwise lethal challenge of the parasite. Recently, two new PFR-like proteins have been identified: PFR5 and PFR6. While they share many similarities with other previously identified PFR proteins, their location within the organism is yet to be established. This project aims to demonstrate their sub-cellular location within the parasite by fusing the PFR 5 & 6 proteins to Green Fluorescent Protein (GFP). GFP is a protein originally isolated from the jellyfish, Aequorea spp., which fluoresces green when exposed to blue light and is a commonly used molecular marker to detect the presence or location of proteins within living cells. These recombinant proteins, PFR5::GFP and PFR6::GFP, will be expressed in the parasite to visually determine where they are located.
SLIPS AND FALLS
Nichols, Sean
Faculty Mentor(s): Roby Robinson, Safety and Health Management

Session: 28 (Morning Poster Session 8:15-11:30 Mezzanine)

My presentation is on the dangers of slips, trips, and falls, and how beneficial it can be for an organization to implement a slip prevention program. I will be discussing floor types and shoe types in particular. There are many different types of flooring that we walk on, and depending on the type of job, the chance of a devastating fall can happen. This can be prevented in two different ways, by changing the types of shoes worn in the organization and/or by changing the walking surface.

TOXIC EFFECTS OF URBAN PARTICULATE MATTER OF VARIOUS SIZE FRACTIONS ON AN IN VITRO MODEL OF SACCHAROMYCES CEREVISIAE
Nieber, Annika
Faculty Mentor(s): James Johnson, Biological Sciences; Anne Johansen, Chemistry

Session: 28 (Morning Poster Session 8:15-11:30 Mezzanine)

Particulate components of industrial and commercial emissions suspended in ambient air can enter the human body via the respiratory system. They are known to cause various health effects, which may be controlled by the particle size and redox potential. Aerosol particles were collected in collaboration with North Seattle Community College near I-5 in Seattle, WA. During the collection process, the particles were separated into three different size fractions: Ultrafine (UFP) with a diameter of < 0.1 µm, Fine (FP) with a diameter of 0.1 µm to 2.5 µm, and Coarse (CP) with a diameter of 2.5 µm to 10 µm. The correlation between particle size, redox potential, and toxicity was investigated in a whole cell in vitro experiment using the yeast Saccharomyces cerevisiae as the model organism. The particles were extracted from the substrates using sonicitation and the yeast was exposed to different sized particulates. The cytotoxic effects of the particles were evaluated by measuring the viability of the yeast, as well as the mutation rate. Cyclic voltammetry was used to determine the redox potential of the collected particulates. These data showed that the UFP fraction has a negative effect on cell survival and the mutation rate increased with decreasing particle size. The role of the redox potential is still being investigated.

SYNTHESIS OF CYCLIC BORINIC ACIDS AS POTENTIAL NOVEL HIV-1 PROTEASE INHIBITORS
Nye, Jesse; Chen, Pei-Mien; Nicolaeva, Elizabeth; Clayton, Donald; Heer, Tajinder; Blackmore, Amanda
Faculty Mentor(s): Levente Fabry-Asztalos, Chemistry

Session: 28 (Morning Poster Session 8:15-11:30 Mezzanine)

HIV/AIDS has affected about 40 million people. One type of drug that is used to treat HIV/AIDS is a protease inhibitor. The HIV-1 protease is one enzyme responsible for the propagation of mature viral particles. By inhibiting the HIV-1 protease, it is possible to slow the spread of the virus and delay the onset of full-blown AIDS. HIV-1 protease eventually becomes resistant to the inhibitors; therefore, new drugs are needed. We are currently synthesizing novel protease inhibitors using known and new synthetic methodologies. We hope that these inhibitors will possess better inhibitory properties, have increased bioavailability, and possibly have less toxicity than the inhibitors currently in use. We hope that these compounds will become lead compounds for further drug discovery for HIV/AIDS.
ISOLATION OF PFR-5 AND PFR-6 PROTEINS IN *TRYPANOSOMA CRUZI*

**O'Neill, Susan**  
*Faculty Mentor(s): Gabrielle Stryker, Biological Sciences*

Session: 28 (Morning Poster Session 8:15-11:30 Mezzanine)

Chagas disease, or American trypanosomiasis, is an endemic disease throughout Central and South America. It is caused by the single celled parasite *Trypanosoma cruzi* which is transmitted by the reduviid, a large hematophagous insect that often lives in rural homes. These parasites have a structure that runs along the length of the flagellum called the paraflagellar rod (PFR) which is composed of a lattice of cytoskeletal filaments. This unique and complex structure is critical for cell motility, though little is known about its molecular assembly. These proteins are of particular importance in *Trypanosoma cruzi*, as purified or recombinant PFR proteins are immunogenic, protecting mice from an otherwise lethal challenge with the parasite. Two recently described genes were discovered that contain PFR-like sequences, PFR-5 and PFR-6. The aim of this project is to determine the sub-cellular locations of these two proteins within the parasite to determine if they are components of the PFR as their sequence data suggests. This study involves the cloning of a small portion of these genes into the bacteria *Escherichia coli* and expression of the recombinant proteins in the bacteria. The recombinant proteins are then purified for immunization of mice to generate antibodies. PFR-5 and -6 specific antibodies will then be used to detect the location of these proteins within the parasites.

VOCABULARY USE OF FOUR CROSS-FOSTERED SIGNING CHIMPANZEEs

**O’Rahilly, Kathleen; Leake, Madeleine; Potosky, Robin; Jensvold, Mary Lee; Fouts, Deborah; Fouts, Roger**  
*Faculty Mentor(s): Mary Lee Jensvold, Anthropology & Museum Studies*

Session: 29 (Afternoon Poster Session 1:15-4:30 Mezzanine)

As infant chimpanzees, Washoe, Moja, Tatu, and Dar were cross-fostered by humans and acquired signs in that environment. As adults at the Chimpanzee & Human Communication Institute they continue to sign to humans and each other. Caregivers maintain checklists of the signs that each chimpanzee uses each day. This study used this database of checklists to examine the chimpanzees' vocabulary usage from 1998-2008. All four chimpanzees used a variety of signs from several different lexical categories. There was variability in the average number of signs used each day from year to year. An average of 70 - 80 percent of their signs were unique from day to day, demonstrating diversity in the content of their conversations. This variety in signing is indicative of a varied, enriching environment in which the chimpanzees are active conversationalists.

MEI

**Ogawa, Emi**  
*Faculty Mentor(s): Hal Ott, Music*

Session: 12 (Performance 10:00-11:30 Theatre)

I received a Farrell Scholarship to create a brief biography of one of the leading contemporary Japanese music composers, Kazuo Fukushima, and a performance guide for his most well-known work, Mei for flute solo. Fukushima was born in Tokyo, Japan in 1930. After World War II, he started composing music. I happened to play one of his works last year and had a great experience playing it. In summer of 2008, I went back to Japan and met with Fukushima to have an interview. In the interview, I investigated his musical inspirations, his life as a composer, and his opinions about music and culture. In addition to the interview with him, two journal articles written by Fukushima were used to learn in more detail how he became a composer, what motivated him to write Mei, and his life as a composer. For SOURCE, I will perform Mei since this is the focus and logical outcome of my research project.
PARTICLE SIZE DEPENDENT SURFACE LOSS AND ITS EFFECT ON NON-RADIATIVE HOST-TO-ACTIVATOR TRANSFER EFFICIENCY IN YBO$_3$:EU$^{3+}$ NANOPARTICLES

Olsen, Kris
Faculty Mentor(s): Anthony Diaz, Chemistry

Session: 15 (Oral Session 1:15-2:45 in 137B)

A preponderance of research that has focused on the synthesis and characterization of nano-scale solid-state luminescent materials (phosphors) has cited surface-loss as a factor in the optical properties of these materials, but no research has attempted to quantitatively measure these effects as was done in this study. YBO$_3$:Eu$^{3+}$ of varying dopant concentration was synthesized. The particle size of these samples, as confirmed through x-ray powder diffraction and application of the Scherrer Equation, was controlled by firing each sample concentration at a range of temperatures. Lower firing temperatures result in smaller particles. VUV spectroscopy was used to determine the host-to-activator transfer efficiency of each sample. Preliminary data indicates that the samples composed of smaller particles exhibit a smaller host-to-activator transfer efficiency as a result of greater losses to surface states.

ELEMENT CONCENTRATIONS IN DRINKING WATER FROM A.C. DAVIS HIGH SCHOOL, YAKIMA, WA

Orem, Caitlin; Kendrick, Casey
Faculty Mentor(s): Beth Pratt-Sitaula, Geological Sciences; Carey Gazis, Geological Sciences

Session: 28 (Morning Poster Session 8:15-11:30 Mezzanine)

ICP-MS analysis provided concentration data (ppb) of dissolved elements in A.C. Davis High School drinking and laboratory water. Elements included in analysis were Na, Mg, Al, K, Ca, Sc, Ti, V, Cr, Mn, Fe, Ni, Cu, Zn, As, Se, Rb, Sr, Cd, Sn, Sb, Ce, Ba, and Pb. This investigation was a senior project at A.C. Davis High School made in collaboration with the CWU NSF-WATERS Program and A.C. Davis High School. Samples were collected from a drinking fountain, a kitchen tap, a hot laboratory tap, and a cold laboratory tap at the high school. Samples were collected once a month, October 2008 – February 2009. Results indicate that some samples may have heavy metal concentrations higher than the national drinking water concentration limits set by the EPA. Samples from the drinking fountain in January, the kitchen in January, the hot laboratory tap in November-January, and the cold laboratory tap in January showed concentrations of As, Al, Cd, Fe, and Pb higher than EPA limits. Other trends of element concentrations were observed over the five months of sampling, most notably an increase in most dissolved elements in the months of December and January in hot and cold laboratory tap samples and in the month of January in the kitchen and drinking fountain samples. The cause of this increase in concentrations is uncertain, but may be explained by variations in water source and usage.

HYDROELECTRIC LEARNING: MODELING OF POTENTIAL DAM SITES AT A.C. DAVIS HIGH SCHOOL

Orem, Caitlin
Faculty Mentor(s): Beth Pratt-Sitaula, Geological Sciences

Session: 28 (Morning Poster Session 8:15-11:30 Mezzanine)

As part of the NSF-WATERS Program, students in the 11th-12th grade physics class at A.C. Davis High School studied potential locations for hydroelectric dams and irrigation reservoirs in central Washington during the 2008-2009 school year. Through this hands-on project students learned about hydroelectricity and the effects of dams on river systems in the western United States, particularly the Yakima and Columbia rivers. By providing a new and exciting cumulative project in the classroom, student ownership and organization of assignments noticeably increased. Through this project, students practiced science skills covered in the class curriculum as well as new topics. Science skills included dimensional analysis, geometry, topographic map reading, scaling and modeling, free-body diagrams and forces, knowledge of electromagnetic induction, and use of computer programs such as Google Maps, Microsoft Excel, and Microsoft PowerPoint. These science skills were combined with material science and artistic expression through the use of a scale model made of plywood, cardboard, starburst, paper mache, paint, and clay. A field trip to the Grant PUD Wanapum Dam was especially helpful in student comprehension of dam mechanics. Student analyses indicate that Union Gap and Selah Gap dam locations are not feasible. These analyses also suggest that building higher dams at Roza, Keechelus, Kachess, and Rimrock may not improve electricity output, water supply, or environmental situations. Ahtanum Creek, Umtanum Creek, and Black Rock Reservoir sites were the most reasonable, but may not be plausible dam sites due to low discharge, environmental protection, and water transport, respectively.
ENVIROMENTAL SUSTAINABILITY AT CENTRAL WASHINGTON UNIVERSITY
Ormberg, Justin
Faculty Mentor(s): Rex Wirth, Political Science

Session: 17 (Oral Session 1:15-2:45 in 201)

In Washington State, the Waste Not Washington Act and Executive Order 05-01 set goals for Central Washington University to move towards more sustainable practices. The purpose of this project is to evaluate Central's present sustainability practices and makes recommendations for future efforts. Efforts are being made by the campus as a whole and entities within it to become more sustainable. Current examples are the renovations of Dean Hall and a future change is the possibility of Dining becoming trayless. Also, this university has signed the President's Climate Commitment which recognizes the need for reducing greenhouse gases by 80 percent by 2050. The project shows other universities’ practices and policies in the Pacific Northwest Region, such as University of Oregon and Western Washington University.

THE USE OF CHILDREN WITHIN POLITICS: THE HITLER YOUTH
Othoudt, Kelsi
Faculty Mentor(s): Heidi Szpek, Philosophy and Religious Studies

Session: 16 (Oral Session 1:15-2:45 in 140)

When people think of the victims of the Holocaust, the victims who were actively persecuted immediately come to mind. There were other groups who were forced to comply under the pressure of the Nazi regime; one such group was the Hitler Youth. The Hitler Youth have traditionally not been considered victims; however, Hitler was keen on brainwashing the youth of Germany into doing what he wanted, and the youth became a key political component that ensured his control over Germany. Hitler had gained such complete control over these young people that many of them became some of the most fanatical fighters on the German side of the war. The children were also used to advance propaganda for the Nazi party, child patrol units kept streets safe for German people, and the children were even used as spies on their own parents and the community to identify any person who opposed the Nazi ideals. These children were slowly brainwashed into becoming the ideal Aryan that the Nazis sought. In light of how the Hitler Youth were manipulated, they too might be considered victims of the Nazi era that swept across Europe.

SOCIO-ECONOMIC IMPACTS OF HYDRO POWER DAMS: THE BUI DAM PROJECT, GHANA (WEST AFRICA)
Otut-Tei, Clement
Faculty Mentor(s): Kathleen Barlow, Anthropology & Museum Studies; Morris Uebelacker, Geography

Session: 5 (Oral Session 10:00-11:30 in 135)

The Akosombo and the Kpong Dams have comprised Ghana’s major sources of hydroelectric energy for the past four decades. Following a major energy crisis between 2006 and 2007, the construction of the Bui dam on the Black Volta River became a national priority. This presentation is based on a study, which investigates the early stages of the mitigation process called for in the Environmental and Social Impact Assessment report for the dam. The following are the research objectives: 1) examine identified potential socio-economic impacts of the projected dam on indigenous communities, 2) identify successes and challenges in implementing the mitigation measures with particular attention to resettlement and proposed livelihood strategies, and 3) make recommendations for mitigation measures and their implementation processes. These will help maximize the positive impacts and also devise strategies to minimize negative impacts of the dam on indigenous communities. Methodology: literature review, community discussions, interviews, and content analysis.
GEODETIC TRANSECT IN CENTRAL NEPAL TO TEST FOR CLIMATE-TECTONIC INTERACTION
Parker, Emily; Pratt-Sitaula, Beth; Upreti, Bishal Nath; Miner, Andrew; Melbourne, Timothy
Faculty Mentor(s): Beth Pratt-Sitaula, Geological Sciences
Session: 28 (Morning Poster Session 8:15-11:30 Mezzanine)

The Himalaya-Tibet system is the largest and most active continent-continent collisional plate boundary in the world. It is the archetype for understanding the development of orogenic mountain belts; yet many questions remain about its structural architecture, evolution, and the distribution of active faulting. In particular, the role of climate and erosion as a control on faulting is not completely understood. The steep front of the Higher Himalaya creates a formidable barrier for moisture laden summertime monsoon clouds, creating a dramatic rain shadow effect with locally intense precipitation at the Higher Himalayan front. It has been proposed that the resulting intensified erosion coupled with rapid rock uplift has resulted in a change in the location of active faulting. While the majority of plate motion is accommodated along the Main Frontal Thrust in the foothills of the Himalaya, there is some evidence that the older Main Central Thrust at the base of the Higher Himalaya has moved recently as well. Sufficient concrete evidence to back this idea is lacking, however, and it has remained largely theoretical. In the summer of 2008, CWU and Tribhuvan University in Nepal installed six permanent GPS stations near potentially active structures in the Annapurna region of Nepal to monitor ground motion. Here we compare the data from this new network, as well as existing geodetic networks in Nepal, with modeled results.

WATERGATE SOCIOMATRIX
Patterson, Darrin
Faculty Mentor(s): Eric Cheney, Sociology
Session: 10 (Oral Session 10:00-11:30 in 202)

The Watergate scandal that shrouded the Nixon presidential election of 1972 is an ideal depiction of how a sociomatrix can be used to dissect the social structure of corruption within a social network. A sociomatrix or socigram as it is sometimes referred to, is a structure that depicts the level and degree of interaction shared between a particular social group. Thus, it is an excellent tool to use to decipher the level and origin of corruption within an organization because it allows its designer to draw out a network that will ultimately display who had interaction with whom, and at what level. Therefore, the text All the President’s Men will be used as a source of data to map out a diagram that will display who the key actors involved in the scandal were. Moreover, this diagram will display the amount of network centrality each actor possessed within Nixon’s deviant social group. By doing this it should become clear who the marquee actors were in the scandal and the scope of influence or culpability they held throughout the Nixon deviant social network. The intention of completing this research is to show how this model can be replicated and applied to any deviant social network to decipher the structure of corruption within an organization.

IDENTITY STYLE, ATTITUDES ABOUT SEX, AND RELATIONSHIP STATUS AS PREDICTORS OF ADOLESCENT RISKY SEXUAL BEHAVIOR
Paulk, Amber; Zayac, Ryan
Departments: Family & Consumer Sciences; Psychology
Session: 29 (Afternoon Poster Session 1:15-4:30 Mezzanine)

Adolescence is a critical period when many developmental transitions occur. Significant changes in sexual maturation, cognitive maturation, and the introduction of romantic relationships influence adolescents’ engagement in sexual behavior. Sexual feelings are part of a normative developmental process during adolescence, which includes sexual exploration, self-discovery through intimacy, and physical attraction. However, early onset of sexual behavior has been associated with risky sexual behaviors, such as having higher numbers of sexual partners and lower frequency of contraceptive use. The goal of the current study was to test a model of sexual risk behavior as predicted by identity styles, attitudes toward sex, and current relationship status. The sample of the present study included adolescents in grades 9 - 12 in public high schools across Alabama (N= 1954). Pearson correlations and latent variable structural equation modeling (SEM) were used to assess the hypothesized associations among the variables. Significant paths were found from attitudes toward sex and from the diffuse identity style to risky sexual behavior. In other words, adolescents who stated they were willing to wait for sex, resist pressure about sex, and who were not diffused in their identity processing styles were less likely to engage in risky sexual behaviors.
THE LAST ACCEPTABLE PREJUDICE: SOCIAL AND CRIMINAL JUSTICE ISSUES IN THE LGBTQ COMMUNITY

Peacock, Derrick; Reasons, Charles
Faculty Mentor(s): Charles Reasons, Law & Justice

Session: 4 (Oral Session 8:15-9:45 in 140)

Since the beginning of the modern day civil rights movement in the 1950s, great progress has been made in advancing the civil and human rights of women, racial and ethnic minorities. This has led to the elimination of de jure racism and sexism. However, there is one major minority group that still faces de jure discrimination—sexual minorities. This oral presentation will identify and explore the many facets of civil and human rights issues facing the lesbian, gay, bisexual, transgendered, and queer community (LGBTQ). A history of the LGBTQ community will be discussed, with a major focus on current civil, social, and criminal justice issues.

MECHANISMS CONTROLLING FREEZE TOLERANCE IN PACIFIC TREEFROGS (PSEUDACRIS REGILLA)

Pense, James; Reynolds, David
Faculty Mentor(s): Jason Irwin, Biological Sciences

Session: 14 (Oral Session 1:15-2:45 in 137A)

Currently little is known about the process of the Pacific Treefrog’s ability to freeze solid, a phenomenon known as “freeze tolerance.” Two important physiological responses allow frogs to survive freezing. First, the frog releases massive amounts of glucose and/or glycerol into its blood while it is freezing, and secondly, its organs lose large amounts of water to reduce the amount of ice forming in the tissues. It is believed that the released glucose allows cells to continue the process of anaerobic respiration, which would create enough energy to keep their cells alive while frozen. The purpose of this experiment was to inhibit the release of glucose with a beta-receptor antagonist, propranolol, and to inhibit the hormone arginine vasotocin (AVT) and its ability to regulate water balance. Through inhibition these physiological responses will not occur in the frog when the frog is freezing. This was done by injecting frogs with 10 µL propranolol (14.5 mg/mL), 40 µL of 4-leucine vasopressin (AVT inhibitor), or physiological saline (control). The temperature of the frogs was then gradually cooled to -2.5°C in a programmable cooling bath. Contrary to expectations, propranolol did not consistently reduce the amount of glucose produced by the liver. Both propranolol and AVT inhibitor did reduce the water content of the liver upon freezing.

REAL-TIME COMPARISON POLARIMETER FOR DATA ACQUISITION IN DETERMINATION OF 0TH, 1ST, AND 2ND ORDER RATE CONSTANTS

Pereze, Edgar
Faculty Mentor(s): Tim Sorey, Chemistry

Session: 28 (Morning Poster Session 8:15-11:30 Mezzanine)

Currently it is difficult for students to experimentally determine stereocenter chemistry mechanisms without an expensive device that offers precision and accuracy in a time efficient manner. In fact, it is usually the instructor that manipulates the device which acquires data for the students to analyze. The purpose of this research is to have undergraduate chemistry students explore optically active chemical systems using a kinetic polarimeter to acquire and analyze data in real-time in the determination of kinetics rate constants in the lab. If this real-time comparison polarimeter can be used to support students’ inquiry and data acquisition of optically active chemicals, then students will construct a better understanding of both chiral molecules and kinetic molecular mechanisms. This proposed device will afford students to easily adjust experimental parameters, make accurate and precise measurements, and use their time more efficiently in the learning laboratory. This proposed analytical instrument will be based upon student accessibility, ease of use, affordability, and offer research quality measurements. This instrument will be assessed experimentally by a known chemical reaction (the hydrolysis of sucrose) and compared with accepted experimental values. Finally, a prototype of this instrument will be implemented and assessed in an undergraduate teaching laboratory (Fall Quarter 2009, CHEM 361 Lab).
With the advent of the laser, the far-infrared region has emerged as an area of fertile exploration. A significant portion of our understanding of atmospheric and interstellar molecules has been through the application of measurement techniques in this region. The wavelength and frequency measurements of laser emissions generated by an optically pumped molecular laser system has aided in enhancing our ability to investigate these molecules in a historically elusive part of the electromagnetic spectrum. In an optically pumped molecular laser, the incident “light” or radiation produced by a pump laser is absorbed by a molecular gas. The gas is thereby excited to energy states normally empty resulting in a population inversion, providing the possibility of a laser emission. By changing the optical cavity’s laser medium, coverage of the entire far-infrared region is accomplished. This research reports the first investigation into whether the partially deuterated isotopic form of methanol, $^{13}$CHD$_2$OH, could serve as a far-infrared laser medium. We are pleased to report the discovery of eight far-infrared laser emissions having wavelengths ranging from 33.8 to 80.9 micron. The frequencies of these laser lines have also been measured and are reported with fractional uncertainties of 3 parts in 10 million. Due to the accuracy with which these measurements were made, they will serve as sources of coherent far-infrared radiation for a variety of spectroscopic investigations. One such study includes the investigation of free radicals (e.g. FeD) in the 30 to 80 micron region using laser magnetic resonance spectroscopy.

Thanks to the support of Student Affairs and Central Washington University, we were able to travel and compete in the National semi-finals for the National Trumpet Competition in Fairfax, Virginia. Six members of Central’s Trumpet Studio were selected to compete in both the ensemble division and solo division. There was a quintet and two soloists, one of whom also played in the ensemble. Performing against schools such as Boston University, Julliard School of Music, University of South Florida and other well-recognized schools, both the ensemble and soloists from Central played competitively and represented the school to the best of our abilities.

The Annapurna Conservation Area Project (ACAP) is the largest protected area and the most popular tourist destination in Nepal. Since it was established in 1966, funding from non-governmental organizations and trekking permit fees have provided support for community-based conservation and development programs. In August 2008, we interviewed ACAP staff, local people, and a trekking guide in the lower Marsyangdi River watershed of ACAP to assess which ACAP programs are locally in place, how natural resources are being managed, and what local people’s perceptions are of ACAP. Our findings indicate that villages along the Annapurna Circuit Trail are receiving greater economic benefits from tourism and more conservation and development program support from ACAP than villages off the main trekking route. However, all people living within the protected area’s boundaries are held to conservation regulations set forth by ACAP. This unequal geographic distribution of costs and benefits is reflected by public perceptions of ACAP.
PHARMACOLOGICAL EFFECTS OF CYCLOSPORIN AS A CALCINEURIN INHIBITOR ON CHICK NEURONAL AXON OUTGROWTH
Quisenberry, Jennae; Landis, Brandi
Faculty Mentor(s): Dan Selski, Biological Sciences

Session: 28 (Morning Poster Session 8:15-11:30 Mezzanine)

The primary goal of this research experiment is to determine the role of Calcineurin in axonal development of retinal neurons. It is known that Calcium, a common intracellular signaling molecule, activates Calcineurin, which in turn activates proteins that regulate gene expression. It is hypothesized that the products of the activation of Calcineurin result in highly specific growth patterns of neuronal axons in the retina to the brain. Developing chick embryos were subjected to treatments of Cyclosporin A (CsA), which has been shown to inhibit the Calcineurin activation of other proteins. Treatments of CsA were performed during very early embryogenesis, followed by injections of fluorescent dye to label the axonal development. Fluorescent microscopy analyses of treated embryo retinas, when compared to controls, suggest that either the neurons undergo irregular axonal outgrowth to the brain, or that normal axon outgrowth occurs and is followed by axonal retraction. Carefully timed treatments are currently underway to distinguish between these two alternatives.

INVESTIGATING THE FUNCTION OF GD³⁺ IN (Y,GD)BO₃:EU³⁺ THROUGH MEASUREMENTS OF HOST-TO-ACTIVATOR TRANSFER EFFICIENCY CALCULATIONS
Rabinovitz, Rosa
Faculty Mentor(s): Anthony Diaz, Chemistry

Session: 15 (Oral Session 1:15-2:45 in 137B)

Yttrium borate co-doped with gadolinium and europium, (Y,Gd)BO₃:Eu³⁺, is the phosphor used in the plasma display industry for its emission of red visible light. It is known that gadolinium increases the efficiency of yttrium borate, but there is no quantitative data to show how this occurs. Multiple sample sets with varying concentrations of gadolinium and europium were synthesized using common solid-state chemistry methods, and x-ray diffraction was used to determine the purity of each sample. Vacuum ultraviolet (VUV) spectroscopy was used to collect emission, excitation, and reflectance data for transfer efficiency calculations. With increasing concentrations of gadolinium, the transfer efficiency of this compound continues to increase as shown in this study.

A DEMONSTRATION OF VOCAL STYLES WITHIN A SINGLE COMPOSITION
Rawlinson, Alexandra
Faculty Mentor(s): David Rawlinson, Information Technology & Administrative Management

Session: 12 (Performance 10:00-11:30 Theatre)

Vocal performance of “The Girl in 14G” (Tesori/Scanlan). This performance will demonstrate distinctive vocal styles, including jazz, musical theater, and classical within a single composition.

STRYCHNINE & KEROSENE LIPS
Redmann, Loui
Faculty Mentor(s): Andrea Eklund, Family & Consumer Sciences

Session: 29 (Afternoon Poster Session 1:15-4:30 Mezzanine)

Strychnine & Kerosene Lips is a project that I started in early April, 2009. The project's original motivation was to push my company Supply & Demand out of my house and on to the shelves. Taking an influence of the tapered leg from the late 70s punk scene, I have designed a pair of jeans. I found this a lot harder to craft than I had expected. Getting the right look and fit out of them was the biggest challenge. I also created the graphic designs, being influenced by the graphic work from Volcom Stone and the early years of Vision Street Wear. I have learned a lot from my project, and I realize that it laid a strong foundation for Supply & Demand. These garments are going to be featured at the spring fashion show along with two other designs of mine. The show is called SatisFashion, and it will be on May 30 at the Milo Smith Tower Theatre in McConnell Hall.
FASHION LINE CALLED MENAGE, BY DAVID MICHAEL

Reimer, David
Faculty Mentor(s): Andrea Eklund, Family & Consumer Sciences

Session: 29 (Afternoon Poster Session 1:15-4:30 Mezzanine)

My garment that I will have on display is inspired by circus related objects and themes. I got the idea while listening to music and was inspired by theatrical costuming as well. The garments are more of an avant garde, rather than a ready-to-wear. The design process started with sketching out my ideas and going from there. I started to drape out my pattern to put it together; after that I made a sample using my pattern. After the sample was completed, I fit it to my model, and from there I made fitting adjustments and finished it in my fashion fabric. It is one of the three garments of my line. The whole line can be seen at the Fashion Merchandising spring fashion show, SatisFashion, May 30, at the Milo Smith Tower Theatre in McConnell Hall.

ADDRESSING STUDENT PRECONCEPTIONS THROUGH FORMATIVE ASSESSMENT

Remington, Tera; Weller, Katie; Johnson, Diana
Faculty Mentor(s): Martha Kurtz, Chemistry/Science Education; Bruce Palmquist, Physics/Science Education

Session: 29 (Afternoon Poster Session 1:15-4:30 Mezzanine)

Much research has shown that student preconceptions are often debilitating to learning—especially in science. Interviews serve as one method of diagnosing student preconceptions and gaining insight into their beliefs. In this study, third grade students were interviewed by student teachers to determine preconceptions on four concepts related to the upcoming chemical tests unit: dissolving, evaporation, pH, and controlled experiment. Interviews were analyzed and specific instructional strategies were implemented to address the incomplete or missing preconceptions. An observation rubric was developed based on data from the interviews. Results were analyzed to determine whether conceptual knowledge increased significantly. Overall by conducting the interviews, developing the observation rubrics, and addressing the preconceptions through instruction, student learning was improved on five out of six skills over a six week period.

A STATISTICALLY MADE MARCH MADNESS BRACKET

Richards, Corey; Ness, Daniel; Blakeway, Levi
Faculty Mentor(s): Yvonne Chueh, Mathematics

Session: 1 (Oral Session 8:15-9:45 in 135)

We would like to study statistics generated from the March madness NCAA Men's Basketball Tournament. We want to study if the higher ranked teams do consistently win over the lower ranks. We will use the information from the previous NCAA tournaments, 1985 to 2008, to find a relationship between the ranks of the team and number of wins they receive in the tournament. We will also use this information to try and find a way to predict upsets, lower ranked teams beating higher ranked teams, to see if there is any way to predict upsets. The information we will use is the number of wins each seed has in the tournament from 1985, when it became the 64 team tournament, to 2008. We will also use a regression model to predict how many wins a team will get dependent upon their ranking. We will compare the results of our regression models to the results from this year’s tournament.
Little to no research has been done determining arthropod activity related to decomposing human (or porcine) remains in the Pacific Northwest. More specifically, no research has been published detailing the activity of arthropods in Central Washington. The purpose of this research is to establish a baseline for this region and to determine the effect altitude has on decomposition rates and insect diversity associated with the decomposing remains. Four locations along an altitudinal gradient, representing four distinct biomes will be selected. At each site, a deceased pig will be placed in a protective enclosure that will allow insect passage, but restrict intrusion by larger animals. This research will take place over 31 days, during which time samples will be collected daily and climatic data will be monitored and documented regularly. Insects present throughout the sampling period will be identified to family and the species present as well as species diversity will be compared among the four sites.

In today's energy hungry environment there is a great need to shift to more energy efficient technologies. Among the many innovations is a technology that has been around since long before the energy struggle of the current age. LED technologies aren't new (Henry Joseph Round discovered the effects of electroluminescence in 1907), but they have grown in leaps and bounds in the last several years. They have grown to a point that makes them practical as a light source for the home, the business, and, my focus, as a theatrical lighting option. In my paper I explore the current state of LED technologies for the theater industry and why they may be the next logical step in lighting solutions.

Since the discovery of Buckminster Fullerenes (C$_{60}$), countless hours have been devoted to the study of this carbon nanoparticle. C$_{60}$ has been investigated in context of photodynamic therapy of cancer, photovoltaic cells, semiconductors, and enzyme inhibition. However, the biological effects of C$_{60}$ remain a mystery. The intention of this study was to examine the effects of Buckminster Fullerene on mitochondrial function to determine the concentration of C$_{60}$ as well as the time frame of exposure that cause maximum dysfunction. Bovine heart mitochondria were exposed to different doses of C$_{60}$ (2 - 35 ppm). To determine if C$_{60}$ dosages result in mitochondrial dysfunction, hydrogen peroxide and lipid peroxidation were also measured as indicators of oxidative stress and membrane oxidation. This study determined that at low concentration (2 ppm), C$_{60}$ enhanced electron function and caused little oxidative stress, while at higher concentrations (10-35 ppm) C$_{60}$ caused no electron transport chain inhibition, or oxidative stress and lipid peroxidation. This study shows that C$_{60}$ has no deleterious effects over a 30-minute time frame.
EFFECTS OF EPIGALLO CATECHIN GALLATE IN GREEN TEA EXTRACT ON ENERGY EXPENDITURE AND RESPIRATORY QUOTIENT IN FEMALES
Rust, Bret; Gee, David
Faculty Mentor(s): David Gee, Health, Human Performance & Nutrition

Session: 23 (Oral Session 3:00-4:30 in 137B)

Green tea extract (GTE) containing catechin polyphenols is marketed widely as a dietary supplement intended to enhance weight loss. Epigallo Catechin Gallate (EGCG) is a polyphenolic compound found in green tea that some studies have found to increase Energy Expenditure (EE) and to decrease Respiratory Quotient (RQ) in human subjects. The purpose of this study was to determine the effect of two weeks chronic supplementation of 540 mg of EGCG per day on blood pressure, EE and RQ in adult women at rest and at low levels of exertion. Indirect calorimetry, blood pressure, and anthropometric data were collected before and after supplementation in 21 women in a randomized, double-blind trial. Indirect calorimetry was conducted with a ParvoMedics TrueOne 2400 metabolic cart in accordance with protocol for measuring REE suggested in the ADA Evidence Analysis Library. Respiratory exchange was also measured continuously for 25 minutes as subjects walked on a treadmill. Data were collected before and after supplementation at 2.5 m.p.h. and at 3.0 m.p.h. Results showed a trend toward reducing resting RQ (p=.098) but no significant differences in post-supplementation RQ when walking at 2.5 m.p.h. A strong trend towards reduction of RQ (p=.056) at 3.0 m.p.h. was found post-supplementation. No significant changes were found in anthropometric data, blood pressure, REE or in EE while walking. These results tend to agree with recent findings in which RQ was reduced after supplementation with GTE and may support claims by supplement manufacturers of a lipolytic effect of GTE.

EFFECT OF SEX, LATENCY, AND STIMULI TYPE ON DELAYED MATCH-TO-SAMPLE AND NON MATCH-TO-SAMPLE PERFORMANCE
Rutledge, Brook
Faculty Mentor(s): Kara Gabriel, Psychology; Wendy Williams, Psychology; Megan Matheson, Psychology

Session: 10 (Oral Session 10:00-11:30 in 202)

The current research examined sex differences in performance on two tasks, the delayed matching to sample (DMTS) and delayed non-matching to sample (DNMTS), commonly used in learning and memory research but for which data assessing gender, latency, and stimuli effects are lacking. Performance in male and female Central Washington University (CWU) undergraduate students was examined following various delays between the presentation of the original stimulus and the identification of the matching or non-matching stimulus. Stimuli in Experiments 1 (DMTS) and 2 (DNMTS) included both geometric (non-verbally encoded), dissimilar verbally-encoded and similar verbal-encoded images tested after 0, 10, 30 and 60 second delays because it is expected that performance in males and females may be mediated by the type of stimuli used. Because hormone levels have been shown to correlate with performance on some cognitive tasks, a post-test evaluation of menstrual cycle stage was undertaken in female participants in an attempt to correlate menstrual cycle stage with task performance. Preliminary data shows that response latencies for the geometric images were higher than both the dissimilar and similar verbally encoded images. In addition, overall accuracy was lower for the geometric images than the dissimilar and similar verbally encoded images. Lastly, response latencies were highest at the 30 and 60 second time delays. In summary, the current research provides information on standards of performance and investigates the impact of methodological considerations in the DMTS and DNMTS.
PUNNING THE PUDENUM: VIOLENCE, LOVE, AND LEARNING IN CHAUCER’S MILLER’S & WIFE OF BATH’S TALES
Sander, Dustin
Faculty Mentor(s): Laila Abdalla, English

Session: 13 (Oral Session 1:15-2:45 in 135)

In both the Miller’s Prologue and Tale and the Wife of Bath’s Prologue and Tale, Chaucer emphasizes the pudendum and sexuality. This emphasis is particularly evident in the way the Miller and Wife use the words “privitee” and “queynte.” It is appropriate that these two bawdiest of his characters are nearly obsessed with sexual organs and promiscuity. However, upon closer inspection, these seemingly silly fixations are in actuality often expressed in the context of violence and danger. This violence is not limited to sexuality; it furthermore concerns knowledge. Through several puns and the reoccurrence of certain words tied to the themes of knowledge and sexuality, Chaucer creates an adumbration of violence which is deeply connected to physical sexuality and knowledge (both with a little “k” and a big “K”—Knowledge of God). By looking closely at these words—their usage, and their multiple meanings (both connotative and denotative)—one can clearly see that these ostensibly playful punnings on sexuality thinly veil a darker violence associated with obtaining two of the most common objects of human desire: sexual pleasure and knowledge. This presentation will begin by delineating occurrences and contexts of the puns in both tales, follow with a look at the medieval usages and etymologies of these words and their cognates, and finish with an analysis of how the linguistic relationship between knowledge and sex is conflated with violent attack and defense language in the pursuit of these desires.

SOPHROSYNE AND OLOLYGA: LAW AND FREEDOM IN ANNE CARSON’S GLASS, IRONY AND GOD
Sander, Dustin
Faculty Mentor(s): Katharine Whitcomb, English

Session: 13 (Oral Session 1:15-2:45 in 135)

Anne Carson includes at the end of her book of poetry Glass, Irony and God the scholarly article “The Gender of Sound.” In this essay, Carson discusses two ancient Greek concepts: sophrosyne, a patriarchal force of restraint that urges us, and most pointedly women, to maintain self-control; and ololyga, an emotional yawp that was once women’s outlet for messy mourning-like outbursts. When one reads the five poems in the book in the context of the concepts proffered in this essay, it is clear that Carson thrusts the work at a male-dominated Western society not only as a treatise on female freedom, but also a comment on freedom in general. She casts law as patriarchal and freedom as feminine—one ominous, the other hopeful. However, the poetry often expresses our desires for social contracts, as well as for freedom, and thus reveals the nuanced reality that through this struggle between apparent opposites, we define who we are. The speaker in the first poem of the book, “The Glass Essay,” mourns the loss of a man named “Law.” His name is no coincidence; the speaker is actually mourning a vision of herself that had boundaries and definition. She has lost herself because she no longer has “Law.” This presentation begins with an overview of Carson’s portrayal of sophrosyne and ololyga, follows with an analysis of the poetry, and finally demonstrates that, as readers of Glass, Irony and God, we are to be interested in how regulations affect a person’s concept of self.

THE PATH TO PROGRESS
Sanford, Janna
Faculty Mentor(s): Laila Abdalla, Douglas Honors College; Matt Altman, Douglas Honors College

Session: 4 (Oral Session 8:15-9:45 in 140)

Throughout history, those in the protected majority have believed themselves to be capable of great accomplishment and therefore able to ignore the reality of the oppressed. However, bigotry is a cancerous cell within the body of society, infecting people with hatred, and just as cancer limits the body’s abilities, prejudice limits the abilities of society. In this presentation, I will demonstrate how William Shakespeare understood the relationship between prejudice and lack of social progress through characters representative of marginalized groups. I will examine the characters of Feste in Twelfth Night, Shylock in The Merchant of Venice, and Ophelia in Hamlet, and illustrate how each character is a victim of the immorality, economic exploitation, and political corruption related to discrimination in his/her surroundings. Through the experiences of these characters, I will illustrate Shakespeare’s argument that prejudice is a limiting and destructive force in society, and that it ultimately prevents social progress.
THE SLIPPERY SLOPE: A CONNECTION BETWEEN SMOKING AND DRUG ATTITUDES  
Scalf, Natalie; Engel, Cynthia  
Faculty Mentor(s): Edward Kingston, Psychology  
Session: Poster Session, CWU-Des Moines

This research investigated how an individual's self-reported smoking status between the ages of 15 and 25 relates to an individual's current attitude on recreational drug use. Participants responded to an online survey asking about their opinions of the wrongness of drug use in six categories. The group of participants who identified as a smoker between the ages of 15 and 25 has a significantly higher score than the group of participants who identified as a non-smoker during the same ages. The mean score for those who identified as a smoker (n=65) was 14.27. The mean score for those who identified as a non-smoker (n=67) was 10.57. There was a significant difference between the smokers and non-smokers, t(130) = 3.46, p < .05. This difference indicates smokers have a more accepting attitude regarding drug use than non-smokers.

STEREOPHOTOGRAPHY: A VIRTUAL 3D METHOD FOR RECORDING ARCHAEOLOGICAL SITES  
Schroeder, William  
Faculty Mentor(s): Morris Uebelacker, Geography/REM  
Session: 29 (Afternoon Poster Session 1:15-4:30 Mezzanine)

Standard photodocumentation of archaeological sites and features is limited by the recordation method(s) used. Some sites and features are situated in a landscape context in which the relief of the topography or the physical characteristics of the subject are integral to the site and its cultural significance, e.g. a rock outcrop that resembles a human face or an animal. Single standard film or digital images are viewed in 2D and therefore lack the relief and/or depth inherent in the original subject. Using a simple technique, a stereopair of digital images can be created and the problem of seeing the subject in its “natural” context is virtually solved. Using data collected at High Bar in Hells Canyon National Recreation Area in March, 2009, I demonstrate the utility of creating stereopairs. I recorded pictographs found on a rock art panel where various relief surfaces were utilized in the past for the placement of red ochre pigment. Stereopairs are capable of revealing to a viewer the relationship of pictographs to the rock wall surface’s relief. The technique requires accurate measurement of the distance from the subject to the camera, accurate height of the camera above ground level, and careful horizontal repositioning of the camera 1/20th the distance from the subject to the camera. This method virtually replicates how human eyes take in visual information and process the information into a 3D image. With practice, one can become proficient taking stereopair images and apply this method in the field when recording sites and/or features.

AÇAÍ PUREE PERFORMANCE AS A FAT REPLACER IN FUDGE BROWNIES  
Sconce, Michael; Rust, Bret; Walton, Michelle  
Faculty Mentor(s): David Gee, Health, Human Performance & Nutrition  
Session: 28 (Morning Poster Session 8:15-11:30 Mezzanine)

Introduction: Açaí (Ah-Sigh-ee) is the top rated fruit in antioxidant potential as measured by the Oxygen Radical Absorbance Capacity (ORAC). Açaí puree is frequently used as a component of fruit smoothies to enhance antioxidant potential. Purpose: The purpose of the present research was to assess the performance of açaí as a fat replacement in fudge brownies in flavor characteristics and in staling behavior. Methods: Eight distinct batches of a control recipe (C), 50 percent volume for volume replacement (50 percent) and a 100 percent less one tablespoon volume for volume replacement (100 percent) of margarine with açaí were tested using a total of 81 judges and six separate sensory evaluation tests and seven objective tests. Results: Sensory Evaluation judges were able to discern differences between each group. 50 percent was not statistically different from C in overall general preference tests and in specific characteristics of flavor. 100 percent was significantly lower in general preference. Desiccation trials revealed declining performance especially in exaggerated drying conditions of both 50 percent and 100 percent. Conclusions: Açaí puree offers an acceptable fat replacement at 50 percent volume for volume fat replacement in fudge brownies. Use of a primarily water soluble fat replacer may lead to accelerated staling in fudge brownies.
Mt. Rainier is an active composite volcano located in the Cascade volcanic arc, ~90km southeast of Seattle Washington. The volcanism at Mt. Rainier is a consequence of subduction of the Juan de Fuca plate under the North American plate. Based on a compilation of data representing basaltic andesites through dacites thermodynamic simulations have been run to constrain the mechanisms of formation of the typical liquid line of descent. Using a variety of parental magmas and iterating through parameters such as water content, pressure, and oxygen fugacity, the best fit models suggest magmas are stored at shallow levels (1-2kbar) and have initial water contents ~1-2.0 wt. percent and oxygen fugacity of ~QFM+1 to +2. These models also provide evidence for fractional crystallization and magma mixing as dominant processes for magma evolution, consistent with previous work. Most Rainier lavas possess plagioclase and pyroxene phenocrysts; however, one lava flow classified as a spessartite lacks plagioclase but contains amphibole. Compared to the typical Rainier magma, the spessartite exhibits enrichments in large ion lithophile (K, Sr, Rb, Ba) and rare earth elements (Th, U, La,). Thermodynamic models are not able to reproduce spessartite signatures, suggesting the possibility of more complex magmatic processes. Electron microprobe data on phenocryst populations indicate magma mixing was important. Some pyroxenes show disequilibrium textures, and are characterized by iron-rich cores and more magnesium-rich rims. Amphibole phenocrysts lack zoning but possess reaction rims composed of pyroxene and opaque oxides. Further work is required to test more complex processes.

2009 HELL’S CANYON RESEARCH OVERVIEW
Shapley, Helen
Faculty Mentor(s): Morris Uebelacker, Geography

In late March 2009, an interdisciplinary group of Central Washington University (CWU) faculty and students traveled up the Snake River into Hell’s Canyon via jetboat to support ongoing field research in the area. This year’s trip, in its fifth iteration, was again the culmination of the Geography of the West course taught by Dr. Uebelacker offered Winter Quarter. Deeper than the Grand Canyon, Hell’s Canyon has a rich and diverse natural and cultural history. This year’s study area was High Bar, a bench located along the east bank of the Snake River downstream from Hell’s Canyon Dam. Field research opportunities available to students were varied and broad in scope, and included elements of geography, hydrology, geomorphology, geology, archaeology, and resource management. In addition to pursuing their individual research interests, students participated in one (or more) of five core research projects: archaeological survey; rock art documentation; landscape topography mapping; dendrochronology; or landform interpretation.

ARCHAEOLOGICAL SITE MONITORING IN HELL’S CANYON, ID, MARCH 2009
Shea, Holly; Fredrickson, Carl; Oosahwee-Voss, Eric
Faculty Mentor(s): Morris Uebelacker, Geography

During Spring Break 2009, a group of students spent a week in Hell’s Canyon, Idaho, performing various in-depth studies of the geographical and archaeological history of the area. Our small group carried out archaeological site monitoring north and south of our camp at Pine Bar. Archaeological sites are nonrenewable resources that contribute to our sense of history and define our collective heritage. Once a site is recorded, it should be monitored regularly to assess its integrity, check for vandalism, looting, and any compromise to the site caused by natural forces such as erosion. Eight previously recorded sites were monitored, ranging from prehistoric pictographs, stacked rock features and house pits to historic mining operations. Our poster illustrates what we did and how some of the sites’ conditions had changed since they were first recorded.
AGE AND POTENTIAL SOCIAL PARTNERS IN TIBETAN MACAQUES (MACACA THIBETANA)

Sheean, Lori; Matheson, Megan; Li, Jinhua; Wagner, R. Steven
Departments: Anthropology & Museum Studies; Psychology; Biological Sciences

Session: 29 (Afternoon Poster Session 1:15-4:30 Mezzanine)

In western cultures, humans may become increasingly socially isolated as they age. Scarce data exist to indicate if this occurs in free-living nonhumans because few individuals live to be old. A habituated group of Tibetan macaques (Macaca thibetana) in Huangshan, China were studied to see whether adult females' ages correlated with the numbers of monkeys nearby, as an indication of each female's sociability potential. In 2007, this group of 21 individuals included 5 adult females aged 15-24 years. Location scans of all animals were taken before and after five minute focals of adult females. The monkeys' area was divided into 6 quadrats. The proportion of scans in which the focal adult female was in a quadrat with 0, 1-2, or 3+ other monkeys was correlated with females' ages. Results show that older females were more often alone (Pearson’s r, 0.587) or with 1-2 other individuals (Pearson’s r, 0.673), and were less frequently with 3+ monkeys (Pearson’s r, -0.675). Hua, the group’s oldest female, was alone during 31 percent (14/45) scans, and was with 1-2 other monkeys during 45 percent (20/45) scans. She was with 3 or more monkeys only 24 percent (11/45 scans) of the time. When Hua was observed with another monkey, she was usually with an infant or juvenile (50/89 individuals scored in the same quadrat as Hua) and rarely with an adult female (12/89) or an adult male (8/89). Our results support the hypothesis that Tibetan macaques have fewer potential social partners as they age.

THE LESBIAN EXPERIENCE IN THE THIRD REICH

Sheldon, Kathleen
Faculty Mentor(s): Heidi Szpek, Philosophy and Religious Studies

Session: 16 (Oral Session 1:15-2:45 in 140)

Although research is readily available on the six million Jewish victims of the Holocaust, relatively less has been written about the other minorities targeted for extermination: the Roma/Sinti (“gypsies”) and homosexuals. While only male homosexual behavior was criminalized under the 1935 revision of Paragraph 175 of the German penal code, lesbians were subject to arrest as “anti-socials” and some were sent to concentration camps. Women were not subject to Paragraph 175 because: 1) lesbian behavior was said to be alien to the nature of “Aryan” women; 2) women were thought to be more emotional and intimate by nature, making it problematic to define which behaviors should be criminalized; 3) lesbians were not perceived as potential political threats; 4) female homosexual behavior did not “waste fertility” as male homosexual behavior did. Lesbians found themselves with three choices: to emigrate, to assimilate, or to agitate. Documentation of the lives of lesbians under the Third Reich was virtually non-existent until the 1990s when a few older women began to tell their stories. This research is comprised of three sections, beginning with definitions and a cursory review of the social context for lesbians in the decades prior to the rise of National Socialism. The second section presents specific changes that affected women in general and lesbians specifically between 1933 and 1945. The final section introduces the small sample of self-identified lesbians who have come out to tell their own experiences of life in the Third Reich.

USING THE FORCE CONCEPT INVENTORY TO IMPROVE STUDENT UNDERSTANDING OF FRICTIONAL FORCES

Sizemore, William
Faculty Mentor(s): Bruce Palmquist, Physics; Michael Jackson, Physics

Session: 28 (Morning Poster Session 8:15-11:30 Mezzanine)

Preliminary research utilizing student assessment of learning through pre- and post-curricula testing has been performed using the Force Concept Inventory (FCI) developed by Hestenes, Wells & Swackhamer in 1992. The use of this assessment instrument revealed several interesting trends and observations, one of which was student misconceptions when dealing with frictional forces. This preliminary assessment of the data appears consistent with the findings of prior physics education research conducted by Hake in 1998. An initial analysis of our FCI data showed a wide range of students with incorrect responses to a small, related group of conceptual questions both at the beginning and end of the instructional quarter. In this presentation, we will recommend the use of specific demonstrations designed to address this issue, with the goal of finding in-class demonstrations with accompanying questions that would prove effective towards increased student understanding of frictional forces within a system. Assessment of the efficacy of the instructional techniques can be performed using subsequent FCI testing.
REFRESHING EARLY JAZZ: THE POTENTIAL OF RETROSPECT

Smith, Bret; Peacock, Curtis
Department: Music

Session: 12 (Performance 10:00-11:30 Theatre)

Jazz is an American treasure, bringing influences from Africa and Europe together into a unique style. The tuba, through the British Brass Band, and the banjo, based on African instruments, formed the original nucleus of the earliest jazz bands, later supplanted by piano and string bass. Smith and Peacock have explored the roots of New Orleans style jazz as a duo, remaining true to the origins of the style (performing the music of Louis Armstrong, W.C. Handy, and Jelly Roll Morton) and interpreting repertoire from later jazz eras and popular music from Bebop to the Beatles. This presentation will introduce the instruments and provide brief examples of traditional and modern pieces that will form the basis of their forthcoming CD project produced by the jazz tuba virtuoso Sam Pilafian.

THE CWU PREPARATORY STRING PROGRAM

Smith, Bret
Department: Music

Session: 29 (Afternoon Poster Session 1:15-4:30 Mezzanine)

CWU has sponsored a unique university/community partnership, the Preparatory Strings Program, since the early 1990s. In 2008, the program was recognized by the National String Project Consortium and the NAMM foundation with a $25,000 grant, joining 20 other universities nationwide. Through the program, CWU undergraduate and graduate students gain hands-on, supervised teaching experience while serving 60-80 community string students ages 5-18 in 6 levels of ensemble. Recent alumni have been successful in competitive job searches, teaching all over the Northwest (including Bellevue, Sunnyside, Pasco, Vancouver, Olympia, Mukilteo, Salem OR).

A STUDY OF CHAMBER MUSIC FROM THE 17TH AND 18TH CENTURIES THAT FEATURES VIOLA AS A PRIMARY VOICE

Solano, E. Angeline
Faculty Mentor(s): Tim Betts, Music

Session: 12 (Performance 10:00-11:30 Theatre)

In a career as a professional musician, the skills a viola player is responsible for include a working knowledge of all musical styles and eras. However, a typical university music curriculum does not include pre-19th century chamber repertory in a standard music performance education. In addition, according to the practices codified in the 20th century, the modern orchestral community mostly treats the viola as an accompanying instrument. As a result it is very difficult for a viola student to acquire practical training, performance experience, and historically-informed understanding of music written before the 19th century, or to develop performance skills beyond those designated to secondary voices. Therefore, this project was a study of chamber music of the 17th and 18th centuries that features the viola as a primary voice. This project has included primary source study, applied viola lessons, and a variety of concert performances of music from these two centuries which comprise the golden years of viola chamber repertory. The piece to be presented at SOURCE by myself and a collaborative artist, Ms. Jessica Jasper, is the W.F. Bach Duet in G minor for two violas. This piece demonstrates the skills and historical performance practices that I have acquired throughout this project, including the use of micro-phrasing, imitative motion, ornamentation, and the use of music as rhetoric.
ANALYZING CONDITIONAL PROBABILITIES THAT ARE COMMONLY COUNTER-INTUITIVE: WHY YOUR DOCTOR MAY BE WRONG AND HOW TO WIN ON GAME SHOWS

St. Brown, Max
Faculty Mentor(s): Bob Carbaugh, Economics

Session: 1 (Oral Session 8:15-9:45 in 135)

In his book, Fooled by Randomness, Nassim Nicholas Taleb writes, “The following famous quiz was given to medical doctors (which I borrowed from the excellent Deborah Bennett’s Randomness). A test of a disease presents a rate of 5 percent false positives. The disease strikes 1/1000 of the population. People are tested at random, regardless of whether they are suspected of having the disease. A patient’s test is positive. What is the probability the patient is sick and the test shows it – close to 2 percent. Less than one in five professionals got it right.” The consequences of your doctor getting this problem wrong could range from the inconvenience of having to be retested to the seriousness of being treated (with all the accompanying side effects) for an ailment that you do not have. In my presentation, I will address how to arrive at the correct answer by analyzing the conditional probability present in the problem. I will look at the game shows, “Let’s Make a Deal” and “Deal or No Deal,” for additional examples of counter-intuitive results to real life problems.

CULTURAL RESOURCE SURVEY, HIGH BAR, HELL’S CANYON, ID

Stanley, Stacy; Volkenand, Todd; Nauer, Christian
Faculty Mentor(s): Morris Uebelacker, Geography

Session: 29 (Afternoon Poster Session 1:15-4:30 Mezzanine)

Systematic survey transects were tracked by three crews of students along elevation contours across the High Bar boulder field landform. Treating the entire landform as one large site, GPS points, photographs, and field descriptions were consolidated to map the cultural features. In 2008 an inadvertent discovery at High Bar brought to light the cultural significance of the boulder field and its potential for excellent archaeological preservation. Previous survey of cultural resources in Hells Canyon has been focused on the areas 100 meters above the high water mark, leaving large areas of the landscape un-surveyed. The results presented here represent the accumulation of the first field survey at High Bar. Site information will be shared with the United States Forest Service (USFS), Nez Perce tribe, and the Idaho State Historic Preservation Officer (SHPO) to better manage these undervalued resources in the face of increased recreational impacts.

SER-7, A SEROTONIN RECEPTOR, IS INVOLVED IN WITHDRAWAL EFFECTS FROM LONG-TERM EXPOSURE TO SEROTONIN IN THE ROUNDWORM, C. ELEGANS

Sudduth, Brandon
Faculty Mentor(s): Lucinda Carnell, Biological Sciences

Session: 28 (Morning Poster Session 8:15-11:30 Mezzanine)

The roundworm, Caenorhabditis elegans (C. elegans) is an excellent model organism for studying behavioral responses controlled by serotonin (5-HT). Studies on wild-type C. elegans (N2) have identified specific 5-HT pathways that control behavior. During a short one-hour exposure to 5-HT these pathways result in a decrease in locomotion and increases in pharyngeal pumping and egg laying. Over a long-term exposure lasting more than four hours, N2 worms decrease egg laying to levels normally seen in the absence of 5-HT. This behavioral response is referred to as adaptation. N2 worms removed from long-term 5-HT exposure and placed in an environment lacking 5-HT show a significant decrease in egg laying; this behavioral response is described as a withdrawal effect. The focus of this research to examine the mutant strain, DA2100, which lacks the SER-7 5-HT receptor for effects of long-term exposure to 5-HT. Based on previous studies by others the SER-7 receptor is essential in the regulation of egg laying in response to 5-HT. In order to understand what role the SER-7 receptor plays in egg laying the mutant strain DA2100 was tested after a long-term exposure to 5-HT. The number of eggs laid during withdrawal was 31.57 (10 worms over an hour) for DA2100 compared to 6.65 for wild-type N2 worms. This increase in egg laying after removal from 5-HT indicates that the SER-7 receptor plays a role in the withdrawal effects normally seen in N2 worms.
INTEGRATED MARKETING COMMUNICATIONS PLAN FOR HABITAT FOR HUMANITY
Sundborg, Susanna; Reinhardt, Ian; Wohlfarth, Stephanie; Peck, Michael
Faculty Mentor(s): Jeffrey Stinson, Management
Session: 26 (Oral Session 3:00-4:30 in 202)

The reasons for conducting this project were to build awareness for Habitat for Humanity in Ellensburg. We began by conducting primary research through surveying the Ellensburg population to determine their levels of awareness of non-profit organizations and to establish a target market. We also surveyed Habitat for Humanity’s current database of volunteers where we determined their initial source of awareness, as well as their satisfaction with their volunteer experience. We then submitted our surveys into SPSS, where we further analyzed the results. Next, we began to build a marketing campaign for Habitat for Humanity. We invented the creative slogan, “Be the Hammer, Build Yourself into the Community.” We chose this slogan because it was not only a call to action, but it also connected to the core values of our target market, ages 18-29. We decided that Habitat for Humanity needed to differentiate themselves against other non-profits in Ellensburg by leveraging their unique selling proposition, which is that building a house is a tangible object that the volunteers can watch grow from the ground up. Next, after reviewing our survey data, we chose the media outlets that should be used, which were word-of-mouth, brochures and fliers, and the Internet. After this, we developed several innovative plans for Habitat for Humanity to build awareness and attract volunteers including a contest, trade promotions, and a fun-run throughout the city of Ellensburg. Overall, we established a great foundation for Habitat for Humanity to establish more awareness throughout the community of Ellensburg.

UTILIZING IN SITU GEOCHEMICAL DATA COUPLED WITH TEXTURAL FEATURES OF PLAGIoclASE CRYSTALS TO DECIPHER THE GEOMETRY OF THE POSTCALDERA MAGMATIC SYSTEM, CRATER LAKE, OREGON
Tebbe, Michelle
Faculty Mentor(s): Wendy Bohrson, Geological Sciences
Session: 28 (Morning Poster Session 8:15-11:30 Mezzanine)

Crater Lake, Oregon, is nestled in the caldera that formed when Mount Mazama climactically erupted 50 km$^3$ of magma ~7,700 years ago. Subsequent eruptions on the caldera floor formed Wizard Island and three subaqueous volcanic edifices. I am investigating the evolution of the postcaldera magmatic system by utilizing in situ chemical analysis of plagioclase crystals from these edifices, coupled with high-resolution textural images, to document distinct crystal populations. Using these data, I will determine the degree of crystal sharing among the eruptions. The degree of crystal sharing reflects the degree of interconnectedness of the magma system (i.e., one vs. several chambers). A single large chamber might indicate a stable or growing system, whereas several smaller chambers might indicate a cooling dying system. The average anorthite (An) content of the plagioclase crystals (i.e., the ratio of Ca/Ca+Na+K reported in mol percent) measured by electron microprobe varies as follows: core, interior, and rim An contents of large crystals (>1mm) average 63.5 (±14.6), 58.2 (±12.8) and 55.3 (±9.68) respectively. The averages for medium crystals (0.5–0.1 mm) are 59.3 (±16.2), 59.6 (±15.1), and 54.7 (±13.9). The smallest crystal population averages are 62.4 (±11.1), 60.0 (±6.3), and 54.1 (±11.4). These data suggest that the postcaldera crystal populations are heterogeneous and may indicate a single magma chamber where diverse crystals mix and associated magmas are erupted at separate vent locations. Collection of in situ data for trace elements and Sr isotopes, which are more sensitive indicators of whether the populations are shared, will test this hypothesis.

THE INADEQUACIES OF DANTE ALIGHIERI’S PARADISE: A NON-CHRISTIAN HEAVEN
Thomas, Nathan
Faculty Mentor(s): Laila Abdalla, Douglas Honors College
Session: 8 (Oral Session 10:00-11:30 in 140)

The paradise Dante describes in his epic poem The Divine Comedy is intended to be a Christian depiction of heaven. History regards this masterpiece of poetry as Christian, and past scholars refer to the text as such. There are, however, particular issues with the idea that Dante’s version of heaven is Christian in nature. The problems that prevent Dante’s work from illustrating paradise as being truly Christian are the premises and foundations for his writing. Dante’s description of heaven is too conditioned by his personal needs for it to be authentically Christian. The place he describes does not reflect the heaven depicted in the New Testament. Some specific ways he deviates from the perceptions of heaven in New Testament scripture are found in his ideas about heaven’s geography, in his thoughts about heaven’s political aspects, and in his views about heaven’s atmosphere.
SCHOOLS MEETING SMI BREAKFAST CALORIE STANDARDS TEND TO BE LARGER AND HAVE LOWER COMMUNITY POVERTY RATES THAN SCHOOLS THAT DO NOT MEET CALORIE STANDARDS

**Tibay, Joseph; Oakley, Charlotte; Elkins, Ann; Aragon, Maria**

*Faculty Mentor(s):* Linda Cashman, Health, Human Performance & Nutrition; Ethan Bergman, Health, Human Performance & Nutrition; Tim Englund, Mathematics

*Session: 28 (Morning Poster Session 8:15-11:30 Mezzanine)*

The School Breakfast Program (SBP) ensures that all children have access to healthy meals. The Food and Nutrition Services of the U.S. Department of Agriculture (USDA) sponsored the third School Nutrition Dietary Assessment Study to provide information about school meals and whether schools met the calorie standards. Data were collected from a nationally representative sample of schools during the 2004-2005 school year.

**Objective:** The objective was to determine the characteristics of schools not meeting the current USDA calorie standards set for the SBP.

**Description:** The percent of students meeting the USDA calorie standards was related to school size and the poverty level of the community in which the school was located. Schools with fewer than 400 students provided appropriate calories to approximately 10 percent of students compared to approximately 25 percent of students in schools with more than 1000 students (p < 0.05). Analyzing data for taken foods, smaller schools presented appropriate calories to about 36 percent of students versus 15 percent in the larger schools; however, this was not statistically significant. School districts were divided into groups based on the percent of households under the poverty level: A: < 20 percent; B: >20 percent and <30 percent; and C: >30 percent. Schools in Group A presented appropriate calories to 18 percent of students compared to 7 percent of students in Group C (p < 0.05).

**Conclusion:** Larger schools and schools located in less impoverished communities tend to present a breakfast menu that meets the USDA standard for calories and results in a greater likelihood that students will accept the foods being offered.

THE DEBT PROBLEM: WHAT DOES THE TREASURY DEPARTMENT DO?

**Trautman, Seth**

*Faculty Mentor(s):* Rex Wirth, Political Science

*Session: 17 (Oral Session 1:15-2:45 in 201)*

The current economic downturn and enormous government expenditures have rekindled controversies about the National Debt. This paper explores the debt problem in an effort to separate rhetoric from reality when it comes to the operations of the Treasury Department. Why is the world’s most powerful nation with the largest economy $11 trillion ($11,000,000,000,000.00) in debt? Who owns all the debt? Since the US government itself owns 40 percent of its debt through programs such as Medicare and Social Security, should it really be considered part of the debt? How is the debt incurred, serviced, and retired? With all of today’s economic problems and hundreds of billions of dollars of government bailouts and stimulus packages, not to mention wars and interest on the debt, where does the cash-strapped Treasury Department get the money to pay the bills? Is the debt a threat to national sovereignty? Are foreign countries able to control the economy or governmental policy because they own almost 25 percent of our debt (or about $2.8 trillion)?

PANTONE PANDEMONIUM

**Triber, Melissa**

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

*Session: 29 (Afternoon Poster Session 1:15-4:30 Mezzanine)*

Pantone Pandemonium, the theme for my spring/summer 2009 fashion line, incorporates the electric colors in style currently with the lightweight clothing materials essential for summer survival. As pantones represent a wide variety of colors, pandemonium signifies the hype for color each individual will have with summer just around the corner. While radiant hues shine throughout each of my garments, the comfortable satin and polyester fabrics are carefully constructed to diversify and complete a daring look. As my theme lies in the bright color craze for exciting neon shades, I found inspiration through the music of rock and roll with a blended touch of 1970s and 1980s fashion. From the Steve Miller Band and the Rolling Stones to Bob Dylan and Rick Springfield with everything in-between, the beauty of melody is moving. Upon being motivated by the edgy style of an unforgettable era, I created a collection that portrays a statement among each individual garment as well as bold colors to finish off each look. With one piece shown today, I look forward to releasing the entire line of Pantone Pandemonium at the Fashion Merchandising spring fashion show, SatisFashion, on May 30 at Milo Smith Tower Theatre in McConnell Hall.
DOWN TOWN CHIC  
Trosper, Ashley  
Faculty Mentor(s): Andrea Eklund, Family & Consumer Sciences  
Session: 29 (Afternoon Poster Session 1:15-4:30 Mezzanine)  

My inspiration for my line “Down Town Chic” is a city setting, with the idea of young independent women taking time from their busy schedules to catch up with girlfriends and enjoy a night out. The garments in my line all have a similar silhouette, structure, and body. They were designed to give the wearer a sense of elegance and confidence.

THE PROGRESSIVE PORTRAYAL OF WOMEN IN THE FILMS OF STANLEY KUBRICK  
True, Duncan  
Faculty Mentor(s): Steve Olson, English  
Session: 25 (Oral Session 3:00-4:30 in 201)  

For your consideration, I have prepared an essay on the portrayal of women in the films of the controversial director Stanley Kubrick. Through a detailed examination of many of Kubrick’s films and an involved analysis of significant elements within these films, my essay argues that Stanley Kubrick’s entire body of work presents a progressive, albeit subtle, perspective of women in society. Many if not most film critics seem to view Kubrick’s films to be overwhelmingly misogynistic, but the essay I am prepared to present is based on the premise of art as being a reflective as well as thought provoking element of society, and on the fact that the most common and pervasive form of society is a patriarchal one. I will present evidence from Kubrick’s films that his work fits this model of art as a reflective critique and offers an optimistic perspective of the potential growth of understanding and acceptance within us all. This essay is an important addition to the many on Kubrick’s films as it offers a progressive interpretation of his work via its focus on artistically subtle yet substantially meaningful thematic elements in each of the films over which he had complete control. Even though Stanley Kubrick passed away more than 10 years ago, he is one of the most notable film directors of the twentieth century and his films remain socially significant. Therefore new ideas regarding the interpretation of his work also remain to be significant.

THE EFFECTS OF WASHINGTON STATE’S TOP-2 PRIMARY ON VOTER BALLOT BEHAVIOR AND THIRD PARTY TURNOUT  
Turner, Meghan  
Faculty Mentor(s): Todd Schaefer, Political Science  
Session: 17 (Oral Session 1:15-2:45 in 201)  

Washington State’s newly adopted Top 2 primary system was put to the test in the recent 2008 election. This study looks at Kittitas County and the effects of the new primary on voting behavior by comparing data from previous primary elections prior to the adoption of the Top-2 system. In essence, the Top 2 primary system should have had a positive effect on voting behavior, in that it should have greatly decreased if not eliminated the number of over and under-voted ballots. After examining the effects of the Top-2 Primary on voter ballot behavior, I focused on the effects of the primary on third party voting. Washington’s new primary intensifies third party awareness and consequently third party voting greatly increased in 2008. In essence, this study focused on understanding and critically analyzing the consequences of adopting the new Top-2 primary system.
ANALYSIS OF THE FRESHWATER MUSSEL (*Margaritifera falcata*) FROM 45KT315, KITITAS COUNTY, WA

VanTine, Launi
Faculty Mentor(s): Steven Hackenberger, Anthropology & Museum Studies

Session: 29 (Afternoon Poster Session 1:15-4:30 Mezzanine)

The Sander’s Site (45KT315), located on Johnson Creek three km from the Columbia River, was excavated by CWU field schools in the 1970s. Three radiocarbon dates of bone above and below shell deposits date to 3,360-3,150 BP. Rapid deposition of shell (*Margaritifera falcata*) at the Sander’s site most likely is a result of broader climate change (the Sub-Boreal or “Neoglacial” period) and the ensuing shift to a more semi-sedentary and storage subsistence pattern on the Columbia Plateau. The mean size of shell is small and does not change by level. Twenty shells were thin sectioned for a sclerochronology study. Due to the shells’ size and state of preservation, the outer prismatic and periostracum layers were not preserved in the thin sections. The shell sample is not suitable for measurement and numerical analysis of growth trends or chronology building. Limited variation in shell layer thickness probably indicates stable tributary conditions.

LEAF DECOMPOSITION IN URBAN STREAMS OF ELLENSBURG, WA

Vashist, Radha; Arango, Clay
Faculty Mentor(s): Clay Arango, Biological Sciences

Session: 6 (Oral Session 10:00-11:30 in 137A)

Decomposition of organic material is an important ecosystem process that provides energy for the stream food web and contributes to nutrient cycling. Decomposition rates are frequently limited by nitrogen concentrations, which autotrophic activity can decrease during carbon fixation and heterotrophic activity can increase during organic matter consumption. Urbanized streams of Ellensburg, WA, contain underground and aboveground reaches, and I hypothesized higher decomposition rates after underground stream reaches emerge due to heterotrophic activity as the stream flows underground. For comparison, I predicted lower decomposition rates below aboveground stream reaches because autotrophic activity would immobilize nitrogen as the stream flows in lighted reaches. To test the prediction, I placed leaf packs of known mass in 12 sampling locations along three streams, above and below underground reaches. I retrieved three leaf packs from each sampling location every week and weighed them to quantify mass lost and to calculate the decomposition rate. With the leaf packs I collected water samples at each site to compare nutrient concentrations in upstream and downstream locations. Along with the above samples, I also measured stream discharge, temperature, dissolved oxygen, specific conductance and average water velocity over the leaf packs. Thus far paired t-tests show that dissolved oxygen is lower downstream of underground reaches when expressed as percent saturation (p = 0.018) and concentration in mg/L (p = 0.008). These results are consistent with the hypothesis that heterotrophic activity is more important in underground stream reaches.

THE BALLPLAYER—SPORTS AND DISABILITY

Vetter, Jeremy
Faculty Mentor(s): Lisa Norris, English

Session: 13 (Oral Session 1:15-2:45 in 135)

This piece is a short story that examines the disabled protagonist, James Berry, as he plays in an impromptu college softball game in his wheelchair. James plays the position of catcher, and he has several chances to re-examine a failed relationship with the woman, Samantha, who is umpiring the game. Samantha has thought of James as a finished product, and she believes she has learned all there is to know of him. She believes their relationship was bound by James’ disability. She and the other players treat James as a fragile human being. For example, they do not throw the ball to him at home plate on close plays. James surprises them, however, with the seriousness of his hitting and his rough play. For example, he catches a pop fly by racing as fast as he can in his wheelchair and then falling to the ground after catching it. Others express shock at the fall, but James expresses his excitement in competing. James’ thoughts turn, as the story progresses, from memories of Samantha and her heron-like grace, to thoughts of a hit he gets in the game, and how the ball’s arc is like the blue heron flying. The excitement of competition takes James from what others see as a stereotypical disabled person to a competitive ball playing person.
BONE GREASE RENDERING AND FRESHNESS OF BONE
Vickers, Sara; Barrett, Carrie
Faculty Mentor(s): Patrick Lubinski, Anthropology & Museum Studies
Session: 29 (Afternoon Poster Session 1:15-4:30 Mezzanine)

Bone grease rendering of faunal remains is a much-researched topic by archaeologists. Unusually shaped bone fragments found at different sites as well as ethnographic accounts show the importance of bone grease as a multi-purpose material of the past. Most recently, experimental archaeologists have focused on different aspects of bone grease rendering such as the role of bone fracture freshness and size of bone fragments in increasing efficiency of grease rendering. Our experiment was conducted to determine if bones could be stored in large quantities before being processed and still yield a significant amount of grease. There is more grease in fresh bones, but older bones are significantly easier to break into the small necessary pieces. Three sets of cow bones were obtained: one set was freshly butchered, the second set was stored 8 weeks after death, and the third set was stored 1 year after the death of the animal. Each set of bones was processed with the same steps, including breaking the bones into pieces 5 cm or less and boiling for 3 hours. Our hypothesis was not confirmed by this experiment. We found that the whole process is a very hard and time consuming ordeal and the quantity of grease rendered decreases with the age of the bone and was non-existent at one year after death of the animal. It would be more efficient for an individual to render the grease soon after butchery of the animal rather than store bones and process large numbers at one time.

LANDSCAPE APPROACH IN CULTURAL RESOURCE MANAGEMENT: GEOMORPHIC CONTEXT OF ARTIFACT DISTRIBUTION IN THE LOWER WHYCHUS CREEK WATERSHED CROOKED RIVER NATIONAL GRASSLAND JEFFERSON COUNTY OREGON
Volkenand, Todd
Faculty Mentor(s): Morris Uebelacker, Resource Management
Session: 29 (Afternoon Poster Session 1:15-4:30 Mezzanine)

This study presents results of landscape analysis of the physical environment and surficial artifact distributions in the lower reach of the Whychus Creek watershed in Northern Central Oregon. Landforms and geomorphic processes are identified, described and mapped. N.R.C.S. soil survey maps and descriptions are used to formulate spatial relationships between landform type, associated sediments and soil catenas. Artifact distributions derived from field survey are assigned to functional categories and are displayed in tabular form cross referenced by associated landform and soil catena. Summary and discussion focuses on the distributional patterning of the artifacts distributions within the context of ongoing physical processes that shape the surficial archaeological record within the study area.

KINEMATICS AND VORTICITY IN KANGMAR DOME, SOUTHERN TIBET: TESTING PATTERNS OF MID-CRUSTAL DUCTILE DEFORMATION DURING THE HIMALAYAN OROGENY
Wagner, Tom
Faculty Mentor(s): Jeff Lee, Geological Sciences
Session: 28 (Morning Poster Session 8:15-11:30 Mezzanine)

Deformation temperatures, kinematics, and vorticity (W_m) were documented in mid-crustal rocks (formed at ~15-30 km beneath the Earth’s surface) now exposed in Kangmar Dome, southern Tibet to test whether: 1) mid-crustal channel flow (rocks flowing like a fluid on geologic timescales) is areally extensive; 2) ductile deformation associated with channel flow is partitioned among different rheologies and/or coupled to a decelerating strain path; or 3) ductile deformation was associated with dome formation. Deformation temperatures in mid-crustal rocks of Kangmar Dome increase from the flanks towards the core, ranging from ~325 °C in chloritoid-zone rocks to >630 °C in deeper staurolite/kyanite-zone rocks. Thin section kinematic indicators show top-north and top-south sense of shear on the north and south flanks of the dome, respectively, and a mix of both in the core. W_m exhibits an increasing pure shear component towards the core of the dome and ranges from 0.37-0.80 (75-40 percent pure shear) in schist and orthogneiss samples and from 0.42-0.88 (72-32 percent pure shear) in quartzite samples. Contours of deformation temperature and vorticity estimates show that the highest deformation temperature and pure shear values overlap. Preliminary interpretations of these data suggest that the ductile deformation patterns were the consequence of a north-south bulk pure shear component in the mid-crust or formation of the domal geometry. These interpretations are different from those predicted by channel flow models and to deformation patterns documented in similar rocks on Mt. Everest, ~225 km to the southwest, and in Mabja Dome, ~150 km to the west.
MAPPING A MUTATION IN THE ROUNDWORM, C. ELEGANS: A TWO-YEAR CLASS PROJECT

Walsworth, Austen; Willauer, Patrick
Faculty Mentor(s): Lucinda Carnell, Biological Sciences

Session: 22 (Oral Session 3:00-4:30 in 137A)

Caenorhabditis elegans (C. elegans) is a model organism for studying genetics, because their genome is mapped and sequenced. The mutant, 42M, was isolated in a genetic screen to identify worms defective in a withdrawal response after removal from long-term exposure to the neurotransmitter, serotonin. The objective of this research was to identify which chromosome contained the mutation with the final goal of identifying the precise location to a specific gene. This study was initiated in our Molecular Biotechnology class and results were confirmed through independent study. The class began by learning techniques to map genetic mutations. After learning the basic techniques, each student was given a F2 generation recombinant from a cross between the mutant and the strain CB4856. Individually, we isolated genomic DNA, cloned regions of each of the six chromosomes using polymerase chain reaction (PCR) and used the restriction enzyme Dral to digest each of the PCR products. In order to determine which chromosome had the mutation, the digested genetic material was observed using gel electrophoresis. This technique allowed us to visually identify chromosome V as the chromosome which had the mutation. This result was confirmed by crossing the 42M mutant with a mec-9 (mechanosensory defective) mutant. The mec-9 gene is also on chromosome V. To determine whether these genes were linked on the same chromosome we crossed the two mutant strains and tested the F2 generation for both phenotypes. The mutations failed to segregate, suggesting the genes were either linked or on the same chromosome.

THE EFFECTS OF TIME DELAY EXERCISE ON STRESS LEVELS FOLLOWING A STRESSFUL EVENT

Washington, Anthony
Faculty Mentor(s): Wendy Williams, Psychology

Session: 29 (Afternoon Poster Session 1:15-4:30 Mezzanine)

Effects of a single bout of moderate, post-stress exercise on cardiovascular reactivity and psychological anxiety will be measured in this study. Participants will be Central Washington University undergraduate and graduate students (n=120) over the age of 18. The stressor will be a difficult logic task with frequent interruptions to raise the arousal level. Participants will then be randomly placed into one of four groups, each placing the post-stress exercise at different time intervals after the stressor, and with one group being the control with no exercise. During the course of the stressor and exercise, both heart rate and blood pressure will be measured, and emotional stress will be measured using a stress scale read orally to participants. The aim of the study is to determine differences in time-delay of exercise after a stressful event on the psychological and physiological level.

TIME DEPENDENT EFFECTS OF CALCINEURIN ON VISUAL SYSTEM DEVELOPMENT

Wessel, Erich; Kramer, Joshua
Faculty Mentor(s): Dan Selski, Biological Sciences

Session: 28 (Morning Poster Session 8:15-11:30 Mezzanine)

The overall goal of this research is to determine the function of Calcineurin on the growth and development of neuronal connections in the visual system. The timing and duration of specific protein synthesis from the genome is crucial for the proper embryonic development of an organism. Calcineurin protein functions in many cell types as a mediator of signals from the cell surface to the nucleus where synthesis of other genes are then activated. Previous studies of Calcineurin have shown that it is involved in cardiovascular, immune cell, and skeletal muscle development in a time-dependent manner, but comparable research is limited with respect to the visual system. Studies have shown that certain immunosuppressant drugs act as inhibitors of Calcineurin, and prior research conducted by our lab has provided a way to observe connections between neurons in the visual system of embryonic chickens. We hope to gain insight into Calcineurin’s effect on the growth and development of neuronal connections in the visual system by treating embryonic chickens with acute doses of an immunosuppressant drug, FK506. Initial experiments suggest that the outgrowth of neuronal connections in the visual system is either inhibited by FK506, or after neuronal connections grow out they retract away from their normal target in the brain. Current experiments are aimed toward distinguishing these two possibilities.
MANASTASH SHOWCASE
Whitcomb, Katharine; Enders, Del; Cavazos, Pedro; Mayer, Chris; Dunning, Sonya; Dykes, Ashley
Faculty Mentor(s): Katharine Whitcomb, English; Joseph Powell, English; Lisa Norris, English
Session: 7 (Oral Session 10:00-11:30 in 137B)

The Writing Specialization English Major will showcase our student-edited, student-produced annual literary and arts magazine, Manastash. The presentation will feature a series of short readings by student writers whose literary work is featured in the forthcoming issue of Manastash. The faculty editorial supervisor, Katharine Whitcomb, will preface the readings with a few words about the Manastash Practicum classes and introduce the student readers.

CHAUER AND THE TRUE VALUE OF ORDINARY EXPERIENCE
Wildes, Sheena
Faculty Mentor(s): Laila Abdalla, Douglas Honors College
Session: 8 (Oral Session 10:00-11:30 in 140)

One of the greatest works of medieval literature is The Canterbury Tales by Geoffrey Chaucer. The Canterbury Tales represents a major achievement because it celebrates the lives of ordinary people in a way not seen in classical and earlier medieval literature. The General Prologue introduces readers to a wide cast of characters, and the tales that follow develop a wide variety of experiences and perspectives on life. Within The Canterbury Tales, Chaucer does not focus exclusively on epic battles or spiritual journeys as holding the ultimate meaning to life. Rather, he accepts war, religious experience, physical passion, women’s perspectives, and the details of everyday life as all equally valuable and worthy of attention. Chaucer exhibits groundbreaking genius by presenting the experiences of ordinary people, in a variety of circumstances, as legitimate and fascinating topics of literary exploration. In so doing, he not only opens up new avenues of exploration for future authors, but also presents characters who teach lessons to all readers, regardless of station.

LATINO POLITICAL PARTICIPATION AND REPRESENTATION IN THE STATE OF WASHINGTON
Wilson, Jana; Alvarado, Pamela
Faculty Mentor(s): Gilberto Garcia, Political Science
Session: 29 (Afternoon Poster Session 1:15-4:30 Mezzanine)

This research was presented at the Pacific Northwest Political Science Association conference in November of 2008. The study was completed as part of a class titled Latinos/as and the US Political System and was performed to test the conclusions of studies on the models of political participation and specifically relating to the Latino/a community and their application to a community in the state of Washington. This research examines the political participation and representation in a small community in central Washington. Even though the Latino/a population in Othello, Washington, constitutes 61 percent of the total population, the local political system lacks Latino political representation. The research explores various theoretical approaches on political participation and representation and their application to the experience of the Latino/a community. The information for the research is a collaboration of demographic data from the US Census, city documents including past newspaper articles, and insight from visits to Othello, WA, to examine the political life of this small community in the Columbia Basin.
EFFECTS OF SALVAGE LOGGING AND SUCCESSION ON AN EASTERN CASCADE BIRD COMMUNITY 14 YEARS POST WILDFIRE

Woodrow, Aja
Faculty Mentor(s): Dan Beck, Biological Sciences

Session: 6 (Oral Session 10:00-11:30 in 137A)

The frequency of catastrophic wildfire, which result in part from past forest practices, is increasing in the eastern Cascades. There is economic pressure to remove dead trees (snags) after fire, yet few studies have investigated how removing snags after fire affects wildlife populations. In 1994, the Rat Creek fire burned through the Wenatchee National Forest Boundary Butte Late-Successional Reserve and adjacent private land. Three snag densities (low, medium, and high) were selected for bird community research in 1998-99, each with two replicates for a total of six, 36.5 hectare stands. These stands were revisited in 2007-08 to investigate succession of the habitat and bird community. Small diameter snags (<15cm) experienced substantial attrition while larger snags (>55cm) experienced less attrition. Shrub cover increased from very low to very high between studies with the genus Ceanothus providing nesting habitat to many shrub-nesting bird species. Woodpeckers that specialize in recently killed trees present in 1998-99 were undetected in 2007-08, while woodpeckers that are only able to excavate decayed trees were undetected in 1998-99 but present in 2007-08. Woodpeckers selected larger diameter snags for nesting (>26cm), and preferred ponderosa pines (Pinus ponderosa). Medium density stands contained the most cavity nests in both studies. Burned stands containing large ponderosa pine snags appear to provide necessary habitat to some bird species well after stand-replacement fire.

AN ADAPTIVE REPLIICATION ALGORITHM IN P2P FILE SYSTEMS WITH UNRELIABLE NODES

Wysocki, Brandon; Sisson, Ben
Faculty Mentor(s): Razvan Andonie, Computer Science; Jim Schwing, Computer Science

Session: 9 (Oral Session 10:00-11:30 in 201)

Our project focuses on distributed file systems in P2P networks. We introduce an adaptive file replication system that reacts to changes in the environment by dynamically creating or deleting replicas. Replication is used to protect data in case of node or communication failure and to decrease the retrieval time. Our system is completely decentralized and nodes can be removed/added dynamically. We also propose an overlay architecture for file searching. This architecture is structured, but also based on random walk. Our system has a mobile agent which performs dynamic load-balancing. This agent circulates the network to find and “destroy” the least important files and thus limit the unnecessary replicas. We have implemented our method at TCP/IP sockets level.

INTERIOR DESIGN CLUB’S SPRING BREAK

Zakhary, Christina; Maurer, Meaghan; Aromin, Gabby; Duncan, Gavin; Frazier, Alyssa
Faculty Mentor(s): Connie Kolokotrones, Family & Consumer Sciences/Interior Design

Session: 2,3 (Oral Session 8:15-9:45 in 137A/B)

In previous years, the Central Washington University Interior Design Club has taken Spring Break to travel to National Design Conferences in places like New York, Las Vegas, and San Francisco. This year however, we decided to do something bigger: we set our sights on a 7 Day Mexican Riviera Cruise. We opened the trip to non-design students who sparked an interest in design and were able to take a variety of peers from across the campus. In previous classes, we had been studying international design and furniture; therefore, we wanted to experience international design first hand. We organized in-depth city, residential, and commercial tours of each port, had private tours of the ship’s design, attended seminars onboard by designers and contractors, held onboard classroom time, and were given daily schedules including assignments and sketches. The Interior Design Club never imagined the extent of information that we would gain on this adventure. However, after taking classes that prepared us to study design abroad, we became equipped to encounter all aspects of Interior Design on a new level. We are excited to be given the opportunity to present our academic adventure to the Central Washington University campus and student body. We believe that we not only furthered our skills, but also gained an immense amount of information to share with our fellow colleagues. The 2008-2009 Interior Design Club became the first on-campus club to arrange and execute a trip abroad separate from the International Studies Department, and we are delighted to be given the chance to share our tactics and experiences with you.
QUESTIONING SUSTAINABILITY RHETORIC: WHEN CULTURAL PRACTICES SUSTAIN DEPLETION OF NATURAL RESOURCES (AN EXAMINATION OF LAS VEGAS CITY OFFICIALS’ SUSTAIN LAS VEGAS POLICY #CM-302)

Zimmerman, Kathryn
Faculty Mentor(s): Rex Wirth, Political Science; Morris Uebelacker, Resource Management; Kathleen Barlow, Resource Management; Nancy Hultquist, Resource Management

Session: 17 (Oral Session 1:15-2:45 in 201)

This examination questions Las Vegas city officials’ rhetorical use of the terms sustain and sustainability. By integrating three inquiries — 1) a chronology of city sustainability campaigns correlated with precipitation records, 2) an analysis of Sustain Las Vegas Policy #CM-302, and 3) the cultural and biophysical history of Las Vegas Valley — this study asks what, exactly, city officials are trying to sustain? This research concludes that city officials’ rhetoric sustains current cultural practices, which sustain water resource problems, deteriorating the fragile desert ecosystem and fissuring the Las Vegas Valley hydrologic structure.

REDESIGNING A UNIVERSITY DEPARTMENT’S WEBSITE: MEETING THE NEED FOR A VIABLE, MAINTAINABLE AND USER FRIENDLY WEBSITE

Zones, Austin; Seelye, Logan
Faculty Mentor(s): Charles Wahle, Information Technology & Administrative Management; Robert Lupton, Information Technology & Administrative Management

Session: 28 (Morning Poster Session 8:15-11:30 Mezzanine)

Over the past year the Central Washington University’s Information Technology and Administration (ITAM) department’s website has been re-constructed by a team of students under the direction of C.P. Wahle. The objectives of this redesign were to use Cascading Style Sheet (CSS) techniques to create an easily maintainable site; gain experience past that given during ITAM classes working with a client; writing code to fit existing web standards; apply skills learned in project management classes to efficiently meet deadlines; and work as part of a web development team. Over the course of the last scholastic year, the web design team has met repeatedly with the client to determine their needs. Site creation started with logo design and content revision. The team then met to plan an overall design that would meet the client’s needs as well as allow for future revision, update and maintenance. Once the design was approved, the team developed CSS templates for implementation. Work continues on construction with a completion target date of June, 2009. Students will present at SOURCE the web site to date and discuss the process of designing and meeting objectives when working as a professional web design team.
2008 STUDENT PRESENTATION AWARDS

Each year, a selection of student presentations is recognized with Outstanding Student Presentation Awards. The awards are based on a review of presentations by a panel of volunteer faculty and staff judges.

Outstanding Oral Presentations

THE LIFE AND TIMES OF HAIRY ELEFANTE: GEOGRAPHY, GEOCHEMISTRY AND PALEONTOLOGY OF THE PRATUM SITE, WESTERN OREGON
Cearley, Stacie; Barton, Bax; Hackenberger, Steve
Mentor: Lisa Ely, Geological Sciences

THE SOCIAL CONSTRUCTION OF PREMENSTRUAL SYNDROME BY COLLEGE AGE MALES
Mirus, Matt
Mentor: Laura Appleton, Sociology

MEASURED EFFECTS OF COMMUNITY-BASED INQUIRY ON CRITICAL THINKING IN NONMAJORS CHEMISTRY
Cornell, Caitlyn; Quitadamo, Ian
Mentor: Martha Kurtz, Chemistry

GOD AND RELATIONSHIPS, SOPHROSYNE AND OLOYGA IN ANNE CARSON’S GLASS, IRONY AND GOD
Sander, Dustin
Mentor: Katharine Whitcomb, English

SAVE BY THE LEAVE OF ALLAH: DOCTRINE CONCERNING SUICIDE IN ISLAM
Soldat, Tyler
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Neumann, Evan  
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THE SELFISHNESS OF POWERFUL WOMEN  
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MOZI’S PHILOSOPHY OF UNIVERSAL LOVE PROVIDES A MEANS FOR ELIMINATING POVERTY AND ACHIEVING WORLD PEACE IN CONTEMPORARY SOCIETY  
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SIXTEEN POINTS: THE RADICALISM OF THE 1956 HUNGARIAN REVOLUTION  
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Mentor: Roxanne Easley, History
THE PRECISION OF TACKING AND JIBING
Zimmer, Alisha; Goodrich, Amber; McGregor, Elizabeth
Mentor: Dan Curtis, Mathematics

“THREE PERFORMANCE PIECES”
Shanks, Andrew; Cartwright, Madeline
Mentors: Keith Edie, Michael Smith & Elise Forier, Theater Arts

ORDERED FUZZY ARTMAP FOR PREDICTING HIV-1 PROTEASE INHIBITOR ACTIVITY
Abdul-Wahid, Badi'; Barker, Grant
Mentors: Razvan Andonie, Computer Science; Levente Fabry-Asztalos, Chemistry

UTILIZATION OF THE NUCLEAR GENE XDH TO INFER PHYLOGENETIC RELATIONSHIPS IN GYMNOSPERMS
Wilcox, Kevin; Peery, Rhiannon; Raubeson, Linda
Mentor: Linda Raubeson, Biological Sciences

THE THEOLOGY OF THE FALL IN ROBOTIC SCIENCE FICTION FILMS
Wickersham, Katy
Mentor: Heidi Szpek, Philosophy and Religious Studies

Outstanding Poster Presentations

THE RECENT EXPRESSIVE LEXICON OF A CROSS-FOSTERED CHIMPANZEE
Wallin, Jason; Jensvold, Mary Lee; Fouts, Roger; Fouts, Deborah
Mentor: Mary Lee Jensvold, Chimpanzee and Human Communication Institute

SCIENCE, ART, AND THE PERCEPTION OF NATURE: MARIA SYBILLA MERIAN AND ALEXANDER VON HUMBOLDT IN THE NEW WORLD
Caulkins, Tamara
Mentor: Thomas Wellock, History

AN EXPLORATORY STUDY OF THE PROPARGYLATION OF AROMATICS WITH Bi(OTf)3 IN IONIC LIQUID SOLVENT [BMIM][OTf]: NEW LIFE FOR A CLASSIC TRANSFORMATION
Brown, Kelley; Kellar, Casey; Charlton, Paul; Laali, K.K.
Mentors: Viorel D. Sarca & Levente Fabry-Asztalos, Chemistry

IDENTIFYING WILDCAT IMPACTS USING AERIAL PHOTOGRAPHY
Wallin, Jason; Jensvold, Mary Lee; Fouts, Roger; Fouts, Deborah
Mentor: Mary Lee Jensvold, Chimpanzee and Human Communication Institute

IDENTIFICATION AND MAPPING OF CULTURAL FEATURES HELL'S CANYON NRA (10NP464), COUGAR BAR, NEZ PERCE COUNTY, IDAHO
Volkenand, Todd; Stanley, Stacey; Barret, Kari; Killsnight, Adriann; Otu-tei, Clement; Nauer, Christian
Mentor: Morris Uebelacker, Geography

EVALUATING THE TIMING OF MAGMATISM AT BAITOUSHAN VOLCANO; INSIGHTS FROM SINGLE MINERAL ISOTOPE ANALYSES
Rodgers, Sarah; Ramos, Frank
Mentor: Frank Ramos, Geological Sciences
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  See you at SOURCE 2010!
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