

**UTAH ACADEMY
of
Sciences, Arts & Letters**

Established 1908

Annual Conference

March 23, 2019

Weber State University

UTAH ACADEMY OF SCIENCES, ARTS, & LETTERS

Annual Conference - Saturday, March 23, 2019

9:00 a.m. – 10:00 a.m.

Check-in & Registration

Tracy Hall Science Center Atrium (2nd Floor)

10:00 a.m. – 10:05 a.m. – H. Laine Berghout, President

Weber State University Welcome: WSU President Brad Mortensen

Wildcat Theater, Shepherd Union

10:15 a.m. – 10:30 a.m. - Rachel Keller, President-Elect

Distinguished Service Award Presentation

Alan and Jeanne Hall

Wildcat Theater, Shepherd Union

John and Olga Gardner Prize Presentation

Gene Sessions

10:30 a.m. – 11:15 a.m.

O.C. Tanner Lecture

By Gene Sessions

Wildcat Theater, Shepherd Union

11:15 a.m. – 11:30 a.m.

Conference Photo

Meet at the WSU Bell Tower

11:30 a.m. – 12:00 p.m.

Poster Session

Tracy Hall Science Center Atrium (2nd & 3rd Floors)

12:00 p.m. – 1:00 p.m.

Lunch

Hurst Center for Lifelong Learning - Dumke Hall

1:15 p.m. – 2:30 p.m.

Division Breakout Session

See “Division Session Room Assignments”

2:30 p.m. – 3:00 p.m.

Refreshment Break

Tracy Hall Science Center Atrium (2nd Floor)

3:00 p.m. – 4:30 p.m.

Division Breakout Session

See “Division Session Room Assignments”

5:00 p.m. – 6:00 p.m.

UASAL Board Meeting

Tracy Hall Science Center 4th floor conference room

Division Sessions

Room Assignments

POSTER SESSION: Shepherd Union Atrium (SU) (2nd Floor)

ARTS:

Session: TY 449

BIOLOGICAL:

Session A: TY 211

Session B: TY 209

BUSINESS:

Session: TY 217

EDUCATION:

Session: TY 351

ENGINEERING:

Session: TY 232

HUMANITIES/PHILOSOPHY/FOREIGN LANGUAGE:

Session: TY 448

KINESIOLOGY AND HEALTH SCIENCES:

Session: TY 240

LANGUAGES/LITERATURE:

Session: TY 426

PHYSICAL SCIENCES:

Session A: TY 234 A

Session B: TY 234 B

SOCIAL SCIENCES:

Session A: TY 340

Session B: TY 354

1. To Access Wireless Internet:
2. Please use “eduroam” wireless network to connect to the Internet.
3. Enter your university credentials for the username and password.
4. If your school does not participate in eduroam, use WSU guest.
5. The log on and password will be provided at the conference

Spring Excursion June 1, 2019 at the Golden Spike National Historic Park (U.S. National Park Service) at 9:30 a.m. See handout for more information.

Distinguished Service Award

Alan and Jeanne Hall

The Distinguished Service Award is given in recognition of exceptional service to the higher education community in Utah.

Alan and Jeanne Hall, both individually and jointly, serve their community by generously supporting access to education. After their marriage and graduation from Weber State College, the Halls joined the Peace Corps in Brazil, an experience that had a lasting influence and cemented their commitment to community involvement and service. Upon their return, they attended BYU where Jeanne earned a master's degree in psychology, and Alan completed an MBA. Jeanne is a certified school counselor and worked with at-risk students in the Ogden School District for almost 20 years. She also served as President of Boys and Girls Clubs of Weber-Davis. Alan has served in many community leadership roles, including Chair of the Weber State University Board of Trustees. Alan and Jeanne Hall established and serve as Chair and President of the Hall Foundation at Weber State. The foundation's mission is to provide educational opportunities to the less fortunate, compassionate care to the afflicted, food to the hungry, cultural experiences to the community and support to cultural and educational organizations. Their philanthropic efforts support a wide range of community organizations. Alan and Jeanne Hall exemplify the ideals of distinguished service in education as they enthusiastically support Weber State, as well as other higher-education institutions. Their sponsorship of scholarships, grants, programs and campus infrastructure allows students and faculty to pursue educational goals through community service.

John & Olga Gardner Prize

Dr. Gene Sessions

The Gardner Prize is awarded annually for exceptional achievement by an academic professional in Utah.

Gene A. Sessions was born and reared in Ogden, Utah, the son of a sheepherder and a farmer's daughter. He received his B. A. from Utah State University in 1970 and his Ph. D. from Florida State University in 1974. After working in the Church of Jesus Christ of Latter-Day Saints Historical Department in Salt Lake City he joined the faculty of Weber State College (later University) in 1975, where his outstanding teaching and scholarship have been recognized through numerous awards including the Crystal Crest Master Teacher Award, John S. Hinckley Fellow award and the Presidential Distinguished Professor award. He has been active throughout his career in faculty service and leadership roles include Chair of the Department of History and chair of Faculty Senate. Gene is widely respected for his scholarship of Utah and Mormon history. He is the author of seven books and numerous articles that have been published in such journals as *The Journal of American Folklore*, *Interamerican Review*, and *Utah Historical Quarterly*. His scholarly works include books on Jedediah Morgan Grant, Science and Mormonism, the Utah War, the Foreign Debt crisis of the 1930s, and a history of Utah International. He has been a consultant on documentaries and committees exploring the Utah War and the Mountain Meadows Massacre and is a past president of the Mountain Meadows Association. He is always in demand to lecture, give presentations, and lead field trips around the West. Gene has long been an excellent ambassador for Weber State and the State of Utah, giving his famous field trip along the Mormon Trail in Utah to hundreds of interested individuals. He has served as the program chair of the Utah War Sesquicentennial Committee and has received the Distinguished Service Award from the Utah State Historical Society. Finally, Gene is a Fellow of the Utah Academy of Science, Arts, and Letters, and has received the Academy's 2006 Distinguished Service Award.

O.C. Tanner Lecture

"The Lion of the Road: Brigham Young and the Transcontinental Railroad"

Dr. Gene Sessions

When the famous Golden Spike ceremoniously united the rails of the Transcontinental Railroad at Promontory Summit, Utah, on May 10, 1869, conspicuously absent from the pageantry of the day was the great Mormon Prophet Brigham Young, arguably the most powerful man in the West. Some have assumed from this, as well as his desire to isolate his followers from the profane world, that Young had opposed the Pacific Railroad and resented its coming through his Great Basin Kingdom. In fact, Young was among the Railroad's earliest and most influential boosters. Not only did he do all in his power to assist particularly the Union Pacific, providing crucial cooperation and labor as the road came into Utah, but he also moved quickly and effectively to accommodate his followers to the coming of the railroad without sacrificing his principles and objectives. This lecture will outline both Young's prominent role in building the Transcontinental Railroad and the actions he then took to protect his followers from the worldly dangers the railroad inevitably threatened while nevertheless enjoying its benefits.

Journal of the Utah Academy Publication Policy

The Journal of the Utah Academy of Sciences, Arts, and Letters publishes works in all of the fields of study encompassed in the Academy's mission. Papers published in The Journal of the Utah Academy of Sciences, Arts, and Letters are drawn from papers presented by members in good standing at the annual conference of the Utah Academy. The Journal of the Utah Academy is a refereed journal. To qualify for publication, the papers must be recommended through a refereeing system.

Presenters are encouraged to publish their paper in The Journal of the Utah Academy. The Journal's criteria are that a submission is (1) fresh, meaningful scholarly insight on its subject; (2) readable and well written; and (3) of general interest for an academic readership beyond the author's field.

If you wish your paper to be considered for publication in The Journal, please submit a Microsoft Word document to the chair of the appropriate division by June 1st 2019. Contact information for division chairs is available on the Utah Academy's website (www.utahacademy.org). Editorial responses will be forthcoming after the resumption of school the following fall when referees have returned their comments to the division chairs.

Papers should be between ten and twenty double-spaced pages. Detailed instructions to authors are available at <http://www.utahacademy.org/>.

Poster Presentations

Poster Session

Division Chair: Erin O'Brien
Dixie State University

Session Leader: Erin O'Brien

Biological Sciences

Novel Small Molecule Pyrazolopyrimidine Analogues Demonstrate Anti-Influenza Activity in vitro

Presenter: Logan Edvalson

Authors: Logan Edvalson, Greg Mohl, Matt Peterson, David Busath

Affiliation: Brigham Young University

Testing the effectiveness of a regional DNA bar coding for identification of lichen-forming fungi

Presenter: Casey Jones

Author: Casey Jones

Affiliation: Brigham Young University

Topical Application of Wogonin Provides a Novel Treatment of Knee Osteoarthritis

Presenter: Jacob Smith

Authors: Jacob Smith, Evan G. Starr, Michael A. Goodman, Romney B. Hanson, Trent A. Palmer, Jonathan B. Woolstenhulme, Jeffery A. Weyand, Andrew D. Marchant, Matthew T. Sterling, Tanner K. Nelson, Brandon J. Rose, James P. Porter, Dennis L. Eggett, David L. Kooyman

Affiliation: Brigham Young University

The Effect of Urbanization on Genetic Diversity in Southern Utah Ant Populations

Presenter: Johanna Garavito

Authors: Johanna Garavito, Glade Shakespeare

Affiliation: Southern Utah University

A Mycological Investigation of Darwin's Naturalization Hypothesis

Presenter: Jonathan H. Wasden

Authors: Jonathan H. Wasden, Geoffrey Zahn

Affiliation: Utah Valley University

Examining the Role of Endophytes in Leaf Decomposition Microbial Fuel Cells for STEM Education

Presenter: Garrett Matthews

Authors: Garrett Matthews

Affiliation: Utah Valley University

Perception Analysis of the use of Indoor Plants and their Benefits among College Individuals

Presenter: Jake Nymeyer

Authors: Jake Nymeyer, Misae Nomiya, Levi Neely, Nate Roundy, Hutch Rhees

Affiliation: Utah Valley University

Changes in xylem anatomy during fire contribute to post-fire mortality

Presenter: Evelyn G. Linford

Authors: Evelyn G. Linford, Jeffery M. Colbert, Jake E. Eiting, Grayson C. Hodge, Kristian R. Valles

Affiliation: Weber State University

Cleaning Up the Taxonomy of *Burkholderia Sensu Lato* Using Comparative Genomics

Presenter: Matthew B. Crook

Authors: Matthew B. Crook, P. Estrada-de los Santos, M. Palmer, B. Chávez-Ramírez, C. Beukes, E. T. Steenkamp, L. Briscoe, N. Khan, M. Maluk, M. Lafos, E. Humm, M. Arabit, E. Gross, M. F. Simon, F. Bueno dos Reis Jr., W. B. Whitman, N. Shapiro, P. S. Poole, A. M. Hirsch, S. N. Venter, E. K. James

Affiliation: Weber State University

The Effect of Fish Stocking Pattern Changes on the Presence of Double-crested Cormorants at Suburban Ponds in Northern Utah

Presenter: Austin White

Authors: Austin White, Nicholas Padilla, Jantz Arbon, Kenzie Isaacson, Greg Mayer, Kelton Friedel

Affiliation: Weber State University

Floral color preference and conditioning in the painted lady butterfly (*Vanessa cardui*)

Presenter: Chyanne Smith

Authors: Chyanne Smith, Heather O'Donnell

Affiliation: Weber State University

Microbial Fuel Cells for STEM Education

Presenter: Malack Mouhammad

Authors: Malack Mouhammad, Mason Burningham

Affiliation: Weber State University

Optimization of Microbial Fuel Cells

Presenter: Mason Burningham

Authors: Mason Burningham, Malack Mouhammad

Affiliation: Weber State University

Predicting Catabolic Pathways in *Lactobacillus wasatchensis* using Metabolic Modeling

Presenter: Serena Seychelle Young

Authors: Serena Seychelle Young, Matthew Domek, Michele Culumber, Craig Oberg

Affiliation: Weber State University

Quantification and Analysis of Fecal Coliforms and the Seasonal Effects on their Relative Concentrations in Taylor Canyon Stream in Ogden, Utah

Presenter: Matthew Mendoza

Authors: Matthew Mendoza

Affiliation: Weber State University

Quantification of *Staphylococcus* Biofilm Clearance

Presenter: Alma Kaneshiro

Authors: Alma Kaneshiro, McKay Griffin, Jonathan Spencer, Daniel N. Clark

Affiliation: Weber State University

Surface Sampling Methods

Presenter: Michael Tene

Authors: William Lorowitz, Michael Tene

Affiliation: Weber State University

Testing a New Disinfection Tool

Presenter: Michael Tene

Authors: Michael Tene, William Lorowitz

Affiliation: Weber State University

Using *Aspergillus oryzae* to Enhance Umami Flavor in Beef

Presenter: Immanuel Rodriguez

Author: Immanuel Rodriguez, Samantha Brailsford

Affiliation: Weber State University

Education

The \$6M Special Education Teacher: Better, Faster, Stronger?

Presenter: David R. Byrd

Author: David R. Byrd

Affiliation: Weber State University

Humanities, Philosophy, and Foreign Language

Interpreters and Interpretation: The Syncretic Crossroads between Cultures

Presenter: Rachel Montalvo

Authors: Rachel Montalvo, Brianna Kroll, Kyle Takke

Affiliation: Utah Valley University

Physical Science

Analysis of Fluoride by FIA in Dental Products

Presenter: Kacey Green

Authors: Kacey Green, Peter Iles, Sarah Moore, Kacey Green, Creed Anderson, Jacob Hughes, Chase Sorensen, Patricia Beslagic, Luther Giddings, Ron Valcarce

Affiliation: Salt Lake Community College

Comparative Analysis of Rose Volatiles in Essential Oils via GC-MS

Presenter: Jie Mei Chong

Authors: Jie Mei Chong, Jessel Meza De La Cruz, Mary Alvarez

Affiliation: Salt Lake Community College

Identification of Pharmaceuticals in Utah's Jordan River

Presenter: Jacob Hughes

Authors: Jacob Hughes, Christopher Peak, Ibtihaj AL-Nidawi, Brendan Schnopp

Affiliation: Salt Lake Community College

9-BBN Catalyzed Hydroboration of Enynes

Presenter: Marcus Mifflin

Authors: Marcus Mifflin, Nathan Werner

Affiliation: Southern Utah University

Caffeine Derived Ligands in the Sonogashira Cross-Coupling Reaction

Presenter: Garrett L. Ruesch

Authors: Garrett L. Ruesch, Nathan S. Werner

Affiliation: Southern Utah University

Demonstration in Classroom, Effect on Learning

Presenter: Hussein Samha

Authors: Hussein Samha, Jessie Byers, Said Bahi

Affiliation: Southern Utah University

Mixed Cell Culture Phantoms for Cancer Differentiation Studies

Presenter: Portia Densley

Authors: Portia Densley, Christopher Berneau, Johnson Alex, David Erickson, Vern Hart

Affiliation: Utah Valley University

Quantification and Comparison of Protein Concentration in Honeys from Various Origins

Presenter: Tyler Thornton

Authors: Tyler Thornton, Craig D. Thulin, Austin D. Sherwin

Affiliation: Utah Valley University

Construction and Development of Dielectric Mie Resonance-Based Metamaterials

Presenter: Spencer Nicholls

Authors: Spencer Nicholls, Shane Howard, Brandon Burnett

Affiliation: Weber State University

Quantitative NMR Determination of Fluorine in Toothpastes

Presenter: Edward Walker

Authors: Thomas Ericson, Edward Walker, Barry Lloyd

Affiliation: Weber State University

Social Sciences

Impact of Massage Chair Use on Perceived Stress and Pain Levels and Physiological Heart and Blood Pressure Rates in Adults

Presenter: Michael Olpin

Authors: Michael Olpin, Shirley Dawson, Ryan Davis

Affiliation: Weber State University

Look Up! Researching the Effects of Technoference on Parent-Child Relationships

Presenter: Amanda Schill

Authors: Amanda Schill, Amanda King-Robinson, Daniel Ruesch, Dr. C. Ryan Dunn (Faculty Adviser)

Affiliation: Weber State University

Oral Presentations

Arts

Division Chair: Angela Banchemo-Kelleher
Utah Valley University

Session Leader: Angela Banchemo-Kelleher

- 1:15 p.m. Welcome
- 1:20 p.m. The Aftershocks: A Research through Dance on the Emotional Symptoms of Persistent Complex Bereavement Disorder
Presenter: Francesca DeMartino
Author: Francesca DeMartino
Affiliation: Utah Valley University
- 1:40 p.m. Japanese Ideals Found in Michio Ito's Choreography and Technique
Presenter: Meladi Hodges
Author: Meladi Hodges
Affiliation: Utah Valley University
- 2:00 p.m. "Triangle of the Squinches" Through A Feminist Perspective
Presenter: Mattea Rogers
Authors: Mattea Rogers
Affiliation: Utah Valley University
- 2:20 p.m. Q & A Discussion
- 2:30 p.m. Refreshment Break - Tracy Hall Science Center Atrium (2nd Floor)
- 3:00 p.m. Zion's Call: Embodied Belief in Virginia Tanner's Woman, the Pioneer
Presenters: Pat Debenham, Kathie Debenham
Authors: Pat Debenham, Kathie Debenham, Chris Ollerton
Affiliation: Utah Valley University
- 3:30 p.m. The Florentine Codex and the Mexica Revival
Presenter: Travis Lee Clark
Author: Travis Lee Clark
Affiliation: Utah Valley University
- 3:50 p.m. Rethinking the Ecology of Islamic Geometric Ornament
Presenter: Barry Wood
Author: Barry Wood
Affiliation: Dixie State University
- 4:10 p.m. Wigman's Hexentanz
Presenter: Vicky Clark
Author: Vicky Clark
Affiliation: Utah Valley University

Biological Sciences

Division Chair: Daniel Clark
Weber State University

SESSION A:

Session Leader: Daniel Clark

- 1:15 p.m. Characterization of the Hemolytic Metabolites of Probiotic *Lactobacilli*
Presenter: Brady Wahlstrom
Authors: Wahlstrom, Kendrick Garret, Jayson Workman, Kymbelle Anderson, Lindsay Jones
Affiliation: Weber State University
- 1:30 p.m. Effect of Extracorporeal Shockwaves on *Rhizopus oryzae* biofilm
Presenter: Tyson Hillock
Authors: Tyson Hillock, Karaleen Anderson, Dr. Katjia Sterflinger, Dr. Cyrill Slezak, Dr. Paul Slezak, Dr. Olga Kopp
Affiliation: Utah Valley University
- 1:45 p.m. Effect of Initial *Lactobacillus wasatchensis* WDC04 Inoculum Levels and Ribose Concentrations on Late Gas Formation in Cheese
Presenter: Ireland Green
Authors: Ireland Green, Craig Oberg, Donald McMahon
Affiliation: Utah State University and Weber State University
- 2:00 p.m. Media Optimization to Differentiate *Lactobacillus* and *Bifidobacterium* species in Fermented Dairy Products
Presenter: Nicole Smith
Authors: Nicole Smith, Courtney Burns, Craig Oberg
Affiliation: Weber State University
- 2:15 p.m. Anti-fungal Synergistic Effect of Amphotericin B and Posacanazole with Thymol and Cinnamaldehyde against *Rhizopus oryzae* Biofilm
Presenter: Jedediah Orullian
Authors: Jedediah Orullian, Tyson Hillock, Levi Neely, Blake Johnson, Ashley Balderrama, Iryna Chelepis
Affiliation: Utah Valley University
- 2:30 p.m. Refreshment Break - Tracy Hall Science Center Atrium (2nd Floor)
- 3:00 p.m. Optimization of Adjunct Lactic Acid Bacteria Cultures for Flavor Production in Dry Salted Gouda Cheese
Presenter: Dillan Gardner
Authors: Dillan Gardner, Craig Oberg, Matthew Domek, Michelle Culumber, Donald McMahon
Affiliation: Weber State University
- 3:15 p.m. *Borrelia burgdorferi* Biofilm: An Investigation into Growth and Control of an Alzheimer's Disease-Associated Bacterium
Presenter: Tyson Hillock
Authors: Tyson Hillock, Kyle Hendricks, Landon Barlow, Rachel Callister, Micheal Richards, Dr. Olga Kopp
Affiliation: Utah Valley University

- 3:30 p.m. Actinomyces and Pigment Production
 Presenter: Bailey Meibos
 Authors: Bailey Meibos, Alexis Thomas, Michele Culumber
 Affiliation: Weber State University
- 3:45 p.m. Non-starter Lactic Acid Bacteria Growth in Cheddar Cheese
 Presenter: Craig Oberg
 Authors: Amanda Varley, Ashley Smith, Michele Culumber, Donald McMahon, Craig Oberg
 Affiliation: Weber State University

SESSION B:

Session Leader: Erin O'Brien

- 1:15 p.m. Identifying Factors Contributing to Spatial Patterns of Mule Deer-Vehicle Collisions
 Presenter: Michael Christiansen
 Authors: Michael Christiansen, Darby Adams, Natalie Barlow, Karl Jarvis
 Affiliation: Southern Utah University
- 1:30 p.m. Thermal niches of fleas from deer mice in the Great Basin Desert: implications for biodiversity conservation
 Presenter: Robert L. Bossard
 Authors: Robert L. Bossard
 Affiliation: Bossard Consulting
- 1:45 p.m. Alkali Bullrush: A Forgotten Food
 Presenter: Stephen L. Clark
 Authors: Stephen L. Clark
 Affiliation: Weber State University
- 2:00 p.m. Distribution and microbial use of molybdenum in soils west of Milford, Utah
 Presenter: Matt Harmon, Huh JungYun
 Authors: Matt Harmon, Huh JungYun, Dr. Elizabeth Pierce, Dr. Kim Weaver
 Affiliation: Southern Utah University
- 2:15 p.m. Supporting Lipid Bilayer Removal by Buffer Flow
 Presenter: Ruth Hunter
 Authors: Ruth Hunter, Micheal Ornstead, Christopher Monson
 Affiliation: Southern Utah University
- 2:30 p.m. Refreshment Break - Tracy Hall Science Center Atrium (2nd Floor)
- 3:00 p.m. Analysis of Four Plant Organellar tRNA genes: More Evidence of Gene Transfer
 Presenter: William D. Speer
 Author: William D. Speer
 Affiliation: Salt Lake Community College
- 3:15 p.m. Analyzing Attitudes toward the Use of Essential Oils among UVU Students
 Presenter: Hunter Brittain
 Authors: Hunter Brittain, Nathan Fletcher, McKay Echols, Zachary Medved, Dr. Olga Kopp
 Affiliation: Utah Valley University

3:30 p.m. The Effects of Housing and Feed on Nutritional Content of Eggs
Presenter: Zack Hansen
Authors: Zack Hansen, Dr. Lindsey Roper, Dr. Elizabeth Pierce
Affiliation: Southern Utah University

Business

Division Chair: Taowen Le
Weber State University

Session Leader: Taowen Le

- 1:15 p.m. Welcome
- 1:20 p.m. Validating Social Media Strategy Frameworks Using Luxury Car Facebook Campaigns
Presenter: Paige Gardiner
Author: Paige Gardiner
Affiliation: Utah Valley University
- 1:40 p.m. Comparative Workplace Orientations and Conditions in the U.S., Western Europe, and Nordic Countries
Presenter: Jonathan Westover
Authors: Jonathan Westover, Colton Harris, Jace Johnson, Jake Epley, Blaine Dudgeon
Affiliation: Utah Valley University
- 2:00 p.m. Facilitating Workplace Unity through Conflict and Communication
Presenter: Annalyse Kofoed
Author: Annalyse Kofoed
Affiliation: Utah Valley University
- 2:20 p.m. Q & A Discussion
- 2:30 p.m. Refreshment Break - Tracy Hall Science Center Atrium (2nd Floor)
- 3:00 p.m. The Farmer and the Cowman Should be Friends
Presenter: Chelsea Dye
Authors: Chelsea Dye, Jennifer Harrison, Ron Mano
Affiliation: Westminster College
- 3:20 p.m. The State Treasurer Needs an Intermediate Maturity Fund: A Discussion of Investment Options Needed to Compliment the PTIF
Presenter: R. Neil Walter
Authors: R. Neil Walter (Independent Researcher), Nathan G. Caplin
Affiliation: Snow College
- 3:40 p.m. Is Social-Cause Marketing an Effective Strategy for Big Brands on Social Media?
Presenter: Kendra Jorgensen
Authors: Kendra Jorgensen, Paige Gardiner
Affiliation: Utah Valley University

4:00 p.m. A Social Impact Evaluation of Project READ
Presenter: Andre Oliveria
Authors: Andre Oliveira, Ronald Miller
Affiliation: Utah Valley University

Education

Division Chair Debora Escalante
Utah Valley University

Session Leader: Debora Escalante

- 1:15 p.m. Welcome
- 1:20 p.m. (Don't) Just Tell Me What to Change: A Practical Approach for Implementing Self-Directed Learning into Student-Instructor Conferences
Presenter: Katie Johnson
Author: Katie Johnson
Affiliation: Brigham Young University
- 1:40 p.m. Intersection of Math, Art, and GeoGebra
Presenter: Violeta Vasilevska
Author: Violeta Vasilevska
Affiliation: Utah Valley University
- 2:00 p.m. The Role of Practitioner Research in Teacher Professionalism
Presenter: Joel Judd
Authors: Joel Judd, Betty Jepson; Christina Hurley; Erica Fordiani
Affiliation: Southern Utah University
- 2:20 p.m. Q & A Discussion
- 2:30 p.m. Refreshment Break - Tracy Hall Science Center Atrium (2nd Floor)
- 3:00 p.m. Taking the plunge a review of faculty in Utah who ran for legislative office in the 2018 election
Presenter: Peter L. Kraus
Author: Peter L. Kraus
Affiliation: University of Utah
- 3:20 p.m. Utah State Capital Resource Allocation: A Proposal for Increasing the Transparency of Capital Expenditures, Including Facilities
Presenter: R. Neil Walter
Authors: R. Neil Walter, Nathan G. Caplin
Affiliation: Snow College
- 3:40 p.m. Exploring the Effects of High Impact Practices on the Traditionally Underserved University Student
Presenter: Jonathan Westover
Authors: Jonathan Westover, Rasha Qudisat
Affiliation: Utah Valley University
- 4:00 p.m. The Impact of Service-Learning on Student Learning, Engagement, Retention, and Completion Title

Presenter: Jonathan Westover
Authors: Jonathan Westover, Rasha Qudisat
Affiliation: Utah Valley University

Engineering

Division Chair: Doran Baker
Utah State University

Session Leader: Ali S. Siahpush

- 1:15 p.m. Airglow Measurement Trends from the SABER/TIMED Satellite over a Solar Cycle
Presenter: Brian Simons
Authors: Brian Simons, Doran Baker, Gene Ware
Affiliation: Utah State University
- 1:30 p.m. An Optimized Lens-Into-the-Body for Passive Beamforming
Presenter: Cody O'Brien
Authors: Cody O'Brien, Chris Trampel
Affiliation: Weber State University
- 1:45 p.m. Open Source Antenna Pattern Measurement System
Presenter: Daniel Newton
Authors: Daniel Newton, Christian Hearn
Affiliation: Weber State University
- 2:00 p.m. Autonomous Surveillance Drone
Presenter: Cody Glad
Author: Cody Glad
Affiliation: Weber State University
- 2:15 p.m. Rehabilitation of Bridges under the Umbrella of Recent Management Techniques by Using Performance-Based Design Model
Presenter: Mohamed Askar
Authors: Mohamed Askar, Jacob Bishop, Aaron Lewis
Affiliation: Southern Utah University
- 2:30 p.m. Refreshment Break - Tracy Hall Science Center Atrium (2nd Floor)
- 3:00 p.m. Heat Transfer Analysis of Water During Liquid-Solid Phase Change
Presenter: Colton Robinson
Authors: Colton Robinson, Cameron Aston
Affiliation: Southern Utah University
- 3:15 p.m. A Simple Approach to Evaluate Thermal Conductivity of Solids
Presenter: Lloyd Stephens, Austin Becker, Reece Alvarado
Authors: Lloyd Stephens, Austin Becker, Reece Alvarado, Dr. Ali Siahpush
Affiliation: Southern Utah University
- 3:30 p.m. Applications of Aluminum Foam
Presenter: Christopher J. Bettencourt, Victoria A. Krull, John R. Webster Jr.
Authors: Christopher J. Bettencourt, Victoria A. Krull, John R. Webster Jr.
Affiliation: Southern Utah University

3:45 p.m. Measuring the Thermal Conductivity of Air
Presenter: Jake Sip
Authors: Jake Sip, Andrea Lauren Reeder, Dallin Giles, Ali Siahpush, Ph.D.
Affiliation: Southern Utah University

Humanities, Philosophy, & Foreign Language

Division Chair: Craig Bergeson
Weber State University

Session Leader: Craig Bergeson

- 1:15 p.m. Welcome
- 1:20 p.m. The Role and Usage of English Words in French Film
Presenter: Dina Iakhina
Author: Dina Iakhina
Affiliation: Snow College
- 1:40 p.m. Two imperfections in Spanish Orthography: A suggestion for the Asociación de Academias de la Lengua Española
Presenter: Tom Mathews
Authors: Tom Mathews
Affiliation: Weber State University
- 2:00 p.m. Arab and Muslim Americans: Two Diverse Minorities
Presenter: Kholoud Al-Qubbaj
Authors: Kholoud Al-Qubbaj
Affiliation: Southern Utah University
- 2:20 p.m. Q & A Discussion
- 2:30 p.m. Refreshment Break - Tracy Hall Science Center Atrium (2nd Floor)

Kinesiology and Health Sciences

Division Chair: L. Nathan Thomas
Salt Lake Community College

Session Leader: L. Nathan Thomas

- 1:15 p.m. Welcome
- 1:20 p.m. The impact of exposure to alcoholism on children and adolescents: A review of the literature
Presenter: Yan Huang PhD
Author: Yan Huang PhD
Affiliation: Weber State University
- 1:40 p.m. Managing College Stress: Perceptions and Physiological Effects
Presenter: Shirley A Dawson
Authors: Shirley A Dawson, Michael Olpin
Affiliation: Weber State University

- 2:00 p.m. A Prophylactic Treatment in a Rat PTSD Model Examining Plasticity of Brain Regions Altered in this Disorder
Presenters: Eliza Neal, Spencer Kimball
Authors: Eliza Neal, Spencer Kimball, Dr. Jeffery Edwards, Roxanne Miller
Affiliation: Brigham Young University
- 2:20 p.m. Q & A Discussion
- 2:30 p.m. Refreshment Break - Tracy Hall Science Center Atrium (2nd Floor)

Language, & Literature
Division Chair: Keith Lawrence
Brigham Young University

Session Leader: Keith Lawrence

Political and Politicized Language

- 1:15 p.m. Welcome
- 1:20 p.m. Ethical Responsibilities of Standard English Speakers toward Users of Black English Sub-Dialects
Presenter: Edgar Corrales
Author: Edgar Corrales
Affiliation: Weber State University
- 1:40 p.m. Two Irish Poets and a Mummy Walk into a Pub . . .
Presenter: Rob Carney
Author: Rob Carney
Affiliation: Utah Valley University
- 2:00 p.m. Martin Espada and the Political Power of Poetry
Presenter: Christopher T. Althoff
Author: Christopher T. Althoff
Affiliation: Brigham Young University
- 2:20 p.m. Q & A/Discussion
- 2:30 p.m. Refreshment Break - Tracy Hall Science Center Atrium (2nd Floor)

Studies in Challenge and Choice

- 3:00 p.m. 'Reason is but Choosing': Navigating Reason, Choice, and Obedience in Milton's Paradise Lost and 'Areopagitica'
Presenter: Amber Bird
Author: Amber Bird
Affiliation: Brigham Young University
- 3:20 p.m. Dueling Heroes: Contrasting Hero Journeys in Shakespeare's As You Like It
Presenter: Patrick Lynch
Author: Patrick Lynch
Affiliation: Dixie State University

3:40 p.m. How Past Narrates the Present in the Letters of Phillis Wheatley and Harriet Jacobs
Presenter: Sarah Vause
Author: Sarah Vause
Affiliation: Weber State University

Physical Sciences

Division Chair: Chris Monson
Southern Utah University

SESSION A:

Session Leader: Chris Monson

- 1:15 p.m. Welcome
- 1:20 p.m. A Deep Learning Approach to Early Cancer Detection using Near-Infrared Laser Scattering Profiles
Presenter: R Ryan Rainey
Authors: R Ryan Rainey, Mason Acree, Christopher Berneau, Portia Densley, Vern Hart
Affiliation: Utah Valley University
- 1:40 p.m. GC-MS Determination of Flux in the APEH/ACY-1 Pathway
Presenter: Carson C. Cole
Authors: Carson C. Cole, Tracy Covey, PhD, David Coffman, Nicolas Drysdale,
Affiliation: Weber State University
- 2:00 p.m. Quantification of Oxygen Levels in Anoxic Environments Using a Microfluidic Device
Presenter: Mariah Clayson
Authors: Mariah Clayson, Maverik Shumway, Esther Harkness, Lohra Miller
Affiliation: Southern Utah University
- 2:20 p.m. Q & A Discussion
- 2:30 p.m. Refreshment Break – Tracy Hall Science Atrium
- 3:00 p.m. Investigating the Light-Absorbing Properties of Dipyrrroles common to Bilins
Presenter: Clayton F. Staheli
Authors: - Clayton F. Staheli, Bridger P. Jeppesen, Jacob C. Dean, PhD
Affiliation: Southern Utah University
- 3:20 p.m. Fabrication of copper nanoparticles
Presenter: Zhuoling Chen
Author: Zhuoling Chen
Affiliation: Southern Utah University
- 3:40 p.m. Examination of the anti-tumor structure-activity relationships of chalcone derivatives
Presenter: Don Davies
Authors: Don Davies, Tracy Covey, Parker Ferguson, Brian Farnsworth, Brian Allen, Nick Eccles
Affiliation: Weber State University

SESSION B:

Session Leader: Brandon Wiggins

- 1:15 p.m. Welcome
- 1:20 p.m. Magnetic Field Modulation Toward High Energy Particle Accelerator RF Source Replacement
Presenter: Clayton Williams
Author: Clayton Williams
Affiliation: Utah Valley University, Jefferson Lab LLC
- 1:40 p.m. Influence of thermal radiation of Universe on evolution of primordial black holes (PBH) and on our ability to detect PBH
Presenter: Alexander Panin
Author: Alexander Panin,
Affiliation: Utah Valley University
- 2:00 p.m. Gearing up for a VASIMR launch at UVU
Presenter: James Loveless
Authors: James Loveless, Michael Burt, Joshua Baum, Raymond Perkins, Phil Matheson
Affiliation: Utah Valley University
- 2:20 p.m. Q & A Discussion
- 2:30 p.m. Refreshment Break – Tracy Hall Science Atrium
- 3:00 p.m. CCD and GAIA Observations Indicate That the Double Star system WDS 02222+2437 Is Not a binary system.
Presenter: Hamza Samha
Authors: Hamza Samha, Jonathan Ginouves, Taimé Clark, Savana LeBaron, Jasmine Tapia, Micah Jackson, Cameron Pace
Affiliation: Southern Utah University
- 3:20 p.m. Core-Collapse Supernova Light Curves
Presenter: Morgan Taylor
Authors: Morgan Taylor, Wesley Even, Ryan Wollaeger,
Affiliation: Southern Utah University
- 3:40 p.m. Hydrodynamic Simulations of Turbulence in Jet Engines
Presenter: Jazmine James
Authors: Jazmine James, Brandon Wiggins
Affiliation: Southern Utah University

Social Sciences

Division Chair: Daniel Poole
Salt Lake Community College

SESSION A:

Session Leader: Theresa Martinez

- 1:15 p.m. Welcome
- 1:20 p.m. To Protect a Scumbag: Larry Flynt as Metaphor for First Amendment Cravenness
Presenter: Thomas C. Terry
Author: Thomas C. Terry
Affiliation: Utah State University
- 1:40 p.m. Plea Bargaining - Is the World Following in our Footsteps in Over Using Plea Bargains?
Presenter: Rachel Watson
Author: Rachel Watson
Affiliation: Weber State University
- 2:00 p.m. Does Unemployment Affect Presidential Elections? It Depends Where You Look
Presenter: Pook Carson
Author: Pook Carson
Affiliation: Salt Lake Community College
- 2:20 p.m. Q & A Discussion
- 2:30 p.m. Refreshment Break - Tracy Hall Science Center Atrium (2nd Floor)
- 3:00 p.m. 'Black, Brown, and White': Oppositional Performance in American Blues and R&B Music
Presenter: Theresa Martinez
Author: Theresa Martinez
Affiliation: University of Utah
- 3:20 p.m. Non-Ideal Theory and Genetic Research for Indigenous Populations
Presenter: Rachel Robison-Greene
Authors: Rachel Robison-Greene
Affiliation: Utah State University
- 3:40 p.m. The Color of Justice: Predictors of support for Black & Blue Criminal Justice Movements
Presenter: R.C. Morris
Authors: R.C. Morris
Affiliation: Weber State University
- 4:00 p.m. Q & A Discussion

SESSION B:**Session Leader:** Daniel Poole

- 1:15 p.m. Welcome
- 1:20 p.m. Survey of First Experience of Sexual Intercourse: Revisited
Presenter: Mackenzie Hughes
Author: Mackenzie Hughes
Affiliation: Salt Lake Community College
- 1:40 p.m. The Silent Military Rape Epidemic
Presenter: Mikelle Wrobel
Author: Mikelle Wrobel
Affiliation: Salt Lake Community College
- 2:00 p.m. Understanding Us: Homelessness in Salt Lake City
Presenter: Jennifer Salazar
Author: Jennifer Salazar, Max Weaver,
Affiliation: Salt Lake Community College
- 2:20 p.m. Q & A Discussion
- 2:30 p.m. Refreshment Break - Tracy Hall Science Center Atrium (2nd Floor)
- 3:00 p.m. Reviewing the Beck Depression Inventory on its Psychometric Properties
Presenter: Bryan J. Dalley
Author: Bryan J. Dalley
Affiliation: Utah Valley University
- 3:20 p.m. Mixed methods evaluation of formal mentoring: Journey UP for aging out of foster care
Presenter: Barrett Bonella
Authors: Barrett Bonella
Affiliation: Weber State University
- 3:40 p.m. Q & A Discussion
- 4:00 p.m. Conclude

POSTER ABSTRACTS

BIOLOGY POSTERS

Title: Novel Small Molecule Pyrazolopyrimidine Analogues Demonstrate Anti-Influenza Activity in vitro

Author: Logan Edvalson

Affiliation: Brigham Young University

Abstract: "Many believe that the days of pandemic-type flu are over but fail to consider the high mutation rate of the virus. According to researchers at the Scripps Research Institute in Los Angeles there are as few as three mutations needed for avian flu to be transmittable to humans. This would be a novel strain, much like the 1918 pandemic flu that killed up to 100 million people. The death toll from an equally deadly pandemic today would wipe out nearly 400 million. But taking into account modern air travel the death toll would almost certainly be much higher. The dangers of flu are not limited to mass pandemics, however. Over 80,000 people in the United States alone died from flu and flu-related causes in the 2017-18 season. Influenza is a serious threat and hundreds of researchers around the world are searching for ways to either prevent or treat the infection.

For our experiments, Dr. Matt Peterson developed small molecule drugs that have shown, through immunofluorescence assays, anti-influenza activity in Madin-Darby Canine Kidney (MDCK) cells at pharmaceutical-grade concentrations. We show that one molecule in particular (J115) is especially effective with an EC₅₀ of 9.1 +/- 6 µM with an EC₅₀/CC₅₀ ratio of 10.99. We believe the primary target of these drugs to be vascular endothelial growth factor receptor (VEGFR) but studies show that pyrazolopyrimidine analogues, like our drugs, target multiple receptor tyrosine kinases (RTKs). The results of our experiment suggest what others have hypothesized: that the sialic acid interaction that is traditionally held responsible for flu infection is insufficient for the virus to enter the cell and that influenza must utilize a yet to be characterized secondary receptor interaction which promotes viral endocytosis."

Title: Testing the effectiveness of a regional DNA barcoding for identification of lichen-forming fungi

Author: Casey Jones

Affiliation: Brigham Young University

Abstract: "Current methods of identifying lichen forming fungal species by molecular means are limited by the generality of global databases. The efforts to create many of these global databases take place in Europe and are lacking in accurate and up to date DNA metabarcoding sequences for many lichen forming fungi found locally in the Northwestern United States. We plan to create a regional database of 500 locally found lichen forming fungi and corresponding DNA metabarcoding sequences that would improve rates of proper identification of said lichen forming fungi down to a species level."

Title: Topical Application of Wogonin Provides a Novel Treatment of Knee Osteoarthritis

Author: Jacob Smith

Affiliation: Brigham Young University

Abstract:

Osteoarthritis (OA) is a degenerative joint disease characterized by joint pain, decreased functional mobility, and deformation of articular cartilage and consequentially diminishing quality of life. Wogonin (WG), a compound extracted from the Skullcap Baicalensis plant, has been shown to have anti-inflammatory effects on the Toll-like Receptor 4 (TLR4) inflammatory pathway and antioxidant properties via Nrf2. We have shown that TLR4 is a major receptor for pain in OA. In our study, we examined the pain reducing, anti-inflammatory, and chondroprotective effects of WG when applied as a topical cream (TC). After destabilizing the menisci of mice to induce OA, we examined the severity and progression of OA with and without the topical application of WG. Using a running wheel to track mice activity, we found that mice with WG treatment were statistically more active than mice without WG treatment. OA progression analyzed using Modified Mankin and OARSI scoring showed a significant attenuation of OA severity among mice treated with WG as well as a decrease in Cyst-Like lesions at the chondro-osseous junction. Immunohistochemistry revealed a significant decrease in protein expression of TGF-β, HTRA1, MMP-13, NF-κB and HePCidin in treated mice showing a decrease in inflammation.

Title: The Effect of Urbanization on Genetic Diversity in Southern Utah Ant Populations

Authors: Johanna Garavito, Glade Shakespeare

Affiliation: Southern Utah University

Abstract: Genetic diversity is critical to a species' survival and the ability to adapt to changing environments. Conservation geneticists can use genetic diversity for various species in a habitat to determine the overall health. With this information, conservation geneticists can prevent extinction and improve population viability. Ants (Formicidae) are tiny, invertebrate omnivores found all around the globe and are considered to be good indicators of ecosystem health. Our main goals were to characterize the population genetic structure and to investigate the effect of urbanization on genetic diversity in southern Utah. Samples were collected throughout Cedar City (Canyon Park, the Lake on the Hills, and Main Street), and outside of Cedar City at the SUU Mountain Center and Three Peaks Recreation Area. DNA was extracted with Qiagen's DNeasy Blood and Tissue Kit and amplified at 10 previously characterized microsatellite loci. Genetic diversity will be compared between urban (Cedar City locations), rural (SUU Mountain Center), and mixed use (Three Peaks Recreation Area) lands to see if urbanization negatively affects ant biodiversity, potentially decreasing ecosystem health.

Title: A Mycological Investigation of Darwin's Naturalization Hypothesis

Authors: Jonathan H Wasden, Geoffrey Zahn

Affiliation: Utah Valley University

Abstract: "Darwin's Naturalization Hypothesis is the idea that species more closely related to each other should be stronger competitors than more distantly related species. This hypothesis has been tested with different organisms throughout the years, particularly with plant groups, yielding mixed results. Our experiment is a preliminary step in testing this hypothesis with fungal species to see if the same patterns found in plants can be detected using this understudied group. We took three fungal isolates of varying phylogenetic relatedness, grew them in a fully factorial combination of competitive scenarios and observed their growth rates. Species' identities were determined by Sanger sequencing of the ITS1-5.8S-ITS2 region of the ribosome encoding DNA sequence. Darwin's Naturalization Hypothesis is the idea that species more closely related to each other should be stronger competitors than more distantly related species. This hypothesis has been tested with different organisms throughout the years, particularly with plant groups, yielding mixed results. Our experiment is a preliminary step in testing this hypothesis with fungal species to see if the same patterns found in plants can be detected using this understudied group. We took three fungal isolates of varying phylogenetic relatedness, grew them in a fully factorial combination of competitive scenarios and observed their growth rates. Species' identities were determined by Sanger sequencing of the ITS1-5.8S-ITS2 region of the ribosome encoding DNA sequence. *Mycosymbiocytes mycenaphila*, an ascomycete, outcompeted the two remaining isolates. However, due to *Mycenaphila* being a fungal parasite and belonging to a different phylogenetic branch, these results are insufficient in either confirming or refuting Darwin's Hypothesis. Although, this test is a poor approximation of natural conditions, but the results are an important first step to further study of Darwin's Naturalization Hypothesis in fungi."

Title: Examining the Role of Endophytes in Leaf Decomposition Microbial Fuel Cells for STEM Education

Authors: Garrett Matthews

Affiliation: Utah Valley University

Abstract:

Current research indicates a high level of reliance and interaction between plants and their fungal endophytes. These communities living within a plant's aboveground tissue can often serve as a beneficial disease modifier or provide other benefits. The majority of studies have investigated this plant-endophyte symbiosis from the perspective of the plant, rather than the fungus. It is more clear what benefit plants are receiving from fungi than what benefits fungi are receiving from inhabiting aboveground plant tissues. One current hypothesis for fungal benefits of endophytism is called latent decomposition. Simply put, saprophytic endophytes may benefit from a 'head start' on decomposition of the plant's tissue when it dies by being present in advance. In order to test the latent decomposition hypothesis we took samples from a single mulberry tree over time as leaves senesced. Leaf samples were finely cut and incubated on a modified mycological medium. Regions of fungal growth were isolated into pure cultures and subjected to Sanger DNA screening of the ITS rDNA. Fungal community structure from all leaf age groupings were compared and there was no significant difference in community membership between healthy and senesced leaves. Our results were unable to disprove the latent decomposer hypothesis, suggesting that arrival priority on dead leaves may be a benefit to endophytic fungi.

Title: Perception Analysis of the use of Indoor Plants and their Benefits Among College Individuals

Authors: Jake Nymeyer, Misae Nomiya, Levi Neely, Nate Roundy, Hutch Rhees

Affiliation: Utah Valley University

Abstract: Indoor plants are common household items across various demographics. Recent studies have shown that common household plants have a host of benefits. These range from medicinal plants, such as *Aloe vera*, that can aide healing and ease pain to plants that can filter various impurities in the air. As more and more indoor plant benefits are discovered, it is worthwhile to investigate the perception of indoor plants among college individuals to analyze awareness and interest. In order to evaluate the perception of indoor plants among college individuals, a survey containing questions related to indoor plant perception and indoor plant benefit awareness will be conducted among individuals affiliated with Utah Valley University. Participants will be categorized based on age, gender, and race before statistical analysis will be utilized to organize and analyze data.

Title: Changes in Xylem Anatomy During Fire Contribute to Post-Fire Mortality

Authors: Evelyn G. Linford, Jeffery M. Colbert, Jake E. Eiting, Grayson C. Hodge, Kristian R. Valles

Affiliation: Weber State University

Abstract: Wildfire increases are putting forest populations at risk, both with initial deaths and post-fire mortality. Populations at the periphery of wildfires are at risk for post-fire mortality, and two hypotheses are attempting to explain this phenomenon. The hypothesis attributing post-fire mortality to xylem conduit failure due to high temperatures has had an increase in support from various studies. The size and shape of the xylem conduit impacts its hydraulic vulnerability, which could be increased with changes to xylem conduit shape. This study examined anatomical changes to xylem conduits due to heating. Results showed a significant difference in conduit area in control and heating groups. This supports the hypothesis that high temperatures from wildfire cause changes in xylem anatomy, which contributes to post-fire mortality.

Title: Cleaning Up the Taxonomy of *Burkholderia Sensu Lato* Using Comparative Genomics

Authors: Matthew B. Crook, P. Estrada-de los Santos, M. Palmer, B. Chávez-Ramírez, C. Beukes, E. T. Steenkamp, L. Briscoe, N. Khan, M. Maluk, M. Lafos, E. Humm, M. Arabit, E. Gross, M. F. Simon, F. Bueno dos Reis Jr., W. B. Whitman, N. Shapiro, P. S. Poole, A. M. Hirsch, S. N. Venter, E. K. James

Affiliation: Weber State University

Abstract: In recent years, three new genera have been segregated from the genus *Burkholderia*: *Paraburkholderia*, *Caballeronia*, and *Robbsia*. A phylogenetic comparison of these groups indicated that *Paraburkholderia* was paraphyletic and should be further split into three monophyletic groups. One of these groups includes the closely related species *P. rhizoxinica* and *P. endofungorum*, which are both symbionts of the fungal phytopathogen *Rhizopus microsporus*. We propose that this group be renamed *Mycetohabitans* gen. nov. The second group comprises the *Mimosa*-nodulating bacterium *P. symbiotica*, the phytopathogen *P. cary*, and the soil bacteria '*B. dabaoshanensis*' and *P. soli*. We propose that this group be renamed *Trinickia* gen. nov. To confirm that these groups deserved generic status, we sequenced the genomes of 8 additional strains, including 7 type strains. The uniqueness of these proposed genera is supported by average nucleotide identity and average amino acid identity calculations and unique gains/losses of genomic content. We also examined the relationship of genes related to symbiosis (*nod* and *nif* genes) and pathogenesis (T3SS genes) relative to other symbiotic or pathogenic species of *Burkholderia Sensu Lato*.

Title: The Effect of Fish Stocking Pattern Changes on the Presence of Double-crested Cormorants at Suburban Ponds in Northern Utah

Authors: Austin White, Nicholas Padilla, Jantz Arbon, Kenzie Isaacson, Greg Mayer, Kelton Friedel

Affiliation: Weber State University

Abstract: The Double-crested Cormorant (*Phalacrocorax auritus*) is a piscivorous bird populating a wide variety of aquatic habitats including urban fishing ponds. The behavior of Cormorants has become increasingly important to wildlife managers in North America due to their predatory activity on stocked fish. Previous studies have looked at how Cormorant numbers respond to the stocking of Rainbow Trout (*Oncorhynchus mykiss*) and Channel Catfish (*Ictalurus punctatus*) in small suburban ponds within northern Utah. These studies suggested that Cormorant numbers increased following the stocking of Rainbow Trout. This prompted recommendations that were implemented with cooperation from the Utah Division of Wildlife Resources (DWR) in 2018. These recommendations included: stocking fewer Rainbow Trout more frequently, stocking Rainbow Trout that are larger in size, and stocking Channel Catfish in place of Rainbow Trout. Every morning during May and June of 2018, we censused the number of Cormorants for 30 minutes at nine ponds, where we also measured other environmental factors. At selected ponds, fewer Rainbow Trout and more Channel Catfish were stocked compared to previous years. At one pond, Meadow Creek, the Rainbow Trout that were stocked were larger in size (~14 in). Another pond, Jensen Nature Park Pond, had Rainbow Trout stocked more frequently than in past years. These both showed a decrease in the average number of Cormorants seen per day at their respective ponds. This also showed an increase in the number of days where the ponds had no Cormorants visit. These results were consistent with our hypothesis that decreasing the number of Rainbow Trout stocked, increasing the size of the Rainbow Trout stocked, and stocking Channel Catfish will reduce Cormorant presence at these suburban ponds.

Title: Floral color preference and conditioning in the painted lady butterfly (*Vanessa cardui*)

Authors: Chyanne Smith, Heather O'Donnell

Affiliation: Weber State University

Abstract: Painted lady butterflies (*Vanessa cardui*), like many other butterflies, are able to visually differentiate between colors. However, floral color conditioning and preference is poorly understood in this species and remains largely unexplored. We investigated the effects of floral conditioning in painted lady butterflies to synthetic white flowers to test trainability and color preference. We hypothesized that these butterflies, after a conditioning period, would be trained to show preference to white flowers, if all other floral factors were the same. Additionally, butterflies raised in a mixed flower color environment should show no preference toward any specific color. Results obtained suggest there is no significant color preference between butterflies conditioned solely on one color of flower versus butterflies conditioned to multiple colors of flowers. Future studies should be conducted which take into account conditioning period length, wing damage, and mating behaviors.

Title: Microbial Fuel Cells for STEM Education

Authors: Malack Mouhammad, Mason Burningham

Affiliation: Weber State University

Abstract: STEM (Science, Technology, Engineering, and Mathematics) projects are an essential component in gaining a quality education. Microbial fuel cells (biobatteries) are an excellent informative topic for a STEM project because they are a simple and inexpensive way to provide insight into the STEM disciplines for students at all levels. They include aspects from multiple science fields, for example, Biology, Physics, Mathematics, and Chemistry. As such, it is our hypothesis that experiments with biobatteries would educate and inspire students in STEM disciplines. Multiple construction methods of the batteries were examined, each with a variety of parameters. These parameters included electrode material, the source of organisms, and environmental factors. Each method provided an experimental approach that can be explored in the classroom. The most successful batteries were incubated at 25°C and were constructed in terracotta pots using soil as the electrolytic medium, terracotta clay-covered copper disks as the anode, and graphite paint covering the outer surface of the pot as the cathode. These batteries achieved an electrical potential reading of above 1 volt, compared to a 1.2-volt theoretical maximum, using this construction method. The target audience for this research is teachers. The biobattery is an easy and educational project to bring to the classroom, and due to the range of the parameters that can be investigated, would serve as a good introduction into the STEM fields. The presentation will also include background information to assist the teachers in explaining the many different concepts behind the biobattery.

Title: Optimization of Microbial Fuel Cells
Authors: Mason Burningham, Malack Mouhammad
Affiliation: Weber State University

Abstract: Microbial fuel cells, or biobatteries, are systems that harness the capacity of some microorganisms to produce an electrical current as they undergo metabolism. These organisms are commonly found in soil samples rich in organic materials. These systems have a wide variety of potential uses, especially in environments that require a small, steady source of electrical power over long periods of time. These batteries are potentially inexpensive while remaining non-toxic, non-flammable, and environmentally friendly. The hypothesis was that simple biobatteries could be constructed that performed as well as more expensive, more complex systems described in the literature. We investigated the parameters under which biobatteries would produce the greatest electrical potential, comparing several factors. The batteries were produced from materials such as copper wire, terracotta pots, Mason jars, soil, graphite paint, and graphite or copper electrodes. Both the physical structure of the batteries and the environmental parameters were investigated. Some physical traits that were tested included the location of the cathode on the terracotta pots, replacing the terracotta pots with Mason jars, the soil inside the pots, and the anode material. Environmental parameters included temperature and available moisture. Through this testing we were able to attain electrical potentials greater than 1000 mV, with some individual cases nearly reaching 1200 mV, which is the theoretical maximum voltage attainable from this system. This is notable because the highest reported potential we have found in the literature was roughly 700 mV. In terms of long-term viability, our pots remained functional over the course of over one year with little to no maintenance, although the electrical potential did decrease. Additional research into increasing output could be necessary for practical viability, which could include investigations into increased surface area of the electrodes and the behavior of the biobatteries when wired together in series or parallel.

Title: Predicting Catabolic Pathways in *Lactobacillus wasatchensis* using Metabolic Modeling
Authors: Serena Seychelle Young, Matthew Domek, Michele Culumber, Craig Oberg
Affiliation: Weber State University

Abstract: *Lactobacillus wasatchensis*, a nonstarter lactic acid bacteria (NSLAB), causes late gas production in aged Cheddar cheese, which results in splits in the cheese and package bloating. In this study, we attempted to identify which sugars or other carbon sources *Lb. wasatchensis* can use for growth and gas production in aging cheese. Previous studies showed galactose could be used by WDC04 to produce gas, but did not determine any carbon sources for late gas production in cheese when no galactose was present. Ultimately, we hope to define cheese compositions that either inhibit *Lb. wasatchensis* growth or prevent gas production. The *Lb. wasatchensis* WDC04 genome was exported from Genbank, then Knowledgebase (KBase) Predictive Biology's metabolic modeling was used to map the genes present for various metabolic pathways. Flux balance analysis showed *Lb. wasatchensis* contained a complete pentose phosphate pathway, while pathways for glycolysis, TCA, and galactose metabolism were incomplete. To confirm these predictions and to look for alternative carbon metabolic pathways, five strains of *Lb. wasatchensis* (CGL02, DH3, LD13, SH05, WDC04) were grown in MRS broth supplemented with 7% oxyrase and 0.5% of either ribose, lactose, galactose, or N-acetylglucosamine (NAG). Growth was significant on ribose but negligible for lactose, galactose, and NAG, which confirmed the metabolic modeling data. KBase also indicated additional carbohydrates that might be used with the most promising being gluconate. It predicted that gluconate is converted to ribose-5-P using phosphogluconate dehydrogenase by a decarboxylating step, producing the CO₂ gas that causes splits in cheese. Further investigation of the metabolic modeling pathways, and metabolic confirmation, may provide a solution to late gas production by *Lb. wasatchensis* in aging cheese.

Title: Quantification and Analysis of Fecal Coliforms and the Seasonal Effects on their Relative Concentrations in Taylor Canyon Stream in Ogden, Utah

Author: Matthew Mendoza

Affiliation: Weber State University

Abstract: Fecal coliforms are facultative, anaerobic, gram-negative bacteria found ubiquitously within the digestive tract of warm blooded mammals and the wastes they secrete. In mountain streams, coliforms are an indicator of potential contamination and the presence of other pathogens. The purpose of this research is to quantify the concentrations of fecal coliforms in Taylor Canyon Stream, in Ogden, Utah and investigate possible correlations between coliform counts and precipitation events and seasonal changes. My hypothesis is that there will be a decrease in coliform population numbers as winter approaches and a snowpack starts to form. Conversely, I predict that there will be an associated increase in coliform concentrations as spring runoff increases, and if any form of a moderate precipitation event occurs. Concentrations of fecal coliforms will be measured once per week, by sampling the surface water of Taylor Canyon Stream in three 50mL centrifuge tubes. Samples will be collected at three different locations. The water samples will be used to inoculate tryptic soy agar (TSA) plates, and fecal coliform and aerobic plate count petri-films for quantification. DNA will also be extracted from the water samples once per month for 16S rRNA gene microbiome sequencing. The microbiome data will give us genus-level resolution of the changes that are occurring during seasonal and weather events. Preliminary results indicate a relatively high total microbial count of between 2,280-3,090 CFUs/mL measured on TSA. Aerobic plate counts on petri-film ranged from 170 to 230 CFUs/mL, while fecal coliform plate counts ranged from 0-30 CFUs/mL.

Title: Quantification of *Staphylococcus* Biofilm Clearance

Authors: Alma Kaneshiro, McKay Griffin, Jonathan Spencer, Daniel N. Clark

Affiliation: Weber State University

Abstract: Antibiotic resistance is a problem of great concern in the medical community, with bacterial resistance to antibiotics increasing proportional to their use; antibiotic use has never been higher. *Staphylococcus aureus* bacteria such as methicillin resistant *S. aureus* (MRSA) can cause fatal infections and are known for antibiotic resistance. The problems due to this resistance are compounded when the infecting bacteria form a biofilm. Biofilms are thick sticky layers of bacteria and their secretions, and they are difficult for antibiotics to penetrate. Biofilm formation is common in hospital settings, such as on stents, catheters, and IV lines. Biofilms also make antibiotic treatment risky due to incomplete “killing” the most resistant bacteria survive exposure. Interestingly, there is some evidence that bacteriophage (the viruses that infect bacteria) are able to break up biofilms, which may make them more susceptible to antibiotics. We chemically induced a *S. aureus* biofilm formation using chemicals that mimic a skin wound (4% glyoxyl, 4% formaldehyde, and 3% hydrogen peroxide). Using bacteriophage K (which specifically infects *S. aureus*), we inoculated the biofilm and observed clearance of the biofilm. Samples of cell pellets and liquid supernatant were collected by centrifugation, and DNA was extracted. Real-time PCR was used to quantify the levels of bacteriophage K replication in the biofilm, representing clearance of the bacteria, causing the biofilm to break apart. This research can be used to find more efficient ways to treat an infection caused by a *S. aureus* biofilm. Bacteriophage used in combination with antibiotics may be able to better clear a biofilm infection compared to antibiotics alone, and may reduce the risk of antibiotic resistance due to more complete clearance of the infection

Title: Surface Sampling Methods
Authors: William Lorowitz, Michael Tene,
Affiliation: Weber State University

Abstract: Students in Microbiological Procedures are required to perform independent projects designed to test a hypothesis, and many have chosen to compare surface contamination using RODAC plates. To expand their experiences, a lab exercise was designed to allow students to compare results using RODAC plates, swabs, and 3M Post-it Durable Filing Tabs (tape). The main hypothesis being tested was that students would gain experience with different surface testing methods and be able to compare them in terms of ease of use, accuracy, precision, and appropriate application. Pre- and post-tests were used to evaluate students' knowledge of these enumeration methods. Dilutions of *Staphylococcus aureus* were spread onto 3.2 cm² areas on aluminum foil. Plastic and glass surfaces were tested, but aluminum foil worked well. Comparisons revealed that RODAC plates had highest recoveries, typically less than 20%. While easiest to use, aseptic preparation of the plates could be challenging. Using the tape was awkward, but students felt it would become easier with practice. Swabs required a consistency in handling to reduce variance in colony counts. Overall, this exercise was deemed a success based on the pre- and post-test scores, lab reports, and use of swabs or tape for sampling in independent projects.

Title: Testing a New Disinfection Tool
Authors: Michael Tene, William Lorowitz
Affiliation: Weber State University

Abstract: Campus custodians purchased a new disinfection device, a Protexus Electrostatic Spraying System. We were asked to test the manufacturer's claims. The manufacturer claims that the chlorine solution (active ingredient sodium dichloro-s-triazinetriol) disinfects surfaces, and an electrostatic charge provides an "attractive force 15 times greater than gravity" allowing for "360 degree application" of the mist produced by the unit. The device itself is a gun-like apparatus that produces a mist of the solution that spreads over a surface, and applies the "electrostatic charge" to the mist. The hypotheses examined were in regard to the effectiveness of the chlorine disinfectant, as well as whether the electrostatic effect allows disinfection of inverted surfaces.

We tested the device against *Staphylococcus aureus* and *Bacillus cereus* by applying 1.5 seconds of activation of the mist to approximately 6 x 10² cells in a 3.2cm square, and then sampled using RODAC plates. Against *S. aureus*, the manufacturer's recommended 528 ppm was 100% lethal but did not have a significant effect on endospore-forming *B. cereus*, there was no difference between treatments using the electrostatic effect and those not using the electrostatic effect. In addition, despite manufacturer's claims, there was no decrease to the cells on the underside of a surface treated by the mist. This has lead us to believe that while the chlorine solution itself is very effective, the electrostatic aspect does not appear to have any effect, bringing into question the cost effectiveness of the mister as opposed to spray bottles. Additional investigations will compare the effectiveness of this chlorine disinfectant with other disinfectants available to the custodial staff.

Title: Using *Aspergillus oryzae* to enhance umami flavor in beef
Authors: Immanuel Rodriguez, Samantha Brailsford
Affiliation: Weber State University

Abstract: Koji is the Asian term for *Aspergillus oryzae*, which is used in many different Asian fermentations such as sake, miso, and soy sauce. *A. oryzae* is a fungus that is able to hydrolyze carbohydrates and proteins. In addition, it adds umami elements into the flavor profile of the fermented product. The hypothesis was that inoculating beef with *A. oryzae* and allowing it to grow would enhance the flavors and textures of the meat, tenderizing and adding elements of umami to the flavor profile of the beef. A literature review revealed methods of seasoning beef with powdered Koji. When we tested this it was agreed that the Koji improved the flavor of steak. The next question was to determine if allowing *A. oryzae* to grow on steaks would improve the beef further. To do this we had to find methods to safely remove the indigenous microorganisms on the steak to prevent illness. After several trials it was determined an 8% salt or ½ strength soy sauce and vinegar (0.3% acetic acid) brine gave us the desired results. Steaks were marinated in the refrigerator for 24 hours. After rinsing they were coated with powdered Koji and incubated in the refrigerator and 30 degrees C for 2 days. The steaks were rinsed and cooked. Results indicated that all of the steaks inoculated with *A. oryzae* were more tender and had a stronger umami flavor. The steaks brined in soy were preferred over the 8% salt brine. Further experiments may include the fermentations of different meats using *A. oryzae* as well as fermenting at different temperatures and times.

EDUCATION POSTER

Title: The \$6M Special Education Teacher: Better, Faster, Stronger?

Author: David R. Byrd

Affiliation: Weber State University

Abstract: Students with special needs represent a significantly large part of the education population; therefore, all types of teachers will have these students in their classrooms during their careers. When students with disabilities receive services in the general education classroom this is often referred to as inclusion, or serving students with various levels of abilities or disabilities in the general education classroom with in-class support, suggesting a major focus on collaboration. Although a universal definition of collaboration has been difficult, collaboration in education suggests a shift from a teacher-centered mode of instruction to one that involves new kinds of relationships, including (among others) teacher-teacher and teacher-specialist interactions, team models and school-family relationships, as well as interactions among learners. Research indicates that collaborative efforts within the school context is beneficial, especially for teaching and learning quality. Collaboration helps create moral support, as teachers respond to problems together. In these collaborative efforts, each set of educators bring different ideas and strengths to the table.

This exploratory study looks at surveys and interviews conducted with mainstream and special education teachers and school administrators to describe what it takes to become an excellent special education teacher in the inclusive situation. Using constant comparative methodology, the researcher examined fifty surveys and interviews of teachers across the US. The guiding principle was to determine what kinds of descriptors the participants used to express their views. The results indicate that specific traits over educational experiences were most frequently mentioned to describe the excellent special education teacher. The findings are applicable to both pre- and in-service teaching situations."

HUMANITIES, PHILOSOPHY, AND FOREIGN LANGUAGE POSTER

Title: Interpreters and Interpretation: The Syncretic Crossroads Between Cultures

Authors: Rachel Montalvo, Brianna Kroll, and Kyle Takke

Affiliation: Utah Valley University

Abstract: Interpreters and their ability to cross cultural divides are always at the forefront of every cultural collision. Their valuable interpretation skills and accompanying multiculturalism often cost the interpreters their ability to fit into any existing group as they themselves have become a new syncretic entity. Interpreters such as La Malinche, Felipillo, Squanto, Sacagawea, Jean Herbert, and David Akira Itami, have all been at the forefront of turning points in history, though in some cases their stories have been told by an unsympathetic winner, or their contributions almost entirely forgotten.

In today's global economy the ever increasing demand for valuable interpretation services has grown exponentially, helping to bridge language barriers and provide vital cultural understanding. In our presentation we will examine the contributions of these pivotal interpreters, how their stories have evolved during and after their lifetimes, and how interpreters continue to pave the way for a new syncretic world.

PHYSICAL SCIENCE POSTERS

Title: Analysis of Fluoride by FIA in Dental Products

Authors: Kacey Green, Peter Iles, Sarah Moore, Kacey Green, Creed Anderson, Jacob Hughes, Chase Sorensen, Patricia Beslagic, Luther Giddings, and Ron Valcarce

Affiliation: Salt Lake Community College

Abstract: According to the Salt Lake Valley Health Department¹ the optimal level of fluoride is 0.7 to 1.2 ppm in drinking water. In 2003 the State of Utah started adding fluoride to tap water. At present the state has about 50% of the population receiving fluoride treated water with the aim of reaching the 1 ppm fluoride level. The acidity of many foods and drinks leads to tooth decay and dental products claim to prevent decay via cleaning and fluoride. This study examined the fluoride content Fluoride dental Varnish and tablets containing Fluoride. Products containing fluoro-phosphate require strong alkaline hydrolysis prior to mixing with TISAB 11 and injection into a flow injection Analysis system employing an Ion-Selective Electrode as detector. The values found in dental products are reported and compared to label claims.

Title: Comparative analysis of rose volatiles in essential oils via GC-MS

Authors: Jie Mei Chong, Jessel Meza De La Cruz, Mary Alvarez

Affiliation: Salt Lake Community College

Abstract: Roses cultivated for commercial perfume production include only a few varieties bred for the purpose. However, many rose varieties are cultivated and sold for different purposes, including color, scent, cold hardiness, and disease resistance. Individuals interested in making rose-scented perfumes or other products at home are more likely to have access to and use rose varieties available locally, including floral shops and garden varieties. In this study, rose petals of different locally available varieties were extracted and analyzed via GC-MS for plant volatiles. Volatile compounds were compared against those present in commercial rose essential oils.

Title: Identification of Pharmaceuticals in Utah's Jordan River

Authors: Jacob Hughes, Christopher Peak, Ibtihaj AL-Nidawi, Brendan Schnopp

Affiliation: Salt Lake Community College

Abstract: The Jordan River is a principle source of ground water along Utah's Wasatch front. Treated waste water is discharged by multiple facilities into its source, Utah Lake, and into the river itself at several locations before it empties into the Great Salt Lake. Detailed analysis of selected pharmaceuticals present in the river's water is sparse. The presence of pharmaceutical products in the river may result from human and animal excretion directly into the watershed, into sewage and septic systems that feed into the river, or by the disposal of excess pharmaceuticals into these systems.

This study intends to conduct analyses of Jordan River water at various locations between Utah Lake and the Great Salt Lake. LC-MS will be used to analyze and identify selected pharmaceutical products present in the river water using EPA method 1694, modified to suit available instrumentation and resources. Identification of common pharmaceuticals in the water may lead to better methods for their removal and improve public awareness of the potential problems these compounds present as pollutants.

Title: 9-BBN Catalyzed Hydroboration of Enynes

Authors: Marcus Mifflin, Nathan Werner

Affiliation: Southern Utah University

Abstract: The importance of organoboron ester derivatives in modern organic synthesis is largely due to their versatility in forming C-C bonds in the Suzuki-Miyaura cross-coupling reaction. The goal of this research was to synthesize a pinacolborane-substituted diene by the 9-BBN catalyzed hydroboration of (E)-but-1-en-3-yn-1-ylbenzene with pinacolborane. This hydroboration reaction is of particular interest because of the two potentially reactive sites (i.e. an alkene and alkyne). Therefore, the opportunity to develop a novel and selective method for the preparation of this class of compounds exists. In addition, the product is of high synthetic utility in the reactions of dienes (Diels-Alder cycloaddition) and boronic esters (Suzuki-Miyaura cross-coupling).

Title: Caffeine Derived Ligands in the Sonogashira Cross-Coupling Reaction

Authors: Garrett L. Ruesch, Nathan S. Werner

Affiliation: Southern Utah University

Abstract: Organic ligands are essential in the selective metal-catalyzed synthesis of compounds for medicinal and materials chemistry. The Lewis basic ligand binds to and affects the reactivity of the metal. Indeed, the unique structure of each new ligand can change the efficacy and selectivity of the overall catalyst. The objective of this research was the preparation of caffeine derived ligands and the study of their effect on the Sonogashira cross-coupling reaction. Our goals for this project were to develop catalysts with increased specificity, efficacy and stability. Catalysts were produced in situ by the combination of copper and/or palladium, the caffeine derivative, and a base. The effect of the caffeine derived ligands on the Sonogashira reaction was determined by gas chromatographic analysis of crude reaction aliquots and isolation of major reaction products.

Title: Demonstration in Classroom, Effect on Learning

Authors: Hussein Samha, Jessie Byers, and Said Bahi

Affiliation: Southern Utah University

Abstract: Demonstrations have become widely used and respected instructional tool in chemistry and other sciences because they provide real examples of everyday life and help students visualize and apply concepts. This presentation discusses the results of a study that evaluates the effectiveness of laboratory demonstrations versus self-directed student experiments in an introductory chemistry course. Final examination scores across twelve semesters for each method of teaching were compared statistically. Scores on the demonstration portion of the exam were found to be significantly higher on average than the scores on the experiment portion of the exam. This suggests that demonstration could be a more effective method of helping students retain information than self-directed experiment. Additionally, students from selected classes were surveyed about their retention and comprehension rates from the two teaching methods. It was found from the survey that students in general retain information better from demonstration.

Title: Mixed Cell Culture Phantoms for Cancer Differentiation Studies

Authors: Portia Densley, Christopher Berneau, Johnson Alex, David Erickson, Vern Hart

Affiliation: Utah Valley University

Abstract: Over the past few decades, a variety of non-invasive imaging modalities have been investigated for detecting cancerous cells in tissue. These approaches involve differentiating cancer on a cellular basis, long before tumors form and are detected in a CT or MR image. Conventional techniques have relied on simulated data from MIE scattering or other analytical approaches. More recent attempts have focused on machine learning, statistical analysis, and complex super-computing simulations. Many of these methods, particularly those involving machine learning, rely on the collection of data from both healthy and cancerous cells. However, human tissue samples can be difficult to procure at small undergraduate institutions without any connection to a medical school or research hospital. As such, our group has been investigating the production of aggregate cell phantoms, composed of mixtures containing multiple cell types at varying concentrations. These samples serve to mimic differences found at the cellular level in malignant and benign tissues as the nuclei morphology, mitochondrial distribution, and cell shape vary from one cell to the next. We will discuss the growth protocols and unique mixing methodologies used to produce aggregate monolayers, in some cases combining cells reliant on entirely different growth media, in samples suitable for imaging studies.

Title: Quantification and Comparison of Protein Concentration in Honeys from Various Origins

Authors: Tyler Thornton, Craig D. Thulin, Austin D. Sherwin,

Affiliation: Utah Valley University

Abstract: Honey is an important substance that has been the focus of agricultural, nutritional, and pharmacological research. Its overall composition has been studied and is mostly understood, however there remains research to be done on its proteome. The proteins found in honey may not only be insightful into the process of its manufacture by bees, but may also provide agricultural information of surrounding flora and fauna of the beehive.

In order to better analyze and identify the proteins found in each honey, the protein concentration of each sample must first be determined. We compared the protein concentration of different honey types including generic commercial honey, Tupelo, Carniolan, and Italian honey bees, and artisanal honeys from New Zealand, Africa, and North America.

Through Bradford protein assay methodologies, protein concentration in honeys differing in geographic origin and harvesting processes were experimentally quantified. These standards characterize the protein content, which should be found within each honey. Additional quantitative analysis techniques need to be performed to increase the reliability and reproducibility of these results.

Quantitative analysis of protein samples has the potential to establish honey protein concentration standards which will allow for more extensive quality control measures to identify honey adulterations including dilutions and substitutions.

Title: Construction and Development of Dielectric Mie Resonance-Based Metamaterials

Authors: Spencer Nicholls, Shane Howard, Dr. Brandon Burnett

Affiliation: Weber State University

Abstract: With the increase in demand of solar and other thermal radiative energy conversion technologies, the need for optimization of thermophotovoltaic (TPV) cells is crucial. The current maximum efficiency from TPV technology is typically 1-10%. A significant portion of the losses in TPV cells is due to the spectral mismatch of the TPV material bandgap and the radiation source energy. It has been theorized that a group of materials called Mie resonance-based metamaterials can help with TPV technology by upconverting low energy light into the bandgap energy range. Currently, actual examples of these types of materials is scarce. We present the construction and optimization of a group of Mie resonance-based metamaterials for the use in TPV cells. Successful fabrication of a metamaterial capable upconverting low energy light at the bandgap of TPV materials can significantly increase the performance of TPV devices.

Title: Quantitative NMR Determination of Fluorine in Toothpastes

Authors: Thomas Ericson, Edward Walker, Barry Lloyd

Affiliation: Weber State University

Abstract: "Toothpastes containing fluoride to help prevent cavities are regulated as "Over-the-Counter" drug products. In the USA, sodium fluoride (NaF) is the fluoride source most often added to supply fluoride. In Europe and other countries, sodium monofluorophosphate (MFP) is active ingredient in toothpastes. Fluoride is most often measured by diluting the toothpaste in deionized water and then tested with a fluoride specific ion electrode (SIE). This works well for ionic fluoride as in NaF, however fluorine in MFP is covalently bound and does not form fluoride ions, thus rendering the SIE useless unless the MFP is first subjected to extensive acid hydrolysis. NMR is particularly useful in analysis pharmaceutical products containing fluorine. We have applied NMR to quantitatively determine the fluorine content in toothpastes for both NaF and MRF active ingredients simultaneously, since fluorine absorbance frequencies shift depending on its molecular environment. Furthermore, whole toothpaste is analyzed directly, avoiding sample preparation such as dilution or hydrolysis."

SOCIAL SCIENCE POSTERS

Title: Impact of Massage Chair Use on Perceived Stress and Pain Levels and Physiological Heart and Blood Pressure Rates in Adults

Authors: Michael Olpin, Shirley Dawson, Ryan Davis

Affiliation: Weber State University

Abstract: "The purpose of this study was to explore the effects that massage chairs have on the stress levels, pain levels, heart, and blood pressure rate of visitors at a university stress relief center in the mountain western United States. From February 2015 to April 2017, data was gathered from over 5,000 visitors using massage chairs at a university stress relief center. The results were analyzed using quantitative causal comparative post hoc methods. Significant lowering of blood pressure, heart rates, perceived pain, and perceived stress levels occurred after using massage chairs for all visitors regardless of age, gender, or university role. "

Title: Look Up! Researching the Effects of Technoference on Parent-Child Relationships

Authors: Amanda Schill, Amanda King-Robinson, Daniel Ruesch, Dr. C. Ryan Dunn (Faculty Adviser)

Affiliation: Weber State University

Abstract: "Technology has become a significant part of most people's daily lives. Pew Research Center (2018), reports that 95% of Americans own some sort of cell phone, and of those, 77% owned a smartphone. Due to the increasing impact technology has on relationships, Stockdale, Coyne, and Padilla-Walker (2018) have coined the term "technoference" to describe the interference, intrusions, and disruptions to a relationship caused by the use of media and technology.

Previous research explores parental distraction from technology, negative impacts of technology use, and positive impacts of technology use. Parent/child relationships have been found to be related to young adult's life satisfaction (Levin & Currie, 2010). Baram (2015) found that media use leads to fragmented and chaotic care due to the disruptions devices caused. When these interruptions add up over time, it can lead to long-lasting consequences and increase the likelihood of risky behaviors and depression in adolescence and young adults.

The current study was framed in Bronfenbrenner's (1979) ecological theory of human development and aims to investigate how parent's screen time during adolescence affects the parent-child relationship as well as life satisfaction for young adults (ages 18-25). To assess these relationships, Weber State University students from the Weber-Davis area of northern Utah were recruited using email, social media, and advertisement posters on campus to take part in an online survey tapping their experiences with parent technology use, life satisfaction, and other socio-demographic factors.

The hypothesis of the research is that there will be a reported relationship between technoference and the quality of the parent-child relationship. The secondary hypothesis is that there will be a negative correlation between the amount of time parents spend using technology during adolescent years and the quality of the parent-child relationship reported by young adults, ages 18-25."

ORAL ABSTRACTS

ART ORAL

Title: Rethinking the Ecology of Islamic Geometric Ornament

Author: Barry Wood

Affiliation: Dixie State University

Abstract: "Geometric ornament in Islamic art is often interpreted in a framework of alleged mystical symbolism. This paper is part of an ongoing project to rethink Islamic ornament and how we relate to it as this-worldly human beings. Building on recent thinking in psychology and neuroscience, I argue that the aesthetic appeal of geometric pattern comes from the sense of cognitive efficacy it affords. Recognizing a pattern means grasping that certain shapes will repeat at certain intervals. A geometric pattern thus provides a field of perceptual input in which the successful prediction of how the world is going to behave (at least in this context) is simple, almost effortless, and the feeling of having succeeded in its fundamental task is uniquely rewarding to human consciousness. The contrast with the difficulty of discerning pattern in the world of things and people, in turn, suggests an explanation for the appeal of geometric ornament to commentators attracted to supernaturalist metaphysics. To illustrate my analysis, I will draw on examples of geometric ornament from around the Islamic world, including patterns from architecture, manuscript illumination, and carpets."

Title: The Aftershocks: A Research through Dance on the Emotional Symptoms of Persistent Complex Bereavement Disorder

Author: Francesca DeMartino

Affiliation: Utah Valley University

Abstract: "According to the DSM- 5 (Diagnostic and Statistical Manual of Mental Disorders Fifth Edition), Persistent Complex Bereavement Disorder (PCBD) affects approximately '2.4%-4.8%' of the populous with unimproving, sustained grief. This disorder is classified one year after the loss of a close relationship due death causing intense mixed emotions, a desire to be reunited with the deceased, and other symptoms that cause significant distress. As a choreographer who creates work on psychological topics, I sought to connect the two worlds and investigate the emotional properties of the PCBD.

In this research project, I explored several PCBD criteria through dance by working with the properties of Time, Space, and Energy. The emotional criteria explored are: (1) intense sorrow/ emotional pain, (2) disbelief/ emotional numbness, (3) anger/ bitterness, (4) confusion about one's role in life or a diminished sense of identity, and (5) feeling alone/ detached from other individuals. In this piece, each dancer represented the physical manifestation of one criteria. Thus, I was able to explore each emotion individually and how the emotions interact with each other and as a whole. Each dancer worked with a different tempo correlating to their emotion (i.e. sorrow is slow, confusion is fast, etc.) and I explored how their tempos changed when interacting with another emotion. I played with spatial patterns and stage placement to show the conflict between different emotions, the ability for one emotion to overpower another, and the cooperation between all the distinctly separate emotions. With Energy, each of the different criteria had a unique movement quality reflecting the emotion (i.e. sorrow is sustained, anger is percussive, etc.). It is my intention for this research to translate the clinical emotional criteria of PCBD into a physical experience which will help the audience understand and become aware of this disorder. "

Title: The Florentine Codex and the Mexica Revival

Author: Travis Lee Clark

Affiliation: Utah Valley University

Abstract: In the wake of the Conquest of Mexico the indigenous population suffered brutal repression under the encomienda system. Natives were required to provide forced labor to the conquerors. The old temples and cities were obliterated and native customs, including native art forms were suppressed. When the New Laws were passed in 1542 they not only liberated much of the native population, they also, remarkably, recognized the titles and land rights of native nobility. This created an interest not only in native genealogy, but in native culture as well. Pre-Columbian themes and motifs that had once been banned began to proliferate. However, the previous suppression of native art forms, and subsequently native artists as well, had impoverished the indigenous artistic vocabulary. When regarding this Mexica Revival, considerable questions remain about what constitutes a survival of the pre-conquest past, or what represents a revival, an innovation created from a pastiche of pre-conquest forms mixed with imported Iberian forms. Separating the Old World from the new has been a daunting challenge, but the incredible ten-volume ethnographic study by the Franciscan Friar Bernardino de Sahagún known as the Florentine Codex, gives us a means of examining this problem in detail. With over 3000 unique illustrations by native artists, the text provides an excellent opportunity to explore the question of how much continuity the artists of the late 16th C. maintained from their pre-conquest heritage, and how much they chose or were forced to adapt to the new culture because the old one was lost. By comparing these illustrations to existing Pre-Columbian examples and Iberian sources, we can hope to narrow down the question of whether this represents a survival or a revival of artistic tradition.

Title: Japanese Ideals Found in Michio Ito's Choreography and Technique

Author: Meladi Hodges

Affiliation: Utah Valley University

Abstract: Cultures create different values and ideals that help them make sense of the world. They are implemented throughout various products of society. New Historicism is a postmodern frame of analysis which connects any work to its original time and place of creation thus providing insight into the culture through what they value. Dance is a product of culture, and by studying its essential aspects, it is clear that dance reflects culture. This research will show, through a New Historicism perspective, that Michio Ito's choreographic philosophies for his works Scriabin Prelude #V and Scriabin Preludes #VI are reflective of Japanese cultural ideals. The Japanese culture views the world through their created values and ideals. These are vital in their society, as they are seen in every aspect of their lives. These ideals include Makoto, Yugen, Iki, and In-Yo. They were created to shape the understanding and beliefs of citizens of Japan. A major theme in these ideals is complimentary opposites working together to make a whole. Another theme is a sense of loyalty: never straying from one's true self. Understanding these ideals will create a deeper understanding of dance in Japan. Michio Ito was born in Japan in 1892 and immigrated to the United States to create his own modern choreography. His technique, "Ten Gestures", was the basis of his creations such as Scriabin Preludes. These works showcase many Japanese cultural values that Ito was influenced by. This research was drawn from reviewed source materials—written and recorded—videos of Repertory Dance Theater (RDT) performing Ito's work, an interview with Sarah Donohue—former RDT member, and a critical analysis of Scriabin Preludes #V and #VI employing Laban Movement Analysis (LMA). LMA is a neutral system of analyzing movement, developed by Rudolf Laban, through the elements of body, effort, shape, and space.

Title: "Triangle of the Squinches" Through A feminist Perspective

Author: Mattea Rogers

Affiliation: Utah Valley University

Abstract: "The social world of ballet depends on a uniformity of body shape and size which is predicated on physical architecture as the balletic body emphasizes preciseness in line, placement and visual design. This corporeal perfection is usually defined as bodily practices and the slender ideal. (Pickard 7) Because feminist criticism seeks to examine the oppression of women (Tyson 83) and oppression is defined as a type of injustice by the inequitable use of authority, law, or physical force to prevent others from being free or equal (Napikoski 1); the feminist perspective is the frame of analysis that will be used to describe the stereotype of female ballet dancers. By looking through the feminist perspective at the stereotype of female dancers, specifically in the 'Triangle of the Squinches' by Alonzo King LINES ballet, a clear understanding of how female dancers are stereotyped in the 21st century world of ballet will become clear. In this paper the feminist perspective will be discussed as a way to examine the oppression of women (Tyson 83), female ballet stereotypes will be defined and explored as petite, elegant and weightless (Pickard 16), and an analysis of 'Triangle of the Squinches' through a feminist perspective will be informative of the female body in dance. Sources of the research will include a critical analysis of 'Triangle of the Squinches' (a video source), a review of written sources, and an embodied experience of the dance. Because all forms of dance reflect the cultural traditions from which they developed (Kealiinohomoku 33), a discussion and analysis of 'Triangle of the Squinches' will reveal the cultural beliefs and traditions in which it was performed. As the feminist perspective, ballet stereotypes, and 'Triangle of the Squinches' are explored, the representation of 21st century women in the world of ballet will be revealed

Title: Wigman's Hexentanz

Author: Vicky Clark

Affiliation: Utah Valley University

Abstract: "The late nineteenth and early twentieth centuries marked a dramatic period of change throughout the World, especially in Germany. (Fensham. 2011., Karina. 2004., Newhall. 2009.) Political events surrounding World War I, artistic movements that focused on fracturing the past in an effort to innovate for the future, and dramatic social changes marked the turbulence of the Post Romantic Era. Amidst the chaos, Mary Wigman emerged as a student of Modern Dance and created her piece Hexentanz. While several researchers (Kirina. 2004., Partsch-Bergsohn. 2003., Reynolds. 2003.) have looked at this work and its relationship to historical and political events, a new evaluation placing deeper consideration on the artistic milieu of the times, as well as Wigman's personal experiences with the artistic environment in which she lived, will reveal new knowledge about the effects of those influences and how they are revealed in the movement vocabulary within the dance. Focusing on Wigman's performance of Witch Dance II, in 1926, and gazing through the lens of New Historicism, such artistic movements as Ausdruckstanz, Expressionism, and Dadaism, will be examined. Deeper connections will be made through review of the activities of specific artists that Wigman acknowledged as influential in her work such as Emile Nolde and teacher/dancer Rudolf von Laban. Additionally, review of existing film footage of the actual performance by Wigman herself, along with a conversation with Sarah Donahue who learned and performed the same version of Hexentanz as a part of the Alumni Concert at the University of Utah in 2007, will provide important insights to the elements of Body, Energy, Shape and Space. Written source materials will allow deeper assimilation of all facets of this artistic event, clearly demonstrating that once again, dance does in fact, reflect the culture in which it is created in (Kealiinohomoku. 2001.)."

Title: Zion's Call: Embodied Belief in Virginia Tanner's Woman, the Pioneer

Authors: Pat Debenham, Kathie Debenham, Chris Ollerton

Affiliation: Utah Valley University

Abstract: "This paper will examine the creation, performance, and re-creation of Virginia Tanner's heroic work Woman, the Pioneer. Following a brief introduction that highlights Tanner's history and addresses her influence regionally and nationally the presentation will address how, historically and culturally, the dance captures the physical and metaphoric experience of the Mormon migration. The presentation will highlight how the work embodies the faith, hope and beliefs of women who crossed a continent with little more than family and the clothes on their backs and explore how, through stylized movement, the dance addresses themes of migration, displacement, loss, gathering and community. Through the lens of Laban Movement Analysis it will show how embodiment of thematic material from the five main sections of the work reveals the arc of struggle and challenge to resolution and peace that the Mormon pioneer women experienced.

BIOLOGY ORAL

Title: Thermal niches of fleas from deer mice in the Great Basin Desert: implications for biodiversity conservation

Author: Robert L. Bossard

Affiliation: Bossard Consulting

Abstract: Seasonality of fleas on North American deer mice (*Peromyscus maniculatus*) varies. During several years, 25 flea species were found on deer mice in the Great Basin Desert, with the dominant flea being *Aetheca wagneri* that occurred throughout the year, and comprised 46% of all fleas collected. I fitted nonlinear curves to estimate realized thermal niches. *A. wagneri* is tolerant of the extreme climate (0°C to 22°C, 33°F to 71°F), typical of western North America. At colder temperatures, *A. thamba* replaces *A. wagneri*. In contrast, secondary fleas on deer mice show narrow thermal niches that appear partitioned to minimize overlap, as has been observed for fleas on other mammals such as flying squirrels. Though deer mice are endotherms, the off-host portion of a flea's life cycle is greatly affected by the abiotic environment. Phylogenetic constraints may limit secondary fleas, but the role of flea competition and dispersal in causing thermal niche displacement requires further research. In general, climate change will alter the flea community of deer mice, and its disease cycles; Centers for Disease Control estimates that bites on humans from fleas and other major arthropod vectors have tripled since 2004. In regard to overall biodiversity, when climate change causes thermal niche displacement (genetic change) and shifts (migration) that minimize thermal niche overlap, outbreaks of species, but endangerment of other species, will occur. "No analog" communities will develop, and many ecosystems may revert to diminished, earlier succession functioning. Thermal niche complicates biodiversity conservation.

Title: Analysis of Four Plant Organellar tRNA genes: More Evidence of Gene Transfer

Author: William D. Speer

Affiliation: Salt Lake Community College

Abstract: Horizontal gene transfer (HGT) has been documented by previous researchers between chlamydial genomes, on one hand, and plant mitochondrial and/or chloroplast genomes, on the other. This study attempts to further evaluate potential HGT between these genomes by phylogenetic analysis of four tRNA sequences (trnD-GUC, trnN-GUU, trnQ-UUG, trnS-GCU) already deposited in GenBank. In addition, corresponding tRNAs from cyanobacterial and γ -proteobacterial representatives were also assessed. For trnN-GUU and trnS-GCU, both previously evaluated and additional new sequences were included in this study. The results obtained here are consistent with the earlier hypothesis of HGT from chlamydia bacterial to certain plant mitochondrial genomes for these two genes. Additionally, new examples of possible HGT are presented here for trnN-GUU which include one chloroplast copy for *Dryopteris blanfordii*, 2) a mitochondrial copy for *Psilotum nudum*, and 3) a putative mitochondrial pseudogene for *Ginkgo biloba*. Although not showing chlamydial associations, the multiple copies of trnS-GCU in the highly complex and diverse mitochondrial genome of the basal angiosperm *Amborella trichopoda* were placed in one of two differing relationship groups for 1) angiosperms and 2) green/red algae. While most copies of mitochondrial trnD-GUC genes for *Amborella* grouped with the mitochondrial copies of diverse taxa, including angiosperms, mosses, and lycophytes, other copies had definite chloroplast relationships, suggesting possible promiscuous gene transferal between the chloroplast and the mitochondrion. Similar observations for the various *Amborella* trnQ-UUG copies were also made with respect to mitochondrial and chloroplast relationships. Altogether, these results indicate that relationships for some plant organellar genes may not necessarily follow endosymbiotic expectations.

Title: Distribution and microbial use of molybdenum in soils west of Milford, Utah

Authors: Matt Harmon, Huh JungYun, Dr. Elizabeth Pierce, Dr. Kim Weaver

Affiliation: Southern Utah University

Abstract: Our study looks at molybdenum concentrations in soil, and how molybdenum is being used by soil microbes and plants. Molybdenum is an essential component of nitrogenase, a nitrogen-fixing protein found in soil bacteria, as well as in other proteins important for sulfur and nitrogen cycles and for chemical reactions of small metabolites.

In environments rich in organic matter, molybdenum is bound and retained by compounds made by plants, bacteria, and fungi. Our study site, just northwest of Milford, Utah, is in the area of outflow from a tungsten mine. Initial surveys found variable molybdenum concentrations over an area of about six square miles, with at least one small spot of much higher concentration rising and falling over about 0.2 miles. The ecology of our study site is much different than areas previously tested in that the main plants are widely-spaced sagebrush and occasional clumps of grasses. In some areas, the soil surface is covered with black cryptobiotic crust. In our previous work, we surveyed metal concentrations relative to sage bushes. Our current proposal includes comparisons of cryptobiotic crust with the underlying soil and amplicon sequencing to identify organisms in the cryptobiotic crust.

Title: Identifying Factors Contributing to Spatial Patterns of Mule Deer-Vehicle Collisions

Authors: Michael Christiansen, Darby Adams, Natalie Barlow, Karl Jarvis

Affiliation: Southern Utah University

Abstract: Habitat fragmentation caused by Utah road systems contributes to wildlife-vehicle collisions (WVCs) with Rocky Mountain mule deer (*Odocoileus hemionus hemionus*), costing millions each year in damage, death, and injury to humans and animals. Our research focuses on identification of ecological and physical factors driving WVC density with the goal of suggesting road mitigation measures that could be implemented by the state. Our hypotheses were that vegetation, topographic roughness, and status of fences along roadways affect WVC density and distribution.

Our team gathered data on fence status along the highway, as well as vegetation density extending out from the road using GPS. We also calculated summary statistics of topographic roughness and vegetation using remotely sensed elevation and landcover data. We used this data to build models to predict the density of WVC incidents along Highway 56 in southern Utah, as measured by the Utah Department of Transportation. We supplemented this with photographic and video data captured from wildlife cameras around significant WVC hotspots and a GPS dash camera.

We imported our data into the R environment to compile and model our data via multiple regression and model selection, to identify factors that best predict WVC density on Highway 56. We found that of the variables we tested, fencing and topographic roughness were the most important predictors of the presence of WVC hotspots. Our top models also contained vegetation density at 15-20 m, but generally not less than 15 m, and we found that general vegetation cover density was a poor predictor of WVCs. This work will allow us to make recommendations to road planners on the locations of potential mitigation structures, such as appropriately sized culverts or revised fencing, which could significantly reduce risk to drivers and wildlife.

Title: Supporting Lipid Bilayer Removal by Buffer Flow
Authors: Ruth Hunter, Micheal Ornstead, Christopher Monson
Affiliation: Southern Utah University

Abstract: The investigation of proteins in the bilayer is difficult to do, because of the complexity of the bilayer. To access the proteins in the bilayer could be very beneficial to furthering our understanding of the functions of proteins we have never had access to. Each protein has specific functions and there are processes to determine what their functions are when they are in the individual proteins, but it is not known how to separate the proteins of the bilayer into their individual protein structures. To be able to separate the proteins in the lipid bilayers, and determine their functions could eventually lead depositing functional proteins to malfunctioning proteins of similar functions. Our project focuses on using a microfluidic device approach to strip individual vesicles in the lipid bilayer. Since the beginning of our project, we have been successful in using the microfluidic device in separating vesicles using lipid bilayers. There is still some work to be done as we are working on confirming that we are stripping the bilayer, through reformation of the bilayer. There have been some successful runs of reformation, we are now working on obtaining a larger range of data.

Title: The Effects of Housing and Feed on Nutritional Content of Eggs
Authors: Zack Hansen, Dr. Lindsey Roper, Dr. Elizabeth Pierce
Affiliation: Southern Utah University

Abstract: Across the United States, the terms "locally grown" and "sustainable farming" have grown in popularity over the last ten years. This has led to an increase in the popularity of farmers markets, home gardens, and small backyard chicken coops for fresh eggs. While there is consensus that the nutritional content of vegetables increases when grown in small scale farms and reduced time between harvest and consumption there is less known about how small scale production of eggs effects nutritional content. Research has been performed for large scale operations, and it has been shown that numerous nutritional benefits can be gained when hens have access to pasture.

The purpose of this experiment is to determine the nutritional differences among chicken eggs from hens eating varied diets, including differences between hens with and without access to pasture in small home farming environments. The experiment is specifically designed to mimic methods for raising small-scale, backyard chicken flocks. The nutritional content of these eggs will be compared to store brand mass produced eggs as well as store bought organic eggs. Although not a central focus of the experiment, additional data will be gathered for efficiency of production, cost of feed, and amount of food waste avoided (by implementing appropriate food scraps as a part of some diets). Comparisons will be made among two different flocks with different diets as well as store bought eggs, and USDA data. We believe that our small-scale operation will show what could be considered nutritional benefits (in terms of their eggs) for hens with access to pasture and/or food scraps as compared to those without access; providing comprehensive evidence that backyard chicken-raising operations provide more nutritious eggs.

Title: Effect of Initial *Lactobacillus wasatchensis* WDC04 Inoculum Levels and Ribose

Authors: Ireland Green, Craig Oberg, Donald McMahon

Affiliation: Utah State University and Weber State University

Abstract: : *Lactobacillus wasatchensis* WDC04 is an obligatory heterofermentative non-starter lactic acid bacteria that causes late gas defect in Cheddar cheese by cleaving a carbon off galactose (resulting in CO₂) when its preferential carbohydrate source, ribose, has run out. Initially, WDC04 growth was examined at a pH of 6.5, 5.2 (cheese pH), and 5.2 with 3% NaCl. Growth curves were determined using MRS-carbohydrate restricted (MRS-CR) broth with 1% ribose adjusted to each pH. Growth was slowest for WDC04 at pH 5.2 + 3% NaCl, then pH 5.2, followed by pH 6.5. It was subsequently investigated if ribose restriction and increased galactose would result in greater CO₂ production. The following ratios of ribose:galactose were used; 10:90, 20:80, 30:70, 40:60, and 50:50 for a total of 1% carbohydrate in MRS-CR broth (pH 6.5). Each ratio was inoculated with WDC04 from 10¹-10⁷ CFU/ml with each dilution done in triplicate in tubes containing Durham tubes for gas detection. Gas production was observed between 8 and 15 d when incubated at 23°C. Gas production was 66% or higher for 10⁵-10⁷ inoculated 20:80 tubes, 10²-10⁷ inoculated 30:70 tubes, 10¹-10⁷ inoculated 40:60 tubes, and 10³-10⁷ inoculated 50:50 tubes. Gas production was 33% for the 20:80 ratio dilutions of 10³ and 10⁴ and for 50:50 ratio when inoculated at 10² CFU/ml. For some dilutions, two tubes showed gas production and for others, only one tube had gas reflecting the variability seen in commercial cheese ripening. Ribose was required at a threshold level of 0.3% for gas formation at most inoculum levels when galactose was present. At higher inoculum levels (10⁵-10⁷ CFU/ml) only 0.2% ribose was sufficient. As ribose concentration increased, the initial inoculum for gas production decreased, showing a correlation between WDC04 cell growth due to ribose availability and eventual conversion of galactose to gas.

Title: Analyzing Attitudes toward the Use of Essential Oils among UVU Students

Authors: Hunter Brittain, Nathan Fletcher, McKay Echols, Zachary Medved, Dr. Olga Kopp

Affiliation: Utah Valley University

Abstract: Essential oils are immensely popular in the state of Utah. Proponents of essential oils suggest that they can be used to improve an array of emotional and physical ailments. Whether they are an effective, helpful, home remedy or not, the perceptions on the therapeutic efficacy of essential oils vary greatly. However, research on the perceptions of essential oils among college-educated adults in the state of Utah is lacking. Receiving higher education in the sciences may influence skepticism of essential oils as a complementary and alternative medicine. The purpose of this study is to understand how Utah Valley University students' education influences their attitudes towards essential oils as complementary and alternative medicines. The information gathered about the students' views on essential oils will be compared with their respective educational disciplines and gender.

Title: Anti-fungal Synergistic Effect of Amphotericin B and Posacanazole with Thymol and Cinnamaldehyde against *Rhizopus oryzae* Biofilm

Authors: Jedediah Orullian, Tyson Hillock, Levi Neely, Blake Johnson, Ashley Balderrama, Iryna Chelepis

Affiliation: Utah Valley University

Abstract: Mucormycosis is a fungal infection primarily caused by *Rhizopus oryzae* and associated with biofilm growth. Biofilms increase resistance to antimicrobial agents and enhance the growth of the microorganisms. In this study, synergistic treatment of the common antifungal agents amphotericin b (amp b) and posacanazole will be used in conjunction with major phytoconstituents of the thyme and cinnamon - thymol and cinnamaldehyde respectively. This research will investigate the antifungal effects of these treatments against *Rhizopus oryzae* biofilm. An optimal concentration of the antifungal agent and paired phytoconstituent will be determined. Studying fungal behavior in the biofilm can provide more accurate information about the treatment response, since biofilms are similar to the environment found in human bodies. Amp b is the primary treatment of the majority of fungal infections, but it has various toxic side effects, such as hepatotoxicity and nephrotoxicity. Even at low concentrations common side effects of amp b are nausea, muscle or joint pain, and headaches. High concentrations of amp b are needed to treat mucormycosis. *Rhizopus oryzae* biofilms will be grown in 96-well plates. A triplicate of synergism plates will be treated with a gradient of dilutions from amp b and posacanazole and a gradient of dilutions of the phytochemical. The biofilms will be washed and treated with XTT/menadione. The amount of inhibition will be determined by absorbance and Crystal Violet Binding Assay. It is expected that a prepared concentration of amp and phytochemical will result in similar inhibition as amp b alone but with less amp concentration.

Title: *Borrelia burgdorferi* Biofilm: An Investigation into Growth and Control of an Alzheimer's Disease-Associated Bacterium

Authors: Tyson Hillock, Kyle Hendricks, Landon Barlow, Rachel Callister, Micheal Richards, Dr. Olga Kopp

Affiliation: Utah Valley University

Abstract: A strong correlation between the bacterial family Spirochaetaceae and the pathogenicity of Alzheimer's Disease (AD) exists. Spirochetes have an affinity for neural tissue and readily reside on the brain where they grow, not as free-floating planktonic cells, but as biofilms: communities of aggregated cells that provide added resistance to antimicrobial agents. Though microorganisms naturally exist as biofilms, they have primarily been studied in the planktonic state and the clinical importance of biofilms is often underestimated. The body responds to *Borrelia burgdorferi* biofilms on the brain by recruiting Amyloid-Beta (AB) in an attempt to neutralize the bacterium. AB is unable to penetrate the biofilm and begins to accumulate on the brain, ultimately initiating degeneration of the neurocircuitry. This study aims to successfully grow *B. burgdorferi* biofilms and investigate the inhibitory properties of antibiotics in biofilm formation. *B. burgdorferi* will be cultivated over various periods of time, using one of two media: modified BSK-1914 media with 6% rabbit serum, and modified RPMI-1640 media with 6% rabbit serum. The biofilms are exposed by removing the planktonic cells and then are treated with XTT/Menadione assay for cell viability. The most effective time length and media for biofilm growth will be determined. That procedure will then be used to cultivate biofilms that are subject to various antibiotics. Spectrometry of the XTT/Menadione assays will be the primary method used to determine cell viability and the inhibitory effects of antibiotic treatments. Future work into the investigation of combination therapy, a process of using several medications and modalities such as Low Level Light Therapy, Low Frequency Ultrasound, and Extracorporeal Shockwave Therapy will be pursued. The results of this work could provide expanded knowledge of inhibition of *B. burgdorferi* biofilm growth and one day lead to increased understanding of the pathogenicity and treatment of AD.

Title: Effect of Extracorporeal Shockwaves on *Rhizopus oryzae* biofilm

Authors: Tyson Hillock, Karaleen Anderson, Dr. Katjia Sterflinger, Dr. Cyrill Slezak, Dr. Paul Slezak, Dr. Olga Kopp

Affiliation: Utah Valley University

Abstract: Fungal infections have gained clinical importance in the last decade. These serious and sometimes fatal infections are often associated with biofilm formation, which can increase resistance to antifungal agents when compared to free living colonies. This increased resistance makes it vital to test antifungal susceptibility using biofilms and not planktonic cells. Fungi belonging to the class Zygomycetes, namely *Rhizopus*, *Rhizomucor*, *Absidia*, *Mucor* and *Lichtheimia* have been implicated in an opportunistic, and sometimes fatal infection known as Mucormycosis. Although, ubiquitous in the environment, this species can be associated with uncontrolled diabetes, diabetic ketoacidosis, hematological problems, malnutrition, trauma and burns. Amphotericin B (ampB) has been used as the first line of treatment for mucormycosis since the 1950's. However, it can have many adverse side effects including chills, fever, headaches, and muscle pain as well as the fatal syndromes of hepato and nephrotoxicity. These side effects, in conjunction with mortality rates of 97% (untreated) and 39% (treated with ampB) demonstrate the need for alternative treatment options. An intriguing treatment possibility is the shockwaves produced by Extracorporeal Shockwave Therapy (ESWT). A shock wave is described as a high-energy wave characterized by a sudden change in pressure, temperature and density of the traversing medium. Differing from pressure waves, a shockwave is a single event of energy dissipation with no frequency associated with it. ESWT is currently used in lithotripsy and has shown promising results towards soft tissue regeneration. By combination of shockwaves and antifungal agents, the necessary concentration of ampB could potentially decrease. This study aimed to investigate the potential disruption of fungal biofilms by High- and Low-Energy Shockwaves. Although, synergistic effects of ESWT and ampB showed an unexpected increase in biofilm formation rather than the anticipated disruption. Hypotheses towards this phenomenon are under preparation for further investigation.

Title: Actinomyces and Pigment Production**Authors: Bailey Meibos, Alexis Thomas, Michele Culumber****Affiliation: Weber State University**

Abstract: Actinomyces are gram-positive bacteria that grow as rods or filaments and are commonly found in soil. The actinomyces bacteria have a very large genome containing roughly 2,900,000 base pairs; this large genome allows the bacteria to code for a large variety of proteins. Actinomyces are known for their pigment production and their ability to produce antibiotic compounds. Nearly two-thirds of natural antibiotics currently used clinically are derived from actinomyces. Two actinomyces were isolated from soil samples and were grown on Nutrient Agar, One-Tenth Nutrient Agar, and Arginine Glycerol Salt Agar in aerobic conditions. The two isolates produced pigments of various colors and shades (pink, purple, and blue) depending on the medium. Our objective is to identify the isolates as well as determine how the environmental conditions effect the production of pigment. The isolates will be grown in broth and the 16S rRNA from each isolate will be sequenced in order to identify the organisms. The pigments will also be examined to determine if environmental or nutrient conditions influence the production of pigment. Nutrient composition of each media will be studied in order to determine if pigment production is dependent on a single nutrient that differs between the various media. Previous research states that nutrient composition and pH have an effect on pigment production. Previous research also states that pH has a larger effect on pigment compared to nutrients present in the agar; however, all three of the media types used thus far have a neutral pH (pH of roughly 7). Based on the preliminary results, it is reasonable to conclude that pH is not a significant factor of pigment production for the two organisms present. Better understanding of how culture conditions influence pigment production may provide valuable insight about the requirements for these organisms to produce other complex molecules, including antibiotics.

Title: Alkali Bullrush: A Forgotten Food**Author: Stephen L. Clark****Affiliation: Weber State University**

Abstract: When the colonists first landed on our eastern shores it is estimated that Native Americans were using ~300 different species of plants for food. Recent archeological digs in British Columbia show people living along the coast were also using dozens of native species for food. Today, most of our food comes from 12 plants, all of which are non-endemic to North America.

Alkali Bullrush (*Scirpus maritimus*) is a plant that grows in temperate regions on every continent except Antarctica. Historically, indigenous people used it for food. It grows in habitats where other plants usually considered important for human consumption will not grow and has the potential of providing a new source of food for a hungry world. It grows best in wet, heavy, alkaline soils, with standing water in the spring, followed by a drier summer, much like domestic rice. In its natural state, it produces an average of 15 bushels of grain/acre and produces more energy, oil, protein and calories per gram than wheat. One problem with its potential use is that the seed coat is very hard and requires more energy to grind than wheat or rice. This presentation will discuss the plant's ecology, cytogenetics, ethnobotany, use by wildlife, stream stabilization properties, germination requirements and seed production. Flour made from the seeds makes tasty pancakes and muffins.

Title: Characterization of the Hemolytic Metabolites of Probiotic Lactobacilli**Authors: Brady Wahlstrom, Kendrick Garret, Jayson Workman, Kymbelle Anderson, Lindsay Jones****Affiliation: Weber State University**

Abstract: Probiotic lactobacilli (PLBs) are valued for their supposed health promoting aspects. However, we observed that seven PLBs caused beta hemolysis when grown on sheep blood agar (SBA), a characteristic of pathogens. This study's goal was to characterize this hemolysis. Initially, PLBs were inoculated onto SBA, incubated at 25, 30 and 37°C, aerobically and anaerobically. All seven PLBs lysed SBA after 2-4 days of incubation under all conditions. Five PLBs were grown in broth for 2 and 6 days, filter sterilized to obtain cell free culture supernatants (CFCs). These were plated on SBA and incubated for 24 hours. All five CFCs of the PLBs caused yellow-opaque alterations of the SBA, with day 6 CFCs causing larger alterations than day 2 CFCs. The pH of CFCs was adjusted to pH 6 and non-cultured broth to 3.5. These were tested along with the original CFCs (pH 3.4-3.5) on SBA. All pH 3.4-3.5 CFCs caused a yellow-opaque alteration of the SBA, while pH 6 did not. In contrast, non-cultured broth of either pH did not alter the SBA. These data indicate that the yellow alteration of the blood is a metabolite of the lactobacilli and is pH dependent. In order to test the heat labile nature of the CFC metabolites, they were autoclaved and plated on SBA. After 24 hours of incubation at 30°C, the heated CFCs caused a yellow-opaque alteration of SBA indicating these metabolites were heat stable. Further biochemical characterization of the metabolites included attempts to separate the active component(s) by molecular weight filtration, methanol extraction and sensitivity to catalase. Our evidence suggested H₂O₂ was one of the yellowing agents. Interestingly, the active CFC products were never able to cause beta hemolysis similar to that caused by lactobacilli colonies growing on sheep blood agar.

Title: Media Optimization to Differentiate *Lactobacillus* and *Bifidobacterium* species in Fermented Dairy Products**Authors: Nicole Smith, Courtney Burns, Craig Oberg****Affiliation: Weber State University**

Abstract: Lactic acid bacteria (LAB) are used to produce a wide variety of fermented dairy products including cheese and yogurt. Many of these products contain added probiotic cultures, primarily species of *Lactobacillus*, *Bifidobacterium* and *Streptococcus* that can provide health benefits to the consumer. To determine shelf life survivability of probiotic cultures in fermented milk products, it is necessary to differentiate them from the LAB starter cultures used to ferment the product. This research was done to determine the optimal media for differentiating probiotic species based on colony morphology differences and exclusionary growth from the starter LAB. Eight different media were examined for their ability to differentiate between 9 species of *Lactobacillus* and 3 species of *Bifidobacterium*. Results show RCA agar with methylene blue can differentiate between the colony morphology for *Streptococcus thermophilus*, *Lactobacillus fermentum* and *Lactobacillus brevis* strains used in this study. MRS agar with vancomycin, used to enumerate *Lactobacillus casei*, also supported growth of *Lb. fermentum*, *Lb. brevis*, and even *Bifidobacterium animalis* ssp. *lactis*. Skim milk media was performed in three separate trials showing previous results were inclusive. All lactobacilli and bifidobacteria grew on MRS plus sorbitol, normally used to enumerate *Lactobacillus acidophilus*. Skim milk media also failed to differentiate between *Lactobacillus* and *Bifidobacterium* contrary to published results. MRS-NNLP agar, containing cysteine, nalidixic acid, neomycin sulfate, lithium chloride, and paromomycin sulfate has traditionally been used to select for *Bifidobacterium* by excluding the growth of *Lactobacillus* species. However, several *Lactobacillus* species including *Lb. fermentum*, *Lb. brevis*, and *Lb. casei* produced colonies on this media, which limits its value when these LAB species have also been added to the product during manufacture. Results show current plating media are inadequate for differentiating starter LAB from added probiotic cultures to provide an accurate enumeration of the different LAB strains in a fermented milk product.

Title: Non-starter Lactic Acid Bacteria Growth in Cheddar Cheese

Authors: Amanda Varley, Ashley Smith, Michele Culumber, Donald McMahon, Craig Oberg

Affiliation: Weber State University

Abstract: Non-starter lactic acid bacteria (NSLAB) growth in cheese can impact the quality of the finished product. Evidence suggests that as cheese ages, the number of NSLAB increases while the number of starter lactic acid bacteria (SLAB) decreases. Our objective was to correlate the growth of NSLAB in aging cheese with the detection of *Lactobacillus wasatchensis*, a NSLAB known to cause gas defects. Two batches of Cheddar cheese were made in a facility with *Lb. wasatchensis* contamination and aged for between 5-48 weeks. SLAB and NSLAB in the cheese were quantified over a 3-month aging period. At each time point, dilutions of the cheese were plated on MRS agar supplemented with 1% ribose and incubated anaerobically to quantify NSLAB growth. During aging, the SLAB remained at about 10^8 cfu g⁻¹, while NSLAB increased from below detection to 10^8 cfu g⁻¹. DNA was extracted directly from the aging cheese at regular intervals using a modified DNeasy Soil DNA Extraction Kit (Qiagen). DNA yields ranged from 445 ng g⁻¹ to 2.2 µg g⁻¹ cheese. *Lb. wasatchensis* was detected by PCR with species specific primers at 3 and 13 weeks of aging when NSLAB were 10^6 cfu g⁻¹ and 10^7 cfu g⁻¹, respectively. *Lb. wasatchensis* appears to accumulate as cheese made at this facility ages. Variation seen in the DNA yields and in *Lb. wasatchensis* detection may be due to heterogeneity in the cheese and to changing chemical and physical properties that occur during aging. Further work to develop more sensitive detection techniques, including microbiome analysis, will allow us to better understand the growth dynamics of this organism, which will help us develop modifications to the cheese aging process to control the development of NSLAB in Cheddar cheese.

Title: Optimization of Adjunct Lactic Acid Bacteria Cultures for Flavor Production in Dry Salted Gouda Cheese

Authors: Dillan Gardner, Craig Oberg, Matthew Domek, Michelle Culumber, Donald McMahon

Affiliation: Weber State University

Abstract: Diacetyl, formed by the fermentation of citrate by some lactic acid bacteria (LAB), is a butter-flavored compound found in dairy products, such as cheese and yogurt. During Gouda cheese manufacture and aging, citrate is fermented by some LAB to diacetyl, which adds to its characteristic flavor. In this study, we characterized LAB that produce diacetyl as potential adjunct cultures that could be added during Gouda cheese manufacture to produce this flavor. In traditional Gouda production, the curd is soaked in brine then pressed into a block. An alternative method is to dry salt the curd first and then press it into a block, which would require adjunct LAB cultures to be more NaCl tolerant. A number of LAB isolates were characterized for the ability ferment citrate to diacetyl and for salt tolerance. Since the final concentration NaCl of Gouda cheese is 4%, isolates were grown in M17 lactose broth with NaCl concentrations of either 0, 3, 4, or 5%. A colorimetric assay was used to determine diacetyl production at these NaCl concentrations. Six isolates (*Lactococcus lactis* ssp. *lactis* biovar diacetylactis 810, *Lc. lactis* ssp. *lactis* biovar diacetylactis 810, *Lc. lactis* ssp. *lactis* biovar diacetylactis 810LD2, *Lactobacillus* sp., *Leuconostoc mesenteroides* 10.00, and *Leuconostoc citrium* 160) could grow and produce diacetyl above a four percent NaCl concentration with an average diacetyl concentration between 4-6 µg per ml. One culture, SD5, produced the highest level of diacetyl, almost 6 µg over 6 days. All six strains appear to be good candidates as flavor enhancing adjuncts for the manufacture of dry-salted Gouda cheese with SD5 as the best candidate. Gouda cheeses were made using these 6 cultures in the cheese and further analysis is required to determine levels of diacetyl.

BUSINESS ORAL

Title: The State Treasurer Needs an Intermediate Maturity Fund: A Discussion of Investment Options Needed to Compliment the PTIF

Authors: R. Neil Walter (Independent Researcher), Nathan G. Caplin

Affiliation: Snow College

Abstract: The Treasurer's office has focused on the performance of the PTIF while its participants have been depositing long-term cash in the Treasurer's short-term investment vehicle. Sophisticated state entities invest longer-term on their own. It is time for the Treasurer to put together an intermediate maturity fund that would create a higher return investment option for counties, cities, school districts, universities, charter schools, and other entities of the state that do not have the ability to manage a similar long-term investment strategy. The combination of the existing PTIF and a new intermediate maturity fund could materially increase cash dividends to the fund participants without requiring the Treasurer to take on additional credit risk.

Title: Comparative Workplace Orientations and Conditions in the U.S., Western Europe, and Nordic Countries

Authors: Jonathan Westover, Colton Harris, Jace Johnson, Jake Epley, Blaine Dudgeon

Affiliation: Utah Valley University

Abstract: The vast cross-disciplinary literature exploring worker attitudes and workplace conditions has linked worker experiences to many individual, organizational, and social outcomes, yet this research has largely failed to shed light on why cross-national differences in worker satisfaction and engagement and their determinants persist over time. Cross-cultural researchers suggest that these differences are due to cultural differences in each country. However, this approach has largely neglected to show that countries with similar cultural orientations still experience significant differences and related challenges. Thus, the question remains, what are the causes of these differences and what are their long-term impacts of sustainable economic development and labor prosperity? Moreover, much research has been conducted that shows either the general improvement or decline in the quality of work, but few studies have looked at such changes in work quality cross-nationally, over time from the perspective of the workers, and while accounting for country-contextual characteristics. This research utilizes attitudinal data from the International Social Survey Program 2015 Work Orientations module, cultural variables from the GLOBE project, and country contextual geopolitical and economic data to examine and explore the cultural, political, and economic structural factors impacting the labor transformation in the U.S., Western Europe, and Nordic Countries.

Title: Facilitating Workplace Unity through Conflict and Communication

Author: Annalyse Kofoed

Affiliation: Utah Valley University

Abstract: This paper starts with my working thesis: companies should encourage the reduction of prejudice and bias in the workplace by cultivating a people-oriented culture wherein victims can feel safe to confront perpetrators and perpetrators can feel safe to recognize a fault and grow past it—both parties being safe from retaliation or shame. Such a thesis is novel in the academic field because a large part of the existing diversity initiatives and research are conducted in hopes of preventing conflict in the workplace; this thesis, on the other hand, moves to embrace conflict and use it advantageously in overcoming diversity issues and facilitating long-term harmony. However, the thesis is focused on the metaphorical gray space between illegal discrimination (which should be dealt with in the legal context) and healthy, positive interactions. It's the space of teasing and mocking that can be harmful, and this can also include the concept of microaggressions. In regard to the content of this project, a variety of academic resources will be utilized and presented to examine the psychology behind the moment of confrontation on the sides of the victim and perpetrator; this includes what costs and benefits are weighed when deciding to confront and how the nuances of that confrontation challenge the perpetrator's schema of being a decent person. Afterward, I will also discuss existing business practices and cultures that enable an active education as it relates to revealing implicit biases and reducing such bias in the workplace. Limitations to the business practices and cultural recommendations I will provide include the likely possibility of employees who resist such initiatives and cultural changes; however, there are existing theoretical models that help provide insight into overcoming these limitations (which will also be discussed).

Title: Is Social-Cause Marketing an Effective Strategy for Big Brands on Social Media?

Authors: Kendra Jorgensen, Paige Gardiner

Affiliation: Utah Valley University

Abstract: Brand exposure and social media marketing engagement are extremely valuable to brands. Whether customers agree with controversial social-cause marketing, big corporate brands are starting to take a stance on social-cause issues on a regular basis. Brands are finding the opportunity to become humanistic by having opinions and feelings towards current social-causes. Through video advertisement, brands across several industries have entered into social- cause marketing. From Dove with Proctor and Gamble, to Nike, and Always, each brand is trying to influence society in some way by touching on subjects of police brutality, breastfeeding in public, and gender equality. Through the use of video advertising and social media channels, these brands are creating controversial social-cause content, and their customer can't help but engage in the conversation. Youtube and Facebook are the top platforms used to show these social-cause advertisements and invite conversation and engagement from all sides and opinions. These conversations keep the brand relevant and top-of-mind for customers, but is this a good brand marketing strategy? How are these brands affected by their social-cause advertisements? Do brands gain more exposure if they advertise an opinion on a social-cause issue? Gillette, Nike, Pepsi, Yoplait, AirBnb, Procter & Gamble, Stella Artois, and Always are brands that have created controversial video ads and voiced opinions about social-cause issues over the past few years. The researchers captured the Youtube and Facebook views and engagements metrics from the social-cause advertisements and correlated the metrics with the respective financial performance of the brands to determine if marketing on social-causes are viable branding strategies. The researchers provide discussion and recommendations for how brands can effectively use social-causes as a branding marketing strategy.

Title: A Social Impact Evaluation of Project READ

Authors: Andre Oliveira, Ronald Miller

Affiliation: Utah Valley University

Abstract: Project READ is an adult literacy program in Utah that offers tutoring services to help individuals improve their reading and writing skills. It aims to transform students' lives by giving them the opportunity to meet personal goals, function well in society, and transition to higher education and improved employment, thereby becoming more productive citizens. In this paper, we describe how an evaluation of project READ was designed to assess its social impact. We identify the project's main stakeholders, develop a theory of change, assess data and time constraints, and produce descriptive statistics from baseline data. We also carry out a basic statistical analysis of the project's impact using student data that includes demographics and test results. The evaluation of project READ has not been implemented yet, and will likely take several months. We outline each stage of the evaluation and discuss the quantitative and qualitative methods that are appropriate for each stage.

Title: Validating Social Media Strategy Frameworks Using Luxury Car Facebook Campaigns

Author: Paige Gardiner

Affiliation: Utah Valley University

Abstract: Effectively using social media to market a product or service is an evolving challenge for many marketers because of the vast possibilities to connect with customers. Parsons and Lepkowska-White (2018) created a four-dimension framework used by marketing managers when creating and implementing social media marketing strategies. The four-dimensional framework includes messaging/projecting, monitoring, assessing, and responding. The purpose of the study was to use the Parsons and Lepkowska-White framework as a theory to examined and describe seven luxury car brands' Facebook social media marketing campaigns during March of 2018. Using a content analysis approach, the researcher described and analyzed how the luxury car brands used different social media marketing strategies and tactics in accordance to the Parsons and Lepkowska-White framework. The researchers compare the success of the social media marketing campaigns and evaluate the social media posts to the social media marketing theoretical framework for effectiveness. The study contributes to the literature by offering a conceptual and empirical validation of possible social media marketing strategic frameworks.

Title: The Farmer and the Cowman Should be Friends

Authors: Chelsea Dye, Jennifer Harrison, Ron Mano

Affiliation: Westminster College

Abstract: In 1972, the late Dr. Robert R. Sterling gave a speech about “Accounting Power” at Oklahoma State University (Bob is a native Oklahoman). Parts of that speech was later published in the July, 1972 issue of the Oklahoma CPA journal and in the January, 1973 Journal of Accountancy. In that speech, Bob Sterling is quoted as saying, “Managerial accountants and public accountants are adversaries in the same way that opposing lawyers in a trial are adversaries.” Forty-six years of history since that speech has proven the statement to be prophetic.

Although the statement has proven to be true, it is a condition that should never exist in the accounting profession. Dr. Sterling states, “The objective of the public accountant is, or ought to be, to tell it like it is.” Dr. Sterling often talked about “truth in accounting.” We believe that it just as much be the managerial accountants objective to “tell it like it is” as it is the public accountants objective to do that. As is professed in Rodgers and Hammerstein’s “Oklahoma,” the Farmer (the managerial accountant) and the Cowman (the public accountant) should be friends.

The Accounting Profession has coined a phrase “management fraud” that seems to be an attempt to distance ourselves from fraudulent financial reporting. Much has been written about Public Accountants who have gotten into legal trouble for having missed finding fraudulent financial statements. However, this group of authors believe that management is not capable of producing fraudulent financial statements without the participation of an in-house (managerial) accountant. This research study includes an analysis of cases in which managerial or in-house accountants failed to insist that the financial statements “tell it like it is” and became criminals because of that activity.

EDUCATION ORAL

Title: (Don't) Just Tell Me What to Change: A Practical Approach for Implementing Self-Directed Learning into Student-Instructor Conferences

Author: Katie Johnson,

Affiliation: Brigham Young University

Abstract: Student-instructor writing conferences are odd environments, especially considering the switch from teacher-led classrooms to student-led, collaborative, and self-directed classrooms (Bruffee, Trimbur, Ambrose, Pajares and Valiante, Dunlap and Grabinger). Usually, conferences are anything but collaborative and self-directed; teachers often give students advice on specific ways to improve their papers and students passively receive that advice with little input or thought of their own (Black, Arbur, Karliner, Park, Wilder). My pedagogical strategy hopes to reshape and disrupt the hierarchal, teacher-led environment of these conferences through self-directed learning (SDL), a process in which individuals take the initiative . . . in diagnosing their learning needs, formulating learning goals . . . and evaluating learning outcome’s (Knowles 18). With semester-long preparation including metacognition, reflection, and self-efficacy exercises, my first-year writing students foster their SDL through directing their last student-instructor conference: students set goals for the writing conference, they decide in advance what they want to discuss, they guide the conversation and do most of the talking during the conference, and they later reflect on their conference's outcomes. The instructor acts as a recorder of the conversation and as sounding board for the students' ideas. I found that this method allows students to generate their own solutions for problems in their papers, brainstorm ideas, evaluate their own learning needs and strengths and weaknesses, and build self-efficacy for writing in general, not just for their specific assignment. At the The Utah Academy of Sciences, Arts, & Letters Conference, I hope to present my pedagogical approach, materials, and results from a limited case study using this method.

Title: Utah State Capital Resource Allocation: A Proposal for Increasing the Transparency of Capital Expenditures, Including Facilities

Authors: R. Neil Walter, Nathan G. Caplin

Affiliation: Snow College

Abstract: "Capital Expenditures are a unique challenge in state budgets because subdivisions of the state are rarely charged for using the state's debt or equity for facilities, equipment, and other investment needs. In an effort to take advantage of the current resource allocation process, state subdivisions lobby for capital expenditure appropriations. The result is an inefficient distribution of resources for capital expenditures within state budgets where the most connected, best funded lobbying efforts frequently win. This paper proposes changing the capital resource allocation processes by attaching a cost to state appropriated capital expenditures in an effort to increase accountability and efficiency while improving the long term credit strength of the state."

Title: The Role of Practitioner Research in Teacher Professionalism

Authors: Joel Judd, Betty Jepson; Christina Hurley; Erica Fordiani

Affiliation: Southern Utah University

Abstract: "The modern history of practitioner-as-researcher can be traced from Dewey (1929), to the emergence of action research (Lewin, 1951), conceptualizations of the practitioner-researcher (Cochran-Smith and Lytle, 1993), and recent claims that teacher professionalism centers on practices that are informed and improved by and through teacher [practitioner] research (Sachs, 2016, p. 424).

This presentation begins with the development of a new teacher research-focused M.Ed. program and its impact on participant teachers. Evidence shows asking and answering personally relevant questions empowers educators and promotes qualities of teacher-leaders (Vaughn & Burnaford, 2015). Three current candidates will each share their experiences designing and carrying out practitioner research projects. Their stories evidence the professional insights, benefits, and changes that stem from critically reflecting on one's work (Sockett, 1993)."

Title: Taking the plunge a review of faculty in Utah who ran for legislative office in the 2018 election

Author: Peter L. Kraus

Affiliation: University of Utah

Abstract: This will be review of all house and senate races of the Utah legislature where those employed in higher education ran for office. Political affiliation, status of employment (staff or faculty rank) and other variables will be examined. The underlying question to be examined, did individuals who ran for legislative office make a difference in the election?

Title: Exploring the Effects of High Impact Practices on the Traditionally Underserved University Student

Authors: Jonathan Westover, Rasha Qudisat

Affiliation: Utah Valley University

Abstract: Using data on all UVU new enrollees between Fall 2009 and Summer 2013, we have compared the effectiveness of certain program on students who self-describe themselves as either American Indian, Alaskan Native, Native Hawaiian, or Pacific Islander. 659 students in our sample fall under that criteria, with 272 describing themselves as American Indian or Alaskan Native, and 387 describing themselves as Native Hawaiian or Pacific Islander. Their information is not included in this data, but as of 2016 UVU had 290 American Indian/Native Alaskan students and 291 Native Hawaiian/Pacific Islander students. We have compared the GPA and graduation rates of these students against those of students of all other ethnicities. The results of this data show that these students of interest have lower graduation rates (9.6% vs 23.3%; $\chi^2(1) = 68.246, p < .001$) and lower GPAs (mean difference (md) = $-.629, p < .001, 95\% \text{ CI} = [-.715, -.544]$). The number of students in the sample used to calculate average Cumulative GPAs in the table below is slightly lower due to a few missing values.

Title: Intersection of Math, Art, and GeoGebra

Author: Violeta Vasilevska

Affiliation: Utah Valley University

Abstract: "In this presentation, a math-art project that includes explorations with GeoGebra software will be described. The presentation will display how art and technology can be integrated as an in or out of math class project. It connects math (in particular geometry), origami, exploration with GeoGebra software, and art. First, some simple origami folds will be shown and the math behind it will be discussed. These origami moves produce tangents to some curves. This construction will also be demonstrated with GeoGebra software, and then used to construct some interesting art pictures. The project was used at a regional STEM conference for junior-high female students, but part of this project could be adapted to different college classes."

Title: The Impact of Service-Learning on Student Learning, Engagement, Retention, and Completion

Authors: Jonathan Westover, Rasha Qudisat

Abstract: "This study examined involvement in Service-Learning (SL) by students at Utah Valley University (UVU). In particular, the study involved seniors at the undergraduate level. Each student participated by taking the National Survey of Student Engagement (NSSE) and were measured on the ten competencies relating to student engagement. A comparison was made between non-SL seniors and SL seniors and their relating demographics. Another aspect the researcher assessed was graduation rate as well as retention. Results indicated that SL seniors performed better relating to certain NSSE competencies as opposed to their non-SL senior counterparts. This included Reflective and Integrative Learning, Student-Faculty Interaction, and Collaborative Learning. In addition, SL seniors had a higher rate of graduation in comparison to non-SL seniors."

ENGINEERING ORAL

Title: Applications of Aluminum Foam

Authors: Christopher J. Bettencourt, Victoria A. Krull, John R. Webster Jr.

Affiliation: Southern Utah University

Abstract: Despite a relatively young history, metal foams have already had an extensive impact on the industry. With ties to military defense, automobile safety, and jet engine sound dampening, metal foams have been optimized to successfully withstand strenuous circumstances. Applications of metal foams in the industry have led to increased safety, superior mechanical properties, and versatility in recent years. This research paper specifically looks at the sound dampening and energy absorption qualities of Aluminum A356 Foam, through compression and acoustic testing.

Title: Heat Transfer Analysis of Water During Liquid-Solid Phase Change

Authors: Colton Robinson, Cameron Aston

Affiliation: Southern Utah University

Abstract: To better understand heat flow through materials undergoing a phase change, experiments were conducted on water during the freezing process. Water was placed in a cylinder and cooled from the outside surface of the cylinder utilizing a counter flow heat exchanger. The heat exchanger provided cooling at constant temperature from the fluid flow of a constant temperature bath system. The phase change analysis system was designed to promote a phase change (solidification) in the inward radial direction. Since the top surface of the water was exposed to the atmosphere, it began to freeze first. However, the frozen top surface provided enough insulation to slow the freeze front from the top surface to a negligible speed. As such, the experiment was considered to be one dimensional heat transfer in the radial direction. The experiment revealed that the heat was transferred in the radial direction on the water below the top surface. The experiment also showed that a steady temperature of 0°C was achieved before freezing occurred. Along with evaluating the freezing process of water, this experiment verified that the system is operating as intended and that further tests can be performed with eicosane as the phase change material.

Title: Measuring the Thermal Conductivity of Air

Authors: Jake Sip, Andrea Lauren Reeder, Dallin Giles, Ali Siahpush, Ph.D.

Affiliation: Southern Utah University

Abstract: Josef Stefan was a 19th-century scientist who was well known for his work in Heat Transfer. With the use of his apparatus, the diathermometer, he was the first one to experimentally evaluate the thermal conductivity of air. In this research at Southern Utah University, the work of Josef Stefan was advanced through the building and experimentation of diathermometers. By submerging the diathermometers in an ice-water bath and measuring the pressure and temperature over time, the thermal conductivity of air can be determined. Three diathermometers were designed and constructed. Several tests were performed, and the data from diathermometers were analyzed to evaluate the thermal conductivity of air. Finally, the results were compared to the published values of the thermal conductivity of air as a function of temperature. The results had some consistent error when compared to published values. This suggests a systematic error.

Keywords: diathermometer, Josef Stefan, thermal conductivity

Title: Rehabilitation of Bridges under the Umbrella of Recent Management Techniques by Using Performance-Based Design Model

Authors: Mohamed Askar, Jacob Bishop and Aaron Lewis

Affiliation: Southern Utah University

Abstract: : "There are more than 54,000 bridges in the United States that need to be repaired or replaced. Bridges had been subjected to constant, sustainable and sequential progress in the last decade. The need to extend the service life of existing prominent bridges and a better perception of the deterioration mechanisms in concrete, has led to efforts to develop a rational methodology for the maintenance of concrete.

In this paper, the subject of maintenance of concrete bridges has been treated in general manner, so that the document can be employed as a basis for developing specific quantitative parameters, specifications and manuals for different concrete bridges. The paper imparts the rehabilitation of an under-construction regional Bridge as a case study for applying the suggested maintenance system. It presents the outline of the design system for the bridge retrofitting on the basis of the performance-based design to satisfy an adequate required level with respect to all required performance items including structural safety and serviceability. An impersonal evaluation technique that is relevant to Value Engineering is implemented to express the convenience of the repair method.

An appropriate rehabilitation method was selected among various alternatives and the performances of the retrofitted bridge by the selected method are verified with required performances after retrofitting until the end of service life considering time-dependent performance deterioration. The concept is to convert any criteria involved to measurable values on the same scale, whether the decisive factor is structural integrity, ease of construction, sustain of traffic service, environmental hazards and repairs cost. Steps forward in numerical analysis techniques and evolution of precise simulation method is a powerful tool, it releases the doubtful sense of the designer to the requirements of his structures taking into account the required precision of the constitutive modeling and its construed parameters."

Title: A Simple Approach to Evaluate Thermal Conductivity of Solids

Authors: Lloyd Stephens, Austin Becker, Reece Alvarado, Dr. Ali Siahpush

Affiliation: Southern Utah University

Abstract: This paper is the fourth-generation, ongoing experiment at Southern Utah University (SUU) to experimentally and analytically evaluate the thermal conductivity of a specific solid, and compare the result with the published value. The solid used in this experiment was UHMW plastic. Multiple tests were performed on this material to prove that results within 2% of the published value can be achieved through utilizing an insulated short cylinder with a large diameter. This configuration simplified the evaluation, and justified the radial one-dimensional heat transfer analysis. This configuration can also be used to test the thermal conductivity of other circular solids.

Title: Airglow Measurement Trends from the SABER/TIMED Satellite over a Solar Cycle

Authors: Brian Simons, Doran Baker, Gene Ware

Affiliation: Utah State University

Abstract: Airglow Emissions in the terrestrial mesospheric region have been studied using a multi-channel infrared radiometer flown aboard a NASA polar-orbiting artificial satellite. The infrared airglow emissions of interest in the present study have included hydroxyl, molecular oxygen, ozone, and nitric oxide. Particular attention has been given to the dynamic trends over the solar cycle and a half since measurements were first obtained in January 2002. The radiometer scanning is achieved by the satellite orbiting to give three dimensional measurements, horizontally by the circumpolar motion of the satellite, and vertical measurements are obtained using an oscillating mirror to give scans from horizon to near space. Although the airglow of prime interest comes from layers in the mesosphere, sometimes multiple layers are observed. However, in this paper attention was restricted to "normal" single layers in the mid-range of the mesosphere. The processing includes examining peak radiance and altitude, both geographically and in relation to the Sun. Possible trends are examined over the course of one and a half solar cycles. Correlations are drawn between the observed emission species.

Title: An Optimized Lens-Into-the-Body for Passive Beamforming

Authors: Cody O'Brien, Chris Trampel

Affiliation: Weber State University

Abstract: : "Small radiofrequency (RF) telemetry systems are the means of communication for Wireless Body Area Networks (WBANs) incorporating implantable medical devices (IMDs). Most current IMDs communicate with a base station via a transmitter powered by a battery. There are a number of drawbacks to these active communication systems. Implantable antennas are inefficient radiators due their small electrical size. As a result, a significant fraction the energy budget of the device must be dedicated to communication. The battery is quickly depleted and must be recharged. Implantable transmitter performance is further limited by specific absorption rates (SAR) in the body.

Radio Frequency Identification (RFID) is an attractive alternative to the state-of-the-art. This presentation describes progress toward the design and fabrication of a wearable metasurface sensor, the lens-into-the-body, designed to increase the read-range of a medical RFID system. This project has two phases. Phase I consists of the optimization of the lens. A binary optimization scheme and genetic algorithm used to design a lens that focuses energy on the implant is described. For a given geometry, Maxwell's equations are solved numerically using a hybrid-finite element mode-matching algorithm that includes an absorbing boundary condition. An objective function capturing the energy delivered to the implant is extracted from the simulation. Lens prototypes will be fabricated and tested during Phase II. Fabrication of the lenses will be accomplished with a 3D electronics printer. S-parameter measurements to characterize the performance of the lens will be made."

Title: Autonomous Surveillance Drone

Author: Cody Glad

Affiliation: Weber State University

Abstract: Soldiers are vulnerable while moving through the battlefield and need reliable real-time information to navigate safely. The Author is developing an autonomous drone to gather, compile, and convey this information to the soldier in real time. This drone will be custom built from a bare frame and custom parts and be coded from scratch. The drone will be able to pilot itself while following a GPS signal that is sent from a control box. The drone and control box will be outfitted with radio modules that will allow for wireless communication for up to 800 meters. It will be outfitted with an ultrasonic sensor array in order to detect, avoid and navigate around hazardous obstacles. The drone will have a function that allows the user to select a location and have the drone go to that location to collect information. Along with the drone, a control box will be developed. This box will connect to the drone through a radio module and display some basic information and be able to send commands. The interface between the drone control box and the drone will be very minimal. The soldier can specify a following distance and a desired height and send some basic commands such as landing, staying still, following the drone control box and going to a specific location. Outside of these commands, the drone will pilot itself while continually avoiding obstacles. This will enable soldiers to safely collect information about their surroundings in real time.

Title: Open Source Antenna Pattern Measurement System

Authors: Daniel Newton, Christian Hearn

Affiliation: Weber State University

Abstract: The Weber State University (WSU) Department of Engineering is integrating a software-defined radio (SDR) link to a portable, motor-controlled antenna positioning system. The project is supported through the Utah NASA Space Grant Consortium. The wireless testbed will trade limited measurement accuracy for a cost-effective, open-source, reconfigurable platform. The automated antenna measurement system will be an educational resource suitable for introductory antenna characterization. Preliminary measured antenna patterns will be presented. It is anticipated the SDR wireless channel will permit the investigation of communication parameter performance (e.g. multipath, fading, narrow- and wide-band noise interference).

HUMANITIES, PHILOSOPHY, AND FOREIGN LANGUAGE ORAL

Title: The Role and Usage of English Words in French Film

Author: Dina Iakhina

Affiliation: Snow College

Abstract: Foreign words constitute an important part of the vocabulary of the majority of languages. The importation of foreign words and their usage can help us to learn more about the interactions and mutual influence between the societies speaking different languages not only in the Present but also from the historical perspective.

This study examines the examples of the importation of English words into the French language on the example of French cinematography. We also study the reasons for such borrowings and their role and functions.

Title: Arab and Muslim Americans: Two Diverse Minorities

Author: Kholoud Al-Qubbaj

Affiliation: Southern Utah University

Abstract: Two of the most rapidly growing minorities in the United States today are Arab and Muslim Americans. Yet, the continual misunderstanding of perceiving these groups as separate minorities leads to the entanglement of identities. One key identifier is recognizing that Arabs are an ethnicity while Muslims are a religious group.

Muslims make up approximately 1.6 billion (about 1/5th) of the world population and follow the Islamic religion. Conversely, Arabs make up approximately 300 million (nearly the population of the United States) of the world population and stem from the geographic region of the Middle East composed of twenty-two countries with a native language of Arabic. Thus, the confusion seems to occur from the lack of understanding that most Muslims do not stem from an Arab ethnicity, but majority of Arabs identify with the Islamic faith.

In terms of Arab Americans, the identities present within the minority do not necessarily mirror that of the Arab geographic region. In fact, more than 75% of Arab Americans are religiously Christians of various denominations: Catholics, Greek Orthodox, Maronite Christian Church, and Coptic. The earliest Arab immigrants to the United States were in fact, Christian. Early immigrants were often part of the working-class, but in modern times are highly educated professionals and entrepreneurs who are prosperous economically when compared to other racial and ethnic minorities.

Understanding the differences geographically and demographically is essential in identifying the diversity of the population that encompasses these minorities. Yet, unfortunately, negative events centering around Arabs and/or Muslims often leads to a rise of discrimination involving both identities and often extending to other related stereotyped minorities.

Title: Two imperfections in Spanish Orthography: A suggestion for the Asociación de Academias de la Lengua Española
Author: Tom Mathews
Affiliation: Weber State University

Abstract: Spanish enjoys a nearly phonemic alphabet. Historically, the Real Academia, and more recently the Asociación de Academias, have made changes as necessary to reflect changing pronunciation and to make the spelling system ever more logical and consistent. The use of accent marks was nearly (but not quite) perfected in 2010. However, the use of the letters «g» and «j» was officially confounded by the early 19th century and has not been revisited.

In this essay I make two suggestions: (1) use an accent mark on three stressed monosyllabic words—lá, sí, mí—when they refer to musical tones. This would make universal the practice of using a tilde on stressed monosyllables when an unstressed word, otherwise spelled the same, also exists; and (2) regularize the use of the letters «g» and «j» to represent the phoneme /x/. Spanish now uses "g" to represent the historical shift of the phoneme /g/: that is, /g/ --> [x] / __ [+vowel, +anterior]. Spanish uses the letter «j» to represent the late medieval shift of the palatal voiceless fricative to a velar fricative: /ç/ --> /x/. Since few modern Spanish speakers know the etymological distinction between the «g» in coger and the «j» in mujer, I recommend that the orthography be regularized.

Documented examples to illustrate each of these proposals will be shared.

KINESIOLOGY AND HEALTH SCIENCES ORAL

Title: A Prophylactic Treatment in a Rat PTSD Model Examining Plasticity of Brain Regions Altered in this Disorder

Authors: Eliza Neal, Spencer Kimball, Dr. Jeffery Edwards, Roxanne Miller

Affiliation: Brigham Young University

Abstract: Post-traumatic stress disorder (PTSD) is a complex anxiety disorder that affects about 1 out of 4 individuals after a traumatic experience. Victims of PTSD are often found with increased levels of catecholamines (adrenaline) and corticosteroids- hormones that increase plasticity in the memory and emotion regions of the brain. While one approach to treating PTSD is to give receptor antagonists for these hormones after a trauma has occurred, our research examined the use of hormone receptor antagonists- propranolol and mifepristone- prior to the trauma in an attempt to prevent PTSD onset. To study the efficacy of these antagonists, a social defeat (SD) model was introduced. The use of the SD protocol is significant as its inclusion of social interaction mirrors the social aspect of human PTSD. To mimic the formation of memories, we performed field electrophysiology experiments in the brain slices of SD and control rats, measuring long-term potentiation (LTP), the cellular mechanism mediating learning and memory. In PTSD, LTP is usually altered in the emotion and learning centers of the brain including the ventral hippocampus (VH), lateral amygdala (LA), and medial prefrontal cortex (mPFC). Results demonstrated that SD caused a significant increase LTP in the VH, LA, and mPFC. Finally, to determine whether a prophylactic treatment could prevent the physiological changes of PTSD (i.e., increased levels of LTP), we simultaneously administered propranolol and mifepristone at 10 mg/kg doses by intraperitoneal injection one week prior to and throughout SD. The levels of LTP returned to control levels in the VH, LA, and mPFC of SD rats that received drug injections when compared to SD rats with no drug injections and controls. Overall, our data suggest that propranolol and mifepristone together may be a viable prophylactic treatment for preventing PTSD. This could be beneficial to those who are susceptible to experience PTSD.

Title: Managing College Stress: Perceptions and Physiological Effects

Authors: Shirley A Dawson and Michael Olpin

Affiliation: Weber State University

Abstract: Stress has become the number one health problem for many adults (American Institute of Stress, 2016) and college students seem particularly vulnerable to stress and its negative physiological effects. Despite the overwhelming presence of stress, few university options are available to reduce stress or provide methods to cope with stress. The primary objective of this study was to determine the impact a university stress relief center on students' stress and well-being as measured by heart and blood pressure rates and perceptions of stress and pain. From 2008-2016 data from almost 12,000 university students who voluntarily visited university stress relief center were gathered. Differences between gender, stress management course enrollment, and participation length and relationships between perceived stress and pain with blood pressure and heart rate were analyzed using quantitative causal comparative post hoc methods. Significant lowering of perceived stress and pain levels and blood pressure and heart rates occurred after time spent using stress relief center tools and interventions for all students regardless of gender, course enrollment, or participation length.

Title: Title: The impact of exposure to alcoholism on children and adolescents: A review of the literature

Author: Yan Huang PhD

Affiliation: Weber State University

Abstract: Objective: The purpose of this literature review was to provide a summary of the impact that exposure to alcoholism has on the health and developmental well-being of children and adolescents.

Method: A search was conducted to analyze the available literature using keywords: alcoholism, children, adolescents, impact, outcome to help identify important articles that were pertinent to the topic using the following databases: Academic Search Premier, ERIC, CINAHL Complete, PsycINFO, and MEDLINE. Articles published from 2006 to 2017 were included.

Results: A total of 9 articles were selected to compose this literature review. The results revealed that children and adolescents living with alcoholism are at increased risk of experiencing emotional, physical, and sexual abuse; developing emotional and behavioral problems; and facing other negative consequences in their lives. The significant impact can endure even beyond adolescence.

Conclusions: The results suggested that efforts should be made to enhance the parenting awareness and capacity. Parents need guidance on effectively controlling their alcohol consumption and need education to understand the problems associated with protecting the younger generation.

LANGUAGE AND LITERATURE ORAL

Title: Martín Espada and the Political Power of Poetry

Author: Christopher T. Althoff

Affiliation: Brigham Young University

Abstract: As part of the Frankfurt School, Theodore Adorno subscribed to a Marxist criticism of capitalism. While Marx viewed history through an economic lens, Adorno looked at society through a cultural lens hoping that it would explain the complacency of the US working class. Media like literature, film, music, and the finer things normally considered “art” became products to be sold. Adorno called this act of turning art into merchandise the culture industry, and he was not a fan. Art for Adorno created meaning and made people ask questions about their perceptions of the world: it should be thought-provoking. The culture industry created “art” to make money. Adorno knew that the culture industry is created to meet the desires of the audience so they would have a certain level of happiness and be comfortable. Many writers share Adorno’s desire to take art back from the culture industry. One of these resistance writers is Martín Espada, who sees poetry as a form of rebellion. In *The Republic of Poetry*, Espada shows how poetry can be used as a tool of resistance to empower the average man to become more than a cog in the capitalist machine.

Title: 'Reason is but Choosing': Navigating Reason, Choice, and Obedience in Milton's Paradise Lost and 'Areopagitica'

Author: Amber Bird

Affiliation: Brigham Young University

Abstract: In *Paradise Lost*, the relationship between God and man is unfolded as Milton acknowledges his aspirations to “justify the ways of God to men” (1.26). Rather than approaching God’s vindication with prose and argumentation, Milton employs the Biblical narrative “of Man’s first disobedience” in an epic poem (1.1). Milton uses the story of Adam and Eve and the principles he articulated in “*Areopagitica*” to argue that the Edenic narrative could not have been complete without the confrontation with choice. Choice is but reason, and reason comes from God. Evidence from Milton’s “*Areopagitica*” highlights how an encounter with choice was necessary to and mandated by the way God created Adam and Eve, and that reason given from God justifies the actions of Adam and Eve that propelled them into a fortunate fall.

Title: Dueling Heroes: Contrasting Hero Journeys in Shakespeare's *As You Like It*

Author: Patrick Lynch

Affiliation: Dixie State University

Abstract: Referencing the Hero’s Journey archetype detailed by Joseph Campbell in his *A Hero With A Thousand Faces*, I propose to measure the adherence to the Hero's Journey model of the two central characters—Rosalind and Orlando—in William Shakespeare’s *As You Like It*. Through a comparison of the respective heroism of the two characters, one better understands the transformation of each character during the course of the play, together with the rich ways the characters shape the play’s larger social concerns.

Title: Two Irish Poets and a Mummy Walk into a Pub . . .

Author: Rob Carney

Affiliation: Utah Valley University

Abstract: A good poem is always about more than its occasion. Seamus Heaney’s “Punishment,” for instance, jumps from observations about a woman’s mummified remains to an indictment of himself and Irish Catholics during The Troubles. He sees no difference between the Iron Age and his own, and little difference between mob violence and standing by and letting it happen. The past and present get wound together like wrappings around a mummy. The contemporary female Irish poet, Paula Meehan, does something similar in her poem “The Pattern.” Hers, however, is more familial and personal, and it is more wide-ranging. How perfect, then, that she chooses sewing and weaving rather than wrappings as her metaphor, and pieces her episodic stanzas together like a quilt. I will discuss both poems, of course, but also share Meehan’s poem aloud in its entirety because Meehan, like Eavan Boland, was at the forefront of a group of Irish women poets in the 1980s taking charge of writing their own stories rather staying in the cultural shadows. They were not content to be emblems and subjects in Irish poetry authored by men. They wanted to speak as and for themselves. And because Heaney’s poem is provoked by the discovery and showcasing of mummies exhumed from bogs in northern Europe, I will tell you some true things about mummies you wouldn’t believe.

Title: Ethical Responsibilities of Standard English Speakers toward Users of Black English Sub-Dialects.

Author: Edgar Corrales

Affiliation: Weber State University

Abstract: Nonstandard dialects often dictate the feelings that arise in an individual towards the speaker; the standard-speaking population may enforce this type of prejudice by affiliating a given speaker with a stereotyped social group. With our rapidly increasing e-world, the prevalence of dialect discrimination has never been more widespread and yet so subtle. The terms prejudice and discrimination should be distinguished, particularly within the context just described. Prejudice is a particular set of feelings towards an individual or a group of individuals based solely on membership within a particular group and is often associated with ethnocentrism, while discrimination is a prejudicial act towards an individual or group. Like every other form of discrimination, language-based discrimination may take on a variety of forms; these forms may be direct and indirect—and may thus lead to the deprivation of multiple material or non-material possessions, goods, or rights. To prevent the divestment faced by black English sub-dialects marked as politically, socially and culturally inferior, the author of this paper proposes four ethical duties of speakers or users of the politically “superior” dialect: 1) abolish negative connotations; 2) implement ethical use of language; 3) move beyond the proper and non-proper way of speaking English, and 4) acknowledge and encourage written literary works in non-traditional dialects.

Title: How Past Narrates the Present in the Letters of Phillis Wheatley and Harriet Jacobs

Author: Sarah Vause

Affiliation: Weber State University

Abstract: Epistolary writing served as the vehicle through which oppressed women, in particular slave women and later, free black women, were able to protest the injustices of their time. In this paper, I will explore representative letters of Phillis Wheatley, who was among the first black women to call the practice of slavery and the destiny of the black American into question, and Harriet Jacobs, who knew firsthand the terror occupying the space and psyche of the black woman slave. The horrific narrative created by the letters of these two women is underscored by their personal stories. Through them, a new and truer American narrative emerges, a narrative impelling the nation toward greater sensitivity to and extended rights for all Americans.

PHYSICAL SCIENCE ORAL

Title: CCD and GAIA Observations Indicate That the Double Star system WDS 02222+2437 Is Not a binary system.

Authors: Hamza Samha , Jonathan Ginouves, Taime Clark, Savana LeBaron, Jasmine Tapia, Micah Jackson, Cameron Pace

Affiliation: Southern Utah University

Abstract: At Southern Utah University Psychics department the Great Basin Observatory telescope was utilized to observe the Double Star System WDS 0222+2437. AstroImageJ software was used to separate the images of the star as well as, the position angle. The separation measured in arcsecond was compared to past observation, what was found was that over the span of several decades it has decreased. Also, the position angle of both stars has noticeably decreased. With this information as well as, the proper motion and parallax data which was found in the Gaia database; it can be concluded that these stars are not gravity bound and not close enough to be a binary system.

Title: Core-Collapse Supernova Light Curves

Authors: Morgan Taylor, Wesley Even, Ryan Wollaeger

Affiliation: Southern Utah University

Abstract: Core-collapse supernovae are challenging phenomena to simulate realistically from first principles. Light curves from such events provide an abundant source of data, helping to constrain theoretical models. They can be used indirectly to determine the possible kinetic energies, masses, and compositions of the explosion outflows. In this project, we take a suite of core-collapse supernovae models with various explosion energies, and post process to generate light curves. The progenitor masses used are 15, 20, and 25 MS. We use the radiative transfer code SuperNu to construct the light curve data. We then compare our results to observed core-collapse light curves to identify realistic explosion models from the suite.

Title: Fabrication of copper nanoparticles

Author: Zhuoling Chen

Affiliation: Southern Utah University

Abstract: The most common current methods of fabricating copper nanoparticles all involve using (small) copper ions to make (relatively large) copper nanoparticles. Most copper nanoparticles made using these methods are not stable over long periods of time. We found a new way to synthesize copper nanoparticles, starting with a copper foil (a very large piece of copper) and sonicating it in hydrochloric acid. Using UV-Vis and fluorescence analysis as well as atomic force microscopy, we were able to determine that we made copper nanoparticles. Additionally, these nanoparticles are stable over long periods of time. Thus, we have developed a method that goes in the opposite direction of previous methods (bigger to smaller, rather than small to big) and makes nanoparticles that are more stable than those made by other methods. We are currently further exploring the properties and fabrication of these nanoparticles.

Title: Hydrodynamic Simulations of Turbulence in Jet Engines

Authors: Jazmine James, Brandon Wiggins

Affiliation: Southern Utah University

Abstract: Noise production in jet engines can have important effects on avian populations. Noise and turbulence production in such engines, however, is a highly non-linear process, requiring direct simulation of hydrodynamic flows to track self-consistently. In this presentation, we explore the efficacy of using Eulerian hydrodynamic simulations to predict the noise signal from rockets by comparing simulation data to photographs of experiments. We carry out hydrodynamics with an ideal equation of state, using the FLASH hydrodynamics code. We compare our results to the literature and comment on the agreement between simulation and experiment.

Title: Investigating the Light-Absorbing Properties of Dipyrroles common to Bilins

Authors: Clayton R. Staheli, Bridger P. Jeppesen, Jacob C. Dean, PhD

Affiliation: Southern Utah University

Abstract: Pigments in plants give us a wide variety of color. They are very beautiful at times, but also serve a more practical purpose for the plants. The dark green visible in almost all plants and algae serve the purpose of collecting light for photosynthetic processes. These green pigments are made of certain molecules called tetrapyrroles. In this project we aim to dissect a certain tetrapyrrole that forms bilins (commonly found in algae) and observe the light absorbing properties of a smaller “building block” that forms this pyrrole chain called a dipyrrole. We will perform NMR spectroscopy, mass spectrometry, gas chromatography, and IR spectroscopy on said dipyrrole compound, in conjunction with previous found data, to discover the light-absorbing properties in order to help us more fully understand what makes the larger natural pigment so efficient at capturing sunlight.

Title: Quantification of Oxygen Levels in Anoxic Environments Using a Microfluidic Device

Authors: Mariah Clayson, Maverik Shumway, Esther Harkness, Lohra Miller

Affiliation: Southern Utah University

Abstract: Understanding anoxic environments is a relatively unexplored field of study that could have an impact on several aspects of life. For this reason, we seek to learn how oxygen levels affect a wide array of reactions by manufacturing a device that is sensitive enough to quantify low levels of oxygen and durable enough to withstand harsh environments. Recently, we have optimized designs to make a microfluidic device that is small enough to decrease reaction time, without sacrificing the durability of the device. Our designs are modeled after the STOX electrode, but we have chosen to use a PDMS microfluidic rather than glass to increase sturdiness. We also use a unique fabrication technique that allows us to create three dimensional channels rather than being constricted to two dimensions, as are most microfluidic devices. We are currently calibrating our device and preparing it for further field testing

Title: A Deep Learning Approach to Early Cancer Detection using Near-Infrared Laser Scattering Profiles

Authors: R. Ryan Rainey, Mason Acree, Christopher Berneau, Portia Densley, Vern Hart

Affiliation: Utah Valley University

Abstract: In the early stages of most cancers, before lesions are visible on a CT or MRI, changes begin to occur at the cellular level as nuclei elongate and mitochondria cluster unevenly. As these organelles are responsible for much (~40%) of the optical scattering which occurs in a cell, changes in cell morphology and structure can largely affect the resulting optical signature. Variations in the physical properties of different cancer types leads to a distinct scattering profile unique to each disease. In this study, optical scattering patterns were investigated from five different cancer cell lines, which were irradiated in vitro with a NIR-1 (854 nm) diode laser. The resulting patterns were collected with a CMOS beam profiler and used to train a convolution neural network. Differences in these profiles were subtle yet significant enough to allow successful classification by the neural network. After being trained with a set of augmented images from each cancer type, the network was able to distinguish cell lines with an accuracy of up to 98.5%. The accurate classification of these patterns at low concentrations could contribute to the early detection of cancerous cells in otherwise healthy tissue. Current methods will also be discussed such as semantics and instance segmentation.

Title: Gearing up for a VASIMR launch at UVU

Authors: James Loveless, Michael Burt, Joshua Baum, Raymond Perkins, Phil Matheson

Affiliation: Utah Valley University

Abstract: A VASIMR, or Variable Specific Impulse Rocket is a magnetohydrodynamic rocket which has been touted as the best plausible technology for executing large scale missions to Mars and other planetary missions. State of the art VASIMR technology uses a helicon antenna to excite a plasma, which passes longitudinally along a confining magnetic field where it is further energized by Ion Cyclotron Resonant Frequency (IRCF) heating. A final magnet provides the field structure to act as a nozzle in which nearly all the plasma kinetic energy is converted into longitudinal thrust. We are constructing a small version of the device at UVU to serve as a platform for studying plasma physics. We present here the baseline physics of the device and the plasma parameters that may be produced and explored as dictated by the constraints of the device size, magnetic field strength, vacuum equipment and RF sources, etc. The project is in its early stage and we anticipate that it will evolve in time to provide substantial opportunities for undergraduate research. Our system currently consists of a 3 inch diameter vacuum vessel, with turbo pump, a meter-long experimental length with two wound coils and magnetron RF source for plasma excitation and an argon source. Studies are underway to fabricate an IRCF antenna. Undergraduate participation in the project includes instrumentation and magnet design, fabrication and characterization, software interfacing, and plasma modelling.

Title: Influence of thermal radiation of Universe on evolution of primordial black holes (PBH) and on our ability to detect PBH

Author: Alexander Panin

Affiliation: Utah Valley University

Abstract: Some scenarios of Big Bang imply formation of primordial black holes (PBH) at early turbulent state of our Universe. Explosive evaporation of small PBH due to Hawking radiation should be observable today and several ongoing projects are aimed at the detection of such x-ray and gamma-ray bursts. Despite that first gamma-ray burst from space were actually detected in 1967 and currently gamma-ray bursts are detected almost daily, none of them have signatures of dying PBH. Black holes are inherently thermodynamically unstable entities - while radiating and evaporating, their temperature is increasing. PBH in space are not at zero-temperature environment - they are constantly absorbing thermal radiation of the surrounding Universe (which in turn is changing as Universe expands) get colder and grow in mass. Therefore, their evaporation rate decreases, and they lasts longer than theoretically predicted age of isolated PBH. In our talk, we discuss the influence of the thermal radiation of Universe on the evolution of primordial black holes of various mass and the limits this factor places on possibility to detect primordial black holes today.

Title: Magnetic Field Modulation Toward High Energy Particle Accelerator RF Source Replacement

Author: Clayton Williams

Affiliation: Utah Valley University, Jefferson Lab LLC

Abstract: Magnetrons are economic radio frequency (RF) sources for driving charged particles through accelerator tunnels due to high efficiency (~80%) and low cost; however at present klystrons are widely used because they are linear amplifiers and have high gain, with relative lower efficiency (~50%). Replacing klystrons with magnetrons is therefore of great interest. To be suitable for driving superconducting radio frequency (SRF) cavities magnetrons must compensate for frequency pushing when increasing gain and for SRF cavity microphonics. The most novel approach to these problems is in modulation of the magnetic field applied across the magnetron. A control scheme suitable for implementing magnetrons in precision applications requiring control over output frequency, phase, and noise is presented, including the use of trim coil magnets, filament control, and injection locking. The principles of SRF acceleration and magnetron operation are discussed and preliminary results from the Jefferson Lab SRF R&D group in magnetron control are presented. Future work, including possible commercial applications of high energy particle accelerators in waste treatment are also presented.

Title: Examination of the anti-tumor structure-activity relationships of chalcone derivatives

Authors: Don Davies, Tracy Covey, Parker Ferguson, Brian Farnsworth, Brian Allen, Nick Eccles

Affiliation: Weber State University

Abstract: Chalcone has been reported to have anti-tumor activity. A structure-activity relationship study has been conducted to discern which components of the chalcone structure are necessary for the anti-tumor activity. Regions examined included 1) the aromatic ring at the 1-position, 2) the aromatic ring at the 3-position, 3) the alkene in conjugation with an electron withdrawing group, and 4) the presence of various types of electron withdrawing groups. Manipulation of each of these four components has led to the discovery of substrates having greater anti-tumor activity than chalcone, as well as many substrates lacking any anti-tumor activity. From these results, we have been able to conclude that the mechanism of action must involve a Michael reaction.

Title: GC-MS Determination of Flux in the APEH/ACY-1 Pathway

Authors: Carson Cole, Tracy Covey, PhD, David Coffman, Nicolas Drysdale

Affiliation: Weber State University

Abstract: Proteases play an important role in the recycling of large macromolecules down to the fundamental molecular units. Acyl Peptide Enzyme Hydrolase (APH/APEH) and Acylase (ACY) work together in recycling amino acids from N-acetylated peptides. There are biochemical approaches to studying each enzyme activity separately, however herein we describe a GC-MS method that allows kinetic observation of both enzymes in different cell lysates. From this, we can determine individual enzyme rates and the flux through both enzymes. We have determined that three different cell lysates have different APEH activity, different ACY activity, and differing overall flux. This is potentially useful as it gives a better understanding of how these enzymes work in a cellular context, can be employed in different disease states, and suggests that there may be an unknown regulation through the enzymes.

SOCIAL SCIENCE ORAL

Title: "'Black, Brown, and White': Oppositional Performance in American Blues and R&B Music"

Author: Theresa Martinez

Affiliation: University of Utah

Abstract: To say that American blues music was born from the horrors of slavery and the legacy of Jim Crow oppression of African Americans would not be putting too fine a point on the matter. Blues was a direct descendant of the field hollers of African slaves and of the experiences of African Americans as they navigated a Post-Reconstruction South. Rhythm and blues was, by contrast, a peppier urban music derived from southern blues that followed the migration of Blacks from the South to the North in the early 20th century. R&B while less of a gritty, country sound, offered no less of a reflection on Jim Crow than its predecessor, although it tended to be more straightforward in its depiction of race, class, and gender realities. This paper is an exploration of these quintessential American musical genres through a conceptual framework that builds on the dramaturgical approach in sociology as well as oppositional culture and resistance theories performance as resistance or oppositional performance. Through a thematic analysis of the lyrics of selected American blues and R&B artists, we will reveal a wealth of oppositional performance.

Title: Non-Ideal Theory and Genetic Research for Indigenous Populations

Author: Rachel Robison-Greene

Affiliation: Utah State University

Abstract: "In 2002, the Navajo Nation placed a moratorium on genetic research within its territorial jurisdiction. Among the motivations were concerns about the misuse of data and the potential for privacy violations. Many members of the Navajo Nation were opposed to the moratorium, primarily because of the medical benefits of genetic testing. Recently, the Navajo Nation announced that they are considering lifting the moratorium.

Concerns about data misuse are not misguided. The Havasupai Tribe encountered just such a situation recently. In 1989, the Tribe entered into a research arrangement with Arizona State University. The Havasupai experience higher than average rates of Type II Diabetes. The research agreement involved an investigation into a possible genetic link to the disease. The search for such a link was unsuccessful. The genetic material was then used for purposes that were never agreed to by the research participants. The samples were used to study migration, inbreeding, and schizophrenia. A lawsuit was later settled out of court. Use of genetic material for these purposes is far from innocuous. The mere engagement in these research projects, regardless of the results, has the potential to further stigmatize and exploit Native People. Policy with respect to genetic testing of indigenous populations must navigate a wide range of political and cultural realities. Ideal theory has little to offer. This paper will explore approaches to this challenge with a non-ideal theoretical ethical framework in mind."

Title: To Protect a Scumbag: Or, what is it about Larry Flynt that Provokes Such Cowardice in the Mainstream Media?

Author: Thomas C. Terry, Ph.D.

Affiliation: Utah State University

Abstract: "Politics makes strange bedfellows, but the mainstream media simply refuses to climb under the constitutional covers with Larry Flynt as he repeatedly defends First Amendment principles. Constitutional controversy seems to be as attractive to Larry Flynt as the women he surrounds himself with. In two decades, he has launched multiple First Amendment assaults in the courts, one making it to the Supreme Court and winning and the one rejected by the high court without being considered.

Larry Flynt is an unlikely hero for journalists. And a difficult one to like and defend. Some disassociate themselves from him while identifying with his stances. He is frequently crude, always outspoken, and unrepentantly hedonistic. Yet some believe his portrait should hang next to that of John Peter Zenger, I. F. Stone, Thomas Jefferson, James Madison, and Edward R. Murrow in any shrine to the champions of a free press. This is not because he necessarily does good journalism or is tasteful in what he does. That is certainly open to much debate. No, it is because he has the strength of character and commitment to defend the First Amendment when the "usual suspects" balk. "If the First Amendment will protect a scumbag like me" Larry Flynt observed, "it will protect all of you."

So, why has the mainstream press in recent years failed to support both Flynt and the ideals that have motivated American journalists for well over two centuries? This article will visit several famous free press challenges, such as the Pentagon Papers, *New York Times v. Sullivan*, and Watergate, when the media did rise to the constitutional challenge. It will look at restrictions on news helicopters post-September 11 and constitutional access to the battlefield that in the past would have prompted legal action by the media."

Title: Does Unemployment Affect Presidential Elections? It Depends Where You Look

Authors: Pook Carson, James P. Gander

Affiliation: Salt Lake Community College

Abstract: This paper examines the relationship between unemployment rates and U.S. Presidential election outcomes over the time period 2000-2016. We use a Bayesian methodology to uncover elasticities between unemployment and both the popular vote and Electoral College vote at the state-level. The models are estimated using Hamiltonian Markov Chain Monte Carlo (MCMC) both with and without shrinkage. The key hypothesis that economic conditions as given by unemployment rates can explain electoral voting outcomes is supported, but only for select states. Unemployment in most states has no effect on election outcomes. The popular vote is more responsive to unemployment, although elasticities vary significantly across states and parties. Higher unemployment increases voter turnout, with Blue States voting more democratic and (most) Red States actually voting more republican. However, this retrenchment in Red States has no effect on election outcomes.

Title: The Silent Military Rape Epidemic

Author: Mikelle Wrobel

Affiliation: Salt Lake Community College

Abstract: Nathan Galbreath, Deputy Director of the Sexual Assault Prevention and Response Office, claimed that it was difficult to determine what caused the increase of sexual assaults regarding the Army (8.4%), Air Force (9.2%), Navy (9.3%) and Marine Corps (14.7%). Do the reported sexual assaults statistics accurately reflect the experience of military personnel? In order to determine whether this was the case or not, I conducted field research through anonymous surveys and interviews. I also analyzed existing statistics that have already been reported. With conflicting statistics being found, it was concluded that further research would be needed to determine whether or not there are more assaults and rapes being reported, like the D.O.D. stated, and less assaults and rapes actually taking place.

Title: Survey of First Experience of Sexual Intercourse: Revisited

Authors: Mackenzie Hughes, CoCo James, Spencer Blake

Affiliation: Salt Lake Community College

Abstract: "One's first experience of sexual intercourse is widely recognized as an important milestone. For most, heavy emotions surround coital debut. Hence, the topic is often discussed in a research setting. In a 1988 survey, Dee Stroub asked students from several colleges across the Intermountain West to reflect on their first sexual experiences (Stroub, 1988). He focused primarily on attitudinal differences in respondents based on sex. He found that women were much more likely than men to report negative reflections of their coital debut (e.g. fewer orgasms, stronger feelings of remorse or misgivings).

CoCo James, Richard Cunningham, and Spencer H. Blake later replicated Stroub's survey at Salt Lake Community College (SLCC) and compared their findings (James, Cunningham, & Blake, 2009). While women still reported more negative reflections on their feelings after sexual debut, the gap between men and women's answers shrank. They also found an increase in the use of contraception, the most common method being condoms. These findings may be attributed to a recent normalization of sex positivity for women.

In 2018, researchers distributed a similar survey again to over 500 SLCC students. The responses expressed attitudinal changes in the Intermountain West over time. The survey's language was updated to reflect current research standards. By stepping outside of the gender binary and adding more LGBTQ-inclusive questions, the researchers created a more thorough and inclusive study. The survey also displayed differences in sexual attitudes based on the religiosity of respondents. Collectively, the survey showed that attitudes in the Intermountain West are changing, and becoming more normative in relation to national data."

Title Understanding Us

Authors: Jennifer Salazar, Blerona Asllani, Matt Roberts, Max Weaver, Dan Poole

Affiliation: Salt Lake Community College

Abstract: Salt Lake Community College student researchers collaborated with Understanding Us, a local non profit organization, to collect demographic information among people experiencing homelessness in downtown Salt Lake City. This organization currently provides several programs including a Tai Chi program at the downtown library and Road Home homeless shelter. Student researchers have collected preliminary demographic survey data to help the organization better understand the population they are serving in order to best meet the needs of participants. This information will help to measure program efficacy, educate the broader community about homelessness, and help to provide data that can be used to further Understanding Us programming.

Title: Reviewing the Beck Depression Inventory on its Psychometric Properties

Authors: Bryan J. Dalley, Jordon K. Ciriako, Kylie Zimmerman, Russell T. Warne, and Kayla Stubbs

Affiliation: Utah Valley University

Abstract: The Beck Depression Inventory (BDI) is one of the most popular instruments in clinical practice and research. Practitioners often use the BDI to screen for depression and to assess the severity of depressive symptoms. Researchers often use the BDI to study depression in various populations, such as college students, adolescents, and substance abusers. In this test review, we explored the literature on the BDI's score reliability and the validity of its uses. Strengths of the BDI include high internal consistency and test-retest reliability, strong content validity, easy and cheap administration methods, and considerable convergent validity evidence. Weaknesses include high face validity (which allows clients to "fake" scores) and unrepresentative norm samples. There are gaps in the literature in regards to criterion-related and divergent validity evidence and test bias among people aged 60 to 80. Until researchers further investigate these areas, we cannot make a full judgment of the BDI. However, for now, the BDI seems to be an appropriate instrument for the screening and researching of depression.

Title: Mixed methods evaluation of formal mentoring: Journey UP for aging out of foster care
Authors: Barrett Bonella, Keeley Beirwolf, Lisa Coleman, Camille Sterger, Katharina Pulli, Clarissa Anguiano, Keirsten Barton
Affiliation: Weber State University

Abstract: There are 415000 children in foster care in the United States. Many of those children will turn 18 before being adopted, meaning they will "age-out" and essentially be on their own as adults. We wanted to see if formal mentoring programs improved outcomes for those aging out of foster care and the Journey Up Mentorship Program in Salt Lake City offered such a program. Forty-nine youth who had aged out of foster care with the help of mentors were surveyed and found they scored significantly higher in their ability to get jobs and were less at risk for addiction, homelessness, and incarceration compared to data from the National Youth in Transition for Utah. Fifteen additional youth were interviewed in focus groups to explore the results further. Qualitative data showed participants were not less at risk given their stories, and benefited from mentors' consistency, positive role modeling, and lessons on being an adult. This is consistent with other studies on the topic of mentoring, but should be expanded into more specified comparative studies and use larger sample sizes.

Title: Plea Bargaining - Is the World Following in our Footsteps in Over Using Plea Bargains?
Author: Rachel Watson
Affiliation: Weber State University

Abstract: "Plea Bargaining has been around for centuries in the United States. Even looking back to 1930 we can see that almost 90% of cases ended in plea bargains. Although the percentage back then was extremely high, courts and lawyers were still relatively Weary and reluctant regarding plea bargaining. It wasn't until 1970 with the case Brady V. United States that plea bargaining established legal grounding. Today, in the United States, around 94% of all cases are plea bargained.

There are many reasons and justifications for why plea bargaining happens so much. In the United States, while most of the reason and justifications are valid, many would argue plea bargaining is over-used. This presentation aims to explore the value and limitations of plea bargaining in the United States by comparing it to plea bargaining in other countries, specifically Francophone countries such as France and Canada focusing on the province of Québec. Previously, both these other countries have been deterred from using plea bargains because of the power it gives the public prosecutor. Does plea bargaining give public prosecutors too much power?

This question will be addressed by means of cultural comparison. The specific case of Brady V. United States where plea bargaining got legal standing will be examined, as well as how it has changed throughout the years in the United States. We will then consider why France and Canada have been so hesitant to implement plea bargaining into their justice systems. Recently Canada and France have both implemented the American style plea bargaining into their courts, though not yet to the same extent as in the U.S. We will look at examples of recent cases where they have implemented plea bargains, how they turned out, and how it affected their court systems."

Title: The Color of Justice: Predictors of support for Black & Blue Criminal Justice Movements

Author: R.C. Morris

Affiliation: Weber State University

Abstract: "In the contemporary politicized climate of Criminal Justice, the term "identity politics" acts as a catchall describing various divisions both within and without professional Criminal Justice. Despite the popularity, the term "identity politics" gets thrown around with little to no conceptual grounding, fostering confusion and miscommunication. Scholars have been working to establish value orientations as an important source of motivation driving the types of behaviors motivating people to participate in social movements where identity politics and criminal justice policy/procedure intersect. Examples where these intersections are prominent include politically charged movements such as #blacklivesmatter and #bluelivesmatter. Research finds that values oriented toward conformity motivate actors to support more punitive social policy. This study extends these findings to test how value domains of conformity and punitivity contribute to support for Blue or Black lives, net of other important factors contributing to social movement participation such as political identity, race, class, and gender. Results indicate that conformity value identities as well as punitivity positively correlate with support for Blue Lives Matter, while negatively correlating with support for Black Lives Matter. Conversely, results indicate that benevolent value identities positively correlate with support for Black Lives Matter, while negatively correlating with support for Blue Lives Matter. Implications for defining "identity politics" as a value driven component of a person's identity get discussed; as well as how support or non-support of Criminal Justice related movements gets influenced by value laden identity politics."

WEBER STATE UNIVERSITY CAMPUS MAP

https://www.weber.edu/financialservices/Parking_Map.html

Parking Enforcement

Permits are required Monday-Friday from 7:00 a.m. to 4:00 p.m. Meter areas are enforced from 7:00 a.m. to 4:00 p.m. The following areas are enforced 24 hours a day, seven days a week:

Red Curbs
Lawns

Roadways
Fire Lanes

Driveways
Disability Spaces

Sidewalks
Reserved Areas

★ Park in the A2 Parking Lot North of the Tracy Hall Science Center

Building Directory		
NAME	LOCATION	CODE
Browning Center	C4	BC
Campus Services	A3	CS
Division Track	C2	TR
Locker Rooms	D1	DC
Dee Events Center	D1	DC
Elizabeth Hall	B3	BH
Engineering Technology	B3	ET
Facilities Management	A1	FM
Heat Plant	A3	HP
Hurst Center for Lifelong Learning	D5	HC
Information Booth	C5	IN
Kimball Visual Arts Center	C4	KA
Lampson Hall	C3	LP
Lind Lecture	B2	LL
Lindquist Alumni Center	E5	AL
Mansoni Health	C3	MH
Midway Education	B4	ED
Miller Administration	B4	MA
Portable Classrooms	A3, B2	M1-4
Public Safety	A5	PS
Receiving and Distribution Services	A1	RD
Residence Hall I	E4	R1
Residence Hall III	E4	R3
Science Lab	B2	SL
Shepherd Union	C4	SU
Social Science	B4	SS
Stadium House	D2	AA
Stewart Bell Tower	B3	ST
Stewart Library	C3	LI
Stewart Stadium Sky Suites	C2	SK
Stewart Watchtower	E4	R4
Stromberg Stadium Offices	C2	SO
Stromberg Strength Training	C2	WR
Student Services Center	B4	SC
Swenson Building	C3	SW
Technical Education	B3	TE
Tracy Hall Science Center	B3	TY
University Village	E2	U-V
Village Community Center	E2	VC
Wattis Business	B4	WB
Wildcat Center for Health Education and Wellness	C3	WI
Wildcat Village	E4	W-V

Annex Directory		
NAME	LOCATION	CODE
Fatigue Studies Lab	A3	A02
Outdoor Program	D2	A09
Upward Bound	A3	A03
Veteran's Services	D4	A05
ROTC	D1	DC
Veteran's Upward Bound	A4	A11
	A4	A12

Non-campus Buildings		
NAME	LOCATION	CODE
Marquardt Field House	D2	MF
Newman Center	A4	NC
Ogden LDS Institute	A4	OI
Weber State Credit Union	E5	CU

Parking Lots		
A1-A14	Permits as Designated	
A1, A2, A7	Visitor Meters	
DC	Dee Center A, W and RW Permits (Shuttle Available)	
PPL	Public Pay Lot	
R1-R4	Residence Halls/R, RW and A Permits	
S1	Children's School Permit	
S3-S4	Special Use Permits	
W1-10	W, RW and A Permits	
	Motorcycle Parking	
	ADA Access	
	ADA (Automated External Defibrillator)	
	*Noted Inset: AED locations	

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The shuttle operates from 6:30 AM to 8:30 PM. The shuttle runs at 5 minute intervals from 7:45 AM to 1:30 PM and every 15 minutes outside of this time frame.

Questions? 801-626-7220 or 801-626-6294

Updated 3/16

WEBER STATE UNIVERSITY

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Ogden, UT 84408
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WEBER STATE UNIVERSITY CAMPUS BUILDINGS

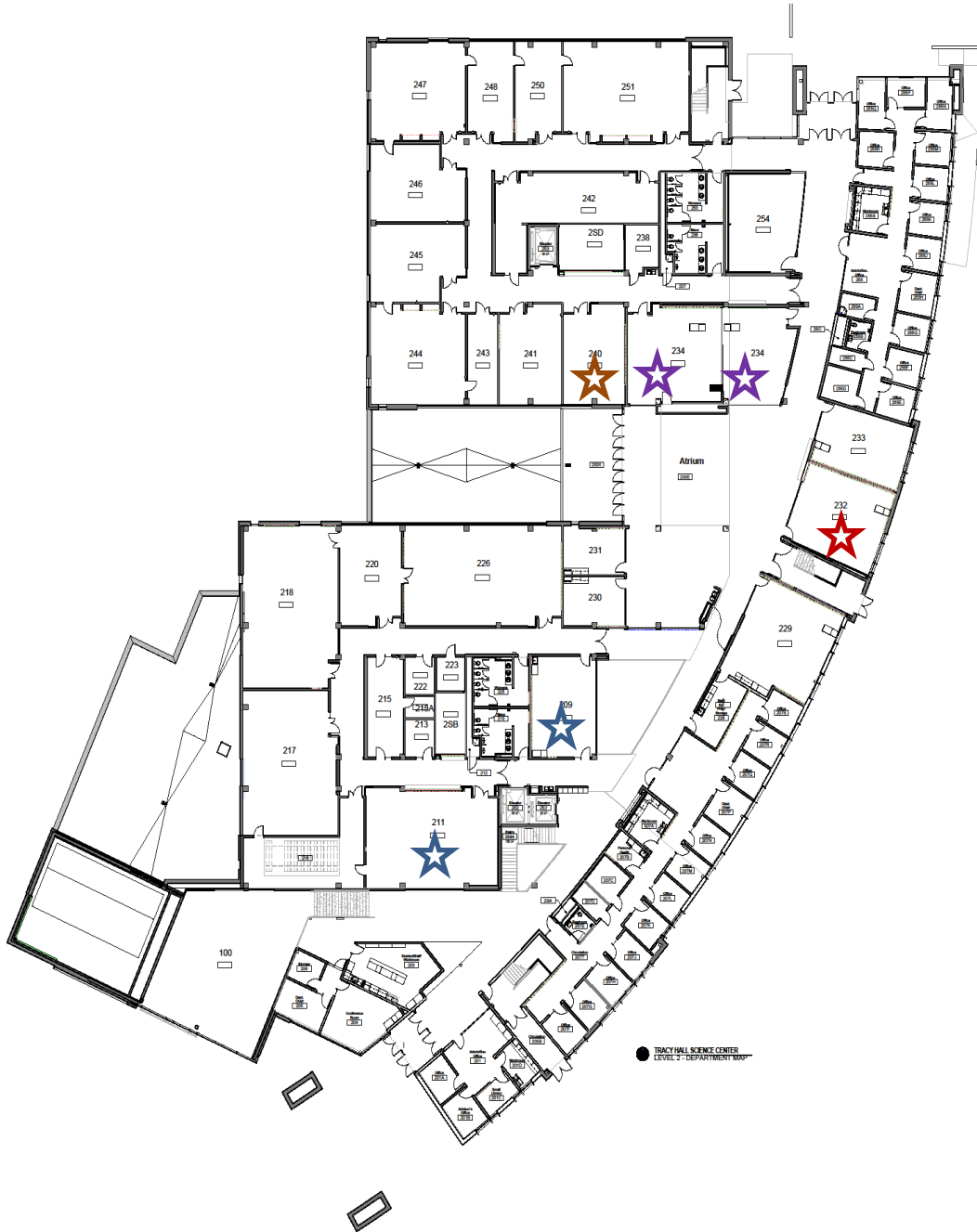


Tracy Hall Science Center (TY) - Registration and Presentations

Shepherd Union (SU) Wildcat Theater - UASAL Conference Opening and Awards

Hurst Center for Lifelong Learning - Dumke (HC) Hall – Lunch

-  Biological TY 209 & TY 211
-  Engineering TY 232
-  Physical Sciences TY 234 A & TY 234
-  Kinesiology and Health Sciences TY 240



● TRACY HALL SCIENCE CENTER
LEVEL 2 DEPARTMENT MAP

★ Education TY 351
★ Social Science TY 340 & TY 354



- ★ Arts - TY 449
- ★ Humanities, Philosophy, Foreign Language - TY 448
- ★ Language Literature - TY 426



TRACY HALL SCIENCE CENTER
LEVEL 4 - DEPARTMENT MAP

