2026 UROC Research Conference

Contents

About UROC

The Undergraduate Research Opportunities Consortium (UROC) is managed by the University of Arizona Graduate College. It was created 31 years ago to unite undergraduate research and graduate school prep programs across the University of Arizona. Thanks to the late Maria Teresa Vélez, PhD and her lifelong commitment to promoting graduate education to students from all backgrounds, UROC has supported thousands of students spanning three decades. It is because of her and the founders of UROC (Donna Treloar, Cindy Neal, Nura Dualeh, Holly Lopez, and Andrew Huerta, PhD) that UROC has been able to reach so many students across disciplines.

UROC's goal is to share resources, create academic community, and uplift the next generation of researchers. Most of the students participating in UROC are conducting research for the first time in intensive 10-week summer programs. They have worked full-time within their fields to produce research posters, oral presentations, and/or research reports.

As we showcase the hard work of the UROC Scholars, we thank everyone who has made this possible. The founders of UROC, program staff, faculty, mentors, sponsors, and of course the students we work with.

Land Acknowledgement

We respectfully acknowledge the University of Arizona is on the unceded land of Indigenous peoples. Today, Arizona is home to 22 federally recognized tribes, with Tucson being home to the O'odham and the Pascua Yaqui. Committed to diversity and inclusion, the University strives to build sustainable relationships with Arizona's Native Nations and tribal communities through education offerings, partnerships, and community service.

Colloquium – Oral Presentations

Thursday, August 6 | 9 am – 3:30 pm

Manuel Pacheco Integrated Learning Center

1500 E. University Blvd., Tucson, AZ 85721

Agenda

Session	Location	Time Frame
Opening and Welcome	ILC 150	9:00 am – 9:10 am
Presentations	Various Rooms	9:20 am – 11:55 am
Lunch	ILC 141/on your own	12:00 pm – 12:40 pm
Presentations	Various Rooms	12:40 pm – 3:15 pm
Closing	ILC 150	3:20 pm – 3:30 pm

Presentations

Room Schedules

ILC 112	
9:20 AM	**Sevilla Smith**, Computer Science *The Effects of AI Disclosure on Player Reception*
9:40 AM	**Ruta Rezene**, Cyber Operations *ARDA: A Multi-Agent Simulation of Adversarial Attacks and Data Poisoning Defense in Machine Learning Phenotyping Pipelines*
10:00 AM	**Ahmed Abakar**, Cyber Operations *Evaluating Supply Chain Security in Autonomous Vehicle Software*
10:40 AM	**Colin Gale**, Physics | Computer Science *Co2MnSi For Potential π-phase S/F/S Josephson Junctions*
11:00 AM	**Frankois Valdez**, Global Studies | Astronomy *STEAM Powered: Improving College-Going Skills and Attitudes in Environmental Justice Communities through Community-Based Youth Science Education Programs*
11:20 AM	**Hakima Abdulkadir**, Political Science *Striving for equity in data report back for rural and urban environmental justice communities*

11:40 AM	**Nicole LeBlanc**, Neuroscience & Cognitive Science *Using Community-based Identified Categories in Addressing and Analyzing the Nexus of Food Security in Environmental Justice Communities*
12:40 PM	**Sarai Juarez**, Public Policy Analysis | Politics *ICE and Local Political Communication: Social Media Responses from Tucson's Mayor and City Council*
1:00 PM	**Nathan Miranda**, Political Science *Empire's Guestroom: Has Puerto Rico's Territorial Status Resulted in Different U.S. Policy Than U.S.-Latin America Policy?*
1:20 PM	**Fabiola Garcia Mata**, Anthropology *Ceramic Analysis from the Tucson Urban Renewal project dated to the Spanish Colonial Period*
1:40 PM	**Gabrielle Zweifel**, Planetary Geoscience *Crater Analysis Among Small Patches of Venus' Tessera Terrain*
2:00 PM	**Mia Molina**, History | Russian *The Illusion of Liberation | Red Army Sexual Violence in 1945*
2:20 PM	**Alina Barajas**, Leadership and Learning Innovation | Mexican American Studies *Learner-Centered Assessment and Development of Critical Thinking*
2:40 PM	**Yumna Elhassa**, Sociology | Public Policy *Beyond Borders: Community Cultural Wealth and the Educational Aspirations of Transnational Students in Mexico*
3:00 PM	**Francisco Cormac Alejandro Burke**, Sociology *The Clerics Who Make Do: How Academic Capitalism Impacts Survivor Support Services & The Butterfly Centers Gender Based Violence Prevention initiatives at Reithwin College*

ILC 120

9:20 AM	**Jeremiah Shankar**, Molecular & Cellular Biology *Investigating Sequential Segmentation: eve Enhancer Exploration with CRISPR/Cas9*
9:40 AM	**Yuridia Amezcua Campos**, Molecular & Cellular Biology *A Genetic Counseling Workforce Assessment: Analyzing Workforce Practices Across Specialties*
10:00 AM	**Rogelio Zepeda Gonzalez**, Natural Resources *Movement Patterns of Kinosternon sonoriense Along a Gradient of Flow*
10:20 AM	**Parami De Silva**, Ecology & Evolutionary Biology | Applied Humanities: Astrobiology emphasis *Building an "Astrobiology Atlas": Mapping Biosignatures in Mars-Analog Environments*

10:40 AM	Natalie Villa, Biological and Natural Resource Science *shRNA-Mediated Knockdown of Nuclear RNA Exonucleases in Neurons*
11:00 AM	Jessica Carvajal, Biology *Detection of cerebral microhemorrhages in humanized APOE3 and APOE4 mice by Prussian Blue*
11:20 AM	Luis Gutierrez, Physiology and Medical Sciences *Impact of Myosin Proximal S2 Region Variants (E924K and E930del) on Cardiac Myosin-Binding Protein-C Interactions in Hypertrophic Cardiomyopathy*
11:40 AM	Quincy Ouzounian, Physiology *Chronic Opioid Exposure Changes Respiratory Outcomes in a Drug Dependent Manner*
12:40 PM	Gavin Connell, Nutrition and Dietetics *Effects of Increasing Pulse Consumption on Cardiovascular Disease Risk: A Randomized Controlled Trial*
1:00 PM	Isabella Guzman, Communication Sciences and Disorders *The Impact of the Sociopolitical Climate on Hispanic/Latiné Master's Speech-Language Pathology Students*
1:20 PM	Alberto Bolanos, Speech, Language, and Hearing Sciences *Whose Perspectives Count? A Critical Interpretive Synthesis of Autism-Service Literature for Latiné Borderlands Families*
1:40 PM	Nelson Semidey, Agribusiness, Economics, and Management *Climate Smart Agricultural Practices and Their Outcomes*
2:00 PM	Jocelyn Tijerina, Agribusiness, Economics, and Management *Climate-Smart Agriculture Adoption among Smallholder Farmers in Ethiopia*
2:20 PM	Donell White, Management Information Systems *From Misidentification to Amplification: Facial Recognition Disparities, Large Language Models, and the Compounding of Racial Bias Against African Americans*
2:40 PM	Jacob Potter, Special Education: Mild to Moderate Disabilities emphasis *Health and Wellness Programs Impact on the Intellectual and Developmental Disability Community*
3:00 PM	Aurora Thompson Lynch, Leadership and Learning Innovation *The Role of Community-Based Support Systems in Reducing the Mental and Physical Health Impacts on Caregivers of Individuals with Intellectual and Developmental Disabilities*

ILC 130	
9:20 AM	**Javier Robinson**, Aerospace Engineering *Study Proposal for Experimental Validation of Affine Formation Control in Flapping-Wing Drones*
9:40 AM	**Jason Anthony Cunningham**, Aerospace Engineering *Balancing Fuel, Accuracy, and Uncertainty in Lunar Landing Guidance:*
10:00 AM	**Reid Granillo**, Mechanical Engineering *Optical Particle Detection Methods for Hypersonic Wind Tunnels*
10:20 AM	**Timothy Akert**, Mechanical Engineering *Autonomous Soaring Gliders*
10:40 AM	**Acacia Han**, Optical Sciences & Engineering *Phase Change Ultrasound Contrast Agents for Brain Imaging and Therapy*
11:00 AM	**Remember Erhart**, Applied Biotechnology *Emerging Fungal Pathogens: A Surveillance Study of Candida Species Distribution at Banner University Medical Center*
11:20 AM	**Samantha Miranda**, Applied Biotechnology *Examining the Phenotype of C. jejuni Strains from Wild Birds*
11:40 AM	**Leslie Ortiz Urrea**, Applied Biotechnology *Development of an FDA-Approved Drug Repurposing Pipeline in Human iPSC-Derived Cardiomyocytes*
12:40 PM	**Devin Strand**, Biomedical Engineering *Design of a Belt-Driven Precision Scanning Stage for In Vivo Confocal Microscopy of Meissner's Corpuscles*
1:00 PM	**Emma Brown**, Biomedical Engineering *Investigating the role of alpha-tropomyosin mutations linked to human cardiomyopathies in modulating calcium dissociation kinetics*
1:20 PM	**David Orta**, Biomedical Engineering *Three-Dimensional Reconstructed Computed Tomography for Regional Density Variation Analysis in the Hamate Bone*
1:40 PM	**Cindy Nguyen**, Biomedical Engineering *Modifiers in S. cerevisiae*
2:00 PM	**Khendall Ervin**, Biomedical Engineering *Engineering Linear Protein Assemblies Toward Stiffness-Guided Design of Red Blood Cell-Inspired Materials*
2:20 PM	**Megan Roberts**, Biomedical Engineering *Design of a Biomimetic Rat Hind Limb for Osseosurface Device Serpentine Testing*
2:40 PM	**Isabella Mixton-Garcia**, Biomedical Engineering *Understanding Clinical Decision-Making and Implementation of ICU Liberation Bundle: A Simulation-Based Cognitive Task Analysis*

3:00 PM	**Katie Nunez**, Pharmaceutical Sciences *Evaluating the Effects of Stabilizers and Nanofabrication Methods on the Physicochemical Properties of Biodegradable Nanoparticles*

ILC 140	
9:20 AM	**Marina Claw**, Psychological Sciences *Measuring age differences in spatial cognition using immersive virtual reality*
9:40 AM	**Sripriya Srinivas**, Psychological Sciences *Effects of Aging and Trauma Symptom Severity on Hippocampus and Amygdala Volumes*
10:00 AM	**Angela Donner**, Psychological Sciences *From Daily Rumination to Weekly Overload: Trait and State Effects on Emotion Regulation in Emerging Adults*
10:20 AM	**Ian Ussery**, Psychology *Training Peer Coaches to Deliver Digital CBT: Preliminary Findings and a Proposed Design for Scalable, High-Fidelity Care*
10:40 AM	**Janeen Louis**, Honors Psychology *Moving Through Distress: Physical Activity and Affect During Digital CBT*
11:00 AM	**María G. Domínguez**, Psychological Sciences *Examining the Neural Correlates Associated with Lower Social Hierarchies: A Comprehensive Review of Neuroimaging Studies*
11:20 AM	**Matthew Bertron**, Psychology *Examining the Relationship of Total Time in Bed Factors on Depressive Symptoms in College Students*
11:40 AM	**Micheal Molina Gutierrez**, Psychology *Examining Emotional Intelligence Training as a Resilience-Building Intervention Across Military Members*
12:40 PM	**Stephanie Dominguez**, Psychological Sciences *Social Support and Hypertensive Disorders of Pregnancy Across Maternal Ages: A Systematic Review*
1:00 PM	**Drizella Sandoval Diaz**, Psychology *Hypertensive Disorders of Pregnancy, Social Support, and Racial-Ethnic Differences: A Systematic Review*
1:20 PM	**Viviana Sanchez**, Psychology *Parent and youth ethnic racial socialization and cultural value concordance in Asian American and Hispanic/Latino/e dyads.*

1:40 PM	**Casandra Chavarria**, Psychology *College Students' Perceptions of Generative AI: Evidence from First and Continuing Generation, Hispanic/Latino/a, and non-Hispanic UA Psychology Students*
2:00 PM	**Jordan Phillips**, Psychology *The Integration of Generative AI in Higher Education: Comparing First-Gen and Continuing Generation Perceptions of ChatGPT*
2:20 PM	**Celeste Salinas**, Psychology *Effects of a Digital Game-Based Learning Workshop on Undergraduate Students' Perceived Instrumentality*
2:40 PM	**Dailyn Breschini Avila**, Psychology *Dispositional Predictors of Defending Behavior in Middle School Students*
3:00 PM	**Tianna Watson**, Psychology *Maternal Caffeine Intake During Pregnancy and ADHD Symptoms in Children*

ILC 150	
9:20 AM	**Leo Jacobson**, Neuroscience & Cognitive Science *The Effect of Medical Stress on Gastrointestinal Symptoms in Hypermobile Ehlers-Danlos Syndrome*
9:40 AM	**Aryan Malik**, Neuroscience *Striatal Dopamine Response Encodes Initiation and Vigor in a Novel Fine Motor Task*
10:00 AM	**Zuwenat Zah'ra Aganju**, Neuroscience & Cognitive Science *The Cognitive U-Net: What can Artificial Intelligence teach us about Neuroscience?*
10:20 AM	**Benite Luhando**, Neuroscience & Cognitive Science *How Experience Influences the Sequencing of Sensory Behaviors During Spatial orientation*
10:40 AM	**Marla Rivas**, Neuroscience & Cognitive Science *Associations between Spatial Navigation and Gait in Young and Older Adults*
11:00 AM	**Yana Surtchev**, Neuroscience & Cognitive Science | Molecular & Cellular Biology *The Differential Effects of Ketamine on Principal Neurons and Interneurons in the Ventral Posteromedial Nucleus (VPM) of the Thalamus*
11:20 AM	**Gabriel Ellington**, Medicine: Integrative and Practice: Focused Medicine emphasis *Gastrocnemius Stretching and Plantar Fasciitis: A Systematic Review*
11:40 AM	**Manuel Castillo**, Biology *High Throughput Screen of FDA Approved Pharmaceuticals for TDP-43 Modifiers in S. cerevisiae*

12:40 PM	Brian Terrazas, Biochemistry *Analyzing PKR independent cell activation pathways in response to saponin adjuvants*
1:00 PM	Joseph Gutierrez Villela, Biochemistry *Understanding how Sequence Variants in the Transmembrane Protein TMEM184B Disrupt Neural Development: A Lipid Hypothesis*
1:20 PM	Maddy Morrow, Biochemistry *Role of CadN Knockdown in Wrapping Glia Morphology in Drosophila melanogaster*
1:40 PM	Andres Ybarra, Physiology *Linking Microstructural Brain Integrity and Sex Differences to Behavioral Decline in a Ferret Model of Normative Aging*
2:00 PM	Rebeca De La Cruz, Biochemistry | Molecular & Cellular Biology *Nuclear EGFR Drives Triple-Negative Breast Cancer Cell Dormancy*
2:20 PM	Angela Quintero, Chemistry *Synthetic optimization of an acid-responsive fluorogenic triazabutadiene probe for environmental sensing.*
2:40 PM	Angel Sarabia Ortiz, Chemistry | Environmental Science *Can The Elaboration of Wastewater Treated Water Change the Public Mind: Reclaimed and Potable Water Focus*

Colloquium ILC Map

Psychology and Modern Language Entrance

Main Library Entrance

Poster Session

Friday, August 7 | 1 – 3 pm

Health Sciences Innovation Building, East Entrance to Forum

1670 E Drachman St, Tucson, AZ 85721

How to Use this Document

It is recommended to use the find and search function to read a specific student's abstract and research information.

The full participant list is alphabetized by last name with the participant's presentation(s) shown in red in the bottom right corner of their cell. Guest program participants were not required to submit abstracts to be part of the poster session portion of the UROC Research Conference.

UROC Research Conference Participant List

Abakar, Ahmed (SRI)
Cyber Operations at University of Arizona
Evaluating Supply Chain Security in Autonomous Vehicle Software
Mentored by: Qingzhao Zhang, PhD (Electrical and Computer Engineering)

This study addresses supply chain security in autonomous vehicle software stacks. Prior research has shown that there are vulnerabilities and attack vectors present in autonomous vehicle software, but there are still undiscovered threats to autonomous vehicle software; for example, tampering in the perception layer, which can wrongfully influence the navigation pipeline. We will research what vulnerabilities are present in autonomous vehicle software stacks, how attackers can exploit them, what the impact of the attack is, and what countermeasures can defend against them. To test this, we will set up an experiment using Autoware and the simulation platform Carla. In the experiments, we will test the differences in outputs of perception data between the original code and the changed code. We will alter the code by inserting a bug door, which will make structured, object-aware perturbations. We will measure the differences in the two code versions by looking at where LiDAR clusters are located. We anticipate the perturbations to alter the location of objects, causing the rest of the software layer to use incorrect data and make wrong decisions. These faulty but real-looking outputs might go unnoticed by developers and could cause the navigation pipeline used for decision-making to make wrong

decisions. This matters because if the navigation pipeline makes wrong decisions, it could cause physical damage to people or property.

Keywords: Cybersecurity, Supply chain security, Autonomous Vehicle Software Stacks, Bug Bombs, Navigation Pipeline

10:00 AM in ILC 112
Poster

Abdulkadir, Hakima (McNair)
Political Science at University of Arizona
Striving for equity in data report back for rural and urban environmental justice communities
Mentored by: Mónica D. Ramírez-Andreotta, PhD, Illiana Samorano, and Arshia Amin (Soil, Water and Environmental Science)

Environmental monitoring and biomonitoring help environmental justice (EJ) communities understand what type of environmental risks they face. Such assessments contribute to their understanding of the health adversities stemming from disproportionate exposure to environmental risks. Report back of research results (RBRR) to EJ communities can increase their environmental health literacy. Researchers/practitioners have observed that EJ communities want their research results reported back; however, RBRR is not universally practiced in environmental health research, and when practiced, there is a lack of equity in its implementation. Via participatory science approaches, the Integrated Environmental Science and Health Risk Laboratory has established partnerships with diverse rural/urban EJ communities in Arizona and Ohio, USA. To inform equitable RBRR and identify preferred RBRR, we used previously collected environmental monitoring/biomonitoring data to co-create report-back strategies centered around three design types: graphs, art, and maps. Rapid prototyping/formative analysis was then extended to diverse community members/interested parties from south-central Arizona rural/active/legacy mining towns during our co-created science and art exhibit titled “Rooted in Resilience" at the Cobre Valley Center for the Arts (Globe, AZ, April 3-25, 2026). Quantitative survey data (N=22) indicated that maps were the most preferred form of data visualization. In addition, over 40% of participants reported feeling empowered across all three design types. Aiding EJ communities in their ability to understand and mitigate the environmental risks they face must go beyond the acquisition of data, as the manner and process in which data is extended is just as important.

11:20 AM in ILC 112
Poster

Aganju, Zuwenat Zah'ra (MHD)
Neuroscience & Cognitive Science at University of Arizona
The Cognitive U-Net: What can Artificial Intelligence teach us about Neuroscience?
Mentored by: Charles Higgins, PhD (Neuroscience)

From a computational perspective, it remains unclear how iterative cognitive refinement works in sensory cortices. This study examines whether a U-Net architecture, common in modern AI image processing, can model this process in the primary visual cortex. A U-Net compresses visual input through an encoder into a bottleneck, then reconstructs full-resolution predictions via a decoder. We hypothesize that the U-Net bottleneck mimics high-level cortical sensory processing by filtering noise and passing forward only essential spatial features. Using generative AI tools to assist development, we have built a predictive U-Net trained on generated visual stimulus sequences to predict upcoming frames. We then removed direct sensory drive, "closed the loop" between output and input, and separately tested modified skip connections to examine how the model maintains internal predictions over time. In our preliminary experiments, open-loop training achieved near-zero training loss, but validation loss plateaued substantially higher, indicating overfitting. Closing the loop caused prediction errors to grow over time, with spatial uncertainty concentrating along target boundaries. Ongoing work seeks to improve next-frame prediction on simple imagery and examine the closed-loop temporal and spatial dynamics of U-Net bottleneck units as compared to neurons in prefrontal cortex or hippocampus.

10:00 AM in ILC 150
Poster

Akert, Timothy (UROC-Prep)
Mechanical Engineering at University of Arizona
Autonomous Soaring Gliders
Mentored by: Sergey Shkarayev, PhD (Aerospace & Mechanical Engineering)

Autonomous soaring gliders capable of extracting energy from atmospheric conditions offer significant value for research and industrial applications that require long-endurance flight with limited onboard power. Prior literature on biological flight strategies, non-uniform wind exploitation algorithms, and simulation-based and real-flight validation demonstrates that endurance can be extended through aerodynamic design and control algorithms that allow gliders to exploit thermals and other wind phenomena. Approaches ranging from model-based and adaptive controllers to reinforcement learning have shown potential, but their environmental adaptability remains difficult to validate because simplified atmospheric models cannot fully represent variable and non-uniform wind fields. This proposed study will evaluate how effectively autonomous soaring algorithms exploit non-uniform winds to increase UAV glider endurance under realistic environmental conditions. Preliminary work completed for the study includes the construction of a Topmodel CZ Enigma glider and the modeling of its wing geometry in XFLR5. The proposed analysis will use aerodynamic estimates, software-in-the-loop simulation logs, real-flight telemetry, sensor measurements, and environmental records. Performance will be evaluated using altitude, airspeed, climb and sink rate, total flight energy, and unpowered flight duration, with simulation results compared against field-flight data. The study is expected to identify

whether and under what conditions autonomous soaring produces consistent improvements in flight endurance.

Keywords: autonomous soaring, UAV gliders, thermals, non-uniform winds, reinforcement learning, adaptive control, atmospheric modeling

10:20 AM in ILC 130
Poster

Amezcua Campos, Yuridia (McNair)
Molecular & Cellular Biology at University of Arizona
A Genetic Counseling Workforce Assessment: Analyzing Workforce Practices Across Specialties
Mentored by: Valerie Schaibley, PhD (Cellular & Molecular Medicine)

Genetic counselors (GCs) are healthcare professionals that assess patient/familial risk for genetic conditions and provide patient support. As the field continues to expand and evolve, it is important to understand the workforce. Although current studies examine workplace practices, analysis by specialty is limited. This study examined differences in workplace practices across clinical genetic counseling specialties in the United States by focusing on patient wait times, billing methods and patient referrals. A national workforce survey was distributed through the American Board of Genetic Counseling (ABGC) by email to certified GCs. Chi-squared tests were conducted on variables that focused on billing, referrals, and wait times. The data's final sample size after removing nonclinical GCs, those defined as non-patient facing or only seeing patients via telehealth, was 128. The primary specialties reported among participants were reproductive health, cancer, and pediatrics. Across clinical GC specialties, we found a significant difference in referrals for patients with complex conditions (p < 0.01), general education (p < 0.0001), and explanation of test results that other providers could not provide (p < 0.005). Wait times were also significantly different across specialties (p < 0.0001). Pediatrics had high wait times while reproductive health had the lowest wait times. These result on patient wait times were consistent with previous research. Differences in referrals suggest that GC roles vary across specialties, reflecting differences in patient needs. These findings contribute to the understanding of differences of workplace practices in different GC specialties. Future research should explore the factors driving these differences.

9:40 AM in ILC 120
Poster

Barajas, Alina (UROC-Prep)
Leadership and Learning Innovation | Mexican American Studies at University of Arizona
Learner-Centered Assessment and Development of Critical Thinking
Mentored by: Anna Ochoa O'Leary, PhD and Rosa Maldonado (Mexican American Studies)

Many studies have studied the role that learner-centered assessment (Muñoz, 2012), reflection (Gaxiola Serrano, 2019), and culturally responsive pedagogy (Caingcoy, 2023) play in supporting student learning as separate pedagogical tools. This self-study specifically explores how using reflection as a learner-centered assessment practice reveals students' development of critical thinking through engagement with their social and cultural contexts in Mexican American Studies (MAS). This matters because there is limited research on how learner-centered assessments specifically and systematically measure complex outcomes such as critical thinking within MAS. Using a qualitative approach, this study utilized a thematic analysis of 47 anonymized student reflections to identify patterns in how students connect personal experiences to academic content. The findings demonstrated that learner-centered reflective assessments make visible complex learning outcomes that are otherwise difficult to capture, such as identity development, critical consciousness, and deeper engagement with course material. This study contributed to the field of Mexican American Studies and Education by offering a framework for using reflection as both a pedagogical and an assessment tool, supporting more meaningful evaluation practices in culturally responsive higher education environments.

Keywords: culturally responsive pedagogy, Mexican American Studies, learner-centered assessments, reflection

2:20 PM in ILC 112
Poster

Barrios, Kaylani (B2)
Plant Sciences at Pima Community College
Impacts of Tree species, Leaf Age, and Drought on Leaf Chemistry and Potential Photosynthesis.
Mentored by: Joost van Haren, PhD, Jason Deleeuw, and Justin Beslity, PhD (Environmental Science)

Tropical forests represent the dominant, but highly variable, terrestrial carbon sink through photosynthesis across species and biomes. The molecule responsible for taking the energy of light for photosynthesis is chlorophyll, but it is a high nitrogen chemical for plants to generate. In part to protect from chlorophyll loss, leaves produce flavonoids and other compounds to protect them from herbivores and other stresses. My study aimed to address the question of what drivers of variability in chlorophyll and flavonoid content in tropical rainforest tree leaves by looking at age, light exposure, pest infestation, drought, and species traits that influence the chemistry of each tree. I used the LI-COR 600 and Dualex 4 to collect leaf-level chemical and physiological measurements from seven tree species. The instruments provided insight into pigment chemistry and chlorophyll activity across species, leaf age, and time. I found significant changes in both chlorophyll and flavonoid chemistry within the tropical rainforest biome and savanna biome between different tree species and with leaf ages observed. This suggests that defense capabilities vary by species and their defensive photosynthetic strategies depending on biome conditions and stress levels. This could explain much of the species-to-species variability in carbon uptake. The research shows a better understanding of how tropical tree species use their energy and resources on leaves that are newer compared to mature leaves can help determine how photosynthetic yields to tropical forests are protected and sustained.

Keywords: Chlorophyll, Flavonoids, Leaf Physiology, LI-COR 600, Dualex 4, Tropical forests, Plant stress responses

Poster

Baugh, Taylor (B2)
Climate & Biology at Harvey Mudd College

Assessing Stem Rehydration Optimization in Theobroma cacao via Ecophysiological Responses to Drought

Mentored by: Joost van Haren, PhD and Justin Beslity, PhD (Environmental Science)

Droughts induced by climate change can diminish the yield and productivity of agricultural commodities; in particular, the chocolate industry faces decreased fruit production due to altered precipitation patterns. When these plants undergo water stress, there is a safety-efficiency tradeoff between shutting off water transport to prevent tissue damage, and stem refilling to maintain sufficient turgor pressure for cambial growth. Species-specific strategies to optimize hydraulic movement given this tradeoff are understudied in low latitude species, despite their importance to equatorial economies and global climate cycles. We set out to determine the extent of nighttime stem rehydration in *Theobroma cacao* by quantifying its hydraulic strategy in response to drought. The Biosphere 2 Tropical Rainforest was subjected to a 15-day drought, during which high resolution meteorological and biological data were recorded for four *T. cacao* trees at different canopy levels. Water stress was tracked via four physiological measures: stem diameter, sap flow, leaf water potential, and stomatal conductance. Leaf-level hydraulic traits were modelled with tree-level metrics of drought stress to assess coupling between the variables, which quantified the degree of nighttime stem rehydration. These data showed a clear stress response to drought, and near-instant recovery after the first rain event. Relationships between response variables indicated variable hydraulic movement across individuals, which were highly correlated to subhourly temperature and VPD. In contrast, there was no consistent difference between canopy level responses. These results inform how *T. cacao* responds to drought events, which improves our understanding of how chocolate is affected by climate change.

Poster

Bertron, Matthew (SRI)
Psychology at University of Arizona

Examining the Relationship of Total Time in Bed Factors on Depressive Symptoms in College Students

Mentored by: Daniel Taylor, PhD, John Richmond Sy, PhD, and Kelly Nayeon Kim (Psychology)

College marks a major transition period for many students and often represents the first time they are responsible for managing their own daily routines and sleep habits. Changes in sleep behaviors, specifically factors that affect total time in bed (TTIB), may contribute to higher rates of depressive symptoms among this population. Thus, the primary objective of this study is to examine the

association of TTIB, TTIB-related sleep parameters, and depression using a large sample of college students. The study was conducted during a two-year period, with participants self-enrolling in an online survey measuring sleep habits using the Split-Week Self-Assessment of Sleep Survey (SASS-Y) and depressive symptoms using the Patient Health Questionnaire (PHQ-8). The results demonstrated that TTIB-related sleep parameters, including sleep onset latency (SOL), wake after sleep onset (WASO), number of awakenings (NWAK), terminal awakening (TWAK), bedtime awake period (BWAK), and total sleep time (TST) were significantly and independently correlated with depressive symptoms. However, total time in bed was not. (ps < .05). Multiple linear regressions identified that SOL (B = .0048, p = < 0.001), BWAK (B = .0019, p = < .001), NWAK (B = 0.077, p = < .001), and TST (B =-0.104, p = < .001) as significant predictors of depressive symptoms in college students. These findings highlight the importance of TTIB-related sleep parameters in depressive symptoms beyond sleep duration, although their combined predictive value warrants further investigation. Disruptions in sleep should be viewed as risk factors for depression among college students.

Keywords: Sleep duration, Total time in bed, Depressive symptoms

11:20 AM in ILC 140
Poster

Bolanos, Alberto (McNair)
Speech, Language, and Hearing Sciences at University of Arizona
Whose Perspectives Count? A Critical Interpretive Synthesis of Autism-Service Literature for Latiné Borderlands Families
Mentored by: Genesis Arizmendi, PhD, CCC-SLP (Speech, Language, and Hearing Sciences)

The experiences of Autistic individuals and their families are shaped by their positions with respect to race, gender, national origin, and geographic location. Speech-language pathologists (SLPs) support their clients' communication goals, yet few studies address the autism-service needs of Latiné families in the US-Mexico Borderlands. Within a larger project examining autism-service systems and Latiné families in Southern Yuma County, the present study reviewed the literature on Autism, Borderlands families, and ethical autism-service provision using a Critical Interpretive Synthesis (CIS) strategy (Dixon-Woods et al., 2006). Ninety-five published works were reviewed between November 2025 to July 2026. First, comparative analysis produced a conceptual framework representing the nature and goals of autism-service provision for Latiné Borderlands families. Second, participant demographics, keywords, and research methods were analyzed by discipline and location to assess representational patterns across the literature. The findings point to a need for greater inclusion of community perspectives in research supporting Latiné Autistic individuals and their families in the US-Mexico Borderlands.

1:20 PM in ILC 120
Poster

Breschini Avila, Dailyn (SRI)

Psychology at University of Arizona
Dispositional Predictors of Defending Behavior in Middle School Students
Mentored by: Jina Yoon, PhD (Education)

Bullying is often framed as a one-to-one dynamic where a perpetrator inflicts repetitive harm on a victim; however, this interpersonal phenomenon can be influenced by various bystanders whose actions can alter the trajectory of victimization. Bystanders can respond in different ways: ignoring, reinforcing, or defending. Defenders, or those who advocate for their targeted peers, typically differ from passive bystanders in attributes possibly influenced by moral or social factors. Although there is strong research linking empathy and justice sensitivity to prosocial behavior, their direct role as independent predictors of defending behavior has yet to be clearly defined. Using a quantitative approach, this study examined (1) whether dispositional characteristics, such as observer justice sensitivity and empathy, predict defending behavior among middle school students and (2) which empathetic facet is the most significant predictor of defending. Participants included 425 middle school students in the 6th-8th grade. To measure empathy, observer justice sensitivity, and defending behavior, respondents completed the Interpersonal Reactivity Index, the observer scale from the Justice Sensitivity Inventory, and the Bullying Participant Behaviors Questionnaire. Results showed that only observer justice sensitivity significantly predicted and correlated with defending behavior ($p < .001$, $r(423) = .342$), with a beta coefficient of .27. Perspective-taking had the strongest correlation among the empathy subscales but did not reach statistical significance (beta coefficient = .07, $p = .207$). Together, the variables explained 13.1% of the variance in defending behavior. The findings have implications for bullying intervention and prevention, considering specific areas of school-based anti-bullying practices and educational opportunities.

Keywords: middle school bullying, defender, bystander intervention, empathy, observer justice sensitivity

2:40 PM in ILC 140
Poster

Brown, Emma (MARC)
Biomedical Engineering at University of Arizona
Investigating the role of alpha-tropomyosin mutations linked to human cardiomyopathies in modulating calcium dissociation kinetics
Mentored by: Jil Tardiff, PhD, MD and Catherine Vasquez (Biomedical Engineering |Cellular & Molecular Medicine)

The sarcomere is the functional unit of contraction in cardiac muscle. It is composed of regulatory proteins organized into thin and thick filaments. The cardiac thin filament (CTF) couples calcium availability to generation of force and is composed of actin, tropomyosin (TM), and the troponin complex (Tn). Mutations in TM have been linked to the development of hypertrophic cardiomyopathy (HCM) and dilated cardiomyopathy (DCM). This project investigates five TM missense mutations: D175N-TM, S215L-TM, T201M-TM, D219N-TM, and E180G-TM, and their effects on calcium

dissociation kinetics. Understanding the rates at which calcium leaves the CTF, can give us insight into how mutations can interfere with cardiac relaxation. Mutations were developed by inserting the mutation on template wild-type (WT) TM DNA via mutagenesis, followed by bacterial expression and purification of TM proteins. We then proceeded to reconstitute the full CTF by incubating our WT TM and mutation-carrying TMs with Tn, actin, and calcium. Calcium dissociation kinetics were measured using a stopped-flow instrument and thiol-reactive IAANS labeled TnCT53C. The dissociation rates for mutation D175N-TM (120±1.947s-1) did not differ from control WT TM rates (122.3±1.827s-1). We observed a decrease in the dissociation rates for CTF mutations D219N-TM (104.8±.4894s-1), E180G-TM (98.98±1.456s-1), S215L-TM (81.31±1.131s-1,), and T201M-TM (106.8±4.131s-1). These data indicate that TM missense mutations can significantly alter calcium dissociation rates, suggesting potential effects on relaxation kinetics. Future studies will focus on gaining insight into potential structural alterations these mutations have on crucial regulatory regions and testing small molecules that can restore these alterations and improve cardiac function.

1:00 PM in ILC 130
Poster

Burke, Francisco Cormac Alejandro (McNair)
Sociology at University of Arizona
The Clerics Who Make Do: How Academic Capitalism Impacts Survivor Support Services & The Butterfly Centers Gender Based Violence Prevention initiatives at Reithwin College
Mentored by: Karla Silva, PhD (Hispanic Serving Institution Initiatives)

This Study explored the impact of Academic Capitalism on Survivor Advocacy and gender-based violence (GBV) prevention work at Reithwin College. A Digital Ethnography was conducted in which data was pulled from digital online sources consisting of news articles, institutional websites, chat messages/forums, and online videos surrounding survivor support services and GBV work at Reithwin College. Four themes—lack of institutional support, lack of resources, understaffing and budgetary shortfalls—were chosen for this study to determine if Academic Capitalism was present in a data source. Through an extensive internet search a total of 6 key sources were found to have direct themes of academic capitalism. These 6 sources consisted of 2 news articles, 2 institutional specific websites, 1 online published video documentary and 1 digitally published student list of demands. Lack of institutional support, lack of resources and understaffing, each appeared in 4 out of 6 sources leaving budgetary shortfall with the least common occurrence of the four themes. Understaffing was especially prevalent in Survivor Advocacy with there being exclusively 2 Advocates for Reithwin's campus of 50,000+ students. Additional findings suggested a relationship between the Butterfly Center and the survivor advocates as they both encounter similar adversities under academic capitalism. Research conducted in this study was significant in adding to the scarcity of conversation on how Academic Capitalism directly affects Survivor Advocacy and Gender-based violence prevention work at public colleges.

Keywords: Academic Capitalism, Survivor Advocates, Gender-based violence, sexual assault, Title IX

3:00 PM in ILC 112
Poster

Calvillo, Antonia (ACOA/MSTEM Thrive Program)
Biology at University of Arizona
From Recognition to Reframing: Designing an AI-Based Ageism Simulator for Gerontology Education
Mentored by: Linda Phillips, PhD (Center on Aging)

Poster

Carvajal, Jessica (MHD)
Biology at Northern Arizona University
Detection of cerebral microhemorrhages in humanized APOE3 and APOE4 mice by Prussian Blue
Mentored by: Paulo W. Pires, PhD and Felipe D. Polk (Physiology)

Cerebral microhemorrhages (CMH) are micro bleeds in the brain caused by damage to small blood vessels and are associated with neurovascular disease, including cerebral small vessel disease which, over time, results in age-related cognitive decline. The Apolipoprotein E4 (APOE4) mutation is a significant genetic risk factor for cerebral small vessel disease. Despite its recognized connection with disease risk, the underlying mechanisms by which APOE4 contributes to neurovascular dysfunction and disease progression remains unclear. Recent evidence suggests that patients who carry the APOE4 mutation have increased incidence of CMH compared to non-carriers. This study investigates whether APOE4 expression is associated with increased microhemorrhage using a humanized APOE mouse models expressing either APOE3 or APOE4. We hypothesize that mice expressing APOE4 will have increased incidence of CMH compared to APOE3-expressing control mice. Fixed brain tissue samples from hypertensive APOE3 and APOE4 mice were sectioned into thin coronal sections using a cryostat. Brain slices were stained with Prussian blue, a histological stain that detects ferric iron deposits left after blood degradation, enabling visualization of CMHs. Our preliminary data shows that few CMH were detected using Prussian blue staining, confirmed by the presence of Prussian blue-positive deposits identified by its characteristic blue coloration. Future work will quantify both the number and area of CMH between APOE4 expressing mice and APOE3 controls. These findings will further validate the association between expression of APOE4 and cerebral small vessel disease pathology.

11:00 AM in ILC 120
Poster

Castaneda, Cory (ACOA/MSTEM Thrive Program)
Molecular & Cellular Biology at University of Arizona
Impact of Pharmacist-Led Interventions on medication Adherence and Safety in Older Adults with Type 2 Diabetes
Mentored by: Jeannie Lee, PharmD (Pharmacy)

Poster

Castillo, Manuel (MHD)
Biology at University of Arizona
High Throughput Screen of FDA Approved Pharmaceuticals for TDP-43 Modifiers in S. cerevisiae
Mentored by: J. Ross Buchan, PhD and Lucas J. Marmorale (Molecular & Cellular Biology)

Over 97% of ALS cases show an accumulation of TDP-43 in the cytoplasm. In previous work in Drs. Ross Buchan, James Shorter, and Aaron Gitler's labs, *Saccharomyces cerevisiae* (budding yeast) has been established as a reliable model to study modulation in protein levels of TDP-43 in high-throughput assays. We are interested in how FDA approved drugs affect these levels of cytoplasmic TDP-43. Understanding how drugs may lower TDP-43 protein levels is an important step in developing novel therapeutics for ALS. Using three strains of yeast, one expressing high levels of TDP-43, one expressing low levels of TDP-43, and one expressing an isoform of TDP-43 (sTDP-43), we screened around 1700 FDA approved compounds and observed which drugs modulate levels of TDP-43. The screen revealed several viable drug hits which lowered TDP-43 protein levels in the high expressing strains although the lower expressing strains did not elicit interpretable results. Interestingly, a drug that had multiple hits and lowered TDP-43 protein levels was vitamin D. In follow up experiments we will confirm candidate drug hits in yeast as well as test these drugs on human iPSC-derived neurons to determine their effect on TDP-43 protein levels, localization, and toxicity.

11:40 AM in ILC 150
Poster

Celestino, Bethany (FRONTERA)
Neuroscience and Cognitive Science | Spanish at University of Arizona
Language Equity in Heat Illness Prevention for Agricultural Workers: A Literature Review
Mentored by: Martha Moore-Monroy, EdD (College of Public Health)

Poster

Chavarria, Casandra (McNair)
Psychology at University of Arizona
College Students' Perceptions of Generative AI: Evidence from First and Continuing Generation, Hispanic/Latino/a, and non-Hispanic UA Psychology Students
Mentored by: Sarah Grace, PhD (Psychology)

Artificial intelligence has gradually been integrated into higher education institutions over the last couple of decades, but only recently, in late 2022, did generative AI break into higher education with the launch of ChatGPT. The integration of generative AI into higher education shifted traditional classroom structures and impacted student learning and professors' teaching practices. Existing research has collected data on student and faculty perceptions of generative AI in higher education but

has failed to present literature on how generative AI is affecting different demographics of students, specifically first-generation and Hispanic/Latino/a college students. The purpose of this study is to highlight the perceptions of first-generation Hispanic/Latino/a students on ChatGPT and generative AI tools. A sub-analysis also compared perceptions of first-generation Hispanic/Latino/a students with those of continuing-generation non-Hispanic students to test for differences. A mixed-methods survey was given to 558 undergraduate students in a Psychology class at the University of Arizona. Six Likert-style survey questions asking students about AI influence on academic development, support, and confidence were analyzed for the study. A two-sample t-test and a factorial ANOVA test were conducted on the six survey questions, and all results came back non-significant. While this study's findings are not statistically significant, further research on AI influence on first-generation and Hispanic/Latino/a students is still needed to determine whether AI tools are helping meet the specific educational needs of this population of students or if AI is being used as a temporary solution by higher education institutions.

Keywords: generative AI, higher education, Hispanic/Latino/a students, first-generation students, student perceptions.

1:40 PM in ILC 140
Poster

Chavez, Brayan (FRONTERA)
Physiology and Medical Sciences at University of Arizona
Let's Talk Health: Addressing Valley Fever Disparities Through Language Justice and Clinical Safety in Arizona
Mentored by: John Galgiani, MD (Medicine)

Poster

Claw, Marina (MHD)
Psychological Sciences at University of Arizona
Measuring age differences in spatial cognition using immersive virtual reality
Mentored by: Arne Ekstrom, PhD (Psychology)

Spatial cognition is the mental processes involved in perceiving, remembering, and navigating one's environment. Previous research suggests that older adults may struggle more with spatial cognition than young adults, an issue most notably seen in Alzheimer's disease. However, these studies are often conducted in environments that older adults have little familiarity with, such as desktop virtual reality. Studies set in more naturalistic environments suggest age-related differences in spatial cognition are more complex. In one study, Kirasic et al. (1991), older adults had to remember locations in a familiar real-world grocery store; no deficit was found, although the study was limited by a small sample size and less detailed data due to technology at the time. We built and tested young (18 to 36) and older adults (65 to 85) in an immersive and walkable grocery store to try to replicate and extend Kirasic's findings. Each participant was placed in a supermarket simulated in virtual reality (VR), either grocery

store A or B. First, participants were asked to shop for a list of groceries and place them into a basket. Next, participants had to place each item back into its original spot with the shelves being empty. Both tasks repeated, a maximum of 3 times, until participants sufficiently restocked the groceries. In our study, using VR, we aim to examine if both groups will continue to show similar performance to Kirasic et al. (1991) in familiar environments and how older adults learn by analyzing data such as head and eye movement

9:20 AM in ILC 140
Poster

Connell, Gavin (MARC)
Nutrition and Dietetics at University of Arizona
Effects of Increasing Pulse Consumption on Cardiovascular Disease Risk: A Randomized Controlled Trial
Mentored by: Kenneth Wilund, PhD, Geovana Martin Alemany, and Kimberly Ceus (Nutritional Sciences and Wellness)

Diet-related chronic diseases remain a major public health concern in the United States, with cardiovascular disease continuing to be the leading cause of mortality. Pulses (beans, lentils, chickpeas, and peas) are rich in soluble fiber, plant protein, micronutrients, and phytochemicals. Their consumption has been associated with improved cardiometabolic health. However, the effects of different intake levels remain unclear. The USDA currently recommends 1.5 cups of pulses per 2,000 kcal per week, but higher intake levels may provide additional cardiometabolic benefits. The objective of this study was to determine whether doubling pulse intake to 3.0 cups per 2,000 kcal per week provided additional benefits. This 12-week clinical trial randomized 136 participants under the age of 70 into three groups: control (n=47), 1.5 cups per week (n=44), and 3.0 cups per week (n=45). Fasting blood lipid panels were collected at baseline and week 12 to assess changes in cardiovascular biomarkers. Panels were available for 62 participants (control, n=19; 1.5 cups/week, n=23; 3.0 cups/week, n=20), who were included in the interim analysis. No statistically significant differences in changes in blood lipid biomarkers were observed among the groups (all p > 0.05). However, a trend toward lower total cholesterol was observed when comparing the intervention groups (3.0 cups: 198.4 ± 44.8 to 192.9 ± 41.6 vs 1.5 cups: 197.9 ± 44.8 to 208.7 ± 53.3, p = 0.063). Although no statistically significant differences were detected, the observed trend toward lower total cholesterol with higher pulse intake warrants further evaluation as sample size increases.

Keywords: Pulses, cardiovascular disease (CVD), blood lipids, clinical trial, dietary intervention

12:40 PM in ILC 120
Poster

Crowther, Claire (B2)
Environmental Biology at Providence College
Investigating Causes of Leaf Litter Decomposition in the Biosphere 2 Tropical Rainforest

Mentored by: Joost van Haren, PhD (Environmental Science)

With tropical rainforests experiencing extreme temperatures due to climate change, there are many gaps in knowledge of how these ecosystems and their components will respond. One such component is the dynamic environment of the forest floor, which plays a major role in nutrient cycling through litter decomposition and the activity of detritivores like arthropods, microbes, and other invertebrates. I set out to improve our understanding of how temperature, plant species composition, and arthropod community composition impact leaf litter decomposition in the Biosphere 2 Tropical Rainforest. Data collection for this study involved measuring the CO2 fluxes of leaf litter samples from multiple regions of the rainforest (including litter from tropical plant species *Clitoria fairchildiana* and *Pterocarpus indicus*), massing those samples, and measuring the temperature of adjacent soil, litter, and air. Soil sampling was also conducted in a similar manner to determine the CO2 flux of the rainforest soil, and arthropods were sampled to determine the diversity and richness of the community at different elevations. Shannon diversity and evenness indices reveal that arthropod diversity and evenness decrease with elevation. Preliminary analysis of litter data using linear regression indicates that there is significant correlation between leaf litter temperature and CO2 flux. Following further analysis, findings from this study will serve as an example of potential forest floor dynamics in a tropical rainforest undergoing extreme temperatures, conditions that may become a reality for rainforests worldwide as climate change warms the planet.

Poster

Cunningham, Jason Anthony (SRI)
Aerospace Engineering at University of Arizona
Balancing Fuel, Accuracy, and Uncertainty in Lunar Landing Guidance:
Mentored by: Jekan Thanga, PhD and Vernekar Harish (Aerospace & Mechanical Engineering)

Lunar landing guidance requires balancing touchdown accuracy, propellant consumption, and robustness to uncertain operating conditions. This study investigated how initial conditions and modeling assumptions affected landing performance, with the objective of identifying favorable descent parameters and establishing a verified simulation foundation for future guidance-system development. Three-dimensional lunar-descent simulations were developed in MATLAB and Python under conditions selected to approximate realistic flight behavior.
The baseline simulation reached the lunar surface with a horizontal miss distance of 0.876 meters and a vertical touchdown speed of 0.206 meters per second. The three-dimensional model reproduced the planar case, and its coordinate transformations passed round-trip verification. Over a descent altitude of 5 kilometers, the inverse-square gravity model differed from the constant-gravity approximation by less than 0.6%. Lunar-rotation effects were also negligible. Increasing the initial altitude improved controller convergence but increased descent time and propellant consumption. These results support the use of constant gravity in short terminal-descent studies while identifying conditions under which

higher-fidelity dynamics may become necessary. Overall, the project provides a verified computational foundation for future rigid-body modeling and guidance-system development.

Keywords: lunar landing, guidance systems, descent optimization, trajectory simulation, MATLAB, Python

9:40 AM in ILC 130
Poster

Cuthbertson, Alexa (ACOA/MSTEM Thrive Program)
Medicine: Medicine and Society emphasis at University of Arizona
Characterizing a Novel PD-L1 Knockout Mouse Strain Using RT-qPCR
Mentored by: Sally Dickinson, PhD (Pharmacology)

Poster

Davis, Elisha (FRONTERA)
Biology at University of Arizona
Community Assessment and Adaptation of an Osteoporosis and Fall Prevention Program for Older Adults
Mentored by: Jennifer Bea, PhD (Cancer Center)

Poster

De La Cruz, Rebeca (MARC)
Biochemistry | Molecular & Cellular Biology at University of Arizona
Nuclear EGFR Drives Triple-Negative Breast Cancer Cell Dormancy
Mentored by: Joyce Schroeder, PhD and Danielle DiFranco (Molecular & Cellular Biology)

Triple-Negative Breast Cancer (TNBC) represents about 15% of new breast cancer cases each year, but is responsible for 40% of all breast-cancer related mortalities. TNBC is a highly aggressive and metastatic subtype of breast cancer that does not respond to hormone therapies as it lacks progesterone, estrogen and HER2 receptors. Interestingly, TNBCs overexpress epidermal growth factor receptor (EGFR), a membrane tyrosine kinase. Although there are therapies targeting EGFR's tyrosine kinase, research shows that EGFR has a kinase-independent role in the nucleus. Previous research done in the Schroeder Lab shows that inhibition of nEGFR trafficking by the peptide cSNX1.3, significantly reduces metastasis in a murine model of TNBC. Furthermore, the lab has shown cSNX1.3-treated TNBC cells have reduced dormancy and are more readily destroyed by Natural Killer cells than untreated cells. Cellular dormancy is a protective state of slowed proliferation that allows cancerous cells to evade the immune system and traditional chemotherapy. Dormant cells can remain clinically undetectable for decades and cause recurrence in patients years later. We hypothesize that nEGFR drives the dormancy and subsequent metastasis of TNBC. To investigate this role of nEGFR in TNBC, we induced a dormant state in a murine cell model of TNBC (4T1) by serum deprivation and assess the impact of nEGFR on their dormant state through confluency, MTT, BrdU, and immunoblot assays. Our data further supports

that nEGFR drives cellular dormancy. By defining the role of nEGFR in TNBC, more targeted therapies for TNBC could be developed for patients.

2:00 PM in ILC 150
Poster

De Silva, Parami (McNair)
Ecology & Evolutionary Biology | Applied Humanities: Astrobiology emphasis at University of Arizona
Building an "Astrobiology Atlas": Mapping Biosignatures in Mars-Analog Environments
Mentored by: Nathan Hadland, PhD and Solange Duhamel, PhD (Lunar & Planetary Laboratory)

One of the central questions in astrobiology is whether life exists beyond Earth. Addressing this question requires understanding how biosignatures are distributed and preserved in terrestrial environments analogous to Mars. This project compiled a georeferenced database of quantitative biosignature measurements from published studies of Mars-analog environments through a literature-based data synthesis. Published studies were identified through literature searches using Google Scholar, publisher databases accessed through the University of Arizona Library, and AI-assisted literature discovery tools, including Elicit and Consensus. Data were extracted only when quantitative biosignature measurements and geographic coordinates were reported. Variables collected included environmental setting, latitude, longitude, DNA concentration, adenosine triphosphate (ATP), total organic carbon (TOC), and other reported biosignatures, together with associated sampling and analytical metadata. The resulting dataset standardized measurements from diverse analog environments into a consistent format suitable for comparison across studies. The database was designed to facilitate analyses of relationships between biosignature abundance, environmental conditions, and sampling location. By integrating biological, geochemical, and spatial information into a single resource, this work established a foundation for future statistical analyses and predictive modeling of biosignature occurrence. The database also provides a framework that can support the development of machine learning approaches for identifying environments with the highest potential for biosignature preservation and detection. This project contributes to ongoing astrobiology research by improving the accessibility and organization of Mars analog biosignature data and supporting future planetary life-detection missions.

Keywords: Astrobiology, Mars analog environments, biosignatures, geospatial database, life detection

10:20 AM in ILC 120
Poster

Dominguez, Stephanie (McNair)
Psychological Sciences at University of Arizona
Social Support and Hypertensive Disorders of Pregnancy Across Maternal Ages: A Systematic Review
Mentored by: Melissa Flores, PhD, Victoria Rueda, Drizella Sandoval Diaz, Josephine Beltramo, and Melanie Garcia (Psychology)

Introduction: Hypertensive disorders of pregnancy (HDP), specifically gestational hypertension, chronic hypertension, pre-eclampsia, and eclampsia, have been a leading cause of maternal mortality (CDC, 2022). Previous literature has identified maternal age as a biological risk factor and suggests that social support may be a protective factor against HDP and can help in improved health behaviors as well as lower stress. This study aims to understand if maternal age moderates the association between social support and HDP.
Methods: A systematic review is ongoing using the databases CINAHL, PsycINFO, PubMed, and Scopus. Studies including self-reported social support scales in relation to HDP and maternal age will be screened through a web-based app for systematic reviews, Rayyan. Data have been and continue to be manually extracted from articles that meet the inclusion criteria and will be synthesized.
Results: The extracted data will be examined through a narrative synthesis in place of a meta-analysis. It is expected that higher social support will be associated with a lowered risk of HDP in the higher risk age populations 15-20 and 35+.
Discussion/Conclusion: The review will synthesize the existing evidence on social support as a protective buffer against HDP and how that varies across maternal age groups. By examining the current evidence, the gap in the literature will be addressed and aims to better understand the associations involved with the risk of HDP.

Keywords: Social support; Perceived social support; Social support interventions; Social networks; Preeclampsia; Hypertensive disorders of pregnancy; Eclampsia; Gestational hypertension; Chronic hypertension; Maternal age

12:40 PM in ILC 140
Poster

Domínguez, María G. (McNair)
Psychological Sciences at University of Arizona
Examining the Neural Correlates Associated with Lower Social Hierarchies: A Comprehensive Review of Neuroimaging Studies
Mentored by: Ying-hui Chou, ScD and Reyna Hickey (Psychology)

Experiences associated with lower positions within social hierarchies, including discrimination, social exclusion, and socioeconomic disadvantage, are consistently associated with adverse mental health outcomes. Understanding how these experiences are reflected in neural systems involved in stress regulation and emotional processing among racial and ethnic minority populations is essential for interpreting neural outcomes within the context of individuals' lived experiences, social environments, and cultural backgrounds. This perspective may contribute to more culturally informed approaches to mental health research, assessment, and prevention.Guided by the Social Competition Hypothesis of Depression and the Dahlgren-Whitehead model of the social determinants of health, this comprehensive literature review examined how these experiences are associated with neural systems involved in stress regulation and emotional processing. Peer-reviewed empirical studies using

neuroimaging methods to examine discrimination, social exclusion, or socioeconomic disadvantage were included. Thirty articles were initially screened, of which 9 met the inclusion criteria. The selected studies used electroencephalography/event-related potentials (EEG/ERP), functional magnetic resonance imaging (fMRI), structural magnetic resonance imaging (MRI), and functional near-infrared spectroscopy (fNIRS).Across neuroimaging modalities, discrimination was associated with alterations in neural systems supporting stress regulation, emotional processing, cognitive control, and attention. Social exclusion was associated with neural responses related to conflict monitoring, attentional orienting, cognitive evaluation, and social cognition. Socioeconomic disadvantage was linked to altered neural responses to social stress, with findings varying across racial and ethnic groups. Collectively, these findings highlight the importance of incorporating sociocultural context and increasing representation of diverse populations in neuroimaging research to improve understanding of mental health disparities.

Keywords: Neuroimaging, Social determinants of health, Discrimination, Social Exclusion, Socioeconomic Disadvantage, Mental Health

11:00 AM in ILC 140
Poster

Donner, Angela (McNair)
Psychological Sciences at University of Arizona
From Daily Rumination to Weekly Overload: Trait and State Effects on Emotion Regulation in Emerging Adults
Mentored by: Zachary Cohen, PhD (Psychology)

Traditional clinical screeners rely on retrospective, cross-sectional assessments that fail to capture how repetitive negative thinking (rumination) fluctuates within a person from day to day. This gap is especially limiting during emerging adulthood (ages 18–25), a developmental period marked by academic, financial, and social stressors that can heighten vulnerability to frequent rumination. Existing approaches infrequently examine how the daily relationship between rumination and emotion regulation difficulty relates to broader weekly overload. Using a secondary analysis of Ecological Momentary Assessment (EMA) data from the WARN-D study, this study evaluates two multilevel models. Model 1 examines whether a person's overall tendency to ruminate (trait-level) and their day-to-day deviations in rumination (state-level) relate to same-day difficulty regulating emotions, reported at the end of each day. Model 2 examines whether trait-level and state-level rumination and regulatory difficulty, aggregated across the week, relate to end-of-week overload. It is hypothesized that state-level rumination will show a stronger association with same-day emotion regulation difficulty than trait-level rumination. Similarly, this pattern of state effects outweighing trait effects is expected to hold for both rumination and emotion regulation difficulty in predicting weekly overload.

Keywords: rumination, emotion regulation, Ecological Momentary Assessment (EMA), multilevel modeling, emerging adulthood

10:00 AM in ILC 140
Poster

Elhassa, Yumna (SRI)
Sociology | Public Policy at CUNY Hunter College
Beyond Borders: Community Cultural Wealth and the Educational Aspirations of Transnational Students in Mexico
Mentored by: Anna Ochoa O'Leary, PhD (Mexican American Studies)

In the midst of intensifying anti-immigration rhetoric, a growing population of mixed-status families have begun their return migration to Mexico. For the youth who lived a substantial time in the United States, reentry into Mexican schools is often demanding. Existing scholarship has most often portrayed transnational students through a deficit-oriented frame, concentrating on shortcomings in Spanish proficiency and difficulties with peer and school adjustment. Less considered are the cultural resources that these students, along with their families, draw on as they navigate return. This study applies Yosso's (2005) Community Cultural Wealth (CCW) framework, rarely used with Mexican return migrant populations, to examine how aspirational, linguistic, familial, social, navigational, and resistant capital shape students' educational goals across the US and Mexican contexts. A CCW based codebook was applied to the analysis of interviews collected from transnational students who enrolled in Mexican schools. Results suggest that familial capital functioned as the primary source of support, aspirational capital was self-generated, and resistant capital developed through adaptation. While their aspirations remain, students encounter challenges with academic Spanish, feelings of disconnectedness from their communities and navigating entirely new education systems. These patterns are valuable to educators and school counselors, identifying the need to treat bilingualism and cross-border experience as strengths rather than deficits. Mexican education systems may also be inclined to offer support programs for this incoming population of students, who continue to be virtually invisible to teachers and administrators.

Keywords: Return-Migration, Transnational Students, Education, Community Cultural Wealth, Linguistic Capital

2:40 PM in ILC 112
Poster

Elias, Alexandra (FRONTERA)
Biochemistry at University of Arizona
Insulin-Stimulated Glucose Uptake
Mentored by: Paul Langlais, PhD (Medicine)

Poster

Ellington, Gabriel (MHD)
Medicine: Integrative and Practice: Focused Medicine emphasis at University of Arizona

Gastrocnemius Stretching and Plantar Fasciitis: A Systematic Review
Mentored by: L. Daniel Latt, MD, PhD (Orthopaedic Surgery)

Gastrocnemius equinus (GE tightness of the calf muscle leading to decreased ankle range of motion) is strongly associated with plantar fasciitis (PF, pain at the heel) and may be a causative factor.. Gastrocnemius stretching is commonly used in the treatment of plantar fasciitis, however, the effectiveness of stretching at relieving the symptoms of PF has not been clearly established, and it is not known whether improvement in ankle range of motion is correlated with symptomatic improvement. We conducted a systematic review of clinical studies of the PF treated with therapeutic exercise including gastrocnemius stretching. We searched PubMed and found 15 articles which met our inclusion and exclusion criteria. The following information was extracted from the articles: while there was not uniform agreement among the articles, 12 of the 15 found that gastrocnemius stretching was effective in relieving symptoms of PF in 65-80% of patients. Moreover, the ROM of gastrocnemius stretching and extension lead to improved degrees of ankle motion and less intense symptoms.

11:20 AM in ILC 150
Poster

Erhart, Remember (UROC-Prep)
Applied Biotechnology at University of Arizona
Emerging Fungal Pathogens: A Surveillance Study of Candida Species Distribution at Banner University Medical Center
Mentored by: Gayatri Vedantam, PhD and Allison Nicole Sullivan (Animal and Comparative Biomedical Sciences)

Candida spp. are eukaryotic fungi, and are an emerging nosocomial, opportunistic bloodstream infection in hospital settings. Manifestations are often a result of post-antibiotic treatment with the gastrointestinal region as the primary reservoir for colonization due to overgrowth. This is a healthcare burden as lethal infection can cause organ failure and sepsis. As of yet, candidiasis has no systematic detection methods for early candidiasis or effective azole antifungal therapeutics. A surveillance study in Banner University Medical Center Tucson was conducted from patient stool samples (n=132) to determine colonization prevalence and were tested for fluconazole resistance, a common antifungal drug. Patient samples were cultured, plated on Candida CHROMagar plates for species identification, and isolates were tested for resistance on RPMI plates with fluconazole e-test strips. Results indicated 40.3% (n=52) from the sample size tested positive for *Candida spp.,* with *C. glabrata* the most prevalent and clinical isolates were determined to be susceptible dose dependent; indicating that fluconazole would need to be used on higher doses or often. Results support the epidemiology shift to NACs (non-albicans Candida) and growing resistance in the clinical setting of Tucson. Further research to better understand candidiasis manifestation includes analyzing patient medical records to assess other factors

that may have influence colonization, and analysis of identified isolates through assays in order to avoid drug toxicity in patients, therapy resistance, and managing the spread in the hospital.

Keywords: *Candida species, Candida albicans, Candida glabrata,* candidiasis, nosocomial infections

11:00 AM in ILC 130
Poster

Ervin, Khendall (MHD)
Biomedical Engineering at University of Arizona
Engineering Linear Protein Assemblies Toward Stiffness-Guided Design of Red Blood Cell-Inspired Materials
Mentored by: Minkyu Kim, PhD and Young Noh (Biomedical Engineering)

Red blood cells (RBCs) transport oxygen throughout the body while repeatedly deforming to pass through narrow blood vessels. Although RBC-inspired materials could help address limitations associated with donor blood, reproducing the deformability of natural RBCs remains challenging. This deformability depends in part on the organization and mechanical properties of the membrane-associated cytoskeleton. Mimicking key features of the RBC cytoskeleton using synthetic protein networks may enable reproduction of this behavior, but directly resolving and controlling how designed protein building blocks organize into complex two- or three-dimensional networks remains difficult. In this study, we use one-dimensional protein assemblies as simplified models to investigate how the flexibility of individual protein building blocks influences filament growth, bending, and structural organization during self-assembly. We hypothesize that excessively flexible building blocks promote filament bending or self-closure, whereas overly rigid building blocks hinder the end-to-end alignment required for continued growth. As an initial step toward testing this hypothesis, we engineered homotelechelic protein building blocks designed to provide varying molecular flexibility that undergo end-to-end ligation to form linear assemblies. The designed proteins were recombinantly expressed, purified, and characterized to confirm their purity, homogeneity, and molecular mass. Ligation assays and imaging confirmed the formation of higher-order oligomers and filamentous assemblies. Together, these results establish a platform for investigating how building-block flexibility and composition influence filament growth and bending. Such relationships may guide the construction of organized protein networks with controlled mechanical properties, ultimately supporting RBC-inspired materials for artificial oxygen delivery and targeted drug delivery.

2:00 PM in ILC 130
Poster

Esquer Amezcua, Karina (FRONTERA)
Human Biology | Anthropology at Emory University
The Ageism Simulator: An AI-Based educational tool for Recognizing, Explaining, and Reframing Ageist Communication
Mentored by: Linda Phillips, RN, PhD, FAAN, FGSA (Medicine)

Poster

Estrella, Mariah (B2)
Geographic Information Systems | Optical Sciences & Engineering at University of Arizona
Leaf Spectral Signatures Reveal Functional Type Identity and Physiological Status in a Desert Plant Community
Mentored by: David Moore, PhD, Lindsey Bell, and Angie Camila Abarzua (Natural Resources & the Environment)

Desert ecosystems are highly sensitive to climate variability, yet scalable methods for monitoring plant physiological status and functional diversity remain limited. This study evaluates whether leaf-level hyperspectral reflectance and functional traits can improve remote sensing of desert plant functional diversity and ecosystem function. Leaf reflectance spectra (350–2500 nm) were collected from 21 plants representing 18 species across five functional types at Biosphere 2 (Oracle, Arizona). Six spectral indices were calculated, while specific leaf area (SLA), leaf thickness, water content, and dry matter content were measured destructively. Photosynthetically active radiation (PAR) was spatially interpolated to each plant location. Functional types were spectrally distinct across multiple wavelength regions, with the strongest separation at 1920–1940 nm (ANOVA, $F > 340$, $p < 10^{-128}$). Succulents exhibited near-zero shortwave infrared reflectance due to high tissue water content, whereas aromatic shrubs showed elevated reflectance consistent with trichome-mediated scattering and drought stress. A two-index classification using the Water Band Index (WBI) and Normalized Difference Vegetation Index (NDVI) clearly separated functional types, with succulents occupying a unique spectral space. Cellulose Absorption Index differed significantly among functional types ($p < 0.001$). Leaf thickness was negatively correlated with NDVI and the Photochemical Reflectance Index (PRI), while SLA was positively correlated with PRI. Although PAR was positively associated with mean NDVI, functional type remained the primary determinant of spectral identity. These findings demonstrate that spectral bands centered on 680, 717–740, 970, and 1920–1940 nm can distinguish desert plant functional types, supporting non-destructive vegetation mapping and drought stress monitoring in arid ecosystems.

Poster

Gale, Colin (UROC-Prep)
Physics | Computer Science at University of Arizona
Co2MnSi For Potential π-phase S/F/S Josephson Junctions
Mentored by: Weigang Wang, PhD and Sarthak Hajirnis (Physics)

The intrinsic π-phase state of Superconductor-Ferromagnet-Superconductor (S/F/S) Josephson junctions has received much attention in current research due to its wide range of applications in superconducting Single Flux Quantum circuits (SFQ), cryogenic memory, and quantum computing. Although π-phase Josephson junctions have been realized using conventional ferromagnets, comparatively little is known about the superconducting transport properties of modern spintronic materials, including Heusler alloys and half-metals, when incorporated into S/F/S junctions. These

materials exhibit highly tunable magnetic properties and, in some cases, exceptionally high spin polarization, making them promising candidates for future superconducting spintronic devices. This work aims to identify promising ferromagnetic Heusler alloy barriers for future Nb-based S/F/S Josephson junctions. To explore this possibility, Co2MnSi films with and without a Tantalum capping layer were tested before and after annealing temperatures of 400 and 450 °C. These films were characterized using Vibrating Sample Magnetometry (VSM), X-ray Diffraction (XRD), and X-ray Reflectivity (XRR) measurements to correlate annealing-induced changes in the microstructure of Co2MnSi with changes in the films' magnetic and structural properties. Annealing at 400 °C increased the Co2MnSi/Ta total thickness in the capped films, while still promoting the formation of the (220) crystal orientation. The improved structural order and observed magnetic properties identify annealed Co2MnSi as a promising ferromagnetic barrier candidate for future Nb-based S/F/S π-phase Josephson junctions and motivate further investigation of Heusler-alloy-based superconducting spintronic devices.

Keywords: Superconducting, Junctions, Spintronics, Ferromagnetic, Heusler

10:40 AM in ILC 112
Poster

Garcia, Jeremy (FRONTERA)
Medicine at University of Arizona
Targeting SARS-CoV-2 nonstructural protein 16 (nsp16) to Advance Antiviral Drug Therapeutics
Mentored by: Hongmin Li, PhD (College of Pharmacy)

Poster

Garcia Mata, Fabiola (SRI)
Anthropology at University of Arizona
Ceramic Analysis from the Tucson Urban Renewal project dated to the Spanish Colonial Period
Mentored by: Suzanne L. Eckert, PhD (Anthropology)

This project looks at indigenous pottery excavated from Spanish Colonial Tucson as part of the Tucson Urban Renewal project. Since the Indigenous and Spanish material was recovered in the late 1960s and early 1970s little research has been conducted on it. Previous research mainly focused on classifying pottery recovered from only one excavation area in the project and entirely ignored the implications of why multiple pottery traditions were recovered. In this project, I classify pottery by tradition, form and provenience. Tradition was determined by examining temper, form, and technology. Form is included in general classification and how to determine tradition due to language for general form overlapping between traditions but form in tradition focused on the key features in the cultures pottery. While most forms were indigenous cooking vessels, some forms were of Spanish tradition but made with indigenous technology. The findings suggest that not only were the Spanish relying on Indigenous potters for vessels needed in daily tasks like cooking and food storage, but were also possibly

commissioning certain forms (platters, candlestick holders, teacups) to continue their European traditions far from home.

Keywords: Spanish Colonial, Historic Tucson, indigenous pottery, ceramic analysis, Colonial archaeology

1:20 PM in ILC 112
Poster

Gonzalez-Montion, Abigail Antonela (B2)
Environmental Science: The Biosphere emphasis at University of Arizona | Pima Community College
Geospatial Analysis of The Biosphere 2 Desert Biome: Effects of Environmental Conditions on Soil Hydrology
Mentored by: David Moore, PhD, Lindsey Bell, and Angie Abarzua (Natural Resources & the Environment)

Soil type, slope, and canopy variation all systemically contribute to the hydrological cycle. Spatially explicit field baselines provide necessary understanding of geospatial dynamics for future time series analysis; particularly on systemic response patterns to climate stress conditions including drought. Modeled to replicate a fog desert (i.e. Baja), The Biosphere2 Desert Biome currently contains five different soil types (characterized by USDA taxonomy) under controlled precipitation cycles; varying slope, vegetation distribution, and canopy biometrics also affect photosynthetic active radiation (PAR) availability. This experiment aims to map baseline soil and environmental relationships across four distinct soil types (Typic Camborthid, Psamment, Typic Haplargid Sandy Loam, and Typic Haplargid Clay Loam), in preparation for future tests observing plant health and productivity response to induced drought. After flagging the field in grid formation for plot identification, soil water content and microclimate measurements (atmospheric relative humidity and temperature, and soil surface temperature) were taken from days representing most and least soil saturation levels. Infiltration rates were monitored during least saturation. For environmental conditions, this analysis focused on canopy biometrics, slope variation (using D4 method), and PAR (above and below canopy). The correlations observed are mapped into surface models and raster layers on ArcGIS. Identifying and mapping links between environmental conditions and soil hydrology within a relatively controlled biotic system provides insight on potential sustainable actions in macroscale geospatial dynamics across various desert ecosystems.

Keywords: Geospatial Analysis, Soil Hydrology, Biosphere 2, Desert

Poster

Granillo, Reid (SRI)
Mechanical Engineering at University of Arizona
Optical Particle Detection Methods for Hypersonic Wind Tunnels
Mentored by: Stuart A. Craig, PhD and Brian Kinsey (Aerospace & Mechanical Engineering)

In hypersonic testing, quiet nozzles are important to limit turbulence in airflow but are delicate to contaminants and particles in the hypersonic flow that can damage the nozzle. This study aimed to develop a method to effectively detect particles in a wind tunnel by observing the scattered light from interactions with a laser sheet. The approach for detection utilized a 100 mW, coherent laser in series with a single cylindrical lens to create a triangular laser sheet for particles to pass through while being recorded by a high-speed camera. Then, a data processing routine was developed to automate the particle counting from the recorded video. Results showed that the laser of this power and the current camera detected particles approximately 10^-5 m or larger but struggled to detect particles smaller than that due to lack of scattering intensity. Further research is necessary to test if the method is effective in hypersonic conditions and what changes are necessary for the process to successfully detect smaller particles both outside the test section and under hypersonic conditions.

Keywords: Hypersonics, Scattering, Particle Detection, Laser Sheet, High Speed Camera

10:00 AM in ILC 130
Poster

Guerrero, Damareese (FRONTERA)
Human Biology, Health, & Society at Cornell University
Development of a Culturally Grounded Infant Cognitive Framework for Pascua Yaqui Early Head Start: A Qualitative and Literature Synthesis Study
Mentored by: Adalberto Renteria, MD (Pascua Yaqui Clinic)

Poster

Gutierrez, Luis (UROC-Prep)
Physiology and Medical Sciences at University of Arizona
Impact of Myosin Proximal S2 Region Variants (E924K and E930del) on Cardiac Myosin-Binding Protein-C Interactions in Hypertrophic Cardiomyopathy
Mentored by: Sakthivel Sadayappan, PhD, MBA, Stephanie Rzewnicki, and Brent Cernyar (Cellular & Molecular Medicine)

Hypertrophic Cardiomyopathy (HCM) is a cardiac disease, highly prevalent worldwide, and is the most common inherited cardiac disease. Mutations in MYH7, the gene encoding beta-cardiac myosin heavy chain, are strongly associated with the development of HCM. Although the broad pathogenesis of HCM has been well characterized, it remains unclear how mutations in specific regions of the myosin filament contribute to disease. The present study will aim to investigate the role of the myosin proximal S2 region in cardiac contractility and HCM pathogenesis using a quantitative protein-protein interaction approach. Wild-type myosin S2 and two MYH7 variants (E924K and E930del), along with the C0-C2 domain of cardiac myosin-binding protein-C (cMyBP-C), will be generated using an IPTG-inducible pET expression system in BL21 bacterial cells and purified with a His-tag affinity column. Effects of each variant on binding to C0-C2 domain will be determined by co-sedimentation and solid-phase binding assays; a second experiment will treat C0-C2 domain with protein kinase A, which will also be

determined with the same method. We anticipate that MYH7 variants will exhibit significantly weaker interactions with the C0-C2 domain of cMyBP-C compared with wild-type S2 protein, and that phosphorylation of the C0-C2 domain will enhance binding of the MYH7 variants. Collectively, the results of this study will define the pathogenic impact of myosin S2 variants on cMyBP-C binding and provide a foundation for future work aimed at identifying therapeutic targets within the disease pathways that drive HCM.

Keywords: HCM, C0-C2 Domain, Recombinant Proteins

11:20 AM in ILC 120
Poster

Gutierrez Villela, Joseph (MHD)
Biochemistry at University of Arizona

Understanding how Sequence Variants in the Transmembrane Protein TMEM184B Disrupt Neural Development: A Lipid Hypothesis

Mentored by: Martha Bhattacharya, PhD and Hazel White (Neuroscience)

Transmembrane protein 184B (TMEM184B) is a candidate transporter protein that resides on endosomes and participates in axon degeneration and synapse malformations. Variations or disruptions in the TMEM184B gene cause a neurodevelopmental syndrome including seizures, hypoplasia of the corpus callosum, and microcephaly. However, how TMEM184B variants disrupt development is unknown. To learn more about TMEM184B's involvement in neuron development, we differentiated induced pluripotent stem cells (iPSCs) with a patient-derived TMEM184B variant (K184E) and Wild Type TMEM184B (WT) into neurons and looked at the process within the two lines. In preliminary work using lipid profiling, cells with the the K184E variant had fewer neutral lipids than the WT cells. We used sterile cell culture techniques, microscopy, and lipid staining processes to visualize cellular lipids, followed by analysis of lipid droplet size and number. We hypothesize that the K184E variant will decrease lipid droplet counts found within cells. This result would suggest that lipid alterations contribute to disrupted development in patients with TMEM184B pathogenic variants. My examination of the upheaval of lipid biology by sequence changes in TMEM184B may permit a better understanding of its potential as a target of intervention. Consequently, this finding elucidates TMEM184B's role within neurodevelopmental and neurodegenerative disease progression.

Keywords: TMEM184B, K184E variant, lipid droplet count, endolysosomal homeostasis, pluripotent stem cells,

1:00 PM in ILC 150
Poster

Guzman, Isabella (MHD)
Communication Sciences and Disorders at Northern Arizona University

The Impact of the Sociopolitical Climate on Hispanic/Latiné Master's Speech-Language Pathology Students

Mentored by: Genesis Arizmendi, PhD, CCC-SLP and Trianna Oglivie, PhD, CCC-SLP (Speech, Language, and Hearing Sciences)

In the speech-language pathology (SLP) profession, fewer than 8% of practicing SLPs identify as Hispanic/Latiné. This lack of diversity contributes to disparities in culturally responsive care and access to services for Latiné and Spanish-speaking communities. In recognition of these disparities, the American Speech-Language-Hearing Association increased its initiatives on diversity, equity, and inclusion. However, federal actions under the current administration have dismantled many of these efforts across institutions and intensified enforcement of immigration policies that disproportionately impact Hispanic/Latiné communities (National Immigration Law Center, 2025). As part of a larger study examining barriers and facilitators to diversity in SLP, this analysis drew on a subsample of 19 Hispanic/Latiné master's students and explored how changes to the sociopolitical climate shape their educational, professional, and personal experiences. Semi-structured interviews were transcribed and analyzed using an interpretative phenomenological approach. Common themes included fear for their future, impacts on their mental health, and concerns for both their own and their clients' families being impacted by Immigration and Customs Enforcement. These findings suggest that the current sociopolitical climate directly affects how Latiné students experience their preparation for the profession. Naming these pressures is a first step toward supporting students whose presence the field depends on.

1:00 PM in ILC 120
Poster

Hale, Hadlee (B2)
Natural Resources and the Environment at Sewanee: the University of the South
Effects of Soil Moisture on Temperature and Evaporation at the LEO West Hillslope
Mentored by: Peter Troch, PhD, Nathan Strom, and Aaron Roznowski (Hydrology and Atmospheric Sciences)

Growing demands for water in the US Southwest call for sustainable water management. Understanding evapotranspiration (ET) processes in arid soils can improve sustainable water management in arid lands. The three-temperature (3T-ET) model uses latent heat flux measurements from a reference surface and uses net radiation, surface temperature, and soil heat flux as input variables to estimate ET. Simulated hillslopes of the Landscape Evolution Observatory (LEO) at Biosphere 2 are used to study Earth's critical zone, such as ET. This study serves as an initial evaluation of the accuracy of the 3T model on the LEO West Hillslope. My project studies the relationships between soil temperature, surface temperature, near-surface temperature, and ET over time, by different cover types, and under different volumetric water contents (VWC) to examine relationships between these variables, which will better inform our 3T model. The hillslope has three cover types:

bare, biocrust, and moss. It is equipped with many sensors which measure volumetric water content, soil temperature, surface temperature, air temperature, and radiation; many are components of the 3T-ET model. Sampling sessions included thermal infrared imaging, closed-chamber water vapor flux and CO2 measurements at 21 locations across the hillslope, and measurements of a separate dry-soil standard. Since moss and biocrust are biologically active, we expect that they will have consistently lower soil, surface, and near-surface temperatures than biocrust or moss and therefore have a higher water flux. Understanding these hydrologic relationships will guide the development and future application of the 3T-ET method on the LEO hillslopes.

Poster

Han, Acacia (MHD)
Optical Sciences & Engineering at University of Arizona
Phase Change Ultrasound Contrast Agents for Brain Imaging and Therapy
Mentored by: Terry Matsunaga, PhD, PharmD, Shoaib Anwar, Kunal Sharma, and Russell S. Witte (Biomedical Engineering)

Delivering drugs using microbubbles have been confirmed to be effective in drug delivery with scholars such as Dr. Hynynen from University of Toronto and Dr. Anastasiadis from University of Maryland Medical Center. The professors stated that microbubbles could be used to assist in ultrasound-mediated blood brain barrier opening for the purpose of improved therapeutic drug delivery. However, researchers have not fully addressed the usage of microbubbles safely, with several different issues referenced such as local bleeding. This study addresses the problem of defining parameters for the cavitation of microbubbles. The goal of this study is to define ultrasound requirements for activation of nanodroplets and inertial cavitation of resultant microbubbles to transiently open up the blood brain barrier and administering drugs, while at the same time minimizing unwanted bioeffects. Using ultrasound and Matlab, I will explore the flow of nanodroplets activating into microbubbles using varying frequencies. We will also work to define parameters for inertial cavitation of these microbubbles This project will determine the requirements to cavitate microbubbles that were activated from nanodroplets. If the parameters for cavitation could be found the controlled cavitation could be useful for opening the Blood Brain Barrier to deliver therapeutics.

10:40 AM in ILC 130
Poster

Hernandez, Lucas (ACOA/MSTEM Thrive Program)
Medicine at University of Arizona
Development of CRISPR Base-Editing Plasmids for Isogenic Modeling of Werner Syndrome
Mentored by: Asaithamby Aroumougame, Ph.D , Jaideep Chaudhary, PhD, and Shibani Mukherjee, PhD (Cellular and Molecular Medicine | Medicine)

Poster

Hernandez, Xennia J. (Quantum Que)
Mechanical Engineering at University of Arizona
Calculating the Binding Energy of the Deuteron with Quantum Simulations
Mentored by: Pooja Siwach, PhD and Michael Hite, PhD (Physics)

Poster

Hon, Casper (Quantum Que)
Physics | Astronomy at University of Arizona
Toward Quantum-Secure Covert Communications
Mentored by: Shelbi Jenkins, PhD, Wyatt Wallis, and Paul Fessatidis (Electrical & Computer Engineering)

Poster

Huber, William (Quantum Que)
Mathematics | Physics at University of Arizona
Toward Quantum-Secure Covert Communications
Mentored by: Shelbi Jenkins, PhD, Wyatt Wallis, and Paul Fessatidis (Electrical & Computer Engineering)

Poster

Jacobson, Leo (UROC-Prep)
Neuroscience & Cognitive Science at University of Arizona
The Effect of Medical Stress on Gastrointestinal Symptoms in Hypermobile Ehlers-Danlos Syndrome
Mentored by: Sarah A. Mathena, PhD (Pediatrics)

Hypermobile Ehlers-Danlos syndrome (hEDS) is one of 14 types of Ehlers-Danlos syndrome, a connective tissue disorder affecting multiple body systems including musculoskeletal, gastrointestinal (GI), autonomic, and immune. Of these, many patients consider the GI symptoms to be of greatest impact. Medical stress—a novel term referring to the psychological effects of negative interaction with medical systems and symptoms—is a debilitating factor for many people with hEDS. This cross-sectional study investigates the correlation between medical stress experienced and severity of GI symptoms. Through a mixed methods correlational analysis of both survey and interview pilot data, the findings suggest that these negative health experiences are associated with greater GI impact. A higher experience of medical stress was correlated with number (p < .001, R-squared=.35) and severity (p=.049, R-squared=.12) of GI symptoms, most distinctly between healthcare impacts and number of GI symptoms (p=.02, R-squared=.41). Medical stress was found to have a positive relationship with several health related quality of life (HRQoL) measures, particularly anxiety, depression, fatigue, and sleep disturbance (p < .05). For anxiety, the regression model showed substantial additional variance (23.1%) explained by medical stress beyond GI symptoms alone. This information gives more insight into the external disease influences in hEDS, which includes those that are perpetuated by society and

the medical system. In clinical practice, there is an urgent need to reduce these instances and their impacts in order to decrease patient harm for this vulnerable population and prevent further physical and psychological symptoms.

Keywords: hypermobile Ehlers-Danlos syndrome, medical stress, gastrointestinal symptoms, DGBI, health related quality of life

9:20 AM in ILC 150
Poster

Juarez, Sarai (SRI)
Public Policy Analysis | Politics at Pomona College
ICE and Local Political Communication: Social Media Responses from Tucson's Mayor and City Council
Mentored by: Angie Torres-Beltrán, PhD (Government and Public Policy)

How does Immigration and Customs Enforcement (ICE) activity influence the public communication of local elected officials? Since the start of the second Trump administration, conversations surrounding the unlawful actions of ICE have reignited. While existing scholarship examines the civic and political responses to interactions with said enforcement at the individual level, little research analyzes the relationship between local instances of immigration enforcement and local elites' political communication. This study collects and analyzes over 3,000 original observations of social media data from Tucson's local mayor and city council and community-sourced ICE events in Tucson from *Tucson Migra Map.* Results from a chi-square test of independence and logistic regression, which compare immigration-related social media communication on days with and without local ICE enforcement activity, demonstrate a statistically significant relationship between local ICE enforcement and immigration-related social media communication. After controlling for officials' demographic characteristics, overall social media activity, and ward differences, local officials were approximately 4.1 times more likely to make an immigration-related social media post on days with ICE enforcement activity than on days without such activity. These findings suggest that local immigration enforcement is associated with increased public communication about immigration. Overall, these findings help us understand that, even amid deep polarization, elected officials prioritize responses to enforcement activities.

Keywords: immigration enforcement, political communication, local elected officials, social media, U.S. Immigration and Customs Enforcement (ICE)

12:40 PM in ILC 112
Poster

King, Rachel (Quantum Que)
Psychological Sciences at University of Arizona
Digital Access to Overdose Prevention: A Gap Analysis of Harm Reduction Resources in Pima County
Mentored by: Allison Huff, DHEd (Family and Community Medicine)

Poster

Le, Hieu (FRONTERA)
Biomedical Sciences at Arizona State University
Disparities in Injury Mortality Rates Between Metro and Non-Metro Areas In Arizona
Mentored by: Tawab Saljuqi, MD, DrPH (Medicine)

Poster

LeBlanc, Nicole (SRI)
Neuroscience & Cognitive Science at University of Arizona
Using Community-based Identified Categories in Addressing and Analyzing the Nexus of Food Security in Environmental Justice Communities
Mentored by: Mónica D. Ramírez-Andreotta, PhD and Alma Anides-Morales (Soil, Water and Environmental Science)

Increasing food security throughout the U.S. presents a complex issue that is inherently tied with societal factors consisting of social, economical, political, environmental and epistemological domains. Communities that are low-income, rural and predominantly people of color often lie in the intersection of these societal factors; the understanding of which are needed to properly address food insecurity. Across the literature, the commonality within successful efforts to tackle these factors is through community cohesion; members' interconnectedness and resiliency. To aid in community efforts an understanding is needed of how certain vulnerabilities emerge and differ across populations. Previously collected survey data from residents in both rural and urban Arizona communities will be used to develop a case study with a community-based organization (CBO) along with questions administered to community members. Rooted in grounded theory, focus groups, surveys and oral history sessions will be conducted with both the CBO and community members to inform what challenges and successes are encountered particularly in the production of food through an environmental justice lens. These findings would provide an effective demonstration of community resiliency for CBOs, researchers and policymakers alike to develop community-involvement tools to properly address the societal factors that influence the interplay of food insecurity cause-and-effect. These tools would need to be adapted to each community's specific context to account for the factors that are relevant for facilitating pursuing food security. Further research should investigate the applicability of this framework through observing the implementation across communities under different societal factors.

Keywords: food security, community-based participatory research, community resilience, community capacity, environmental health

11:40 AM in ILC 112
Poster

Li, Joni Grace (Johnson Lab)
Biochemistry | Molecular & Cellular Biology at University of Arizona

Metal Homeostasis in Streptoccoccus Pneumoniae: Developing Novel Technique in Quantifying Copper Transport
Mentored by: Michael D. L. Johnson, PhD and Sahan Senanayaka (Immunobiology)

Poster

Linder, Zachary (B2)
Mathematics at Coe College
Analyzing spatial distributions of uranium located in riparian zones across the Puerco River Watershed in the southwestern United States
Mentored by: Joseph Hoover, PhD, Anu Sethuraman, and Miles Fule (Environmental Science)

Uranium is a geogenic metal commonly found in sedimentary rock deposits across northern Arizona and the Colorado Plateau. The occurrence of these deposits led to extensive uranium mining in the mid-twentieth century. Located in the southwest portion of the Colorado Plateau, residents of the Navajo Nation were significantly impacted by such mining operations and legacy waste. The Puerco River watershed, in northeast Arizona, received uranium-contaminated mine effluent from 1967 to 1986 and the Church Rock tailings dam spill in 1979. Contaminants flowed downstream and potentially seeped into the alluvial aquifer, where downstream residents pump shallow groundwater for drinking and livestock. Despite these impacts, groundwater sampling has been limited, and historical data reports are often incomplete. To address this gap, this study created a spatially comprehensive groundwater uranium prediction map for the watershed. Existing water quality datasets were harmonized, and linear geostatistical models were used to quantify relationships between uranium and geochemical predictors. Additionally, groundwater uranium was spatially interpolated (with and without predictor variables) using Ordinary Kriging and Empirical Bayesian Kriging (EBK) in R and ESRI ArcGIS Pro. Preliminary results suggest that EBK with predictors provided the best model fit based on root-mean-squared error values, with bromine and molybdenum concentrations significantly correlated with groundwater uranium. Predictive maps generated with EBK suggest higher uranium concentrations in the alluvial aquifer near legacy mines and Petrified Forest National Park. Further analysis is needed to understand the correlation between prediction variables and zones of uranium concentration within the alluvial formation.

Poster

Lopez, Christian (Johnson Lab)
Medicine | Microbiology at University of Arizona
Zinc Synergizes with Aminoglycosides Through Disruption of Metal Homeostasis in Streptococcus pneumoniae
Mentored by: Michael D. L. Johnson, PhD and Rithy Meas, PhD (Immunobiology)

Poster

Louis, Janeen (MHD)

Honors Psychology at Howard University
Moving Through Distress: Physical Activity and Affect During Digital CBT
Mentored by: Zachary Cohen, PhD and Nathaniel R. Choukas (Psychology)

Physical inactivity is common among individuals with anxiety and depression and is associated with poorer treatment outcomes. Although physical activity may support emotional functioning, its momentary relationships with affect during cognitive behavioral therapy (CBT) remain unclear. This study examined temporal, contemporaneous, and between-person associations between physical activity and affect during digital CBT. Participants were 38 community college students receiving digital CBT who completed ecological momentary assessments five times daily during treatment weeks 1–2. Nine affect items, rated on a five-point scale, formed positive and negative affect composites. Physical activity was assessed with one item: “How physically active is what you’re doing right now?" on the same scale. Multilevel vector autoregressive models estimated lag-1 temporal, contemporaneous, and between-person associations among physical activity, positive affect, and negative affect. Concurrently, greater activity was associated with higher positive affect (partial r =.18, p < .001). Between individuals, greater average activity was associated with higher average positive affect (partial r =.54, p =.001) and negative affect (partial r =.37, p =.023). Temporally, higher negative affect was associated with greater activity at the next assessment (b =.10, p =.014), whereas activity did not predict later affect (p ≥.541). Although preliminary, this pattern is consistent with individuals increasing activity following distress and experiencing higher positive affect while active, suggesting that physical activity may be a strategy for regulating affect. Follow-up analyses should test whether activity type and social context account for person-specific affective–activity dynamics and whether engagement with digital CBT techniques alters these dynamics over time.

Keywords: Physical activity, Affect, Cognitive behavioral therapy, Ecological momentary assessment, Emotion regulation

10:40 AM in ILC 140
Poster

Luhando, Benite (McNair)
Neuroscience & Cognitive Science at University of Arizona
How Experience Influences the Sequencing of Sensory Behaviors During Spatial orientation
Mentored by: Mel Wohlgemuth, PhD, Katie Braham, Emma-Rose Buhman-Wiggs, Jenna Kunde, and Tebbi (Neuroscience and Cognitive Science)

A central question in neuroscience is how experience in a novel environment shapes the sequencing of sensory and motor behaviors during goal-directed actions such as flight and hunting. This process is particularly important during spatial orienting, when an animal detects a target, directs attention toward it, and executes movements to approach and intercept it, despite dynamic environmental disturbances. Echolocating bats provide an ideal model for investigating this question because they actively generate the sensory signals, they use to perceive their surroundings. Because vocal

production, echo reception, and movement are tightly coupled, the complete sensorimotor loop can be measured in real time using synchronized audio and video recordings. In this experiment, natural hunting behaviors are recreated under controlled laboratory conditions, enabling simultaneous recordings of echolocation calls and flight trajectories during free flight in a three-dimensional environment. This project examined how repeated experience influences the sequencing of sensory sampling and motor behavior during spatial orienting. We hypothesize that experience-dependent learning will produce measurable changes in echolocation pattern and flight trajectories, reflecting more efficient sensorimotor coordination over time. Understanding these adaptive mechanisms will provide new insights into the neural principles underlying learning, spatial navigation, and active sensing across species.

Keywords: bats, echolocation, sensory, behavior, spatial orientation

10:20 AM in ILC 150
Poster

Malik, Aryan (SRI)
Neuroscience at University of Arizona
Striatal Dopamine Response Encodes Initiation and Vigor in a Novel Fine Motor Task
Mentored by: Torsten Falk, PhD and Stephen Cowen, PhD (Medicine)

Dopamine (DA) release in the dorsolateral striatum (DLS) is involved in the initiation and maintenance of ongoing motor function, sensorimotor integration, and motor learning. Most studies of DA release in the DLS have focused on gross motor function. Consequently, less is known about DA's role in fine motor control and inter-limb coordination, behaviors that are compromised in disease states such as Parkinson's Disease (PD). To investigate this, our group developed an automated string-pulling task optimized for neural recording (Jordan et al., 2024). Here we utilize fiber photometry to resolve sub-second to seconds long DA release in the DLS. Adult male Sprague-Dawley rats (n = 3) were trained on the task. Virus (AAV2/9-hSyn-GRAB-DA2h) was injected in the right DLS (AP 0.5, ML 3.4, DV 4.8 mm). Rats received a sham 6-hydroxydopamine (6-OHDA) injection in the medial forebrain bundle (AP-1.8 to-2.8, ML 1.8 to 2.8, DV 8.2). Fiber photometry measures of DA release were acquired during 3 30-minute string-pulling sessions. Preliminary analyses indicate that DA release correlates with the overall string speed. DA levels also increase prior to each string-pulling bout. Analysis of the contralateral paw's movement revealed that DA levels peaked during the slow downwards pull/push phase. Interestingly, DA release during this phase was positively correlated with subsequent reach height and speed. Taken together, these data suggest that DA is not only involved in the initiation and vigor of movement but also plays a role in shaping movements within a sequence of fine-motor actions.

Keywords: Dopamine, Motor Control, Striatum, Basal Ganglia, Parkinson's Disease

9:40 AM in ILC 150
Poster

Mark, Katharia (ACOA/MSTEM Thrive Program)
Medicine at University of Arizona
Be Your Own Champion: How to encourage pre-health professionals to meaningfully participate in interdisciplinary teams to effectively introduce delirium protocols into everyday clinical practice
Mentored by: Marianne Kughleit, MD and Michael Duerden, MD (Psychiatry, Tucson VA Hospital)

Poster

Mercado, Jesus (Quantum Que)
Cyber Operations | Cybersecurity at University of Arizona
Data Integrity Vulnerabilities in Industry 4.0 Technologies: An Analysis on Vulnerability Detection and Response in Industry
Mentored by: Pritak Satam, PhD, Josh Dean, and Lin Yu-Zheng, PhD (Systems & Industrial Engineering | Electrical & Computer Engineering)

Poster

Miranda, Nathan (McNair)
Political Science at University of Arizona
Empire's Guestroom: Has Puerto Rico's Territorial Status Resulted in Different U.S. Policy Than U.S.-Latin America Policy?
Mentored by: Shelby Smith, PhD (School of Geography, Development & Environment)

This research examines Puerto Rico's U.S. territorial status within the broader context of U.S.-Latin American Relations. Specifically, it compares U.S. policy in Cuba and Puerto Rico following the Spanish American War using Greg Grandin's Empire's Workshop framework to investigate if the colonial relationship between the U.S. has led to Puerto Rico being treated as a testing ground for U.S. policy like the rest of Latin America. It employs a qualitative approach of comparative historical analysis using sixty archival government documents to showcase that U.S. policy goals for Puerto Rico resembled that of U.S. foreign policy in Cuba. These documents were gathered from both government and private archival databases and analyzed in accordance to Braun and Clarke's reflexive thematic analysis (RTA) process. This research will show how the U.S. has been able to use Puerto Rico's territorial status to test policy to further U.S. interests. Puerto Rico's territorial status has isolated it from Latin America despite sharing the historical, linguistic, geographical, and cultural traits that define the region. In this research, I will highlight the priorities of the U.S. and policy approaches used to ultimately achieve the goals. These findings may contribute to conversations regarding Puerto Rico's inclusion in Latin America, the U.S.-Puerto Rico relationship, and sovereignty in Latin America.

Keywords: Puerto Rico's U.S. territorial status, colonialism, U.S.-Latin America relations, U.S. foreign policy, U.S.-Puerto Rico relations, U.S.-Cuba relations

1:00 PM in ILC 112
Poster

Miranda, Samantha (MARC)
Applied Biotechnology at University of Arizona
Examining the Phenotype of C. jejuni Strains from Wild Birds
Mentored by: Kerry Cooper, PhD and Dominic Rodriguez (Animal and Comparative Biomedical Sciences)

A major global problem is the spread of bacterial gastroenteritis which is mainly caused by the bacteria Campylobacter jejuni. This bacteria is primarily obtained by consuming undercooked poultry containing Campylobacter, and new strains are largely introduced to poultry birds by wild birds. However, it is unclear as to which strains are the leading cause of health concerns such as bloody diarrhea and malnutrition. My research addresses this issue by examining the phenotype of C. jejuni strains that were collected from wild birds. This summer I investigated 12 of these strains, coming from pigeons, doves, and black birds. I conducted attachment assays, which are a useful indicator as to whether the bacteria will cause disease. The results of these experiments showed no significant difference in attachment between the species tested. This indicates that the attachment rate of C. jejuni strains is consistent between species and may not serve as a good indicator of their disease-causing capability. Overall, examining the phenotype of Campylobacter strains in wild birds will provide a clearer view as to which strains are responsible for severe illness and help advise public health officials on how to devise better strategies to control the spread of gastroenteritis.

11:20 AM in ILC 130
Poster

Mitchell-Reyes, Jose (FRONTERA)
Public Health at University of Arizona
Utilizing FQHCs and Dental Clinics to Address Parental Vaccine Hesitancy among Southern Arizona Families
Mentored by: Sheila Soto, DrPH, MPH (College of Public Health)

Poster

Mixton-Garcia, Isabella (MARC)
Biomedical Engineering at University of Arizona
Understanding Clinical Decision-Making and Implementation of ICU Liberation Bundle: A Simulation-Based Cognitive Task Analysis
Mentored by: Vignesh Subbian, PhD (Systems & Industrial Engineering)

Implementation of the ICU Liberation Bundle has been shown to reduce ICU mortality, shorten mechanical ventilation duration, and decrease delirium incidence, yet adherence in critical care remains inconsistently low, with sedation monitoring compliance documented at about 37% of patient days and delirium assessment at 71%. These gaps contribute to preventable complications including prolonged mechanical ventilation, delirium, and increased mortality. While the bundle clinical benefits are well-studied, the importance of looking at how clinical teams reason and prioritize bundle components in

resource-constrained, high-interruption environments remains poorly understood. Our goal is to characterize how ICU clinicians make decisions related to Liberation Bundle components and identify the cognitive and contextual factors shaping those decisions in simulation-based environments. We will apply the Critical Decision Method, a cognitive engineering technique used to identify reasoning in clinical domains. Participants will include up to 24 intensivists, who will participate in a simulated environment configured to mimic an ICU bay including patient manikins, vital sign monitors, and interfaces to electronic health record systems. We anticipate findings will reveal how objective clinical data, subjective bedside assessments, and contextual factors, such as team communication and resource availability, shape clinical team decisions across specific bundle components, and identify which components are most vulnerable to clinical workflow breakdown. The study will identify specific decision points where the bundle components are most vulnerable to breakdown, by directly informing the design of explainable clinical decision support tools that target the barriers clinicians face when executing bundle protocols in the ICU environments.

Keywords: ICU Liberation Bundle, Critical Decision Method, simulation, cognitive task analysis, human factors engineering

2:40 PM in ILC 130
Poster

Molina, Mia (McNair)
History | Russian at University of Arizona
The Illusion of Liberation | Red Army Sexual Violence in 1945
Mentored by: Colleen Lucey, PhD (Russian & Slavic Studies)

Despite the extensive research scholars have done on the Holocaust, the topic of Soviet sexual violence against Jewish women during the liberation of the concentration camps is largely understudied. This can be attributed to many reasons, such as the uncomfortable nature of the topic, the poor training interviewers received when talking to survivors, or the political atmosphere of countries that were in alliance with the Soviet Union. However, despite the fact that the research on this topic is limited, many testimonies from the USC Shoah Foundation have recounted stories of Soviet soldiers raping Jewish women. The motivation behind the rape often comes from a place of entitlement, as soldiers who liberated the Jewish women expected them to partake in sexual intercourse as a reward. Alternatively, soldiers saw women as tools of sexual desire rather than humans, thus taking advantage of them in such a vulnerable state. In this paper, the primary analysis is on the motivation behind Soviet rape as well as the circumstances that soldiers experienced both during and before World War II that promoted an environment of rape. Analysis is performed by watching testimonies from the USC Shoah Foundation and organizing the videos based on the motivations that the survivors have attributed either to their rape or the rape of someone they know and whether the rape was committed by an individual perpetrator or by a gang-rape.

2:00 PM in ILC 112
Poster

Molina Gutierrez, Micheal T. (McNair)
Psychology at University of Arizona
Examining Emotional Intelligence Training as a Resilience-Building Intervention Across Military Members
Mentored by: William D. Killgore, PhD, Alisa Huskey, PhD, and Shivani Mann, PhD (Psychiatry | Medicine)

Military service members face repeated stressors that can affect psychological functioning, making resilience an important concern in military populations. Rather than as a fixed trait, resilience is generally understood as a dynamic process of maintaining or regaining adaptive functioning after adversity (Abate et al., 2024; Egan et al., 2024; Hamby et al., 2025). Emotional intelligence (EI), including emotional awareness, understanding, and regulation, is proposed as one of the foundations of resilient functioning (Smith et al., 2018). The University of Arizona SCAN Lab developed an online Emotional Intelligence Training (EIT) program that improved self-reported and performance-based EI, mindfulness, emotional awareness, and emotion regulation (Durham et al., 2023; Smith et al., 2024). However, it remained unclear whether these gains translated into higher resilience scores. This secondary analysis examined whether EIT increased total Connor-Davidson Resilience Scale (CD-RISC) scores and whether change differed among participants who were nondeployed, deployed without combat exposure, or deployed with combat exposure. A mixed-design repeated-measures ANOVA found no significant increase in total CD-RISC scores following EIT and no meaningful moderation by deployment or combat history. These findings suggest that EIT can improve targeted emotional skills, yet these benefits alone may not be sufficient to address the broader processes that underlie resilience. These results may also reflect a mismatch between the mechanisms targeted by EIT and the broader range of personal and adaptive capacities measured in the CD-RISC.

11:40 AM in ILC 140
Poster

Molmenti, Alexia (FRONTERA)
Biology at University of Arizona
Determinants of Parental Vaccine Hesitancy and Vaccination Decision Making Across the United States
Mentored by: Tomas Nuno, PhD (College of Public Health)

Poster

Morrow, Maddy (MHD)
Biochemistry at University of Arizona
Role of CadN Knockdown in Wrapping Glia Morphology in Drosophila melanogaster
Mentored by: Megan Corty, PhD (Neuroscience)

Understanding how axon-associated glia develop, and function is important to further our understanding of neurodegenerative disorders. We are interested in how non-myelinating glia

develop, as non-myelinating glia are understudied relative to their myelinating counterparts. *Drosophila melanogaster* wrapping glia are analogous to vertebrate Remak Schwann cells . Like Remak Schwann cells, *Drosophila* wrapping glia impact transmission of information and precision of neuronal signaling Kottmeier et al, 2020. We utilize *Drosophila melanogaster* as a model organism because of its accessible molecular toolkits, which allow for specialized gene expression, silencing, and tractability. The utilization of the GAL4-UAS system allows for cell type specific gene manipulation and labeling, including knockdown of genes using RNAi. We did a large screen to find regulators of wrapping glia development and are following up on initial screen hits. I am aiming to analyze a preliminary "hit" to confirm its role in wrapping glia development, selectively dissecting 3rd-instar larvae in which CadN gene expression is knocked down, and imaging nerves to further analyze morphology. In the loss of adhesion imposed by the CadN gene knockdown, we expect to see a disruption in the wrapping glia and axonal system, resulting from improper wrapping or deviations in glial morphology.

1:20 PM in ILC 150
Poster

Nguyen, Cindy (MHD)
Biomedical Engineering at University of Arizona
Modifiers in S. cerevisiae
Mentored by: Mario Romero-Ortega, PhD and Kristen Jackson
Lindsay Stoy (Biomedical Engineering)

Peripheral nerve gaps occur when a nerve is damaged, and the severed endings retract. Injuries exceeding 3cm are classified as long-gap nerve injuries and remain a significant clinical challenge due to limited axonal regeneration, often resulting in prolonged denervation, skeletal muscle atrophy, and permanent functional loss. Currently, autograft repair is the clinical gold standard, as direct end-to-end repair can cause excessive tension. However, this requires sacrificing a healthy donor site, creating additional morbidity. This study aims to investigate an alternative repair strategy by evaluating skeletal muscle preservation following a 1.5cm gap nerve injury by comparing autograft repair with a hollow PLCL (poly(lactide-co-caprolactone)) nerve guidance conduit repair. The gastrocnemius muscle was harvested from ten Lewis rats twelve weeks following sciatic nerve repair, and compound muscle action potentials (CMAPs) were recorded to assess functional reinnervation. Muscle tissues were cryosectioned and stained with hematoxylin and eosin (H&E) to evaluate muscle fiber count and area. Immunofluorescence staining for CHRNA1, a neuromuscular junction (NMJ) marker, was performed to assess denervation, reinnervation, and NMJ remodeling following nerve injury and repair. Comparison between repair groups will evaluate the extent of skeletal muscle preservation following each treatment. We anticipate that the PLCL conduits will enable functional reinnervation, preserve muscle architecture and reinnervation markers, and achieve NMJ integrity comparable to autograft repair. This work seeks to improve our understanding of skeletal muscle responses following peripheral nerve injury

and repair and support the development of regenerative therapies that restore function while reducing the limitations associated with current surgical procedures.

1:40 PM in ILC 130
Poster

Nunez, Katie (MHD)
Pharmaceutical Sciences at University of Arizona
Evaluating the Effects of Stabilizers and Nanofabrication Methods on the Physicochemical Properties of Biodegradable Nanoparticles
Mentored by: Abhijit Date, PhD, Sanjoli Joshi, and Yashika Garg (Pharmaceutical Sciences)

Polymeric nanoparticles have been studied for several years as drug delivery platform due to their ability to improve drug stability, control release and enhance therapeutic efficacy. Poly(lactic-co-glycolic acid) (PLGA) is one of the most common polymers used to synthesize nanoparticles due to its biodegradability and biocompatibility. However, creating nanoparticles can be complicated as formulation parameters can substantially impact the particle size, uniformity, surface charge, and stability. This study evaluated the effects of various surfactants, nanoparticle synthesis methods, and polymer molecular weight and type on the physicochemical properties of the particles. Fourteen unique formulations were prepared using nanoprecipitation and single emulsion method with varying surfactants and polymer types. Analysis of the nanoparticles was done using dynamic light scattering to determine the size, polydispersity index (PDI), and zeta potential immediately after synthesis and again after 24 hours to check stability. Among the formulations tested, Tween 80 (T80) and Poloxamer 188 (P188) produced the most stable nanoparticles by nanoprecipitation, with average particle sizes of 72.46 nm and 100.58 nm, whereas P188 synthesized by single emulsion had an average particle size of 71.84 nm. This study suggests that various parameters in nanoparticle synthesis do have a significant effect on the physicochemical properties of the particles with stable formulations shown to be possible. The findings of this study provided an optimized platform for future drug encapsulation and drug delivery studies.

3:00 PM in ILC 130
Poster

Orta, David (UROC-Prep)
Biomedical Engineering at University of Arizona
Three-Dimensional Reconstructed Computed Tomography for Regional Density Variation Analysis in the Hamate Bone
Mentored by: Johnny Ray Runyon, PhD, Zong-Ming Li, PhD, and Trevour Greene (Environmental Science | Orthopaedic Surgery)

Bone density variation is known to be influenced by regional physiological load, yet previous studies often evaluate carpal bones as unified structures with a single, average density. The purpose of

this study was to investigate regional bone mineral density (BMD) variations within the hamate bone. It was hypothesized that the hook of the hamate region will exhibit higher average vBMD as an adaptation to the transverse carpal ligament attachment site. Computed tomography (CT) scans were obtained from 14 *ex vivo* dry bone specimens, for three-dimensional reconstruction. Utilizing a semi-automatic segmentation approach, reconstructed models were processed using a 100 Hounsfield Unit (HU) threshold to isolate bone tissue. Hamate models were split into the central body and the Hook of Hamate regions. Regional HU values were converted into physical mass density using a linear calibration, $\rho = 1.0 + 0.001HU$. A two tailed paired t-test was used to compare vBMD between hook and body of the hamate. The vBMD of the hook region(1.67 ± 0.19 g/cm^3) was significantly greater compared to the body (1.55 ± 0.11 g/cm^3). This mean regional difference of 0.12 (g/cm^3) was statistically significant ($p = 0.006$), when a two tailed t-test was performed. Findings support the hypothesis that the Hook of Hamate demonstrates a higher average vBMD in comparison to the central body. Regional analysis suggests the observed increase in rBMD is an adaptation to the strain imposed by the transverse carpal ligament.

Keywords: density, carpal, CT, 3D reconstruction, Hounsfield

1:20 PM in ILC 130
Poster

Ortiz Urrea, Leslie (MHD)
Applied Biotechnology at University of Arizona
Development of an FDA-Approved Drug Repurposing Pipeline in Human iPSC-Derived Cardiomyocytes
Mentored by: Hesham Sadek, MD, PhD and Malay Chaklader, PhD (Medicine)

Repurposing drugs enables and accelerates the discovery of treatments for inherited genetic heart diseases. Candidate selection can be optimized by integrating computational approaches with human iPSC-derived cardiomyocyte models and in vivo testing. This project aims to develop an FDA-approved drug repurposing pipeline for identifying structural protein expression in human iPSC-derived cardiomyocytes. An in silico screen of FDA-approved compounds using large-scale gene expression facilitated the prioritization of candidate molecule identification, followed by in vitro molecular validations at the transcript and protein levels. Thereafter, the most efficient compounds will be assessed by in vivo mouse models. This workflow allowed for the prioritization of several compounds for experimental confirmation. The use of computational screening with human iPSC-derived cardiomyocyte assays and in vivo models created a reliable and efficient way for identifying molecules with a possible therapeutic benefit. This offers a framework for FDA-approved drug repurposing and simplifies the translation of computational predictions into experimental confirmation using human iPSC-derived cardiomyocytes and animal models.

11:40 AM in ILC 130
Poster

Ouzounian, Quincy (MARC)
Physiology at University of Arizona
Chronic Opioid Exposure Changes Respiratory Outcomes in a Drug Dependent Manner
Mentored by: Tally Largent-Milnes, PhD and Kelly Karlage (Pharmacology)

The opioid epidemic is a pressing matter in the field of pharmacology with scholars advocating novel treatments. The rapid increase of opioid overdoses emphasizes the need for efficient mechanisms to treat opioid-induced respiratory depression (OIRD) while minimizing side effects. This sparks the investigation of cannabidiol (CBD) and studying its utility when used with opioids. Over 4 weeks, we conducted a chronic study on 32 male mice and 32 female mice. We used whole body plethysmography to measure respiratory function and blood gas analysis on mice treated with CBD, morphine, both drugs and neither. In mice injected with both CBD and morphine, females showed higher sO2 and FO2Hb and lower FHHb compared to males. The respiratory rate, tidal volume, and minute volume outcomes differed depending on the chronically administered drug and the sex of the mouse. Establishing cannabidiol as a strategy to mitigate OIRD can facilitate clinical translation to help end the opioid epidemic. By researching the impact of drugs on respiratory function, communities affected by opioids can learn about the potential to reduce fatalities and pave a path to future discoveries.

11:40 AM in ILC 120
Poster

Pema, Leya (ACOA/MSTEM Thrive Program)
Psychological Sciences at University of Arizona
Falls Prevention Interventions for Latino, Hispanic, Native American, and Asian American Older Adults
Mentored by: Tawab Saljuqi, MD (Surgery)

Poster

Peña, Ruben (B2)
Biosystems Engineering at University of Arizona
Applying the three-temperature (3T) model to estimate spatially distributed evaporation across the Landscape Evolution Observatory
Mentored by: Peter Troch, PhD and Nathan Strom (Hydrology and Atmospheric Sciences)

Evapotranspiration (ET) is a critical component of the water cycle in arid and semi-arid environments. This cycle has direct implications for organisms that rely on water and geochemical reactions activated by water; however, it is difficult to measure at high spatial resolution under controlled field conditions. The Landscape Evolution Observatory (LEO) at Biosphere 2, provides a unique platform for precise control and monitoring of hill slopes which allows ET processes to be studied at scales and resolutions difficult to achieve in natural field settings. This study applies the three-temperature (3T) model, a surface energy balance approach to estimate spatially distributed ET across the LEO hillslope by combining point-scale LI-COR 850 ET measurements, with thermal surface temperature imaging. The 3T

model uses a known reference evaporation and applies a factor of the surface temperatures to estimate the evaporation at a target location. This method requires precise measurements of energy balance for accurate evapotranspiration calculations. Model performance was evaluated by comparing 3T estimated evaporation against direct LI-COR measurements. Additionally individual energy balance inputs were evaluated including net radiation, soil heat flux, surface temperature and sensor-sample location distances. Results will help understand the key experimental limitations at LEO, energy balance input requirements and measurement improvements required to improve 3T-ET model functioning.

Poster

Peralta, Sebastian (FRONTERA)
Physiology and Medical Sciences at University of Arizona
Socioeconomic Disadvantage, Stage at Diagnosis, and Undertreatment of Pancreatic Cancer: A National Cancer Database Analysis
Mentored by: Faisal Shah Jehan, MD (Surgery)

Poster

Perez, Isabella (ACOA/MSTEM Thrive Program)
Psychological Sciences | Religious Studies | Spanish at University of Arizona
Challenges in Treating Late Life Treatment Resistant Depression: The Background and Rationale for IRL-GREY-C
Mentored by: Jordan F. Karp, MD (Psychiatry)

Poster

Phillips, Jordan (MHD)
Psychology at Alabama State University
The Integration of Generative AI in Higher Education: Comparing First-Gen and Continuing Generation Perceptions of ChatGPT
Mentored by: Sarah Grace, PhD (Psychology)

Generative artificial intelligence (GenAI) has prompted substantial debate in higher education and psychology. Some scholars view the integration of GenAI as a valuable resource for student success, whereas others raise concerns about its effect on learning and critical thinking. Yet educational research has devoted limited attention to how students themselves perceive these effects, particularly whether perceptions differ by first-generation status. This study examines first-generation and continuing-generation students' perceptions of GenAI's contributions to their learning, critical thinking, and academic experiences. Data were collected from 558 undergraduate psychology students through a survey containing Likert-scale items, a multiple-choice response item, and demographic questions. The sample included 145 first-generation students (26.0%), 386 continuing-generation students (69.2%), and 27 students who selected not applicable (4.8%). Most participants identified as women (n = 438, 78.5%). Findings indicate that both generational groups perceive AI as a meaningful academic tool.

However, the results also reveal differences in the degrees and ways in which students regard AI as contributing to their academic experiences, suggesting that its perceived value is more nuanced than a uniform positive or negative assessment. Examining these perceptions can help instructors better understand how students engage with GenAI and how that engagement may relate to learning, critical thinking, and academic success. These findings may also inform the development of instructional practices that acknowledge differences among students while supporting thoughtful, transparent, and academically purposeful uses of GenAI in psychology courses across diverse undergraduate populations in higher education settings.

Keywords: Generative artificial intelligence (GenAI), perceptions, first-generation (first-gen)

2:00 PM in ILC 140
Poster

Potter, Jake (UROC-Prep)
Special Education: Mild to Moderate Disabilities emphasis at University of Arizona
Health and Wellness Programs Impact on the Intellectual and Developmental Disability Community
Mentored by: Alyssa Smith, PhD, OTR/L, NBC-HWC, End-of-Life Doula (Speech, Language, and Hearing Sciences)

Prior research has shown that individuals with Intellectual and Developmental Disabilities (IDD), as well as their care-partners are underrepresented and under-supported in the health and wellness space. Our research employs a parallel mixed methods design to investigate the healthcare needs, health-related literacy, autonomy, and stress coping strategies of individuals with IDD as well as their care-partners. This study addresses the importance and benefits of health coaching for individuals with IDD by comparing data collected from in-field conversations (transcripts) with individuals who have IDD in a health coaching setting to data collected from our future IDD-care partner community needs survey. This study uses a mixed methods approach incorporating our quantitative data in the form of a community survey. This instrument captured descriptive metrics on prevalent healthcare needs, access to health literacy programs, and care-partner stress levels. Concurrently, qualitative data were generated by cleaning and analyzing multiple transcripts of structured sessions between the research mentor and individuals with IDD. We will use the qualitative data from the transcripts to complete a thematic analysis in order to pinpoint the most common health and wellness related needs and supports for individuals with IDD. Our anticipated findings are that the data from individuals with IDD in the transcripts as well as from our community survey will align to give us a full picture of the health and wellness needs of individuals with IDD. These results will promote further research and implementation within IDD and care partner communities in improving health promotion program development.

Keywords: IDD, Health, Wellness, Care-partner, Coaching

2:40 PM in ILC 120
Poster

Quintero, Angela (UROC-Prep)
Chemistry at University of Arizona
Synthetic optimization of an acid-responsive fluorogenic triazabutadiene probe for environmental sensing.
Mentored by: John Jewett, PhD and Abby Dalton (Chemistry & Biochemistry)

This project consisted of the organic synthesis of a fluorogenic triazabutadiene (TBD) molecule. The TBD serves as a biomolecular sensor that responds to changes in acidic pH environments. The objective was to optimize the synthetic reaction conditions for TBD, since it is highly acid-labile and prone to degradation. When the optimized fluorogenic TBD is exposed to an acidic environment, it releases aryl diazonium ions, causing an intense fluorescent signal. The lab experiments followed these reactions: first, the azidation of 4-bromoaniline to 4-bromophenyl azide; second, the creation of the imidazolium salt by reacting 1-tert-butylimidazole with methyl iodide; and third, the use of potassium tert-butoxide (KOtBu), a strong base that generates the N-heterocyclic carbene, which reacts with the azide to form the TBD scaffold. Stoichiometry and percent yield calculations were used to determine the efficiency of each reaction, and nuclear magnetic resonance (NMR) confirmed the final product's identity. Results showed a yield of 44% for the azide reaction and a 99% yield for the imidazolium salt synthesis. NMR confirmed the presence of the expected functional groups. The final steps included the workup of the acid-sensitive TBD, which reduced side products and provided the successful synthesis of a fluorogenic TBD for biological pH detection.

Keywords: Fluorogenic triazabutadiene, optimization of organic reactions, acid-labile probes, pH detection, biomolecular sensor.

2:20 PM in ILC 150
Poster

Rabiee, Millad (B2)
Pre-Engineering at Norco College
Vertical Distribution of Total Organic Carbon Concentration and Accumulation at the Landscape Evolution Observatory
Mentored by: Katerina Dontsova, PhD, Favianna Cubello, and Norma Villagomez-Marquez (Environmental Science)

Soil fertility and global carbon cycling are strongly influenced by carbon accumulation during soil development. Understanding how organic and inorganic carbon accumulates during soil formation is important for understanding how ecosystems evolve and how carbon is sequestered during soil development. The Landscape Evolution Observatory (LEO) at the University of Arizona Biosphere 2 is an experimental facility designed to study early soil and ecosystem development processes in a controlled setting. This study examines changes in total organic carbon (TOC) concentration and accumulation with soil depth in the Landscape Evolution Observatory. We hypothesize that TOC concentrations will decrease with increasing depth because organic matter inputs originate primarily at the soil surface,

where microbes are the most active. Three replicate hillslopes composed of granular basalt were used in this study. Soil cores were collected from multiple slope locations, air-dried, homogenized, and analyzed for total organic carbon using a Shimadzu TOC analyzer. Statistical analyses were performed to evaluate differences among soil depths. Data collection and analysis are currently underway; however, we expect surface soils to contain significantly greater TOC concentrations and carbon accumulation than deeper soil layers. These findings will improve our understanding of how carbon is distributed throughout the soil profile during the early stages of soil formation and help explain the mechanisms regulating carbon storage in young ecosystems. This work will lay a foundation for further research in soil development, ecosystem evolution, and long-term storage of carbon in natural and artificial systems.

Keywords: Total organic carbon (TOC), Landscape Evolution Observatory (LEO), Soil development

Poster

Rezene, Ruta (UROC-Prep)
Cyber Operations at University of Arizona

ARDA: A Multi-Agent Simulation of Adversarial Attacks and Data Poisoning Defense in Machine Learning Phenotyping Pipelines

Mentored by: Alexander Bucksch, PhD (Plant Sciences)

Automated plant phenotyping pipelines guide crop-breeding decisions in resource-constrained regions. Yet their vulnerability to adversarial manipulation remains underexplored, where manipulated images fed to the model yield inaccurate measurements that misguide food-security policy. This study tests whether a co-evolutionary defender, one that retrains against an adapting attacker each round, detects manipulation more reliably than a defender trained once on a fixed dataset. We hypothesize that the static detector's accuracy will degrade as the attacker adapts, while the co-evolutionary detector's will hold, producing a widening detection gap over successive rounds. To test this, an adaptive attacker and an adaptive defender compete across iterative rounds on plant root images. The attacker perturbs pixels, metadata, and compression under a gray-box constraint, meaning it has partial system knowledge, while the defender combines a Vision Transformer with two complementary forensic checks. Both defenders face an identical recorded attack sequence, isolating adaptation as the only variable. The comparison is repeated against three cyber threat intelligence adversary profiles, spanning stealth-prioritizing, balanced, and damage-prioritizing motivations, to test whether the defender advantage holds across qualitatively different attackers. Preliminary results support the hypothesis: the co-evolutionary defender caught 64% of attacks against 29% for the static baseline, a 35-point advantage that widened as the attacker adapted. These findings indicate that deployed phenotyping detectors require continual adaptation rather than one-time training to remain reliable against motivated adversaries. Left undetected, such manipulations poison the scientific datasets that train future models, with direct implications for securing agricultural AI in the Global South.

Keywords: adversarial machine learning, threat modeling, image forensics, cyber threat intelligence, data integrity

9:40 AM in ILC 112
Poster

Rivas, Marla (MHD)
Neuroscience & Cognitive Science at University of Arizona
Associations between Spatial Navigation and Gait in Young and Older Adults
Mentored by: Paul Hill, PhD and Sabrina Sutherland (Psychology)

Path integration is a fundamental component of spatial navigation that allows individuals to estimate their position and orientation using self-motion cues. Impairments in path integration have been linked to normal aging and may serve as an early marker of Alzheimer's disease. The objective of this study was to examine whether age-related differences in gait, which relies on many of the same cognitive and sensorimotor systems as spatial navigation, account for age-related differences in path integration performance. This study investigated age-related differences in path integration performance and the relationship between gait and path integration performance in 44 healthy participants (22 young and 22 older adults). Participants completed a virtual reality Triangle Completion Task, in which they walked to two visual waypoints and then returned to the starting location without visual landmarks. Path integration performance was measured using angular error (deviation in heading direction) and linear error (difference between the estimated and actual return distance). To assess gait, participants completed standardized two-minute walking assessments while wearing digital inertial sensors under single- and dual-task conditions. Multiple regression analyses examined the relationship between gait and path integration while accounting for age group. Preliminary results showed that older adults had significantly greater angular error than younger adults, while linear error was numerically higher but not statistically significant. Significant interactions between age groups and both gait stability and turning dynamics suggest these gait measures are more strongly associated with path integration performance in older adults.

10:40 AM in ILC 150
Poster

Roberts, Megan (MARC)
Biomedical Engineering at University of Arizona
Design of a Biomimetic Rat Hind Limb for Osseosurface Device Serpentine Testing
Mentored by: Philipp Gutruf, PhD and Vaishnavi Narayanan (Biomedical Engineering)

Continuous monitoring of bone density and deformation provides a basis for determining bone health. Osseosurface devices monitor these metrics and transmit data from live models, giving real-time information on bone healing. While large animal models allow for the entire device to be placed on

femur, small animal models face difficulties due to space constraints. As such, it is optimal to place the device body subcutaneously on dorsum and sensor panel on femur, routed through tissue using a serpentine interconnect. However, with in vivo rodent testing, this serpentine deteriorates during prolonged movement over the hip joint. Current benchtop and FEA testing methods indicate device should withstand indefinite deformation, which does not align with consistently observed failures when implanted. To address this discrepancy, a biomimetic rat hind limb was developed to replicate real conditions and kinematics of bone, muscle, and skin for osseosurface device serpentine testing. Serpentines were tested until failure (200,000+ gait cycles) while monitoring resistance via voltage divider at strike, stance, and swing phases. Data accurately modeled the results of serpentine failure behavior during in vivo studies. This introduces a system for rapid development and testing of new serpentines while minimizing the need for live rats. Future applications of this device include testing of any flexible implantable electronics that undergo non-linear deformation.

Keywords: Biomimetic Testing, Flexible Electronics, Mechanical Fatigue

2:20 PM in ILC 130
Poster

Robinson, Javier (SRI)
Aerospace Engineering at Embry-Riddle Aeronautical University
Study Proposal for Experimental Validation of Affine Formation Control in Flapping-Wing Drones
Mentored by: Hossein Rastgoftar, PhD (Aerospace & Mechanical Engineering)

Affine formation control is a method for controlling coordinated groups of autonomous vehicles that allows a formation with any number of vehicles to reliably move, rotate, scale, or shear over time. It has been tested in quadcopter drones, but not in flapping-wing drones which are less conventional. This is likely because the mechanics involved in flapping-wing drone operation are more complex and less widely studied. However, they show potential for high efficiency in particular applications such as enclosed spaces and small-scale operation, making them a valuable subject for future research. This proposal aims to design several tests for implementing affine formation control on flapping-wing drones. A basic flight test is expected to demonstrate control of flapping-wing vehicles as an autonomous group, and verify relevant hardware that will be necessary for implementing affine formation control. An affine convergence test is expected to show that affine formation control is capable of physically converging on a target. Finally, an obstacle avoidance test is expected to fully validate affine formation control under identical conditions that have been previously tested with quadcopters. This will enable future research on flapping-wing vehicle cooperation and broaden the range of platforms that affine formation control can be applied to.

Keywords: affine transformation, autonomous control, autonomous vehicle, flapping-wing

9:20 AM in ILC 130
Poster

Salinas, Celeste (MHD)
Psychology at University of Arizona
Effects of a Digital Game-Based Learning Workshop on Undergraduate Students' Perceived Instrumentality
Mentored by: Katherine Cheng, PhD and Isabella Palazuelos (Educational Psychology)

Historically marginalized students (HMS) continue to face barriers to participating in undergraduate research despite its importance as a pathway to graduate education and STEM careers. Future Time Perspective (FTP) theory suggests that students are more motivated to engage in present learning when it is perceived as beneficial for achieving future academic and career goals. To foster future-oriented motivation, *StatQuest*, a three-day digital game-based learning (DGBL) workshop, was developed to teach foundational research methods, statistics, and R programming. Participants reinforced newly learned concepts by applying them in an interactive game, *Mystery at Stat Manor*. Pre- and post-workshop survey data were collected from undergraduate participants (N = 45) using an adapted Perceived Instrumentality Scale (PIS). A 2 x 2 mixed-design ANCOVA, controlling for age and Hispanic/Latinx status, examined changes in perceived instrumentality over time between first-generation and continuing-generation students. Results revealed no significant main effect of time, $F(1, 17) = 4.27$, $p = .054$, partial eta squared = .20. A significant main effect of first-generation status was observed, $F(1, 17) = 12.08$, $p = .003$, partial eta squared = .42. The Time x First-Generation Status interaction was not significant, $F(1, 17) = 1.34$, $p = .264$, partial eta squared = .07. These findings suggest that first-generation students consistently perceived greater future value in research and statistics than continuing-generation students. Future research should examine whether longer or repeated DGBL interventions can lead to long-term improvements in perceived instrumentality.

2:20 PM in ILC 140
Poster

Sanchez, Viviana (UROC-Prep)
Psychology at University of Arizona
Parent and youth ethnic racial socialization and cultural value concordance in Asian American and Hispanic/Latino/e dyads.
Mentored by: Melissa Flores, PhD, Sei E. Kim, PhD, and Melanie Garcia (Psychology at U of A | Family Science and Human Development at Montclair State University)

Parental ethnic racial socialization (ERS) involves parents conveying messages about race and ethnicity to their children and is associated with many youth well-being outcomes. The transmission of cultural values including collectivism, individualism, and familism, is another important and well-studied process. Nonetheless, ERS dimensions and their correlation with parent-child cultural value concordance remains understudied. Researching cultural transmission helps explain how adolescents internalize parental messages. This study investigated the relationship between parental ERS and parent-child cultural value concordance.

Data from a parent-youth well-being study in New Jersey and New York were reanalyzed. Participants included 83 Asian American and Hispanic/Latino/e adolescents (ages 13-19) and one parent or caregiver. Concordance was calculated by subtracting youth scores from parents' scores. Multiple linear regressions analyzed parent-adolescent concordance in parental ERS and individualism, collectivism, and familism, controlling for age, gender, U.S. generation status, race/ethnicity, and education level.

Parent-youth-reported ERS demonstrated association patterns with parent–youth concordance of cultural values. Across both parents and youth, Cultural Pluralism (*b*=-.883, 95% CI [-1.308,-.458]), (*b*=-.593, 95% CI [-1.025,-.160]) and Becoming American (*b*=-.698, 95% CI [-1.110,-.286]), (*b*=-.709, 95% C [-1.300,-.118]) were consistently associated with lower collectivism and familism concordances. Maintenance of Heritage Culture showed few associations.

More parental Cultural Pluralism and American assimilation messages were associated with less concordance suggesting that when parents encourage acculturation, adolescents retain culture. Findings insinuate that ERS emphasizing bicultural adaptation may be more related to intergenerational cultural values than heritage preservation.

Keywords: parental ERS, cultural values, individualism, collectivism, familism, Asian-Americans, Latinos, adolescent well-being

1:20 PM in ILC 140
Poster

Sandoval Diaz, Drizella (McNair)
Psychology at University of Arizona

Hypertensive Disorders of Pregnancy, Social Support, and Racial-Ethnic Differences: A Systematic Review

Mentored by: Melissa Flores, PhD, Victoria Rueda, Stephanie Dominguez, Josephine Beltramo, and Melanie Garcia (Psychology)

Introduction

Hypertensive disorders of pregnancy (HDP) encompass 4 high risk diseases related to maternal health outcomes: eclampsia, preeclampsia, chronic hypertension, gestational hypertension, and are the leading causes of maternal morbidity and mortality affecting about 10% of pregnant people worldwide. Previous literature indicates that maternal health outcomes disproportionately affect different racial-ethnic groups and suggests social support may be linked to improved maternal health behaviors. This systematic review aims to understand how racial-ethnic differences may moderate the association between social support and HDP.

Methods

Four databases were searched, including PubMed, PsychINFO, Scopus, and CINAHL. Articles from these databases were screened through Rayyan. A total of 14,011 articles were pulled. Quantitative self-report measures of social support, both structural and functional, in relation to HDP and racial-ethnic differences, were included.

Results

Quantitative data once manually collected from articles that meet the inclusion criteria will be put into an extraction table. A narrative synthesis will then be conducted in place of a meta-analysis to qualitatively review the evidence between HDP and social support. It is hypothesized that higher levels of social support may be associated with lower health risks of HDP in different racial-ethnic groups.
Discussion/Conclusion
This review will synthesize existing evidence examining the association between social support and HDP and evaluate how these associations may differ across racial-ethnic groups. By examining these findings, gaps in literature may be addressed, and aims to strengthen understanding of correlations with the risk of HDP.

Keywords: Social support; Perceived social support; Social support interventions; Social networks; Preeclampsia; Hypertensive disorders of pregnancy; Eeclampsia; Gestational hypertension; Chronic hypertension; Racial-Ethnic

1:00 PM in ILC 140
Poster

Sarabia Ortiz, Angel (UROC-Prep)
Chemistry | Environmental Science at University of Arizona
Can The Elaboration of Wastewater Treated Water Change the Public Mind: Reclaimed and Potable Water Focus
Mentored by: Luisa Ikner, PhD and Simran Singh (Environmental Science)

Natural potable sources of water such as the Colorado river and aquifers are being depleted in Tucson, Arizona, with little contingency to replenish them; therefore, innovative methods to substitute these sources must be achieved and explored. Recycling wastewater back into either reclaimed or potable water are two feasible methods, yet they're undermined by Tucson's public eye for its disdain and prejudice against utilizing wastewater for potable applications. By detailing practiced qualitative methods in wastewater treatment plants in which secondary and tertiary effluent denatures, eliminates, and filters out pathogens, with additional interest in Advanced Water Purification techniques, AWP, and Direct Potable Reuse method, DPR; these complex processes can be reformed into layman terms, allowing for more accessibility in public understanding. The proposed quantitative survey will recruit participants residing in Tucson through in-person interaction with flyer distribution, with information to direct participation through an online REDCap survey. A follow-up conference with participating individuals from the survey will have an opportunity to taste AWP-treated potable water in comparison with commercial bottled water. Survey and follow-up conference will assess participants' perception of reclaimed water and AWP before and after conference information. Mixed methods expected findings of participant opinion data sheets will be overall accepting, therefore beneficial for the approval of proper and safe applications of reclaimed water and AWP within Tucson. Anticipated approval would benefit AWP and wastewater treatment plants for data analysis of Tucson. Broadening water safety and how to approach establishing wastewater to DPR AWP facilities in tandem with Tucson's' public trust.

Keywords: Advanced Water Purification, Reclaimed water, Direct Potable Reuse, Public acceptance, Potable water

2:40 PM in ILC 150
Poster

Semidey, Nelson (UROC-Prep)
Agribusiness, Economics, and Management at University of Arizona
Climate Smart Agricultural Practices and Their Outcomes
Mentored by: Jeffrey Michler, PhD and Anna Josephson, PhD (Agricultural & Applied Economics)

Sub-Saharan Africa suffers significant amounts of food insecurity and poverty. The region is primarily made up of subsistence farmers, who rely on what they grow to feed themselves and their families. Because climate shocks and prolonged droughts pose severe threats to agricultural yields and household food security, climate-smart agriculture (CSA) can be utilized to hedge against climate risk, while improving productivity and optimizing inputs. Current research has mixed findings on whether CSA practices improve yields. Using survey data from the World Bank, focus will be put on Ethiopia (2012 – 2022) to find out if the use of climate-smart agricultural practices are associated with a positive impact on yields versus traditional agriculture. As part of this study, 3,774 rural households were investigated. A fixed effects regression analysis was completed with crop yields transformed using the inverse hyperbolic sine (IHS) function. Crop yield is the dependent variable and CSA practices (including crop rotation, intercropping, seed type, irrigation, manure, compost, organic fertilizer use, and planting dates) are the independent variables. Results show percent increases of crop yields when the CSA practices of irrigation (38.6%), manure (13.4%), improved seeds (28.8%), and intercropping (39.1%) were adopted, and were significant at the 1% level. While adoption remains low, results from this research and other research done in the field can potentially convince families and governments to implement CSA and work towards reducing food insecurity overall.

Keywords: Climate Smart Agriculture, Smallholder Farms, CSA Adoption, Food Insecurity, Rural Ethiopia

1:40 PM in ILC 120
Poster

Serrano, Dianella (FRONTERA)
Physiology and Medical Science at University of Arizona
Studying the Effects of Aging and Loss of the Transcription Factor, Nrf2, on Neural Stem Cells
Mentored by: Lalitha Madhavan, MD, PhD (Medicine)

Poster

Shankar, Jeremiah (SRI)
Molecular & Cellular Biology at University of Arizona
Investigating Sequential Segmentation: eve Enhancer Exploration with CRISPR/Cas9

Mentored by: Lisa Nagy, PhD (Cellular & Molecular Medicine)

A fundamental feature of arthropod development is segmentation, a process adding repetitive units within a body plan. *Drosophila melanogaster* and *Tribolium castaneum* have evolved separate modes of segmentation: simultaneous and sequential. *Drosophila* segmentation relies on a genetic cascade to pattern the embryo and modular *even-skipped* (*eve*) enhancers to produce stripe-specific expression. In *Tribolium*, *eve* also drives segmentation within a molecular oscillator operating in the embryonic posterior, or Segment Addition Zone (SAZ). However, *Tribolium eve* enhancers have yet to be described. Previous students in the lab identified a putative enhancer region 11-12 kb downstream of the *eve* ORF using MCAST, FIMO, and published ATAC-seq data. Knockdown of transcription factors predicted by bioinformatics to regulate *eve* cause complete to partial segment loss (*Caudal*), or segment loss posterior to their expression domains (timer genes *hunchback* and *Krüppel*). Characterizing *Tribolium eve* enhancers will reveal important details of the ancestral regulatory network underlying insect segmentation. Hypothesis: disrupting Caudal binding sites will result in a complete loss of segments; disrupting the timer gene binding sites will lead to posterior segment loss. To validate my hypothesis, I am targeting the full region with CRISPR/Cas9 and fixing embryos, extracting DNA, or preparing cuticles from resulting abnormal embryos and hatchlings. My CRISPR/Cas9 injections yielded a larva missing the eighth abdominal segment. This could support the expected phenotype(s) of either Caudal or timer gene binding site disruption, potentially indicating a previously unidentified regulatory relationship of the timer genes with the oscillator.

Keywords: Tribolium castaneum, segmentation, enhancers, even-skipped (eve), CRISPR/Cas9, evo-devo

9:20 AM in ILC 120
Poster

Silva, Aruna (B2)
Environmental & Earth Science at Saint Mary's College of California

Investigating Changes in Cation and Anion Concentrations in Agricultural Enhanced Rock Weathering (ERW) Experiment

Mentored by: Katerina Dontsova, PhD, Kielah Dyer, and Norma Villagomez-Marquez (Environmental Science)

There is a global need to find approaches that can decrease atmospheric CO2 concentrations. Enhanced Rock Weathering (ERW) serves as a potential carbon removal technology that can also enrich soil in plant nutrients. ERW is the application of finely crushed silicate rocks to soil, accelerating natural weathering processes to help drawdown atmospheric CO2 at faster rates. ERW in Arizona is mainly limited by the lack of water and generally alkaline soil conditions (both crucial factors influencing rock weathering). ERW is practiced in agriculture as irrigation systems eliminate this limitation. We studied the combined application of basalt (inorganic) and compost (organic) amendments to drive ERW in Arizona agricultural systems. Alfalfa and blue grama were grown in soil sourced from the UA Red Rock Agricultural Center, with different soil amendments including control, compost, basalt, and combined

compost and basalt treatments in a greenhouse mesocosm at University of Arizona campus. Unplanted control was also examined. Soil samples were collected at four time periods and analyzed for weathering-derived cations and anions using ion chromatography. We hypothesize that combined basalt and compost treatment will increase carbon sequestration potential through enhanced weathering, as opposed to basalt treatment alone. Compost may promote microbial activity and organic acid production, accelerating basalt dissolution. ERW remains a promising strategy for carbon sequestration with potential for large-scale cost-effective application. Findings from this study will support efforts towards sustainable practices in Arizona and Sonoran Desert agriculture.

Keywords: Enhanced Rock Weathering (ERW), agriculture, basalt, compost, soil, ion chromatography, cations, anions, carbon sequestration

Poster

Smith, Sevilla (UROC-Prep)
Computer Science at University of Arizona
The Effects of AI Disclosure on Player Reception
Mentored by: Andrew Kemp-Wilcox, PhD (Information Science)

Artificial Intelligence (AI), specifically Generative Artificial Intelligence (GenAI), has become a prominent topic in video game development, offering opportunities to improve efficiency, streamline workflows, and support creative production. Nevertheless, its growing use has also raised concerns regarding jobs, economics, the environment, human input during development, and more. Existing research has examined GenAI in the video game industry primarily from developers' perspectives, whereas AI disclosure (notification of AI use) research has focused on fields outside game development, including journalism, marketing, and education. However, limited research has examined video game players' perspective on GenAI. This study addresses this gap by investigating the research question: how does disclosure of generative AI assistance in game development influence player perceptions of creative value, developer effort, and trust? This study will use a mixed-methods experiment with participants randomly assigned to disclosure or no-disclosure conditions before playing the same video game. Following gameplay, participants will complete a survey measuring perceptions of creative value, developer effort, and trust. Participants in the AI disclosure condition are expected to report lower ratings across all three measures than those in the no-disclosure condition, with the largest reduction observed in perceived creative value. By examining player perceptions of AI-assisted game development, this research seeks to contribute to the growing understanding of public attitudes toward AI-assisted creativity and may help inform future disclosure practices, industry standards, and approaches to balancing technological innovation with transparency and consumer trust.

Keywords: Artificial Intelligence, Generative Artificial Intelligence, Video Game Development, AI Disclosure, Player Perception, Video Game Ethics

9:20 AM in ILC 112

Poster

Srinivas, Sripriya (UROC-Prep)
Psychological Sciences at University of Arizona
Effects of Aging and Trauma Symptom Severity on Hippocampus and Amygdala Volumes
Mentored by: Ashley Huggins, PhD (Psychology)

Episodic memory function involves various brain regions, including the hippocampus and amygdala. Trauma exposure and related symptoms are associated with altered structure of these regions, potentially explaining memory disturbances in trauma-exposed individuals. Additionally, memory decline is a core feature of typical aging, relating to reduced hippocampal volumes. While both trauma exposure and aging are associated with structural brain changes that worsen memory, the interaction between these variables is poorly understood. The proposed study aims to determine the effects of this interaction on relevant brain regions (i.e. hippocampus and amygdala) in older (>60 years) and younger (18-30 years) female adults (N=100). Self-report questionnaires will be used to assess trauma exposure and posttraumatic stress disorder (PTSD) symptom severity. Structural MRI scans will be used to measure hippocampal and amygdala volumes. It was found that there was a significant interaction effect between trauma exposure and aging on amygdala volumes. These results demonstrate the importance of considering age when developing and implementing treatments for PTSD, as normal age-related brain changes may be exacerbated by trauma history and result in cognitive challenges that impede recovery.

Keywords: hippocampus, amygdala, aging, posttraumatic stress disorder

9:40 AM in ILC 140
Poster

Steen, Holly (B2)
Bioresource and Agricultural Engineering at California Polytechnic State University, San Luis Obispo
When Can Accessible 3D Scanning Measure Individual Understory Plants?
A Matterport Workflow for Coffee in the Biosphere 2 Rainforest
Mentored by: Ash Black, MS, Tau Schimmels, and Jeff Larsen (Information Science)

Complex shade-coffee systems have the capacity to retain substantial aboveground carbon, yet the plant-level measurements needed to estimate this carbon accurately and non-destructively remain limited, especially among the small, densely branched plants that form the understory. Through this project, we evaluate whether an accessible Matterport-based scanning system can recover meaningful structural measurements from Coffea arabica plants in the Biosphere 2 Rainforest. Using a multi-year census of 116 plants, we focus on 24 established coffee plants spanning the observed stem-diameter range, along with six backups and eight seedlings established in 2025. From one registered whole-biome 3D reconstruction, we connect mapped census locations to the point cloud, identify individual plants, and measure total height and lower-stem diameter wherever the

structure is visibly and reliably captured. These scan-derived measurements are then compared with matched field observations using identification completeness, bias, absolute error, and repeatability. Published coffee allometry from Segura et al. (2006), which uses diameter measured at 15 centimeters and total height, provides provisional, model-based aboveground-biomass estimates ranging from approximately 0.017 to 3.356 kilograms, pending standardized field measurements. Early analysis shows that measurability depends strongly on plant size, architecture, and exposure, as larger, well-exposed stems are resolved more consistently than thin, occluded, or low-branching plants. In response, we are developing a scan-observable routing rule that directs each plant toward automated, interactive, or unresolved measurement. Ultimately, this study works to define the conditions under which accessible whole-biome scanning can, and cannot, support repeatable, non-destructive monitoring of individual understory coffee plants.

Poster

Stoltzfus, Lena (Johnson Lab)
Biology at Haverford College
Refining a molecular Trojan horse: Investigating synergistic antimicrobial interactions between dithiocarbamates and transition metals
Mentored by: Michael D. L. Johnson, PhD (Immunobiology)

Poster

Strand, Devin (SRI)
Biomedical Engineering at University of Arizona
Design of a Belt-Driven Precision Scanning Stage for In Vivo Confocal Microscopy of Meissner's Corpuscles
Mentored by: Dongkyun Kang, PhD and Carmella Ocaya (Optical Sciences)

Reflectance confocal microscopy has emerged as a promising non-invasive technique for imaging Meissner corpuscles, which serve as an important biomarker for assessing peripheral nerve health. Accurate and repeatable imaging of these mechanoreceptors requires a motorized scanning system capable of precise positioning over a small imaging area. Although previous research has demonstrated the effectiveness of motorized microscope stages and precision belt-driven positioning systems, limited work has focused on developing a scanning stage specifically for reflectance confocal imaging of Meissner corpuscles in the fingertip. This proposal presents the design of a compact, low-cost motorized scanning stage intended for this application. Engineering requirements were established through discussions with a research mentor and a review of the existing literature before a complete three-dimensional CAD model was developed in SolidWorks and mechanical components were selected for fabrication and future testing. The proposed design is expected to provide smooth, repeatable motion across a 3 mm x 3 mm scanning area while meeting a positioning accuracy within 300 micrometers. Future testing will evaluate positioning accuracy, repeatability, backlash, and motion

smoothness to determine whether the system satisfies the established design requirements. If successful, the proposed scanning stage could provide an affordable alternative to commercial microscope positioning systems while improving the accessibility of automated Meissner corpuscle imaging for biomedical research and future clinical applications.

Keywords: Reflectance confocal microscopy, Meissner corpuscles, precision positioning, motorized microscope stage, belt-driven design

12:40 PM in ILC 130
Poster

Surtchev, Yana (SRI)
Neuroscience & Cognitive Science | Molecular & Cellular Biology at University of Arizona
The Differential Effects of Ketamine on Principal Neurons and Interneurons in the Ventral Posteromedial Nucleus (VPM) of the Thalamus
Mentored by: Stephen Cowen, PhD (Psychology)

Ketamine is a general anesthetic that has received renewed interest as a treatment for depression and Parkinson's dyskinesia in subanesthetic doses. While ketamine is known to alter activity in several subcortical regions, less is understood about its effects on interactions between individual neurons within the thalamus. The ventral posteromedial nucleus of the thalamus, a key relay in thalamocortical communication, plays an important role in sensorimotor processing and exhibits abnormal excitability in motor disorders. To clarify ketamine's impact on thalamic circuitry, we examined how it alters correlations between putative principal cells and interneurons in the VPM. Prior neocortical work suggests that ketamine suppresses the activity of narrow waveform interneurons, leading us to hypothesize that similar suppression would occur in the VPM. We measured the firing rates, bursting patterns, and cell-to-cell correlations in large populations of VPM neurons. Five Sprague-Dawley rats (3 male, 2 female) were implanted with Neuropixels probes, and recordings were acquired (AP: 3.35mm ML: 2.8mm DV: 5.25-6.5mm) while rats explored an open field. Animals received two subanesthetic ketamine injections (20 mg/kg) two hours apart. Neurons were classified as putative principal cells and interneurons through manual inspection of waveform width and firing rate. Preliminary analysis of over 250 single cells showed varied, complex responses to ketamine. Contrary to our predictions, narrow-waveform interneurons did not show uniform suppression but instead displayed heterogeneous firing-rate changes. These findings suggest ketamine modulates thalamic excitability through diverse alterations in firing patterns that may influence Parkinsonian motor dysfunction. Supported by: NIH R01 RF1AG081767, NIH R01 NS122805-03.

Keywords: Ketamine, thalamus, electrophysiology

11:00 AM in ILC 150
Poster

Terrazas, Brian (SRI)

Biochemistry at University of Texas El Paso
Analyzing PKR independent cell activation pathways in response to saponin adjuvants
Mentored by: Deepta Bhattacharya, PhD and Noah Franz (Immunobiology)

Adjuvants are compounds that can enhance or prolong the humoral immune response to a co-administered antigen. Saponins originate from the bark of the Quillaja saponaria tree, making them a naturally derived type of adjuvant and a strong candidate for vaccine development in humans. However, their mechanism of action remains poorly understood, particularly their role in plasma cell development. Prior research in the lab of Dr. Deepta Bhattacharya has elucidated the central role of the double-stranded RNA (dsRNA) sensor Protein Kinase R (PKR) in the activation of myeloid-derived monocytes and macrophages in response to saponin adjuvant. Although inhibition of PKR results in unequivocal suppression of cell activation in response to saponin adjuvant *in vitro*, *ex vivo* results from mouse experiments suggest alternative molecular pathways may be compensating in the absence of PKR. In this study, we will investigate if germline knockout (KO) of PKR in commercially available mice results in the presence of exon-skipped or alternatively spliced PKR variants with functional properties, as well as which molecular pathways may be compensating cell activation in the absence of PKR in response to saponin adjuvant. To investigate this, we will stimulate cells from PKR KO mice with dsRNA and assess eIF2α phosphorylation, a modification canonically catalyzed only by PKR in response to intracellular dsRNA, detectable phosphorylation would indicate residual PKR activity. Together, these findings will sum to the understanding of the molecular mechanism underlying saponin adjuvants.

Keywords: Saponin Adjuvants, PKR, plasma cell development, cell activation, molecular pathways.

12:40 PM in ILC 150
Poster

Thatcher, Emma (B2)
Microbiology | Philosophy at Cochise Community College
Cyanobacterial Pioneers on Mars Regolith Simulants
Mentored by: Aaron Roznowski, PhD, Katerina Dontsova, PhD, Norma Villagómez-Márquez, Kielah Dyer, Wei-Ren Ng, and Scott Saleska (W.A. Franke Honors College)

The evolution of biogenerative life-supporting systems is crucial for long-term exploration on the Moon, Mars, and any other bodies within our solar system. A promising pioneer organism for this issue is Cyanobacteria; they can photosynthesize, fix atmospheric nitrogen, and excrete polymeric substances which can promote biocrust formation and substrate stability. This study investigates whether the cyanobacterial strain *Trichormus variabilis* strain MSU A-37 can colonize and induce plant growth promoting chemical changes in three types of regolith: basaltic regolith obtained from a terrestrial volcanic crater, lunar regolith, and Mars Global Simulant (MGS-1). Twelve microcosms with inoculated and uninoculated control treatments were maintained under controlled temperature and photoperiod conditions. Substrate properties such as pH, moisture content, ammonium and nitrate concentrations, and exopolysaccharide abundance, were monitored over an eight-week trial while

chlorophyll-*a* concentration, and microscopy was used to assess biocrust development and colonization of the cyanobacteria. We hypothesized that cyanobacteria will successfully establish on both regolith types and improve their chemical properties by reducing pH, increasing moisture retention, and nitrogen availability; ultimately creating more favorable conditions for future plant growth. Findings from this study may advance our understanding of Cyanobacteria as a pioneer for extraterrestrial soil development and how it could contribute to agricultural systems for future off-world habitats.

Poster

Thompson, Tasheena (FRONTERA)
Medicine at University of Arizona
Development of an Artificial Intelligence Augmentation Program for Community Health Workers and Community/Patient Advisory Boards for a 21st Century Model of Chronic Disease Prevention and Community Engagement
Mentored by: Gloria Coronado, PhD (Cancer Center)

Poster

Thompson Lynch, Aurora (SRI)
Leadership and Learning Innovation at University of Arizona
The Role of Community-Based Support Systems in Reducing the Mental and Physical Health Impacts on Caregivers of Individuals with Intellectual and Developmental Disabilities
Mentored by: Alyssa Smith, PhD, OTR/L, NBC-HWC, End-of-Life Doula (Speech, Language, and Hearing Sciences)

Caregivers of individuals with intellectual and developmental disabilities (IDD) often experience significant mental and physical health challenges while providing long-term support. This literature review examined how community-based and outside support systems influence caregiver well-being. Peer-reviewed articles were identified through searches of the University of Arizona Library, Google Scholar, PubMed, and Academic Search Complete using keywords related to intellectual and developmental disabilities, caregiver burden, community-based support, and caregiver well-being. Studies were included if they focused on caregivers of individuals with IDD and examined community supports, healthcare services, educational interventions, psychological interventions, or caregiver outcomes. Eight articles met the inclusion criteria and were synthesized using thematic analysis. Three themes emerged: caregiver burden and health outcomes, community-based support systems, and educational and psychological interventions. Across the literature, caregiver burden was consistently associated with increasing caregiving responsibilities, complex healthcare needs, financial strain, and limited access to coordinated services. Community-based resources, including healthcare, respite care, transportation, and informal support networks, were associated with improved caregiver well-being when they were accessible and effectively coordinated. Educational and psychological interventions further strengthened caregiver knowledge, confidence, and coping skills. Despite these findings,

relatively few studies examined how multiple support systems work together to improve caregiver well-being over time. Future research should investigate coordinated models of caregiver support to better inform policies and practices that strengthen caregiver health and improve outcomes for individuals with IDD.

Keywords: intellectual and developmental disabilities (IDD), caregiver burden, community-based support, caregiver well-being, respite care

3:00 PM in ILC 120
Poster

Tijerina, Jocelyn (SRI)
Agribusiness, Economics, and Management at University of Arizona
Climate-Smart Agriculture Adoption among Smallholder Farmers in Ethiopia
Mentored by: Jeffrey Michler, PhD and Anna Josephson, PhD (Agricultural & Applied Economics)

Climate-smart agriculture (CSA) can improve agricultural productivity and strengthen farmers' resilience to climate-related risks, but adoption remains
uneven among smallholder producers. This study examined factors associated with CSA adoption in Ethiopia using five waves of the Ethiopia Socioeconomic Survey, collected through the World Bank's Living Standards Measurement Study--Integrated Surveys on Agriculture program. The matched analytical sample contained 75,033 field-wave observations. Four harmonized CSA practices were examined: irrigation, improved seed use, manure or compost application, and protection from erosion. Adoption was measured using an indicator for whether a field adopted any observed CSA practice and a count of adopted practices among the indicators observed for that field. Preliminary linear regression models included primary-manager gender, age,
education, and survey-wave fixed effects; models covering Waves 2 through 5 also included collateral rights. Standard errors were clustered by holder identifier. Female-managed fields were associated with an approximately 4.0 percentage-point lower probability of adopting any observed CSA practice in the all-wave model. In models covering Waves 2 through 5, collateral rights were associated with a 6.7 percentage-point higher probability of adoption and approximately 0.114 additional adopted practices. These estimates represented conditional associations rather than causal effects. The study was guided by the hypothesis that greater access to land, credit, and extension services supported adoption, while resource constraints and gendered inequalities reduced it. The preliminary estimates provided initial evidence for the land-rights and gender components of that framework

Keywords: climate-smart agriculture, agricultural technology adoption, gender, land rights, Ethiopia

2:00 PM in ILC 120
Poster

Ussery, Ian (SRI)
Psychology at University of Arizona
Training Peer Coaches to Deliver Digital CBT: Preliminary Findings and a Proposed Design for Scalable, High-Fidelity Care
Mentored by: Zachary Cohen, PhD, Torsa Chattoraj, and Nate Choukas (Psychology)

Anxiety, depression, and other common mental-health disorders are prevalent among college students, contributing to physical and social impairment and poor academic outcomes. While cognitive behavioral therapies (CBT) and other evidence-based treatments exist, few students receive these treatments, and when they do, outcomes are modest and variable. Digital mental-health treatments (DMHT) can address these gaps by increasing accessibility and personalizing care. Pairing DMHTs with trained paraprofessionals could enhance personalization, target wider concerns, and improve engagement. However, a challenge paraprofessionals face is balancing scalability and fidelity.
To explore this integration, the Personalized Treatment Lab at the University of Arizona adapted a peer coaching model from UCLA, grounded in learning theory, within an undergraduate clinical training course. Students were trained to deliver a CBT-based DMHT built around interactive digital workbooks, supporting participants' engagement with module content and skills. Preliminary data (N= 32) showed significant improvement in self-perceived coaching competency across three time points, a large effect (F(1.51, 46.83)= 29.72, p < .001, partial eta squared = .318). Clinical confidence showed a marginal trend approached significance (p= .054), while coaching confidence and stress levels remained stable. Students reported meaningful personal benefits including improved communication style (N= 23). However, training occurred entirely in class, lacking real coach-participant interactions.
With preliminary findings, this paper proposes a refined design collecting data from coaches exposed to actual participants delivering the DMHT, with weekly competency ratings from supervisors, and participant-coach satisfaction reports. Concurrently, we aim to refine the data collection tool while identifying coaches' training support needs.

Keywords: digital mental health treatments (DMHT), college students, common mental health disorders, peer paraprofessionals, cognitive behavioral therapy

10:20 AM in ILC 140
Poster

Valdez, Frankois (McNair)
Global Studies | Astronomy at University of Arizona
STEAM Powered: Improving College-Going Skills and Attitudes in Environmental Justice Communities through Community-Based Youth Science Education Programs
Mentored by: Mónica D. Ramírez-Andreotta, PhD and Kaitlyn Krushefski (Soil, Water and Environmental Science)

Rural communities have historically faced lower college enrollment and degree attainment rates compared to suburban and urban areas. Additionally, certain rural communities are considered Environmental Justice (EJ) communities, which may make the college-going process more difficult for youths. This study bridges the gap between Community-based STEAM Education Programs (CSEPs), rural EJ community youths (approx. ages 11-18), and Social and Emotional (SE) skills and attitudes for college enrollment and retention. Our study centered on community-based and co-created STEAM education programs in rural Arizona known as Youth Advisory Boards (YABs). Following Palawat and Ramirez-Andreotta, we used a mixed-methods analytical approach consisting of thematic analysis of qualitative focus groups (n=15) and quantitative/qualitative surveys. We sought to answer three main questions: (1) Do rural EJ youths experience an increase in desires to change and give back to their communities as a result of CSEPs, (2) Do CSEPs develop SE skills for college success in their participants, and ultimately (3) Do CSEPs increase chances of college enrollment and retention in EJ community youths? The results suggested an increase in attitudes and skills desirable for college admission and retention. Although directly answering our third question was outside the scope of the recorded data, results suggested an increase in SE skills and educational outlook in youths. Therefore, we suggest further research on the relationship between college attendance and retention for EJ community youths who participate in Community-based STEAM Education Programs.

Keywords: Environmental justice, Community science, Rural population, Community engagement, Education, College enrollment, College retention

11:00 AM in ILC 112
Poster

Vazquez-Lopez, Miguel (FRONTERA)
Medicine at University of Arizona
Developing and Validating an Efficient Shared Decision-Making Model for Pulmonary Hypertension
Mentored by: Franz Rischard, DO, MSc (Medicine)

Poster

Velazquez, Pedro (FRONTERA)
Public Health at University of Arizona
Lens of Faith: Religious & Cultural Influences on HPV Vaccine Decision-Making
Mentored by: Purnima Madhivanan, MBBS, MPH, PHD (Medicine)

Poster

Villa, Natalie (MHD)
Biological and Natural Resource Science at University of Arizona
shRNA-Mediated Knockdown of Nuclear RNA Exonucleases in Neurons
Mentored by: Kevin Rhine, PhD (Pharmacology & Toxicology)

Age-related changes in RNA metabolism contribute to neuronal dysfunction and neurodegenerative disease. RNA exonucleases are responsible for nuclear RNA decay and degradation, removing defective or damaged RNA molecules to maintain RNA homeostasis. During aging, the efficiency of these nuclear RNA decay pathways declines, allowing aberrant RNA transcripts to accumulate. The accumulation of these transcripts can disrupt gene expression and cellular function and contribute to cellular stress and neurodegeneration. However, the effects of reduced exonuclease activity remain poorly understood in aged neurons. This project aims to knock down the expression of four RNA exonucleases, DXO, DIS3, RRP6, and XRN2, in young and aged neurons using shRNA. shRNA oligonucleotides targeting each exonuclease were cloned into a plasmid vector through restriction digestion and ligation. The plasmids were amplified by bacterial transformation, purified by miniprep, and verified through sequencing. HEK293T cells were infected to produce lentiviral particles carrying the shRNA constructs. Human fibroblasts were transdifferentiated into induced neurons, which were infected with lentivirus to knock down each target exonuclease. All shRNA plasmids were successfully generated and confirmed by sequencing. Lentiviral titration demonstrated successful virus production as mCherry fluorescence increased with increasing viral concentration. Future RNA sequencing experiments will determine how reduced exonuclease expression alters RNA accumulation in young and aged neurons.

10:40 AM in ILC 120
Poster

Watson, Tianna (SRI)
Psychology at Florida International University
Maternal Caffeine Intake During Pregnancy and ADHD Symptoms in Children
Mentored by: Karla Smith, MPA, ABA Cert. (Graduate College)

Maternal Nutrition is an important prenatal factor and it's often overlooked when determining the risk of neurodevelopmental disorders in children. This critical literature review examined the evidence on how maternal caffeine intake during pregnancy may influence the development of neurodevelopmental disorders, specifically Attention-Deficit/Hyperactivity Disorder (ADHD) in children. ADHD is a known neurodevelopmental disorder throughout childhood that is characterized by persistent patterns of inattention, hyperactivity, and impulsivity. A critical literature review was conducted with the goal of identifying caffeine as a potential contributor to ADHD risk in children. Sixteen peer-reviewed articles were evaluated through a matrix using search terms such as caffeine intake, pregnancy, ADHD, maternal nutrition, and neurodevelopmental disorders. Evidence from this literature suggests that maternal caffeine intake during pregnancy may be associated with an increased risk of ADHD but there is not a direct link to establish a causal relationship. Evaluation of current literature on the topic also demonstrated that there is some association between the amount of caffeine intake during pregnancy with the risk of developing ADHD. Specifically there is some indication that caffeine intake of 760mg/8 cups of coffee per day or more during pregnancy has a stronger correlation with ADHD development for the child. While a lot of research also showed that lower levels of caffeine intake were not consistently associated with ADHD. The evidence reviewed in this critical literature review suggests that additional

research is needed to clarify the relationship between caffeine exposure and the development of ADHD or other neurodevelopmental disorders.

Keywords: caffeine intake, pregnancy, ADHD, maternal nutrition, neurodevelopmental disorders

3:00 PM in ILC 140
Poster

Weber, Taylor (B2)
Biology at Pima Community College
Effects of 1-aminocyclopropane-1-carboxylic acid on Rhizosphere Microbial Communities Associated with Field-Grown Maize
Mentored by: Laura Meredith, PhD and Vaishnavi Padaki (Hydrology and Atmospheric Sciences)

Volatile organic compounds (VOCs) are ubiquitous low-molecular-weight biochemical signaling compounds. A wide array of VOCs are produced by plants as well as microbes. VOCs play a crucial role in plant-microbe interactions, promote plant growth, and assist in carbon sequestration. Ethylene is a VOC produced by plants and rhizosphere bacteria via a shared precursor, 1-aminocyclopropane-1-carboxylic acid (ACC). ACC in the rhizosphere can follow three paths: it can be absorbed by plants to produce ethylene, decomposed by microbes into ammonia and carbon-rich substrates, or converted into ethylene through bacterial fermentation. This study investigates how ACC metabolism affects the root and shoot physiology of Maize B73, as well as its influence on the microbial community in the rhizosphere. To determine the mechanisms, we divided the field into four treatments: two ACC-injected plots with and without nitrogen limitation and their respective controls. We injected 150 µM ACC over a period of three weeks into the maize rhizosphere. Plant physiological traits such as photosynthesis rate, plant height, root architecture, and number of crown roots were measured. Rhizosphere soil was collected for carbon fractionation and DNA/RNA extractions to characterize microbial community composition and activity. Our physiological results indicate that manipulating the rhizosphere with ACC boosts plant biomass, enhances photosynthesis, increases crown root numbers, and improves plant productivity. While future multiomics research is important, our current findings indicate that minimal rhizosphere manipulations could be crucial for enhancing agricultural plant resilience and stress tolerance, significantly benefiting real-world farming applications.

Poster

White, Donell (SRI)
Management Information Systems at University of Arizona
From Misidentification to Amplification: Facial Recognition Disparities, Large Language Models, and the Compounding of Racial Bias Against African Americans
Mentored by: Paul Kealey, MS (Management Information Systems)

The growing deployment of facial recognition systems and large language models across society has raised concerns over bias, fairness, and equitable use within the communities where they are deployed. Due to the relatively recent emergence of this technology, prior research remains limited and has largely addressed bias through a technical lens; this critical review instead examines the extent and mechanisms of racial bias in facial recognition systems and large language models through the intersection of technology and society. This critical literature review draws on approximately 25 sources published between 2016 and 2025, identified through Google Scholar, Elicit, and Research Rabbit using Boolean search combinations such as facial recognition AND racial disparity, and graded for credibility before being organized into themes of facial recognition disparities and AI amplification. The review found that limited representation of non-white individuals in facial recognition training datasets, such as Adience, composed of 86.2% light-skinned individuals. This produced higher error rates for darker-skinned individuals, with the Gender Shades study reporting error rates as high as 34.7% for darker-skinned women compared to 0.8% for lighter-skinned men. These disparities carry risk when extended to applications such as predictive policing. Large language models compounded bias in a similar way, reproducing harmful rhetoric embedded in web-scraped training data through their decisions and responses. These findings suggest that addressing bias in facial recognition and large language models requires more than technical correction alone; meaningful change demands attention to the social and institutional structures in which these technologies are built and deployed.

Keywords: facial recognition, algorithmic bias, large language models, racial disparity, AI alignment

2:20 PM in ILC 120
Poster

Ybarra, Andres (MARC)
Physiology at University of Arizona
Linking Microstructural Brain Integrity and Sex Differences to Behavioral Decline in a Ferret Model of Normative Aging
Mentored by: Beth Hutchinson, PhD (Biomedical Engineering)

Ferrets offer a unique advantage in understanding age-related neurodegenerative diseases due to their gyrencephalic (folded) brains, which closely mirror human neuroanatomy, and their human-similar immune systems. This study evaluates the relationship between brain structure and behavioral decline in a ferret model of normative aging. Additionally, ferrets are known to be sexually dimorphic, and so we also evaluated sex differences in the context of aging, brain structure, and behavior. We utilized Diffusion Tensor Imaging (DTI) to quantify tissue microstructural integrity across Fractional Anisotropy (FA), Radial Diffusivity (RD), and Axial Diffusivity (AD). Concurrently, we assessed cognitive, memory, and recognition changes using a Novel Object Recognition (NOR) behavioral task. DeepLabCut pose estimation was used to quantify motor and exploratory behaviors. We hypothesize that regional alterations in DTI metrics will strongly correlate with deficits observed during novel object interactions, reflecting focal atrophy in task-relevant brain networks. Ultimately, combining precise behavioral

tracking with advanced neuroimaging techniques enhances our understanding of brain-behavior relationships in normal aging models.

1:40 PM in ILC 150
Poster

Zepeda Gonzalez, Rogelio (UROC-Prep)
Natural Resources at University of Arizona
Movement Patterns of Kinosternon sonoriense Along a Gradient of Flow
Mentored by: Michael Bogan, PhD (Natural Resources & the Environment)

Sonora mud turtle (*Kinosternon sonoriense*) is one of the only native aquatic turtles found in southern Arizona's rivers. Flow, the volume of water moving through a river, is likely a key influence on the movements and behaviors of these turtles. However, very little is known about how they move within the Santa Cruz River, one of the region's major rivers. This study tracked the movements of 9 Sonora mud turtles across 2 sites within the Santa Cruz River. Three turtles were tracked in Tumacácori for 12 weeks (May to July 2026) and 6 individuals were tracked in Nogales for 4 weeks (July to August 2026). During that time, Tumacácori dried completely, turning the habitat from slow flow and pools to a dry riverbed. Two of three tracked individuals in Tumacácori stopped moving when the river dried for 7 weeks, and the third moved 60 meters once during that period. However, after monsoon rains caused flow to return, all three turtles resumed movement, with one moving over 300 meters. In contrast, individuals in Nogales made consistent, short-range movements (mean = 27m) throughout the entire study period. The findings of this study suggest that constant flow enables consistent movement, but at least some individuals are resistant to drying over short periods. Together, these findings highlight the importance of flow in desert rivers and suggest how this species may respond to future reductions in available water due to climate change or water withdrawals.

Keywords: Kinosternon sonoriense, Sonoran Mud turtle, Santa Cruz River, Telemetry, Movement.

10:00 AM in ILC 120
Poster

Zweifel, Gabrielle (MHD)
Planetary Geoscience at University of Arizona
Crater Analysis Among Small Patches of Venus' Tessera Terrain
Mentored by: Lynn Carter, PhD and Alexandra Le Contellec (Lunar & Planetary Laboratory)

The age and formation mechanisms of Venus' warped and folded tessera terrain is debated among planetary scientists. Venus has ~900 known craters, a low number compared to other terrestrial bodies in the Solar System; this deficit combined with suspected ongoing volcanic activity make Venus' geologic history somewhat mysterious. Prior studies of tessera have primarily focused on the largest

plateaus while generally overlooking smaller patches. Analyzing crater populations among smaller patches of tessera planetwide is essential to developing a better understanding of Venus' geologic evolution. This project utilized Synthetic Aperture Radar data from NASA's Magellan mission to look for evidence of post-impact partial infilling among a selection of 36 craters in small tessera patches, and utilized the Polygonal Crater Identification software by Robbins and Riggs (2023) to look for post-impact tectonic modifications. Polygonal craters are non-circular, showing straight portions of their rims. Some are partially polygonal, while others are fully deformed. Though Robbins and Riggs estimate that ~10% of craters in the Solar System are polygonal, among those analyzed for this study, ~47% appear deformed and are either fully or partially polygonal. Of the regions surveyed, the Cocomama, Laima, and Manatum tesserae appear to contain multiple polygonal or partially polygonal craters. Cocomama and Manatum also sport multiple radar dark-floored or partially infilled craters. The orientation of the deformed portions of crater rims could help scientists understand the deformation history of these regions of Venus, indicating that further study of small tessera patches is needed to better constrain the planet's geologic history.

Keywords: Tessera

1:40 PM in ILC 112
Poster

Closing Ceremony

Friday, August 7 | 3:30 – 5 pm

Health Sciences Innovation Building, RM 305/306

1670 E Drachman St, Tucson, AZ 85721

UROC Outstanding Student Award

Matthew Bertron

Psychology

Summer Research Institute (SRI)

Matthew is a member of the Summer Research Institute (SRI) Cohort. He is a first-generation college student of Puerto Rican descent and a Tucson native. He graduated from Mountain View High School in the Marana Unified School District and is currently a senior at the University of Arizona, where he is majoring in Psychology and minoring in Criminology. He is expected to graduate in December 2026. After graduation, Matthew plans to pursue a Ph.D. in Clinical Psychology. His long-term goal is to improve mental health care for incarcerated populations by advancing access to evidence-based psychological services and advocating for better mental health outcomes within the criminal justice system. This summer Matthew has worked with Dr Daniel Taylor and Dr John Sy in the Insomnia and Sleep Health Research Laboratory investigating sleep duration and depression among college students. Mathew has demonstrated enthusiasm, eagerness to learn, professionalism and academic excellence and a tremendous amount of growth in the short duration of the program. Matthew's bravery to step into the unknown and forge his own path in academia exemplifies the curiosity and tenacity within UROC students.

Keynote Speaker

Luisa Ikner, PhD

Assistant Professor, Environmental Science
Assistant Professor, Applied BioSciences - GIDP

Luisa Ikner is an Assistant Professor and Environmental Microbiologist in the Department of Environmental Science. She obtained her Ph.D. in Soil, Water and Environmental Science from the U of A in 2010. She then worked as a Senior Virologist and Study Director for Antimicrobial Test Laboratories (now Microchem) located in Round Rock, Texas from 2010 to 2014 to oversee and perform antiviral efficacy evaluations for data submission to the US EPA.

Dr. Ikner returned to the University of Arizona in 2014 with a strong desire to conduct research, collaborate with faculty, most importantly - to work with and mentor aspiring students towards their life goals. At the Water & Energy Sustainable Technology (WEST) Center, Dr. Ikner partners with industry and municipal entities to conduct hygienic intervention studies, oversee rigorous antibacterial/antiviral efficacy testing, and evaluate water treatment technologies for pathogen inactivation and reduction. She is currently involved as a co-investigator for USDA, EPA, and CDC research projects in several areas including soil health, virus tracking in wastewater plants, and cell culture method development for SARS-CoV-2 detection at the BIO5 Institute.

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Professor of Practice: Caitlin Rosario Kelly, ABD
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Instructor: Karla Smith, MPA, ABA Cert.
Graduate Teaching Assistants: Yoneri Bueno-Diaz , MA
Sponsor: University of Arizona Graduate College

UROC-Prep
Program Coordinator: Karla Smith, MPA, ABA Cert.
Instructor: Karla Smith, MPA, ABA, Cert
Graduate Teaching Assistants: Sergio Castro, ABD
Sponsor: University of Arizona Graduate College

UROC Affiliate Program

Environmental and Earth Systems Research at Biosphere 2 (B2 REU)
PI: Katerina Dontsova, PhD
Co-PI: Kevin Bonine, PhD
Sponsors: National Science Foundation Research Experiences for Undergraduates (NSF REU) Program and University of Arizona Graduate College

UROC Guest Programs

ACOA/MSTEM Thrive Program Summer Research Intensive
Co-PIs: Mindy Fain, MD and Linda Phillips, PhD, RN, FGSA
Co-Directors: Mindy Fain, MD and Linda Phillips, PhD, RN, FGSA
Program Coordinator: Margaret Proffitt, MET
Sponsor: R25 grant from the National Institute on Aging MSTEM: Advancing Diversity in Aging Research through Undergraduate Education Initiative

FRONTERA Summer Internship
PI: Francisco Moreno, MD
Director: Alejandra Zapien Hidalgo, MD, MPH
Program Coordinator: N/A
Sponsor: HRSA & Office of Student Engagement and Career Advancement

Michael D. L. Johnson Lab
PI: Michael D. L. Johnson, PhD
Sponsors: 2R35128653 and Honors Exploratory Mini-Grant

NSF Quantum Que Program PCC/UA
PI: Dr. A. Huff (UA) and Dean of Science, Dr. Christopher Cabello (PCC)
CoPI: Dr. B. Bash (UA)
Sponsor: National Science Foundation