Symposium Schedule

ORAL PRESENTATIONS

9:00 AM - 12:00 PM University-Student Union, 3rd Floor

POSTER PRESENTATIONS

10:00 AM - 12:00 PM Golden Eagle, 3rd Floor, Ballrooms 1, 2 & 3

RECEPTION

2:00 PM – 3:30 PM Golden Eagle, 3rd Floor, Ballroom 1, 2 & 3

ORAL PRESENTATIONS

Group 1 ▪ Behavioral and Social Sciences I
▪ University Student Union – Alhambra Room 305

9:00 **Angela Valadez**
M.A. Psychology
Verbal Working Memory Predicts Performance on Different Spatial Tasks
Faculty Mentor: Dr. Corinne Bower

9:15 **Ingrid Lopez Cristina Martin**
M.S. Social Work
Exploring Mental Health Literacy and Access among Social Work Students at a Hispanic-Serving Institution
Faculty Mentors: Dr. Anh-Luu Huynh-Hohnbaum and Dr. Jia-Lin Liu

9:30 **Izalina Bittencourt**
M.A. Psychology
Academic Self-Efficacy Buffers Against Math Anxiety's Negative Association with Math Performance
Faculty Mentor: Dr. Corinne Bower

9:45 **Jessica Vega**
M.A. Psychology
Executive Function, Spatial Cognition, and Verbal Working Memory in Bilinguals versus Monolinguals
Faculty Mentor: Dr. Corinne Bower

10:00 **Lisette Bailey**
M.A. Psychology
Disentangling Ideological Influences on Hispanic Voting Behavior: Evidence from the ACT Model
Faculty Mentor: Dr. Heidi Riggio

Break 10:15-10:45

10:45 **Mary Gars**
B.S. Nursing
Interventional Study on Mental Wellness Among Undergraduate Nursing Students
Faculty Mentor: Dr. Stacey A. Warmer

11:00 **Raymond Tran**
M.S. Social Work
Exploring the Impact of Dating Apps on Rape Culture, Sexual Violence, & Dating Violence in Asian American MSM
Faculty Mentor: Dr. Anh-Luu Huynh-Hohnbaum

11:15 **Wirin Phonkert**
M.S. Social Work
Model Minority Myth Impacting the Mental Health of AANHPI College Students and the Importance of Campus Resources
Faculty Mentor: Dr. Anh-Luu Huynh-Hohnbaum

11:30 **Drusilla Szatko**
B.A Psychology
Examining Predictors of College Students' Math Anxiety: The Roles of Early Parental Expectations of Math Performance and Parental Math Help
Faculty Mentor: Dr. Corinne Bower

11:45 **Samantha Ashley Lemus**
M.A. Child Development
The Role of Bilingual Teachers in Teaching High Schools Emergent Bilingual Students
Faculty Mentor: Dr. Simona Montanari

Group 2 ▪ Behavioral and Social Sciences II
▪ University Student Union – Montebello Room 309

9:00 **Angie Louie**
M.A. Psychology
Well-Being, Social Connection, and Alternative Subculture Membership
Faculty Mentor: Dr. Pamela Regan

9:15 **Mia Hagooli Bolanos**
B.A. Psychology
Loving in Vain: The Prevalence of Unrequited Romantic Love in Cal State LA Students
Faculty Mentor: Dr. Pamela Regan

9:30 **Jasmine Huerta**
B.S. Criminal Justice
Perceived Role of Police in Mental Health and Suicide Cases: The Influence of Lived Experiences
Faculty Mentor: Dr. Shichun Ling

9:45 **Alvin Orozco and Samuel Ugoezue**
Master of Public Health
Tobacco Use and Mental Health Outcomes
Faculty Mentor: Dr. Ndifreke E. Etim

10:00 **Jessica Estrada and Uma Mehta**
M.S. Forensic Psychology
Examining the influence of pre-admonition suggestion on witnesses' decision-making under real-world conditions using field-simulation paradigms
Faculty Mentor: Dr. Mitchell Eisen

Break 10:15- 10:45

10:45 **Rebecca Aguilar**
M.A. Psychology
Physical Activity as a Moderator in the Relationship Between Age and Well-Being
Faculty Mentor: Dr. Robert Kennison

11:00 **Gabriel Bejar**
B.A. Psychology
Coffee with a Cadet or a Cop: Examining Officer Rank Across Two Samples
Faculty Mentor: Dr. Alma Olaguez

11:15 **Harmony C. Chiang**
M.A. Psychology
Religiosity and Negative Attitudes toward Women: Links with Right-Wing Authoritarianism
Faculty Mentor: Dr. Heidi Riggio

11:30 **Gianna Vignale and Madison Jurez**
B.A. Psychology
Examining Lineup Photos Generated by Facial Recognition Systems: How Criminal History Can Bias Face-Matching Decisions
Faculty Mentor: Dr. Mitchell Eisen

Group 3 ▪ Biological and Agricultural Sciences
▪ University Student Union – San Gabriel Room 313

9:00 **Benjamin Eddy**
M.S. Biology
Systematic revision of Costasiellidae, a family containing photosynthetic sea slugs: Species discovery and phylogenetic analysis.
Faculty Mentor: Dr. Patrick Krug

9:15 **Kristofer Gonzalez**
M.S. Environmental Science, Geospatial Sciences option
Assessing Hydroclimatic Whiplash in Southern California and Its Impacts on Vegetation and Land Cover
Faculty Mentor: Dr. Alireza Farahmand

9:30 **Shelby Yarbrough**
M.S. Biology
Unrecognized isopod invasion of California wetlands driven by sea slug mimicry
Faculty Mentor: Dr. Patrick Krug

9:45 **Jaelyn Asamoah**
M.S. Biology
Preserved Ice Recrystallization Inhibition Activity of Tenebrio molitor Antifreeze Protein Following Thermal Stress
Faculty Mentor: Dr. Xin Wen

10:00 **Emily Zempel**
B.S. Biochemistry, minor in Bioinformatics
Computational Analysis of Antifreeze Protein–Mediated Enzyme Cryoprotection and Trypsin Resistance
Faculty Mentor: Dr. Caitlin Scott

Break 10:15 – 11:00

11:00 **Jennifer Flores**
M.S. Biology
Investigating the Effect of Phosphorylated Alpha-Synuclein Peptides on Dopamine Oxidation
Faculty Mentor: Dr. Yixian Wang

11:15 **Maximilian Mobley**
M.S. Biology
Characterizing the role of potassium and potassium transport in the context of the circadian clock of Synechococcus elongatus PCC 7942
Faculty Mentor: Dr. Susan Cohen

11:30 **Morgana Morris**
M.S. Biological Sciences
Comparative kleptoplastic capabilities of Elysia hedgpethi on two algal species.
Faculty Mentors: Dr. Patrick Krug

11:45 **Yahan Lin**
B.S. Biochemistry and Biology, Microbiology option
Coordination of Circadian Rhythms and Cell Division by TlyA and FtsZ Interactions in Cyanobacteria
Faculty Mentor: Dr. Susan Cohen

Group 4 ▪ Humanities/Liberal Arts/Health
▪ University Student Union – Board Room 303A

9:00 **Arwa Hammad**
B.A. Political Science and Philosophy
When Defending Democracy Limits It: Exclusion and Inclusion in U.S. Political History
Faculty Mentor: Dr. Michael McLendon

9:15 **Kelsey Faamausili**
M.A. TV, Film, and Media Studies
Woven Currents: Vai and the Cinematic Language of Indigenous Feminism and Decolonial Thought
Faculty Mentor: Dr. Mercedes Chavez

9:30 **Natalie Sanchez**
B.A. Liberal Studies, Interdisciplinary Studies in Culture and Society option
Challenging Human and Rat Narratives through Multispecies Education
Faculty Mentor: Dr. Jeannette Vaught

9:45 **James Carter II**
M.A. Anthropology
The Erasure of Christian Identity in Palestine
Faculty Mentor: Dr. Aaron Sonnenschein

10:00 **Marineh Mousalu**
M.A. Anthropology
Non-metric Dental Variation in a Classic Period (AD 250−900) Human Sacrificial Assemblage from Midnight Terror Cave, Belize
Faculty Mentor: Dr. Michele Bleuze

Break 10:15- 10:45

10:45 **Aidan Wait**
M.S. Kinesiology, Exercise Science option
Knowledge, and Attitudes of Collegiate Soccer Players Toward Injury Risk Factors and Prevention Strategies
Faculty Mentor: Dr. Leila Rahnama

11:00 **Matthew Minor**
M.S. Kinesiology
Kinesiology is Political
Faculty Mentor: Dr. Saemi Lee

11:15 **Yezica Ramirez**
M.S. Kinesiology
Immediate vs. Delayed Cold-water Immersion on Muscle Soreness and Power Following Plyometric Exercise
Faculty Mentor: Dr. George Crocker

11:30 **Eric Gonzales**
M.A. Anthropology
The Science and Significance of Red Pigment on Ancient Maya Human Remains from Non-funerary Contexts
Faculty Mentor: Dr. Michele Bleuze

Group 5 ▪ Engineering/Computer Science/Technology I
▪ University Student Union – Los Angeles Room 308A

9:00 **Edrei Pliego Jr. and Jose Hernandez**
M.S. Civil Engineering
Quantifying Changes in Compound Flood Driver Dependencies Along the US Pacific Coast
Faculty Mentor: Dr. Joseph Lucey-Rentaria

9:15 **Filiberto Zavala and Lesly Avila**
B.S. Civil Engineering
A Comprehensive Estimation of Compound Flood Driver Dependencies Across the US Pacific Coast
Faculty Mentor: Dr. Joseph Lucey-Rentaria

9:30 **Mallory Spillard**
B.S. Civil Engineering
Evaluating Various Methods for Risk Estimation in Data Sparse Environments
Faculty Mentor: Dr. Joseph Lucey-Rentaria

9: 45 **Miracle Sanchez, Gerald Davenport, Julian Barba, Keira Tung and Nehemias Orellana**
B.S. Electrical Engineering
Early Detection of Downed Power Lines to Reduce California Wildfire Hazards
Faculty Mentor: Dr. Arash Jamehbozorg

10:00 **Arthur Espinosa**
B.S. Mechanical Engineering
A Two-Stage Workflow for Cooling Plate Geometry Optimization in EV Battery Packs
Faculty Mentor: Dr. Chris Bachman

Break 10:15 – 10:45

10:45 **Charlie Sanches**
M.S. Mechanical Engineering
Humidity-Induced Natural Convection Currents
Faculty Mentor: Dr. Jeffrey Santner

11:00 **Christian Perez**
B.S. Mechanical Engineering
A Computational Tool for NFPA 2–Compliant Hydrogen Infrastructure Layout Design
Faculty Mentor: Dr. David Blekhman

Group 6 ▪ Engineering/Computer Science/Technology II
▪ University Student Union – Los Angeles Room 308B

9:00 **Fahed Taher, David Wu, Luis Chavez, Kevin Padilla, Gauri Chahal, Geovanny Montano, Juan La Serna, Annie Lin, Diana Martinez, Nichols Gochi and Lester Low**
B.S. Computer Science
Graph Neural Networks for Social and Biological Network Analysis
Faculty Mentor: Dr. Jiang Guo

9:15 **Hector Gardea and Alonso Torres**
B.S. Electrical Engineering
Continuous Parkinsonian tremor detection dual-threshold during daily living activities and its clinical relevance
Faculty Mentor: Dr. Deborah Won

9:30 **Akash Saraf**
M.S. Computer Science
Machine Learning Automates Protein-Ligand Docking in Virtual Reality
Faculty Mentor: Dr. Negin Forouzesh

9:45 **Anthony Lee**
M.S. Computer Science
Using Machine Learning to Predict Traffic Speed for Mass Evacuation Planning
Faculty Mentor: Dr. Jiang Guo

10:00 **Camila Takisava Kussaba**
M.S. Civil Engineering
An in-depth analysis of uncertainties and their impacts on coastal flood defense design
Faculty Mentor: Dr. Joseph Lucey-Rentaria

Break 10:15 – 10:45

10:45 **Luis Chavez and David Wu**
B.S. Computer Science
GNN–Enhanced Detection of Lymphocytes in Complex Tissue Environments
Faculty Mentor: Dr. Jiang Guo

11:00 **Rojina Zalzar**
B.S. Computer Science
AI-Driven Personalized Recommendations and Support for the BookEx Web Platform
Faculty Mentor: Dr. Jiang Guo

Group 7 ▪ Physical and Math Sciences I
▪ University Student Union – Los Angeles Room 308C

9:00 **Aziell Paul S. Limbo and Courtney Wu**
M.S. Physics, Research option
Infrared Absorption Spectrum of HFE-347pcf2
Faculty Mentor: Dr. Karine Le Bris

9:15 **Cristina Guevara**
B.S. Biochemistry
Investigating conformational changes of fentanyl and its analogs using molecular dynamics
Faculty Mentor: Dr. Caitlin Scott

9:30 **Mitchell R. Jacobs**
M.S. Physics
Absorption Cross Section of Enflurane by Fourier Transform Infrared Spectroscopy
Faculty Mentor: Dr. Karine Le Bris

9:45 **Annalissa Valdez**
B.S. Biochemistry
Photooxidation Reactions Catalyzed by Metal-Organic Frameworks
Faculty Mentor: Dr. Matthias Selke

10:00 **Nathan Venegas**
B.S. Biochemistry
Analysis of Microplastics and Their Organic Contaminants in Southern California Beaches Using HT-TD/Py-GCxGC-TOFMS
Faculty Mentor: Dr. Petr Vozka

Break 10:15 – 10:45

10:45 **Rayana Ramirez**
M.S. Criminalistics
Fingerprint Aging Model Comparison of OPTIC-4 PYRO and Extraction Methods Via GCxGC-TOFMS
Faculty Mentor: Dr. Petr Vozka

11:00 **Dominique Dang**
M.S. Chemistry
Single Nanoparticle Electrochemical Analysis Using Critical Angle Reflection Microscopy
Faculty Mentor: Dr. Yixian Wang

11:15 **Eric Gutierrez**
M.S. Physics, Research option
Magnetic Properties of Ferrocene in Various Carbon Matrices Synthesized via Co-Pyrolysis with Nanodiamond
Faculty Mentors: Dr. Armen Kocharian and Dr. Oscar Bernal

Group 8 ▪ Physical and Math Sciences II
▪ University Student Union – Pasadena Room 307

9:00 **Edgar Yak-De Padua**
M.S. Mathematics
Chromatic Number of 6-valent Circulant Graphs: Extension Ladder Homomorphisms
Faculty Mentor: Dr. Michael Krebs

9:15 **Cathryn Price**
M.S. Physics
Cataloging High-Mass X-ray Binary Candidates in Nearby Low-Mass, Low-Metallicity Galaxies with Chandra and Hubble
Faculty Mentor: Dr. Margaret Lazzarini

9:30 **Jared Sweatman**
M.S. Physics
Analyzing Data from the Cassini Spacecraft to Better Understand Titan's Atmospheric Airglow Response to Saturn's Magnetospheric Particles and Solar Activity
Faculty Mentor: Dr. Emilie Royer

9:45 **Laura Fredericks**
B.S. Physics
The Solar System Before the Planets Formed: Investigating Physical Processes in Young Star System L1527
Faculty Mentor: Dr. Susan Terebey

10:00 **Luis David Cruz Vega**
M.S. Physics
Tracing the Building Blocks of Life in Young Stars CED110 IRS4 A and B
Faculty Mentor: Dr. Susan Terebey

Break 10:15 – 10:45

10:45 **Marlon Brandon Reyes Silva**
M.S. Physics
Characterizing High Mass X-ray Binary Populations in Low Metallicity, Low Mass Dwarf Galaxies Using Chandra and Hubble Data
Faculty Mentor: Dr. Margaret Lazzarini

11:00 **Sophia Grusnis**
M.S. Physics, Astrophysics Research option
Reading the Ice: Probing Enceladus' Surface With Ultraviolet Light
Faculty Mentor: Dr. Emilie Royer

11:15 **Angel Morales**
M.S. Physics
How the Solar Cycle Affects Titan's Upper Atmospheric Nitrogen Airglow
Faculty Mentor: Dr. Emilie Royer

11:30 **Kenneth Stebbing Cabrera**
M.S. Physics
How Shocks Influence Organic Chemistry in Young Planetary Systems: Insights from the Protostar L1527
Faculty Mentor: Dr. Susan Terebey

Dr. Raymond Garcia Poster Session

Behavioral & Social Sciences

Group One

1. Melysa Gomez, Noemi Alanis & Danielle Romero
2. Noemi Alanis and Jessica Vega
3. Susan Lee
4. Ysabel Jumarang

Group Two

5. Ryan Christopher Lefever
6. Evelyn Mojarro-Pedroza, Lisette Bailey & Sylvia Williams
7. Simant Baral
8. Alvaro Ramirez
9. Fiona Baker, Diego Orozco & Ruth Uribe-Kirby

Group Three

10. Fernanda Perez, Kelly Vuong, Jessica Gomez & Korintia Espinosa
11. Iggy Scott
12. Juan Cisneros, Junpeng Huang & David Nguyen
13. Sara Cruz & Carmine Escamilla
14. Talia Leano

Biological & Agricultural Sciences

Group One

15. Alec Cozaana Zapata & David Vera
16. Lisya Tanujaya, Robert Juarez & Adam Santos
17. Sandra Rivas
18. Umniah Moshi
19. Ashley Maritato
20. Roberto Ponce

Group Two

21. James Che
22. Rachelle Soriano
23. Jungeun Choi, Hannah Mohammadi & Samantha Imperio
24. Kevin Vazquez
26. Alexcia Garcia, Caden Nugyen & Janida Williams

Group Three

27. Gilda Vazquez
28. Lesly Nunez
29. Parker Saikley
30. Zander Milburn
31. Bianca Pacheco

Group Four

32. Daniel Yang
33. Cristina Hurtado
34. Jafet Canales
35. Jasmine Ly
36. Brian Le

Education/Learning Letters

Group One

38. Samantha Avalos
39. Violet Brianna Tirado
40. Chantelle Lopez

Engineering & Computer Science

Group One

41. Matthew Lowry
43. Jonathan Federico Sanchez Gutierrez
45. Frida Melgar and Elizabeth Miranda
46. Christian Mendoza

Group Two

47. Alvaro Hernandez
48. Andres Lopez
49. Ilana Moreno
50. Tommy Taking

Group Three

51. Alyssa Madewell
52. Zane Price & Daniel Castillo-Lalyre
53. Boris Lagutin
54. Derreck Soriano
55. Hector Gomez-Cano & Aaron Garcia

Group Four

56. Alynne Wong
57. Dervin Lopez & Je Beatriz
58. Jiewu Zheng

Health, Nutrition and Clinical Sciences

Group One

61. Adrienne Limqueco & Beth Santana
62. Celeste Aguilar
63. Kendra Hensley
65. Marissa Winfrey

Group Two

66. Melody Coleman & Kimberly Stayman
67. Kiara Ortega
68. Mary Gars, Marissa Gonzalez, Joana Hernandez & Leilani Hilliard
69. Melody Kashani, Hilla Lasry, Faith Hernandez & Elizabeth Anaya
71. Vanessa Avelino, Inca Stienhans & C. Kenobi Donart

Physical and Mathematical Sciences

Group One

73. Cesar Eruviel Varela
74. Anay Rosas

75. Brandon Bautista
76. Elise Hastie
77. Lidia Garcia Marroquin

Group Two
78. Angel Vo
79. Erik Weisner
80. Ismael Sandoval
81. Shruti Soman
82. Joshua Pool

Group Three
83. Doroteo Manriquez
84. Kaycee Willis
85. Madison Ngo
86. Marilyn Heidecker
87. Michelle Rodriguez-Vergara
88. Prisha Mitra & Kamyrn Flade

Group Four
89. Bruno Bitencourt
90. Sergio Gomez
91. Amanda Miloserny
93. Koelle Rahman

Group Five
94. Randy Muñoz
95. Julia Ryen Johnston
96. Ernesto Ramirez Jr.
97. Ethan Potter
98. Luis Eduardo Olague Rodriguez
99. Yabo Ogunduyile

Abstracts of Oral Presentations

Group 1 ▪ Behavioral and Social Sciences I
▪ University Student Union – Alhambra Room 305

Angela Valadez
M.A. Psychology
Verbal Working Memory Predicts Performance on Different Spatial Tasks
Faculty Mentor: Dr. Corinne Bower

Spatial ability is the malleable ability to manipulate objects and space; however, it's significance between verbal working memory remains unclear. This study examined whether verbal working memory would be associated with performance in particular spatial tasks, while controlling for cognitive fluency. This study hypothesized that performance on the verbal working memory task would be positively correlated with both 2D and 3D spatial ability. Students (n=201) completed tasks that measured their spatial cognition (2D vs 3D spatial ability), verbal working memory, and cognitive fluency. Results indicate a significant positive correlation between verbal working memory and the Spatial Relations performance (r =.194, p=.006) but not Block Rotation performance (p=.348). This implies that verbal strategies are utilized in spatial exercises that require 2D positional descriptions, whereas 3D Block Rotation may be better represented with visual-spatial working memory. Future research should explore interventions aimed to investigate how working memory strategies may support spatial ability.

Ingrid Lopez Cristina Martin
M.S. Social Work
Exploring Mental Health Literacy and Access among Social Work Students at a Hispanic-Serving Institution
Faculty Mentors: Dr. Anh-Luu Huynh-Hohnbaum and Dr. Jia-Lin Liu

University students report rising mental health distress, yet many, particularly first-generation and racially minoritized students, underutilize campus mental health services. Guided by the Ecological Validation Framework, this qualitative study examines how bachelor's and master's social work students at a commuter Hispanic-Serving Institution understand, access, and interpret campus mental health resources. Using semi-structured interviews with social work students, the study explores mental health literacy, perceived accessibility, and help-seeking within institutional, cultural, and professional identity contexts. Findings highlight how fragmented communication, navigation burdens, and stigma shape students' willingness to seek care, while validating relationships with faculty, peers, and campus partners facilitate engagement. By centering student voice, this research reframes mental health literacy and accessibility as institutional responsibilities rather than individual deficits. Implications emphasize the need for coordinated equity-centered outreach and cross-campus collaboration to foster student-ready environments that support well-being, retention, and ethical social work practice.

Izalina Bittencourt
M.A. Psychology
Academic Self-Efficacy Buffers Against Math Anxiety's Negative Association with Math Performance
Faculty Mentor: Dr. Corinne Bower

Previous research has found a moderate, negative association between math anxiety and math performance (Namkung et al., 2019). The present study investigates academic self-efficacy as a potential moderator of this association. Undergraduate students (n = 169) completed a mathematics assessment and questionnaires assessing math anxiety and academic self-efficacy. Multiple regression analyses indicated that math anxiety significantly predicted math performance ($\beta = -1.30$, $p < .001$), and the interaction between math anxiety and academic self-efficacy was significant ($\beta = 0.81$, $p = .027$). A simple slopes test indicated a significant negative association between math anxiety and math performance for participants with average or lower academic self-efficacy ($\beta = -1.30$, $p < .001$, $\beta = -1.91$, $p < .001$, respectively). However, when participants reported above-average academic self-efficacy, this relationship was not significant. This suggests that higher levels of academic self-efficacy may buffer against the negative association between math anxiety and math performance.

Jessica Vega
M.A. Psychology
Executive Function, Spatial Cognition, and Verbal Working Memory in Bilinguals versus Monolinguals
Faculty Mentor: Dr. Corinne Bower

Executive function is a term used to describe a family of effortful mental processes used in cognitive and behavioral inhibition, working memory, and cognitive flexibility – all of which are necessary for basic tasks such as planning and paying attention (Diamond, 2014). Speaking more than one language is commonly associated with greater executive function abilities, particularly in inhibition and cognitive flexibility (Bialystok, 2015; Yurtsever, 2023), though the literature is trending towards mixed findings (Ware et al.,

2020). This study (RQ1 N=244; RQ2 N=219) analyzed the associations between number of languages spoken (NumLang) and cognitive function across three domains: concept formation, spatial cognition, and verbal working memory (VWM), while controlling for caregiver education. Results suggest an unexpected negative association between NumLang and a composite of cognitive assessments. Further, there was no statistically significant association between NumLang and VWM. Caregiver education was significantly associated with cognitive function and VWM across both analyses.

Lisette Bailey

M.A. Psychology

Disentangling Ideological Influences on Hispanic Voting Behavior: Evidence from the ACT Model

Faculty Mentor: Dr. Heidi Riggio

This study investigates how dimensions of the Authoritarianism-Conservatism-Traditionalism (ACT) model relate to voting behavior among Hispanic and Latino voters in the United States. The ACT framework divides traditional right-wing authoritarianism into three subcomponents: authoritarian submission, conservatism, and traditionalism, providing a nuanced understanding of how ideology interacts with demographic factors such as age, sex, and income. Primary survey data were analyzed using multinomial logistic regression to predict voting behavior, controlling for demographic covariates. To contextualize and validate results, secondary data from the American National Election Studies (2000–2024) were used to compare national trends in ideological and demographic predictors of voting. Findings highlight that distinct ideological dimensions differentially shape political behavior within Hispanic populations, underscoring the complex interplay between belief systems and structural factors in electoral decision-making.

Mary Gars

B.S. Nursing

Interventional Study on Mental Wellness Among Undergraduate Nursing Students

Faculty Mentor: Dr. Dr. Stacey A. Warmer

Studies report arduous educational programs, student stressors, and comorbidities of anxiety and depression as risk factors for self-harm and suicide ideation among nursing students. A cross-sectional interventional study was conducted to explore the relationship between a streamlined mental wellness curriculum and perceived stress, psychological flexibility, and resilience among undergraduate nursing students. A total of 127 responses were collected in the 35-question pre-survey, and 60 responses were collected in the 33-question post-survey for statistical analysis. It is recommended for nursing programs to incorporate strategies to promote student self-care and well-being initiatives in curricula, and further studies on well-being strategies for stress reduction and resilience-building in nursing students are warranted.

Raymond Tran

M.A. Social Work

Exploring the Impact of Dating Apps on Rape Culture, Sexual Violence, & Dating Violence in Asian American MSM

Faculty Mentor: Dr. Anh-Luu Huynh-Hohnbaum

Sexual and dating violence are pervasive issues within the men who have sex with men (MSM) community and have been exacerbated by online dating apps and the culture created through its usage. The impact of dating apps on sexual violence within the Asian American MSM community is of interest, particularly since Asian Americans (AA) are faced with underreporting and being under-researched when it comes to sexual violence and dating violence (Lai et al., 2024). The intersection of these identities produces a unique experience with rape culture and violence, especially on online dating apps. Qualitative interviews with AA MSM were employed to shed light on the specific issue of exoticization and fetishization of AA communities briefly touched upon in existing literature. Findings help understand the forces that contribute to sexual violence within the MSM community, especially racially-motivated violence against Asian Americans, as well as dating app involvement in these processes.

Wirin Phonkert

M.S. Social Work

Model Minority Myth Impacting the Mental Health of AANHPI College Students and the Importance of Campus Resources

Faculty Mentor: Dr. Anh-Luu Huynh-Hohnbaum

The model minority myth is a harmful stereotype that portrays AANHPI individuals as inherently intelligent, hardworking, obedient, and free from mental health struggles. This myth places significant pressure on AANHPI college students, as they internalize the myth's expectations, and with the additional academic stress, their mental health is negatively impacted. Findings from a mixed-methods survey administered to CSULA students indicate a clear need for accessible, culturally responsive mental health services for AANHPI students. However, campus resources are often limited, as many students reported long wait times for campus counseling services and, at times, never met a therapist. Also, a lack of student organizations that adequately represent diverse AANHPI identities. Furthermore, insufficient campus advocacy and visibility surrounding AANHPI mental health contribute to these gaps in support. Although campus resources have the ability to address the mental health needs of AANHPI college students, current efforts are insufficient to meet these needs effectively.

Drusilla Szatko

B.A Psychology

Examining Predictors of College Students' Math Anxiety: The Roles of Early Parental Expectations of Math Performance and Parental Math Help

Faculty Mentor: Dr. Corinne Bower

Math anxiety is known to be negatively associated with overall math performance. Limited research exists on caregivers who have high expectations of their children's math achievement, but feel that they are not equipped to support them in math concepts. Additionally, how childhood math anxiety transfers into higher educational environments has not been thoroughly researched. The present study (N=170) investigates early-childhood parental expectations of math-achievement and their ability to assist with math, and college students' current math anxiety levels. Results suggest that high parental-expectations of math in early-childhood may predict lower math anxiety in higher-educational environments (β=-.15, p=.013). Ability of the caregiver to assist was not a significant predictor of math anxiety (p=.325). This may be due to insufficient quantity of questions regarding the caregivers' ability to help. These results align with previous research that caregivers' math attitudes can influence their children's math anxiety and performance.

Samantha Ashley Lemus

M.A. Child Development

The Role of Bilingual Teachers in Teaching High Schools Emergent Bilingual Students

Faculty Mentor: Dr. Simona Montanari

This study explores how bilingual high school teachers use language and instructional strategies to support emergent bilingual students. Drawing on translanguaging and culturally responsive teaching frameworks, the research examines how teachers shift between languages and draws on cultural backgrounds while navigating instructional challenges to create equitable classrooms. Using a qualitative multiple case study design, five bilingual secondary teachers at a public high school in California participated. Data were collected through teacher interviews, classroom observations, and instructional artifacts. The data were analyzed through thematic coding to identify patterns in instructional strategies, language use, cultural identity and connection, and challenges teachers face in their work. Preliminary findings show that bilingual teachers foster inclusive and engaging learning environments by affirming students' linguistic and cultural identities while supporting academic growth and navigating institutional barriers shaping teachers' practices. The research shows value of bilingual educators and calls for stronger support of multilingual pedagogy.

Group 2 ▪ Behavioral and Social Sciences II
▪ University Student Union – Montebello Room 309

Angie Louie
M.A. Psychology
Well-Being, Social Connection, and Alternative Subculture Membership
Faculty Mentor: Dr. Pamela Regan

Emerging adulthood is a developmental period characterized by identity exploration and formation (Arnett, 2007; Erikson, 1958). During this time, some individuals may join an alternative subculture—a group of emerging adults with shared preferences for music genres, artistic interests, and appearances, and an emphasis on values of nonconformity and self-expression (e.g., punk, goth, emo; Jordan et al., 2019). Prior (mostly anecdotal) evidence has suggested that alt-subculture membership is associated with negative outcomes (e.g., criminality, self-harm). Potentially positive outcomes (e.g., well-being, support) have been unexplored. The current thesis study compared a sample (N=524, Mage=23.2) of alt-subculture members and their non-alt peers on standard measures of well-being and social support. While alt-subculture members scored significantly lower on well-being and instrumental support than their non-alt peers, they did not differ on emotional support and friendship. In sum, alt-subculture identity appears associated with a mix of both positive and negative personal and interpersonal experiences.

Mia Hagooli Bolanos
B.A. Psychology
Loving in Vain: The Prevalence of Unrequited Romantic Love in Cal State LA Students
Faculty Mentor: Dr. Pamela Regan

Existing research suggests that unrequited love was a common experience among young adults in earlier decades and that it was associated with a variety of both positive and negative outcomes (e.g., Baumeister et al., 1993). Interestingly, little research has been conducted recently on this presumably common experience. Thus, the primary goal of this IRB-approved honors thesis is to explore the prevalence of unrequited love in a contemporary university student sample. After receiving a definition of unrequited love, participants (N=380, M age=23.3) from introductory science courses indicated whether or not they had experienced this particular event/situation. Results revealed that unrequited love indeed remains a common interpersonal experience, with 83.7% responding affirmatively, and with no difference in prevalence found as a function of gender identity, sexual identity/orientation, and ethnocultural background. Loving in vain appears to be part and parcel of the human romantic condition

Jasmine Huerta
B.S. Criminal Justice
Perceived Role of Police in Mental Health and Suicide Cases: The Influence of Lived Experiences
Faculty Mentor: Dr. Shichun Ling

In the US, law enforcement officers commonly serve as first responders for mental health crises. However, there is a debate about whether law enforcement should intervene, as their discretionary actions may impact the well-being of others, particularly those with suicidality. Using a national sample of 2,097 respondents, this study examines how lived experiences of suicidality and criminality influence perceptions of the role of law enforcement in mental health- and suicide-related cases. Findings indicate differences in perception of the role of law enforcement in mental health- and suicide-related cases among those who have personal experiences with suicidality compared to those who do not. However, personal experiences related to criminality are not related to perceptions of the role of law enforcement in mental health and suicide-related cases. Implications and future directions are explored.

Alvin Orozco and Samuel Ugoezue
Master of Public Health
Tobacco Use and Mental Health Outcomes
Faculty Mentor: Dr. Ndifreke E. Etim

Serious psychological distress (SPD) is a key marker of population mental health burden and is shaped by social and behavioral factors. Using your 2024 California Health Interview Survey (CHIS 2024) analytic dataset of 24,810 adults, we examined demographic and behavioral correlates of SPD in the past 12 months. SPD was defined using the CHIS-derived K6 indicator (score ≥ 13 vs ＜13). Overall, 11.2% of adults reported positive for SPD. Younger adults and women showed higher odds of SPD, and odds declined steadily across older age groups. After adjustment for age, sex, education, race/ethnicity, socioeconomic status (SES), and substance use, SPD was more common among those with lower income, current marijuana users, current cigarette smokers, and those reporting recent binge drinking. Current e-cigarette users had somewhat lower odds of SPD than non-users. Compared with prior US and global studies, our CHIS 2024 findings suggest a higher burden of distress in California.

Jessica Estrada and Uma Mehta

M.S. Forensic Psychology

Examining the influence of pre-admonition suggestion on witnesses' decision-making under real-world conditions using field-simulation paradigms

Faculty Mentor: Dr. Mitchell Eisen

Pre-admonition suggestion explains how when witnesses encounter suggestions that the perpetrator has likely been caught before making an identification, this information increases the chances of witnesses identifying a suspect even when recognition is weak or absent. This study used a field-simulation paradigm to examine pre-admonition suggestion under real world field conditions. Participants witnessed a staged crime and were randomly assigned to be informed that police detained a suspect or not before making an identification. A significant interaction between accuracy, suggestion, pressure, and culprit presence emerged. When suggestion was present and witnesses felt pressure to make an identification, they were significantly more likely to identify an innocent suspect when in culprit absent conditions, and to identify the actual suspect when he was present. The results will be discussed in context of what is known about witness performance under real world conditions and findings from lab studies on point.

Rebecca Aguilar

M.A. Psychology

Physical Activity as a Moderator in the Relationship Between Age and Well-Being

Faculty Mentor: Dr. Robert Kennison

The current study aims to evaluate the moderating effects of physical activity on the relationship between age and well-being, such that increased physical activity will enhance the relationship between age and well-being. Physical activity measured in Metabolic Equivalents of Task (METs), positive affect, and well-being in a sample of adults aged 18-94 (N=223) were analyzed. Two hierarchical multiple regression analyses were conducted, entering centered METs and centered age in Block 1 and the age x METs interaction in Block 2. In the well-being and the positive affect regression models, the interactions were significant (R-squared Change = .02). Age was positively associated with well-being ($\beta = .21$) and positive affect ($\beta = .19$). The interaction terms were significant predictors ($\beta = .19$, $\beta = .14$) of the dependent variables. Older age is positively associated with well-being, and these findings provide support that higher levels of physical activity can amplify that relationship.

Gabriel Bejar

B.A. Psychology

Coffee with a Cadet or a Cop: Examining Officer Rank Across Two Samples

Faculty Mentor: Dr. Alma Olaguez

Efforts to improve police-community relations emphasize informal interactions, such as "Coffee with a Cop." Although these events can enhance perceptions of law enforcement, they often experience low attendance. This study examined whether hosting such events with a police cadet, rather than a uniformed officer, influences willingness to attend and perceptions of police legitimacy. Participants were recruited through Prolific or a university subject pool and randomly assigned to view a flyer advertising either a cadet-led or officer-led event. Measures assessed willingness to attend, willingness to contact police in hypothetical scenarios, and perceived police legitimacy. Perceived legitimacy was positively associated with willingness to attend and contact police, and age positively correlated with all outcomes. While no statistically significant differences emerged between presenter conditions, trends indicated greater willingness among Prolific participants regardless of presenter rank, whereas students leaned towards higher willingness when the event was officer-led. Demographic differences between samples may provide insight.

Harmony C. Chiang

M.A. Psychology

Religiosity and Negative Attitudes toward Women: Links with Right-Wing Authoritarianism

Faculty Mentor: Dr. Heidi Riggio

Although religiosity has been equated with moral beliefs (McKay & Whitehouse, 2015), evidence links greater religiosity and traditional beliefs to negative social attitudes toward marginalized groups (Ralica, Mojarro-Pedroza, & Riggio, 2025; Whitehead, 2018; Zetino, Leiderman, & Riggio, 2023). Religiosity is also linked with greater endorsement of authoritarian ideals (Baum & Riggio, 2022; DiMaggio, 2021). This study investigates the relationship between religiosity and authoritarianism. We predict religiosity and authoritarianism are linked with more sexist attitudes when examined together as predictors and individually. Participants completed the Duke Religion Index (Koenig & Büssing, 2010), Attitudes toward Women Scale (Spence et al., 1973), the Ambivalent Sexism Inventory (Glick & Fiske, 1996), and the Right-Wing Authoritarianism Scale (Altemeyer, 1983). Multiple regression analyses indicate religiosity and greater authoritarianism strongly predict negative attitudes toward women and greater ambivalent sexism. Results are discussed in terms of historical religion as a patriarchal system, reinforcing gender inequality and male dominance.

Gianna Vignale and Madison Jurez
B.A. Psychology
Examining Lineup Photos Generated by Facial Recognition Systems: How Criminal History Can Bias Face-Matching Decisions
Faculty Mentor: Dr. Mitchell Eisen

Closed-circuit television footage is frequently paired with facial recognition systems to generate potential suspect matches from databases such as mugshots or DMV records. Investigators who view these photos are likely to review suspects' criminal histories while viewing the photos, which can bias identification decisions. This study examined whether viewing a suspect's criminal record influences whom police identify as the perpetrator. We predicted that faces paired with criminal histories similar to the crime would be chosen most often. Participants (N=153) watched video footage of a simulated carjacking involving two perpetrators, one Black and one Latino. Acting as police officers, participants reviewed six photos of suspects purported to be generated by the face-recognition program that did not include the actual culprit. Each photo was paired with a distinct rap-sheet. As predicted, participants were most likely to select the photo associated with a background of committing felonies similar to the one in question.

Group 3 ▪ Biological and Agricultural Sciences
▪ University Student Union- San Gabriel Room 313

Benjamin Eddy
M.S. Biology
Systematic revision of Costasiellidae, a family containing photosynthetic sea slugs: Species discovery and phylogenetic analysis.
Faculty Mentor: Dr. Patrick Krug

Family Costasiellidae includes two genera, Costasiella and Panderevela with 20 described species. However, the true diversity of this clade has been obscured by a tumultuous taxonomic past and a high degree of pseudocryptic (visually similar) speciation. Costasiellidae includes one of only two independent origins of long-term chloroplast retention (kleptoplasty) in metazoans, making this family of significant research interest to those studying origins of photosymbiosis. Bayesian and maximum likelihood analyses were used to generate phylogenetic hypotheses of 35 species belonging to Costasiellidae based on a concatenated four gene dataset. Species delimitation analyses uncovered 26 new species. To interrogate differences in internal anatomy among species, SEM images of radular teeth and micro-CT tomographies are presented. Integrating genetic and morphological characteristics, 23 new species are described, over doubling the current diversity of this family. The updated taxonomy and improved understanding of Costasiellidae biodiversity lays the groundwork for future taxonomic, photobiology, and conservational efforts.

Kristofer Gonzalez
M.S. Environmental Science, Geospatial Sciences option
Assessing Hydroclimatic Whiplash in Southern California and Its Impacts on Vegetation and Land Cover
Faculty Mentor: Dr. Alireza Farahmand

Southern California is a biodiversity hotspot with a mild climate, but it has become increasingly arid with climate change, leading to more intense droughts and rainy periods that pose significant ecological and societal challenges. Precipitation whiplash describes sudden shifts from one weather extreme to another. In this research, we examine the frequency, duration, and intensity of precipitation whiplash events from 1980 to 2024 across Southern California, a region spanning diverse climate zones and ecological habitats. Using identified whiplash events, we analyzed climate variables including temperature and vapor pressure deficit, along with ecological variables such as the Normalized Difference Vegetation Index (NDVI), a satellite-derived measure of vegetation greenness or health, and root-zone soil moisture, all derived from monthly satellite data. A sensitivity analysis across eight land cover types was performed alongside spatial distribution maps to identify both locations and specific land cover types exhibiting heightened vegetation sensitivity to hydroclimatic transitions

Shelby Yarbrough
M.S. Biology
Unrecognized isopod invasion of California wetlands driven by sea slug mimicry
Faculty Mentor: Dr. Patrick Krug

Invasive species disrupt coastal ecosystems by altering habitat and ecosystem functions. In my surveys an undescribed, non-native isopod, identified in San Francisco bay in 2008, was abundant on piers from Northern California, with a mean density of 3,750±90 isopods/m2, to Los Angeles 1,200±600 isopods/m2, in barnacle communities. In Northern California wetlands two of ten sites were invaded, mean density was 2,100±183 isopods/m2, in Alameda, and 855±126 isopods/m2 in Mill Valley, making P. spA the most abundant invertebrate. In marshes, isopods mimic a native slug, Alderia, that is distasteful to predators, suggesting change in morphology enabled ecological shifts. In three trials, marsh isopods were attracted to Alderia slime, pier isopods had no preference or avoided Alderia scent cues. Fish (Clevelandia ios) were either exposed daily to Alderia or remained naïve to slugs. Fish experienced with Alderia preyed less upon marsh than pier or non-mimetic Sphaeroma isopods, indicating mimicry of slug patterns.

Jaelyn Asamoah
B.S. Biology
Preserved Ice Recrystallization Inhibition Activity of Tenebrio molitor Antifreeze Protein Following Thermal Stress
Faculty Mentor: Dr. Xin Wen

Antifreeze proteins (AFPs) from cold-adapted insects inhibit ice formation by binding to ice crystal surfaces, thereby suppressing ice recrystallization during freeze–thaw cycles. Hyperactive insect AFPs have attracted increasing interest as cryoprotective agents for preserving cells, tissues, and organs, particularly by limiting ice growth during thawing. However, the functional stability of many insect AFPs, including Tenebrio molitor antifreeze protein (TmAFP), remains poorly characterized. In this study, we systematically evaluated the thermal stability and ice recrystallization inhibition (IRI) activity of TmAFP across a concentration range of 0–50 μg/mL before and after heat treatment at 60 °C for 30 minutes. IRI activity was quantified using the splat cooling method by measuring mean largest grain

size (MLGS). TmAFP exhibited strong, concentration-dependent IRI activity that was largely retained following thermal stress, demonstrating substantial resistance to heat-induced functional loss. These findings support the potential of TmAFP as a stable and effective cryoprotective agent.

Emily Zempel

B.S. Biochemistry, minor in Bioinformatics
Computational Analysis of Antifreeze Protein–Mediated Enzyme Cryoprotection and Trypsin Resistance
Faculty Mentor: Dr. Caitlin Scott

Donor organ preservation relies on cold storage to extend viability; however, hypothermic conditions introduce challenges, including ice formation and protein degradation, compromising enzyme function. Antifreeze proteins (AFPs) offer strategies to counteract this via ice binding, limiting ice growth, and exhibiting thermal hysteresis activity. DAFP-1, an AFP from Dendroides canadensis, has been shown to preserve enzymatic activity under freeze-thaw conditions. In 2025, we characterized DAFP-1's cross-species binding with alcohol dehydrogenase (ADH) from Saccharomyces cerevisiae via 100ns MD simulations in triplicate, and demonstrated enzymatic activity protection via assays. Consistent trends across experiments revealed orientation-specific ADH binding. To confirm that DAFP-1 remains functional in protease rich environments, trypsin digestion assays followed by SDS–PAGE were performed, revealing cleavage of the positive controls and DAFP-1 remained intact. Cluspro docking informed atomic distance insight to DAFP-1s resistance to trypsin digestion in contrast to the controls. These findings support its potential as a cryoprotectant for organ-preservation systems.

Jennifer Flores

M.S. Biology
Investigating the Effect of Phosphorylated Alpha-Synuclein Peptides on Dopamine Oxidation
Faculty Mentor: Dr. Yixian Wang

Dopamine oxidation plays a crucial role in neuronal physiology, but it also has implications for neurodegeneration. Under physiological conditions, dopamine can undergo spontaneous or catalyzed oxidation, resulting in reactive quinones and semiquinones that can disrupt cellular function. Although the oxidation of dopamine involved in disorders such as Parkinson's disease in conjunction with α-synuclein, the mechanism of how α-synuclein may influence dopamine oxidation pathways remains unclear. In this study, we investigate dopamine oxidation in the presence of phosphorylated or non-phosphorylated α-synuclein peptide using UV-Vis spectrophotometry over a 72-hour period to characterize intermediate formation. We observed that double phosphorylated α-synuclein affects dopamine oxidation pathways, resulting in reduced formation of neuromelanin compared to non-phosphorylated peptide and iron-catalyzed dopamine oxidation. Future studies will determine whether these oxidation products elicit cytotoxic effects on SH-SY5Y neuroblastoma cells. This research was funded by the National Institutes of Health (NIH R15NS120157) and CSU-Bridges to Doctorate Program (T32 GM146700).

Maximilian Mobley

M.S. Biology
Characterizing the role of potassium and potassium transport in the context of the circadian clock of Synechococcus elongatus PCC 7942
Faculty Mentor: Dr. Susan Cohen

The circadian clock is the internal timekeeping mechanism used to anticipate the daily environmental changes. Cyanobacteria are simplest organisms to display a circadian clock and have a core oscillator made up of KaiABC proteins. KtrA, a potassium transport regulatory protein, was identified as associating with KaiC. Pharmacological inhibition of potassium transport with CsCl results in an ~3 hour period increase. Overexpression of ktrA and the transporting subunit ktrB also results in a lengthened period. Altering the extracellular potassium concentration in the media did not significantly alter the circadian period; however, it did alter the amplitude of circadian rhythm where higher potassium led to higher amplitudes. Using an internal potassium tracking kit, we found that potassium levels decrease during the night. Taken together, this data can suggest that it is potassium transport that plays an integral role in the proper functioning of the circadian clock of cyanobacteria.

Morgana Morris

M.S. Biological Sciences
Comparative kleptoplastic capabilities of Elysia hedgpethi on two algal species.
Faculty Mentor: Dr. Patrick Krug

The ability to steal functional chloroplasts known as kleptoplasty is documented in protists, flatworms, and sea slugs, but the longevity of their use is understudied. Kleptoplasts can still photosynthesize and produce sugars that benefit the host. The local sea slug Elysia hedgpethi was studied in a factorial experimental design in light and dark treatments and fed versus starved treatments on Bryopsis corticulans and Codium fragile for functional kleptoplast retention and consumption rates. Starved treatments showed the longevity of kleptoplast use while fed allowed the slugs to uptake new kleptoplasts. Fed E. hedgpethi was found to be highly photosynthetic at 36 days when dark starved treatments showed no photosynthetic capabilities. E.

hedgpethi on Bryopsis had a longer duration of high photosynthetic ability at 36 days than Codium at 23 days. E. hedgpethi has a higher consumption rate and photosynthetic capacity on Bryopsis than Codium.

Yahan Lin

B.S. Biochemistry and Biology, Microbiology option

Coordination of Circadian Rhythms and Cell Division by TlyA and FtsZ Interactions in Cyanobacteria

Faculty Mentor: Dr. Susan Cohen

Cell division and circadian rhythms are cyclic processes that are coordinated to ensure that division occurs only under favorable conditions. Synechococcus elongatus, a photosynthetic cyanobacterium, exemplifies this through the circadian gating of cell division. Under constant light conditions, cell division is suppressed for ~6 hours after dusk in anticipation for the onset of darkness. This occurs through the inhibition of FtsZ, a bacterial tubulin protein, by TlyA, a predicted rRNA methylase. We seek to elucidate the mechanism in which TlyA inhibits FtsZ. Our results demonstrate that TlyA and FtsZ show enhanced association under slower growth rates. TlyA mutants lacking the FtsJ domain or with an altered D85 residue did not associate with FtsZ, indicating interaction through the methyltransferase domain. TlyA and FtsZ association is not mediated by RNA, as association persisted in the absence of RNA. We identified TlyA inhibits cell division through potential non-RNA mediated methyltransferase activity.

Group 4 ▪ Humanities/Liberal Arts/Health
▪ University Student Union – Board Room 303A

Arwa Hammad
B.A. Political Science and Philosophy
When Defending Democracy Limits It: Exclusion and Inclusion in U.S. Political History
Faculty Mentor: Dr. Michael McLendon

This presentation examines how U.S. democracy has historically responded to perceived internal threats through a comparison of exclusionary and inclusionary policies. It focuses on mid-20th century measures such as McCarthy-era loyalty oaths and the suppression of Black civil rights activism, which were framed as necessary defenses against "subversive" influences. These policies are contrasted with later inclusionary reforms, particularly the Voting Rights Act, which expanded minority participation in democratic institutions. Drawing on secondary historical sources, the presentation argues that exclusionary approaches undermined democratic legitimacy by restricting civil liberties and political participation, while inclusionary reforms ultimately strengthened democracy. By comparing these historical responses, the analysis highlights the long-term consequences of how democracies define and defend themselves.

Kelsey Faamausili
M.A. TV, Film, and Media Studies
Woven Currents: Vai and the Cinematic Language of Indigenous Feminism and Decolonial Thought
Faculty Mentor: Dr. Mercedes Chavez

This paper examines Vai (2019), a collaborative Pasifika film directed by nine Indigenous women from seven Pacific nations, as a cinematic expression of Indigenous feminist and decolonial theory. Drawing on Pacific epistemologies and Indigenous sociology, I propose that the film Vai embodies a dynamic framework of relational knowledge across generations, in which land, water, and kinship shape identity, memory, and resistance. Through collective authorship and nonlinear storytelling, the film reimagines filmmaking as a form of sovereignty and care that challenges colonial ideas of individuality and representation. Focusing on Vai, this paper establishes a foundation for extensive research into the ways Samoan and Pasifika narratives preserve Indigenous knowledge, memory, and continuity through film and media.

Natalie Sanchez
B.A. Liberal Studies, Interdisciplinary Studies in Culture and Society option
Challenging Human and Rat Narratives through Multispecies Education
Faculty Mentor: Dr. Jeannette Vaught

Over the past year, I have conducted ethnographic research at the Santa Monica Mountains Visitor Centers. At these centers, I educated the visitors about wildlife and their ecological importance through pop-up tabling. At these tabling events, I focused on gathering public feedback on wildlife. I noticed that many visitors shared a similar outlook on rodents, viewing them as dangerous, unsanitary, and emphasizing the need for rodent control. My project examines the cultural narratives of public perspectives, with the goal of finding an answer to how to coexist with the most hated animal: rats. I challenge the narratives of the convenience versus ecology tensions, where people tend to prioritize convenience without necessarily considering the damage it causes. I hope to foster at least an understanding of human and rodent relationships and to inspire people to stop using poison, and highlight that wildlife is an integral part of our shared environments.

James Carter II
M.A. Anthropology
The Erasure of Christian Identity in Palestine
Faculty Mentor: Dr. Aaron Sonnenschein

Christianity's geographic origin is Occupied Palestine. From the time Christianity separated itself from Judaism until the Nakba, Christians, Muslims, and Jews cohabitated in Palestine with little religious tension. The metanarrative concerning the contradiction between Palestinian autonomy and Israeli statehood is that the dissonance between Palestinians and Zionist settlers is religious, not political and that Palestinians, and indeed all Arabs, have a primordial, ontological deficiency that causes them to hate the Jewish religious identity. This depoliticization of the Palestinian struggle transposes the settler-colonial occupation of the Levant from a recent historical development into an irretractable quagmire centered on religion and ethnicity. In this work, I will argue that the erasure of Palestinian Christians functions to not only physically cleanse the Christian presence in Historic Palestine, but to further entrench Zionist colonialism by reifying the settler colonial dynamic into an ethnic-religious one.

Marineh Mousalu
M.A. Anthropology
Non-metric Dental Variation in a Classic Period (AD 250−900) Human Sacrificial Assemblage from Midnight Terror Cave, Belize
Faculty Mentor: Dr. Michele Bleuze

Variation in non-metric dental traits is used to reconstruct population histories and relationships among Classic period Maya groups. Dental morphology in the sacrificial

assemblage from Midnight Terror Cave, Belize is compared with contemporaneous funerary (Altun Ha, Barton Ramie) and non-funerary (Seibal) samples to explore population structure across mortuary and geographic contexts. Shoveling, double-shoveling, interruption groove, and tuberculum dentale on maxillary teeth were scored using the ASUDAS system and dichotomized for comparison. Multiple-sample tests of proportions show significant differences: double-shoveling is higher at MTC than Altun Ha and Barton Ramie , while shoveling differs significantly only between MTC and Barton Ramie. Mean Measure of Divergence (MMD) values indicate MTC is closest to Seibal and more distant from Altun Ha and Barton Ramie. These results contribute insight into identities of sacrificial victims, social organization, and broader (necro)political implications.

Aidan Wait

M.S. Kinesiology, Exercise Science option
Knowledge, and Attitudes of Collegiate Soccer Players Toward Injury Risk Factors and Prevention Strategies
Faculty Mentor: Dr. Leila Rahnama

Background. Soccer is a popular sport with a high incidence of injuries among collegiate athletes, with various factors contributing to the prevalence of injuries. Purpose. This study aimed to assess collegiate soccer players' knowledge of injury prevention and their attitudes towards injury prevention strategies. Methods. This cross-sectional study used two validated surveys to assess the knowledge and attitudes regarding injury prevention among collegiate soccer players across California Results. A total of 148 athletes responded to the survey with a mean age of (20.1 ± 1.7). The results demonstrated significant correlations ($p<0.001$) between missed playing time and athletes' negative attitudes, with r2 values ranging from 0.217-0.509. No significant associations were found between injury prevention knowledge or attitudes and a history of past injuries. Conclusion. Negative injury-related attitudes were associated with prolonged time lost from sport. Future studies should evaluate psychological interventions to improve recovery in injured collegiate soccer players.

Matthew Minor

M.S. Kinesiology
Kinesiology is Political
Faculty Mentor: Dr. Saemi Lee

When these dimensions remain unexamined, assumptions about gender, race, morality, and responsibility shape real-world decisions about who is allowed to participate, how movement is judged, and which choices are deemed "healthy." The purpose of this project is to highlight the sociocultural and political nature of kinesiology by critically examining two dominant assumptions: the "Great Sport Myth" and "Exercise is Medicine." Using a Foucauldian perspective, I examine who benefits from these assumptions and how they shape perceptions of moving bodies. Building from this analysis, I develop teaching resources to support students and faculty in recognizing how kinesiology contributes to unequal opportunities and outcomes in sport and exercise.

Yezica Ramirez

M.S. Kinesiology
Immediate vs. Delayed Cold-water Immersion on Muscle Soreness and Power Following Plyometric Exercise
Faculty Mentor: Dr. George Crocker

Delayed-onset muscle soreness (DOMS) can impair athletic performance, making effective recovery strategies essential. Cold-water immersion (CWI) reduces DOMS when applied within 15 minutes post-exercise; however, this timing may not be feasible in collegiate settings. This study examined whether delaying CWI by 50 minutes affects DOMS and muscular power over three days following exercise-induced muscle damage (EIMD). Fourteen student-athletes performed five sets of 20 drop jumps, then were randomized into one recovery intervention: immediate CWI, 50-minute delayed CWI, or no CWI. Vertical jump height and soreness were assessed across three days post-EIMD. Jump height decreased with no significant differences among groups ($p = 0.406$). The delayed CWI group reported more soreness than the immediate CWI group ($p = 0.021$), with no differences between immediate CWI and no CWI ($p = 0.331$) or delayed CWI and no CWI ($p = 0.114$). These data suggest delaying CWI may increase soreness without impacting power.

Eric Gonzales

M.A. Anthropology
The Science and Significance of Red Pigment on Ancient Maya Human Remains from Non-funerary Contexts
Faculty Mentor: Dr. Michele Bleuze

The ancient Maya frequently used red pigments, specifically ochre and cinnabar, for funerary purposes. Ochre was more readily available to the general population and has been documented in non-elite funerary contexts. Natural sources of cinnabar were restricted making it a rare, highly valued prestige commodity primarily reserved for elites. At the Cueva de Sangre in Guatemala, the red-painted bones of two individuals were found in a non-funerary context. Red pigment has also been documented on the skeletal remains of human sacrificial victims at the Midnight Terror Cave in Belize. These findings indicate that the mortuary use of red pigments was not confined to funerary functions. This study investigates the chemical composition of the pigments using gas-chromatography

mass spectrometry and x-ray fluorescence and discusses the application methods and the symbolic and ritual significance of red pigment in non-funerary contexts during the Classic period (AD 250−900).

Group 5 ▪ Engineering/Computer Science/Technology I
▪ University Student Union – Los Angeles B Room 308A

Edrei Pliego Jr. and Jose Hernandez
M.S. Civil Engineering
Quantifying Changes in Compound Flood Driver Dependencies Along the US Pacific Coast
Faculty Mentor: Dr. Joseph Lucey-Rentaria

Coastal flooding is a worldwide concern. Climate change has further increased the frequency of coastal flooding and compound flood events (multiple flood drivers co-occurring). Compound events may be most detrimental when the individual events' peaks are not simultaneous (i.e., "lagged"). Previous work has not thoroughly estimated the dependencies among flood drivers and the potential lag times critical to compound-event development. This study aims to quantify the dependencies between observed water levels and precipitation, estimate potential changes in these dependencies, and identify critical "lags" between drivers. Multiple locations along the US Pacific coast are considered. Correlations between drivers describe variable dependencies. A moving window analysis provides insight into how dependencies may have changed over time. Cross-correlations enable the quantification of lags between drivers. Future work will expand the analysis to the Gulf and Atlantic Coastlines.

Filiberto Zavala and Lesly Avila
B.S. Civil Engineering
A Comprehensive Estimation of Compound Flood Driver Dependencies Across the US Pacific Coast
Faculty Mentor: Dr. Joseph Lucey-Rentaria

Coastal flooding is an increasing concern. Coastal flooding can be induced by marine (marine water levels, storm surge, and waves) and hydrologic (precipitation and discharge) drivers. Climate change has further amplified the frequency and magnitude of flooding. Interactions among multiple flood drivers (compound events) can induce additional flooding. Previous studies have examined dependencies among specific flood drivers, but there is a paucity of research that quantifies dependencies among all flood drivers. This study evaluates the relationships among storm surge, observed water levels, total water levels, precipitation, waves, and river discharge along the US Pacific coast. Dependencies between drivers and a driver's dependency with time are estimated with correlations. Assessing a variable's relationship with time can indicate potential influences from climate change. Quantifying correlations between drivers enables the identification of critical flood driver pairs. Future work will expand the analysis to the Gulf and Atlantic coastlines.

Mallory Spillard
B.S. Civil Engineering
Evaluating Various Methods for Risk Estimation in Data Sparse Environments
Faculty Mentor: Dr. Joseph Lucey-Rentaria

Sparse or incomplete observations are a persistent challenge in hydrologic and climate studies for conducting a flooding analysis. Precipitation, as a primary source of flooding, is widely analyzed in flooding studies; Missing observations can hinder models and limit assessment reliability. Gap-filling techniques, such as regression methods or spatial averaging, often assume simple, linear precipitation behaviors. As a result, they struggle to represent the realistic nonlinear behaviors of precipitation patterns, and, therefore, underestimate extreme events which are often of greatest interest for flooding. Machine learning can provide an alternative approach for addressing missing observations. Previous studies prove machine learning can replicate the complex behaviors of precipitation, indicating that these models consistently outperform traditional gap-filling methods by improving the quality of predicted datasets. This benefits hydrologic modeling and flood prediction, supporting more educated decision-making in water resource management. Future work will extend this approach to additional station networks and climate regions.

Miracle Sanchez, Gerald Davenport, Julian Barba, Keira Tung and Nehemias Orellana
B.S. Electrical Engineering
Early Detection of Downed Power Lines to Reduce California Wildfire Hazards
Faculty Mentor: Dr. Arash Jamehbozorg

Downed power lines are extremely dangerous. They can electrocute people, start wildfires, and knock out electricity for entire communities. This research develops a smart detection system that can identify broken power lines and automatically shut them off before these dangers occur. Our approach uses a combination of simulation and machine learning tools. PSCAD software simulates how power lines behave during normal operations and when faults happen. MATLAB organizes this simulation data into a format that the neural network can process. An LSTM neural network learns to spot the patterns that signal a power line is failing. We then evaluated how well the system performs in real-time compared to traditional detection methods. Our results show that this neural network method can catch problems that traditional methods miss. The system identifies faults faster and more accurately, making the power grid safer and more dependable for everyone.

Arthur Espinosa

B.S. Mechanical Engineering

A Two-Stage Workflow for Cooling Plate Geometry Optimization in EV Battery Packs

Faculty Mentor: Dr. Chris Bachman

Effective thermal management is critical for the safety, performance, and longevity of electric vehicle battery systems. This work investigates the thermal design tradeoffs of a liquid-cooled battery cold plate using a simulation-driven approach. Computational fluid dynamics (CFD) and conjugate heat transfer simulations were used to evaluate how geometric parameters, including channel layout and cross-sectional features, influence temperature uniformity, pressure drop, and heat transfer performance. Rather than optimizing for a single metric, the study emphasizes system-level tradeoffs between thermal effectiveness and manufacturability constraints. Preliminary results demonstrate that modest geometric changes can significantly alter local heat transfer behavior and flow distribution, highlighting the importance of early-stage simulation in guiding design decisions. This ongoing research provides insight into how simulation tools can be leveraged to inform practical cooling plate design in electric vehicle battery systems and identifies key areas for further refinement and experimental validation.

Charlie Sanches

M.S. Mechanical Engineering

Humidity-Induced Natural Convection Currents

Faculty Mentor: Dr. Jeffrey Santner

The study of hygro-convection plays an important role in enhancing climate models, improving weather prediction, and optimizing applications such as building energy efficiency and HVAC system performance. This experiment aims to gather empirical data for a humidity-driven convection cell within a rectangular cavity to validify an analytical derived solution. A sealed rectangular enclosure, constructed from ABS and acrylic, was designed to house the formation of humidity-driven convections cells. The enclosure is designed to emulate a starting condition, where the bottom boundary is set at 100% relative humidity (i.e. water) and the top boundary is set at 0% relative humidity (i.e. silica packets). To monitor humidity and temperature, eight sensors that detect temperature and humidity were placed at equidistant locations within the enclosure. The sensors are connected to a data acquisition system (MCC-2416-4AO) and plotted using LabVIEW.

Christian Perez

B.S. Mechanical Engineering

A Computational Tool for NFPA 2–Compliant Hydrogen Infrastructure Layout Design

Faculty Mentor: Dr. David Blekhman

Green hydrogen has the potential to become a leading form of sustainable energy; however, the inherent dangers associated with hydrogen's elemental properties raise concerns among the general public. NFPA 2, the National Fire Protection Association code specific to hydrogen, outlines recommended safety guidelines for facilities that dispense, produce, or store hydrogen in either gaseous or liquid form. These guidelines include both general safety criteria and calculations for recommended separation distances between physical assets.This program allows users to input a two-dimensional representation of a hydrogen station layout. An algorithm then evaluates whether the layout complies with NFPA 2 safety requirements and automatically adjusts component positions to achieve compliance. A tool of this nature would enable both private and public organizations to address safety requirements early in the design process, potentially accelerating the deployment of renewable energy projects.

Fahed Taher, David Wu, Luis Chavez, Kevin Padilla, Gauri Chahal, Geovanny Montano, Juan La Serna, Annie Lin, Diana Martinez, Nichols Gochi and Lester Low
B.S. Computer Science
Graph Neural Networks for Social and Biological Network Analysis
Faculty Mentor: Dr. Jiang Guo

Graph-structured data is central to many scientific and social domains, yet traditional machine learning models often fail to capture the relational dependencies within such data. This project investigates Graph Neural Networks (GNNs) as a framework for learning from complex networks, with comparisons to feature-only baselines. We evaluate multiple GNN architectures—including GCN, GraphSAGE, GAT/GATv2, and APPNP—across diverse applications: node classification on the ogbn-arxiv citation network, immune cell detection in spatial lymphocyte graphs, fake news detection in social networks, innovation adoption prediction in physician networks, and developmental age classification using fMRI brain connectivity graphs. Our results show that GNNs consistently outperform traditional models when relational structure is informative, while highlighting challenges such as class imbalance, over-smoothing, over-squashing, and scalability. Attention-based, sampling-based, and ensemble approaches further improve robustness and generalization across domains.

Hector Gardea and Alonso Torres

B.S. Electrical Engineering
Continuous Parkinsonian tremor detection dual-threshold during daily living activities and its clinical relevance
Faculty Mentor: Dr. Deborah Won

Our objective was to develop and test the clinical relevance of an algorithm which could detect Parkinsonian tremor practically through a wearable device and do so continuously over time during daily living activities. Acceleration was acquired from five Parkinson's disease patients with deep brain stimulation (DBS) while performing a series of activities: sitting, standing, walking, and typing text messages on their phones. We developed a dual-threshold tremor detection algorithm based on spectral peak frequencies. Tremor levels, measured by the percentage of time that tremor was detected, correlated strongly with DBS stimulation level according to the repeated correlations measure (r ranging from -0.93 to -0.97, $p << .01$). This work contributes to the development of a DBS controller that would apply the appropriate stimulation when needed to not only increase power efficiency of the DBS system but also provide more focused stimulation and minimize side effects of unnecessary stimulation.

Akash Saraf

M.S. Computer Science
Machine Learning Automates Protein-Ligand Docking in Virtual Reality
Faculty Mentor: Dr. Negin Forouzesh

Drug discovery relies heavily on an understanding of protein–ligand binding, but traditional molecular dynamics simulations are constrained by slow convergence and the challenge of sampling uncommon binding events. Our recent research has shown that by enabling users to intuitively guide ligands into binding sites, virtual reality–guided interactive molecular dynamics can speed up docking and produce trajectories that enhance adaptive steered molecular dynamics (ASMD) performance. Our project builds on these discoveries by reproducing and validating previously published results that demonstrate that Amprenavir can be docked into HIV-1 protease under human guidance to achieve crystallographic binding poses in minutes and generate potential of mean force (PMF) values nearly twice those of traditional ASMD. To further this work, create a machine learning pipeline to replace manual VR experiments with predictive models and validate the methodology on selected protein-ligand complexes.

Anthony Lee

M.S. Computer Science
Using Machine Learning to Predict Traffic Speed for Mass Evacuation Planning
Faculty Mentor: Dr. Jiang Guo
Emergency evacuation scenarios present unprecedented challenges for urban traffic management, requiring advanced prediction systems to forecast traffic. In this research, we seek to utilize machine learning to predict traffic speeds, in which they can be used to enhance evacuation planning capabilities. This would provide emergency management agencies with a reliable tool for designing and testing evacuation strategies before they occur. The results indicate that machine learning can significantly enhance evacuation planning capabilities within an acceptable margin of error.

Camila Takisava Kussaba

M.S. Civil Engineering
An in-depth analysis of uncertainties and their impacts on coastal flood defense design
Faculty Mentor: Dr. Joseph Lucey-Rentaria

Data availability is a critical limitation in flood event estimation and coastal infrastructure design. Traditional engineering manuals do not suggest a minimum level of

observations required for reliable design estimates. Using fewer observations to estimate events also resulted in increased uncertainty, which increased sharply at large return periods. All coastlines experienced significant uncertainties when observations were limited. Event estimates derived from larger data records, when applied to a preliminary design scenario, resulted in higher flooding percentages, highlighting uncertainty impacts on the designed infrastructure.

Luis Chavez and David Wu

B.S. Computer Science
GNN–Enhanced Detection of Lymphocytes in Complex Tissue Environments
Faculty Mentor: Dr. Jiang Guo

We developed and evaluated machine learning and graph neural network (GNN) methods to detect lymphocytes in complex tissue environments using cell graphs, where nodes represent individual cells with high-dimensional features and edges capture local neighborhood relationships. We established feature-only baselines (e.g., Logistic Regression and KNN with normalization) and progressed to neural models (MLP) and multiple GNN families (GCN, GraphSAGE, GATv2, APPNP, and regularized/deeper variants). To ensure realistic generalization and reduce leakage, we emphasized graph-level splitting (by connected components) and reported classification metrics including accuracy, macro-F1, and ROC-AUC under class imbalance. Overall, incorporating spatial/cellular context via message passing improved minority-class sensitivity compared to feature-only approaches, with attention-based GNNs providing the strongest performance. These results support GNNs as a principled way to model tissue microenvironments for robust lymphocyte detection.

Rojina Zalzar

B.S. Computer Science
AI-Driven Personalized Recommendations and Support for the BookEx Web Platform
Faculty Mentor: Dr. Jiang Guo

The BookEx project integrates AI to enhance both book discovery and user support within a tier-based digital marketplace. The implementation leverages a recommendation agent that ranks books using on-site data such as user ratings, comments, prices, and subscription tiers, ensuring that suggestions remain consistent with each user's search filters and access permissions. In addition, an AI-powered support chatbot was embedded as a floating widget visible across all pages, allowing users to ask natural-language questions about books, exclusive content, and site features. Both agents are powered through API calls to a lightweight large language model, which operates strictly over BookEx's own database and business rules rather than external web content. This work demonstrates how targeted AI integration can personalize user experience, preserve access control, and improve navigability in a student-built, production-style web application.

Group 7 ▪ Physical and Math Sciences I
▪ University Student Union – Los Angeles Room 308C

Aziell Paul S. Limbo and Courtney Wu
M.S. Physics, Research option
Infrared Absorption Spectrum of HFE-347pcf2
Faculty Mentor: Dr. Karine Le Bris

Despite their relatively low concentration, fluorinated compounds significantly impact the climate due to their high radiative efficiency and long atmospheric lifetimes. Hydrofluoroethers (HFEs) have been introduced into the market as an alternative to chlorofluorocarbons (CFCs), hydrochlorofluocarbons (HCFCs) and hydrofluorocarbons (HFCs). These new compounds have shorter lifetime and, therefore, do not accumulate as much in the atmosphere. However, due to their high radiative efficiency, they are still greenhouse gases whose impact on the energy balance of the atmosphere needs to be evaluated. Our objective is to obtain the infrared absorption spectrum of HFE-347pcf2 using quantum chemistry computational analysis and experimental measurements via Fourier Transform spectroscopy. This will allow us to improve the reliability of the molecule's global warming potential value (GWP). This information can then be used by legislators to regulate the use and emissions of this compound into the atmosphere.

Cristina Guevara
B.S. Biochemistry
Investigating conformational changes of fentanyl and its analogs using molecular dynamics
Faculty Mentor: Dr. Caitlin Scott

Fentanyl is a strong binding opioid that treats chronic pain. Fentanyl and its analogs interact with the human μ-opioid receptor (μOR) causing intracellular signaling. Two pathways of particular interest involves the Gi and the β-arrestin proteins. The Gi pathway provides analgesia while the β-arrestin desensitizes the μOR by blocking Gi signaling and causes internalization of the receptor leading to tolerance. To isolate the desired effects of fentanyl, our research focuses on fentanyl's conformational changes. Fentanyl and its analogs can have cis, gauche, or trans conformations in solution. 100 ns molecular dynamics simulations were performed in triplicate on fentanyl and β-methyl fentanyl in water boxes. Fentanyl showed the most stability in the cis conformation, aligning with quantum mechanical results. Changing the solvent polarity affected the conformation of the ligand. These conformational changes may explain the differences between potency, binding affinity, and efficacy of fentanyl and its analogs with the μOR. justified configuration of the new station.

Mitchell R. Jacobs
M.S. Physics
Absorption Cross Section of Enflurane by Fourier Transform Infrared Spectroscopy
Faculty Mentor: Dr. Karine Le Bris

Halogenated organic compounds play a disproportionate role in atmospheric radiative forcing due to strong infrared absorption, yet many remain poorly characterized spectroscopically. In this work, quantum-chemical methods are used to generate absorption data in the infrared (IR) spectrum for Enflurane, a halogenated ether that was once a widely used inhaled anesthetic for general anesthesia but is now considered largely obsolete. This served as a case study in computationally informed atmospheric spectroscopy on large molecules. Density functional theory (DFT) calculations were performed with optimized molecular geometry to obtain the harmonic vibrational frequencies, from which infrared intensities were extracted. These discrete vibrational features were subsequently broadened to produce continuous absorption spectra and converted into absorption cross-sections relevant to atmospheric conditions. This work establishes a reproducible computational pipeline linking electronic structure theory to climate-relevant spectroscopic quantities, providing a foundation for the systematic assessment of other atmospherically relevant molecules.

Annalissa Valdez
B.S. Biochemistry
Photooxidation Reactions Catalyzed by Metal-Organic Frameworks
Faculty Mentor: Dr. Matthias Selke

Metal-organic frameworks (MOFs) have been extensively studied for the photooxidation of organic sulfides. However, other singlet oxygen reactions have not previously been investigated with MOFs as photocatalysts. The singlet oxygen ene reaction is a method for introducing oxygen functionality to an alkene; however, its potential is somewhat limited due to the formation of different regioisomeric products. We investigated several MOFs as photocatalysts. The aims were to assess MOF efficacy in altering product selectivity and whether these reactions occur in or outside the MOF pores. Our results show a modest alteration in the product ratio of the two allylic hydroperoxides compared to homogeneous solutions. We then investigated the photooxidation of triarylphosphines. In a homogeneous solution, these reactions are sensitive to steric effects: Hindered phosphines undergo intramolecular formation of phosphinate esters rather than phosphine oxide. We also studied the relative reaction rates by pseudo-first-order

kinetics. Results will be shown.

Nathan Venegas

B.S. Biochemistry
Analysis of Microplastics and Their Organic Contaminants in Southern California Beaches Using HT-TD/Py-GCxGC-TOFMS
Faculty Mentor: Dr. Petr Vozka

Plastics are synthetic, non-biodegradable materials that degrade into fragments (>5 mm) called microplastics (MPs). MPs are widespread pollutants in the local marine environments and can act as vectors for organic contaminants, but how these adsorbed compounds vary along highly urbanized coastlines remains poorly understood. This study investigates spatial variation in MP contamination and associated organic compounds across beaches in Southern California. Ten common polymers will be identified using high-temperature thermal desorption/pyrolysis coupled with comprehensive two-dimensional gas chromatography and time-of-flight mass spectrometry (HT-TD/Py-GCxGC-TOFMS) to identify key polymer-specific marker compounds. MP samples collected from multiple beaches were thermally desorbed to remove organic compounds, then pyrolyzed to determine plastic composition. ChromTOF Tile and Sync will be used to perform statistical comparisons for organic compounds across sites. Results indicate site-to-site differences in the abundance and types of detected analytes.

Rayana Ramirez

M.S. Criminalistics
Fingerprint Aging Model Comparison of OPTIC-4 PYRO and Extraction Methods Via GCxGC-TOFMS
Faculty Mentor: Dr. Petr Vozka

Fingerprints are widely used for personal identification in forensic casework; however, fingerprint residue also contains chemical information that can aid forensic interpretation. This research aims to use the chemical degradation of target analytes to estimate time-since-deposition. Prior work using solvent-based extraction with GC-TOFMS demonstrated reproducible aging behavior but revealed limitations including labor-intensive preparation, variable extraction efficiency, and loss of environmentally sensitive analytes. This study systematically compares solvent extraction with direct thermal desorption using an OPTIC-4 pyrolyzer coupled to GC×GC-TOFMS. This alternative method enables minimal sample preparation by introducing residues directly into the GC inlet, potentially improving sensitivity for high-molecular-weight lipids and reducing handling variability. This research evaluates analytical reliability, degradation patterns of cholesterol, squalene, and their byproducts (e.g., cholesta-3,5-diene), and the impact of thermal desorption on time-since-deposition modeling. Preliminary results indicate the continued detection of squalene and cholesterol in fingerprints and patterns in cholesterol-to-squalene ratios over time.

Dominique Dang

M.S. Chemistry
Single Nanoparticle Electrochemical Analysis Using Critical Angle Reflection Microscopy
Faculty Mentor: Dr. Yixian Wang

Single Entity Electrochemistry (SEE) enables the analysis of individual cells, nanoparticles, and molecules, revealing heterogeneity and behaviors that are often hidden in ensemble measurements. Surface plasmon resonance microscopy (SPRM) is a label-free SEE technique that detects refractive index changes and allows imaging of nanoscale reactions. Critical Angle Reflection Microscopy (CARM) is a newer approach that builds on SPRM by using an indium tin oxide (ITO) electrode instead of a gold film and operates below the critical angle rather than at the SPR resonance angle. To demonstrate the capabilities of CARM, surface oxidation and reduction (SOR) experiments were conducted on commercial gold nanowires. Electrochemical activity from 10 μm gold nanowires was successfully detected and analyzed using ImageJ and MATLAB. In contrast, shorter nanowires (4 and 1 μm) produced no detectable signal, likely due to limited system sensitivity. This work was supported by NSF CREST CATSUS (HRD-2112554).

Eric Gutierrez

M.S. Physics, Research option
Magnetic Properties of Ferrocene in Various Carbon Matrices Synthesized via Co-Pyrolysis with Nanodiamond
Faculty Mentors: Dr. Armen Kocharian and Dr. Oscar Bernal

This study explores the implementation of nanodiamond powder (1~10 nm) in the synthesis of carbon-based magnetic nanoparticles (MNPs) produced from ferrocene. With a focus on their morphological, structural, and magnetic properties. To obtain a deeper insight into the influences of impurities in graphene matrices towards their magnetic properties. Particularly, the impact of nanodiamond on the magnetic properties of hydrogen-rich materials. Of which the hydrogen to carbon ratio (H/C) is a minimum of 1. Initial magnetization measurements indicate that the samples without nanodiamond powder display some ferromagnetic behavior. However, samples with nanodiamond powder (~10wt%) have shown an increase in the saturation and coercivity. Moreover, we aim to explore different concentrations of nanodiamond powder, pyrolysis temperature and time. As well as study different variants of ferrocene with diverse H/C ratios. With the aim of

characterizing the ideal conditions for nanodiamond to effectively be implemented in the further study of MNPs.

Group 8 ▪ Physical and Math Sciences II
▪ University Student Union – Pasadena Room 307

Edgar Yak-De Padua
M.S. Mathematics
Chromatic Number of 6-valent Circulant Graphs: Extension Ladder Homomorphisms
Faculty Mentor: Dr. Michael Krebs

The Euclidean plane is flat, rigid, and endless in every direction. Yet, the Euclidean Plane still holds some secrets. The so-called chromatic number of the plane problem asks for the smallest number of colors with which we can assign every point in the Euclidean plane a color such that points of distance one apart from each other receive different colors. This problem remains unsolved. The 6-valent circulant graphs may be central to finding a solution. A formula for the chromatic number of 4-valent circulant graphs is known. However, neither this formula nor its proof generalizes easily to circulant graphs of higher valence. In particular, we have developed a new construction, called “extension ladder homomorphisms,” to determine the chromatic number of these circulant graphs. Our technique has successfully reduced the problem from coloring infinitely many graphs to coloring just a manageably small, finite number of base cases.

Cathryn Price
M.S. Physics
Cataloging High-Mass X-ray Binary Candidates in Nearby Low-Mass, Low-Metallicity Galaxies with Chandra and Hubble
Faculty Mentor: Dr. Margaret Lazzarini

High-mass X-ray binaries (HMXBs) are systems in which a neutron star or black hole accretes material from a massive star companion, producing some of the brightest X-ray emission. Because massive stars have short lifetimes, HMXBs are closely linked to recent star formation and can be used to trace star formation rates (SFRs) in galaxies. Studying HMXBs also provides insight into the evolution of binary systems, compact objects, and the origins of gravitational wave sources. In this talk, I present a catalog of HMXB candidates in a sample of nearby, low-metallicity galaxies. Using new and archival observations from the Chandra X-ray Observatory, we measure X-ray source positions and fluxes across multiple energy bands. Sources are classified using X-ray hardness ratios to distinguish soft thermal emitters from harder, more absorbed sources, such as HMXBs. Future work will combine Hubble Space Telescope imaging and photometry to identify optical counterparts consistent with massive stars.

Jared Sweatman
M.S. Physics
Analyzing Data from the Cassini Spacecraft to Better Understand Titan’s Atmospheric Airglow Response to Saturn’s Magnetospheric Particles and Solar Activity
Faculty Mentor: Dr. Emilie Royer

Titan, Saturn’s largest moon and the only moon in the Solar System known to possess a dense nitrogen atmosphere and an active ionosphere, offers a rare environment for studying upper atmospheric processes. Its atmosphere, coupled with continuous exposure to Saturn’s magnetospheric environment and varying solar activity, produces distinctive airglow emissions in the Far Ultraviolet (FUV) spectrum. Leveraging the Cassini–Huygens UVIS dataset collected between solar cycles 23, 24, and 25 (2005 – 2017), our project investigates how magnetospheric particle bombardment and solar variability influence Titan’s upper atmospheric nitrogen airglow response. By studying the interplay between the magnetospheric interaction with respect to Titan’s orbital position in Saturn’s magnetosphere, and Titan’s relative day and night cycle, we can begin to understand if solar contributions remain the main driver in the production of nitrogen airglow.

Laura Fredericks
B.S. Physics
The Solar System Before the Planets Formed: Investigating Physical Processes in Young Star System L1527
Faculty Mentor: Dr. Susan Terebey

Planets form out of the gas and dust in the disk around a young star (protostar). We investigate whether material falling onto a forming disk undergoes a sudden deceleration at the disk’s outer edge, potentially altering the initial conditions for planet formation. Using Atacama Large Millimeter Array (ALMA) observations, we trace the motion of material in and around the disk of protostellar system L1527. We compare these observations with a disk model that incorporates effects of instantaneous deceleration at the disk edge. The model bears a strong qualitative resemblance to the ALMA observations, warranting quantitative analysis of shock signatures in L1527 and other young star systems. This work was carried out in part at the Jet Propulsion Laboratory, California Institute of Technology, under contract with NASA.

Luis David Cruz Vega

M.S. Physics
Tracing the Building Blocks of Life in Young Stars CED110 IRS4 A and B
Faculty Mentor: Dr. Susan Terebey

A protostar is a star-like object formed when a dense cloud of interstellar gas and dust undergoes gravitational collapse during the earliest stage of star formation. As the protostar forms, the additional material coalesces into a protoplanetary disk. This material includes molecular precursors to organic compounds. If these molecules survive the stellar formation process, they may arrive on planets as part of icy comets. Our goal is to determine their survivability by studying their motion within the disk. Data on nearby star-forming regions gathered by the Atacama Large Millimeter Array (ALMA) was used to study gaseous components such as C18O, 12CO, and 13CO. We measured their abundance and movement and will compare the results to simulated disk models based on the RadChemT software. The outcome of our research will further test current star and planet formation theories while advancing our understanding of the origins of life.

Marlon Brandon Reyes Silva

M.S. Physics
Characterizing High Mass X-ray Binary Populations in Low Metallicity, Low Mass Dwarf Galaxies Using Chandra and Hubble Data
Faculty Mentor: Dr. Margaret Lazzarini

High mass X-ray binaries (HMXBs) are extreme systems where a compact object accretes material from its high mass companion, forming an accretion disk that emits bright X-ray radiation. HMXBs are interesting systems as they are a possible intermediate stage of the evolution of massive binary stars, which are the progenitors of double compact object mergers that produce gravitational waves. HMXBs also play a role in their host galaxy's evolution by providing ionizing radiation and injecting heavy elements through supernova feedback. We study HMXBs in local low metallicity, dwarf galaxies because they are analogs to early universe galaxies, providing insight into how HMXBs impacted early galaxy evolution. In this talk, I will discuss work I have done to catalog HMXB candidates using hardness ratios to identify hard point sources. A good HMXB candidate is a hard X-ray point source with a bright, blue point source optical counterpart in overlapping HST observations.

Sophia Grusnis

M.S. Physics, Astrophysics Research option
Reading the Ice: Probing Enceladus' Surface With Ultraviolet Light
Faculty Mentor: Dr. Emilie Royer

Enceladus, a small icy moon of Saturn, has one-of-a-kind plumes that spray material into space and continually renew its surface. First observed by NASA's Cassini mission, this unique cryovolcanism shows that the moon is geologically active and may even provide conditions suitable for life. In this study, we investigate Enceladus' surface by examining how it reflects ultraviolet (UV) light from different viewing angles. From these measurements, we build an overall UV brightness curve that captures the moon's global surface behavior. We use this curve to estimate key surface characteristics, including how reflective the ice is, the typical size of surface grains, and the way light scatters across the frozen terrain. Together, these results offer a clearer picture of Enceladus' surface texture and composition. This work also supports future exploration of icy moons, including observations by the Europa Clipper mission, which may help identify Europa's possible plume activity and potential habitability.

Angel Morales

M.S. Physics
How the Solar Cycle Affects Titan's Upper Atmospheric Nitrogen Airglow
Faculty Mentor: Dr. Emilie Royer

Titan, Saturn's largest moon, possesses a nitrogen-rich atmosphere that resembles Earth's early atmosphere. When solar ultraviolet radiation interacts with Titan's upper atmosphere, it excites and ionizes molecular nitrogen, producing a far-ultraviolet (FUV) airglow observable from orbit. This emission provides a powerful diagnostic of how Titan's atmosphere responds to changes in solar radiation driven by solar cycle variability. This study analyzes FUV observations from NASA's Cassini Ultraviolet Imaging Spectrograph collected over more than one full solar cycle. Two nitrogen emission features sensitive to solar radiation were examined. The data were filtered to altitudes between 800-1200 km and used to compare airglow behavior across different years, solar cycle phases, and Saturn local time sectors, with a focus on dayside conditions. The results reveal long-term variability in Titan's upper atmosphere correlated to changes in solar radiation, demonstrating a strong solar-cycle influence on atmospheric excitation and improving our understanding of planetary atmospheric evolution.

Kenneth Stebbing Cabrera

M.S. Physics
How Shocks Influence Organic Chemistry in Young Planetary Systems: Insights from the Protostar L1527
Faculty Mentor: Dr. Susan Terebey

When a dense region of a molecular cloud collapses, it forms a protostar surrounded by an accreting disk. Observations of gas around the protostar L1527 show

that precursors to organic molecules are prominent in the disk. Understanding why could provide deeper insight into how these molecules are distributed during planetary formation. Earlier astrochemistry models that did not incorporate shock physics showed that precursors form efficiently but occur as ice mantles on dust grains. When infalling material impacts the disk, it passes through a shock that heats the material and could release precursors from grain surfaces into the gas phase. Using conditions prevalent in L1527, we generate shock models with our revised astrochemistry code. Our models show a significant increase in gas-phase abundances for three of the four molecules considered. In contrast, dust-grain abundances for all four decrease significantly. This suggests that shocks may explain the discrepancy between observations and modeling.

Abstracts of Poster Presentations

Behavioral and Social Sciences

1. Melysa Gomez, Noemi Alanis & Danielle Romero

M.A. Child Development

Parental Goals and Beliefs About Early Bilingual Development Among Spanish-Speaking Early Head Start Families

Faculty Mentor: Dr. Allison Fuligni

This qualitative study examines Spanish-speaking parents' goals, beliefs, and concerns regarding their young children's bilingual language development. Using focus groups with Spanish-speaking parents (N=12) participating in an Early Head Start program with their child under age 3, the study addresses three research questions: whether parents aim for full bilingualism or prioritize development in Spanish or English; which language practices parents believe best support these goals; and what concerns parents have about their children's language development and the resources available to support it. Seven focus groups were conducted, half in Spanish and half in English, and data was analyzed using thematic coding. The findings indicate that families value maintaining Spanish for cultural and familial connections while promoting English for academic success. This study contributes to research on preschool- and school-aged DLLs by highlighting the goals and practices of parents of infants and toddlers during a critical period for language development.

2. Noemi Alanis & Jessica Vega

B.A. Psychology

Understanding Adult Math Anxiety Through Childhood Math Experiences at Home and School

Faculty Mentor: Dr. Corinne Bower

Although many children in California learn more than one language, little research has examined the goals and beliefs that motivate parents to foster bilingualism during infancy and toddlerhood. This study presents descriptive findings from a follow-up survey designed to better understand parents' goals for raising their children as dual language learners. Participants were Spanish-speaking parents enrolled in UCLA's Early Head Start program (N = 12). The survey assessed demographic background, children's language exposure, and beliefs about bilingualism. Results show that most parents did not believe learning two languages causes language delays and strongly supported maintaining home languages and bilingual education. Reliability analyses of belief items were examined as two related constructs: knowledge of bilingual development (3 items; α = .70) and value of bilingualism (4 items; α = .83). These findings provide quantitative context for understanding parent perspectives on early bilingual development and helping in improving measurement in future research.

3. Susan Lee

M.A. Communication Disorders, Speech-Language Pathology emphasis

Collaborating with Teachers: A Pilot Study of Early Literacy Skills in Classroom Activities

Faculty Mentor: Dr. Erica Ellis

Emergent literacy skills including alphabet knowledge, print conventions, and rhymes have been associated with strong development of later reading and academic achievement. Interdisciplinary collaboration between teachers and SLPs is critical to fully support individual learning and communication needs for students from diverse backgrounds. The purpose of this project is to evaluate early literacy practices by teachers in a variety of preschool (N= 3) and early intervention classrooms (N = 2) from two different early childhood programs in Los Angeles. An adapted measure of the Systematic Assessment of Book Reading (SABR) was used to quantify teacher strategies. Preliminary data analysis indicated a variation in both frequency and quality of early literacy strategies used during literacy activities, with teachers reporting classroom engagement from medium to high levels. This study may further provide insight into specific early literacy strategies, areas for growth, and tools for SLPs to connect with teachers to implement strategies.

4. Ysabel Jumarang

B.A. Psychology

Association Between Early Traditional vs. Digital Play and Later 3D Spatial Skills

Faculty Mentor: Dr. Corinne Bower

Traditional toys are known for enhancing cognitive skills (İleri et al., 2023). Certain digital toys can promote the development of spatial skill through features that present new spatial information (Polinsky et al., 2023). In this study, we examine if there is a significant difference between the usage of traditional and digital toys in childhood and mental rotation ability in early adulthood. A 3D mental block rotation task was administered to 165 undergraduate psychology students. Later, they took a survey where they rated digital and traditional toys based on frequency of usage in childhood. The results suggest that there is no significant correlation between both types of play and block rotation ability. While not significant, usage of both types of toys in

childhood was linked to better block rotation scores. Future studies may observe other types of play to see if they have a significant effect on mental rotation ability.

5. Ryan Christopher Lefever

M.A. Psychology
How Common is Asexuality? A Review of Empirical Research on Prevalence
Faculty Mentor: Dr. Pamela Regan

Defined as an enduring lack of sexual attraction towards others, asexuality remains one of the least studied sexual orientations. Studies of its prevalence are likewise limited. This literature review summarizes the results of survey research using national probability and convenience samples conducted across the past eight decades, both in the United States and abroad. Across studies, a range of between 0.4% and 1.3% of adults identified as asexual, with an overall average of 0.7%. In reports that captured gender differences, asexuality was found to be more common in women than men, at a nearly 2:1 ratio. This literature review indicates that while asexuality is uncommon, it is nonetheless persistently observed in the population. We recommend continued inclusion of asexual response options and standardized operationalization of sexual orientation items in future surveys.

6. Evelyn Mojarro-Pedroza, Lisette Bailey & Sylvia Williams

M.A. Psychology
Political-Ideological Predictors of Benevolent, Hostile, and Gender-Blind Sexism in College-Age U.S. Voters
Faculty Mentor: Dr. Heidi Riggio

Major U.S. media continue to question links between Trump/Republican support and sexist beliefs. Political support for Donald Trump is tied to right-wing authoritarianism, which correlates with conservatism, traditionalism, and negative attitudes toward women. This study examined how authoritarianism, conservatism, traditionalism, and political support predict different forms of sexism, including benevolent, hostile, and gender-blind sexism. A diverse sample of adults (N = 569; 56% women; 55% Latinx; M age = 25.5) completed online measures of sexism, authoritarianism-conservatism-traditionalism, and voting behavior. Multiple regressions (controlling for age and sex) revealed that benevolent sexism was linked to authoritarianism and traditionalism, while hostile and gender-blind sexism were associated with authoritarianism, conservatism, traditionalism, and Republican support. Even after accounting for overlapping predictors, Trump/Republican support remained a significant predictor of negative attitudes toward women, suggesting that political allegiance independently contributes to sexist beliefs.

7. Simant Baral

M.A Psychology
Creating welcoming faith communities for people with MH conditions
Faculty Mentor: Dr. Crystal Slanzi

Up to 78% of individuals with mental health conditions have reported that religious participation is important to them; however, up to 63% of those individuals report not engaging in religious activities as much as they would like (Salzer et al., 2014). Although numerous positive effects of religious participation have been documented, there is evidence that participation may be low due to discrimination. Frameworks have been developed to outlining strategies to create more welcoming spaces in faith communities for people with disabilities and MH conditions (e.g., Carter, 2013), yet none, to our knowledge have been tested. In this study implemented an intervention with four faith communities to promote religious participation by changing practices (e.g., using more inclusive language) and developing new program (e.g., support groups). Preliminary data from two congregations indicate that incorporation of these practices is associated with an increased sense of belonging and inclusion amongst individuals with MH conditions.

8. Alvaro Ramirez

B.A. Chicana/o Latina/o Studies
Nepantla and Decolonial Healing in Marginalized Communities
Faculty Mentor: Dr. Anita Tijerina Revilla

This presentation explores Gloria Anzaldua's theory of Nepantla, a Nahuatl term and theoretical framework described as both a liminal and liberatory space that makes visible the intersections of identity, resistance, and healing among marginalized communities. Building from Anzaldúa's vision, I place Nepantla in conversation with Therí A. Pickens's "Black Madness", Jose E. Munoz's "Disidentifications" and McRuer's "Crip Theory". Their writings help me frame Nepantla not only as a borderland between identity and culture but also as a methodology of healing. Together these great thinkers give us the ways toward a decolonial healing framework that is rooted in the experiences of those who live within the "in-between". Their theoretical frameworks share the idea that liberation comes from reframing what it means to be "whole". Moreover, my research aims to make visible how the intersections of identity affect mental health challenges through the lens of Queer Chicanx students.

9. Fiona Baker, Diego Orozco & Ruth Uribe-Kirby

B.A. Psychology

Associations Between Early Stressful Life Events, Dimensions of Emotion Dysregulation, and Posttraumatic Stress Symptoms

Faculty Mentor: Dr. Yvette Szabo

Exposure to stressful life events “early in life” (eSLEs) are common and associated with increased posttraumatic stress symptoms (PTSS). To inform pathways, this study investigates the contributions of cumulative eSLEs to specific facets of emotion dysregulation and, in turn, PTSS. Participants (n = 227, 73.5% female, 83.7% Hispanic/Latine, m age = 20.11) completed questionnaires of eSLEs (before age 18), emotion dysregulation and PTSS online. When both the path between eSLEs and emotion dysregulation and the path between emotion dysregulation and PTSS were significant, we conducted mediation analyses. The facets of Nonacceptance, Impulse, and Strategies partially explained the associations between eSLEs and PTSS (indirect effects ≈ .30 - .36, $p < .05$). Results suggest that these specific ways of managing emotional responses may link eSLEs to PTSS among college students. More studies are needed, including those that are longitudinal, use clinical samples, and consider aspects of eSLEs (type, age of exposure).

10. Fernanda Perez, Kelly Vuong, Jessica Gomez & Korintia Espinosa

Masters in Public Health

COVID-19 and Cancer Screening rates

Faculty Mentor: Dr. Ndifreke Etim

Our cross-sectional analysis looked at delayed screening due to COVID-19 worry in adults with a cancer history, to understand the impact COVID-19 has on screening behaviors in this population. Cancer survivors are at increased risk for developing second primary cancers, making it necessary to continue cancer screening tests. During the COVID-19 outbreak screening rates decreased and have not yet returned to pre-pandemic rates. Using data from the NCI’s HINTS, we used a logistic regression model to analyze the relationship between cancer history and delayed screening. While the association between cancer history and delayed screening was not statistically significant, our study found significant associations between income, education, race, depression and heart disease with screening delay. Future research could focus on screening delays in adults with depression and heart disease as those conditions can be risk factors for cancer.

11. Iggy Scott

B.A. Psychology

Promoting Activation to Reduce Avoidance and Increase Engagement

Faculty Mentor: Dr. Crystal Slanzi

Individuals with serious mental illnesses frequently report not engaging in activities in the community that are important to them as often as they like (Salzer et al., 2014). This can be considered problematic as community participation has been associated with increased physical activity and improvements in physical health as well as improved cognition, perceived quality of life. Although many barriers to participation are environmental such as lack of access to transportation or discrimination, some barriers are also related to personal factors. We conducted are conducting an intervention with 50 participants with an initial focus on small, low-effort goals to overcome issues with both motivation and avoidance. Preliminary data would suggest that higher frequency and range of participation in meaningful activity is associated with positive mental health outcomes such as reduced avoidance and social impairment and improvements overall activity levels and perceived quality of life.

12. Juan Cisneros, Junpeng Huang & David Nugyen

Masters in Public Health

Associations Between Gambling Behaviors and Social Determinants of Health Among Adults in California: A Cross-Sectional Study Using CHIS 2023 Data

Faculty Mentor: Dr. Ndifreke Etim

Objective: To examine the associations between key socioeconomic factors and substance use behaviors and past-year gambling among adults in California using data from the 2023 California Health Interview Survey. Methods: A cross-sectional analysis was conducted to discover relationships between gambling and binge drinking, marijuana use, illicit drug use, and some key Social Determinants of Health. Multivariable logistic regression estimated odds ratios and statistical significance. Results: The study sample included 21,671 California adults. Older adults, aged 50–59 (OR = 1.94) and 60–69 (OR = 1.82), had higher odds of gambling compared to those aged 18–29. Women had lower odds than men (OR = 0.82). Black adults had higher odds than white adults (OR = 1.55). More importantly, gambling was strongly associated with binge drinking (OR = 1.43), marijuana use (OR = 1.18), and illicit drug use (OR = 1.94). Conclusions: Gambling behavior is linked to demographic differences and substance use.

13. Sara Cruz & Carmine Escamilla

M.S. Counseling, Specialization in Rehabilitation
Exploring Treatment Experiences and Barriers Among Black Americans with Bipolar Disorders
Faculty Mentor: Dr. Cailine Kim

Black Americans living with Bipolar I and Bipolar II disorders often face barriers in receiving accurate diagnoses and effective mental health care. While research has documented disparities in treatment outcomes, fewer studies focus on how Black individuals personally experience and navigate the mental health system. This proposed study seeks to explore the treatment experiences of Black adults with bipolar disorder including how they understand their diagnosis, engage in treatment, and encounter challenges or support within care settings. Following IRB approval, participants will be invited to complete an online Qualtrics survey sharing their experiences with mental health services, providers, and treatment options. By centering lived experiences, this study aims to highlight gaps in care and identify opportunities for more culturally responsive mental health practices. Findings are intended to inform clinicians, educators, and advocates working to improve equity and quality of care for Black individuals affected by bipolar disorder.

14. Talia Leano

M.A. Psychobiology
The Relationship Between Mental Health Symptoms and Help-Seeking Intentions Amongst Muslim Americans
Faculty Mentor: Dr. Dana Saifan

This study addresses the following: (1) Do help-seeking intentions differ amongst Muslim Americans with clinically elevated mental health symptoms versus those without? (2) Does symptom severity predict help-seeking intentions for Muslim Americans? We hypothesized those with clinically elevated anxiety symptoms would report higher help-seeking intentions, whereas those with elevated substance use, post-traumatic stress, and depressive symptoms would report lower help-seeking intentions compared to their non-elevated counterparts. Anxiety was hypothesized to positively predict help-seeking intentions whereas other mental health symptoms would negatively predict help-seeking intentions. Participants (N=324) with non-elevated anxiety ($t(312) = 2.46$, $p = .014$) and non-elevated depressive symptoms ($t(312) = 4.54$, $p < .001$) had higher help-seeking intentions in comparison to their clinically elevated counterparts. Results indicated that depressive symptom severity negatively predicted help-seeking intentions, $b = -.03$, $SE = .02$, $p = .025$. Findings suggest that help-seeking interventions among Muslim Americans should focus on individuals with anxiety and depression.

15. Alec Cozaana Zapata & David Vera

B.S. Biology, Ecology, Evolution and the Environment

The Utility of a Wildlife Camera as a Community Science Application in Characterizing Coyote and Other Wildfire Behavior

Faculty Mentor: Dr. Evelyn Alvarez

The Environmental Justice Club currently documents urban wildlife on campus via observational walks and the maintenance of a wildlife camera installed at the Urban Food Garden. This poster aims to highlight campus biodiversity using photos captured by the camera, wildlife observations, an evaluation of techniques that worked and did not work for the trail camera, and patterns in animal activity over time. Through these methods we have identified that green spaces on campus, like the Urban Food Garden, act as safe corridors and food sources for animals. Notable animals that have been documented using these urban green spaces are coyotes, trapdoor spiders, and rabbits. Other wildlife has been observed to adapt directly into urban landscapes such as peregrine falcons nesting on the Simpson Tower. Overall, the campus is host to multiple species that contribute to a diverse local ecology and further documentation of wildlife will continue through this initiative.

16. Lisya Tanujaya, Robert Juarez & Adam Santos

B.S. Biochemistry

Acid/Base Regulatory Cells on Dogfish Rectal Gland

Faculty Mentor: Dr. Jinae Roa

Acid/base homeostasis is crucial for maintaining essential organismal function. Sharks experience a post-feeding blood alkalosis caused by gastric acid secretion for digestion and by continued bicarbonate absorption into the bloodstream. Eventually, alkalosis returns to stable conditions through bicarbonate excretion across the gills, although it can persist for up to 24 hours and can vary with meal size. Ongoing blood alkalosis has been reported to be associated with significant transcriptional and enzymatic changes in the rectal gland, a unique organ in elasmobranchs responsible for NaCl secretion. Since blood alkalosis is closely linked to feeding, it may function as a physiological signal of nutrient availability. Changes in the rectal gland may reflect the processes related to nutrient absorption and metabolic regulation. This raises the question of how the rectal gland can sense alkalosis and translate signaling into coordinated transcriptional responses.

17. Sandra Rivas

M.A. Anthropology

Preparatory Processes for a Fossil Dentary of Sylvilagus audubonii (desert cottontail) at Rancho La Brea

Faculty Mentor: Dr. Amira Ainis

In this presentation, I discuss fossil preparation techniques learned during my time as a volunteer at the Rancho La Brea Tar Pits and Museum, which houses the largest collection of late Pleistocene asphaltic fossils in the world. Because many fossils are preserved in asphalt, effective degreasing methods are essential. A comparative study of six solvents revealed that Novec™ 73DE is the most effective based on safety, efficiency, fossil integrity, and material changes.

My project focused on cleaning and consolidating a lower dentary from Project 23 using Novec™ 73DE, acetone, water, Kozo paper, and Paraloid B-72. Analysis of enamel crenulation on the premolar (p3) allowed identification of the specimen as Sylvilagus audubonii (desert cottontail). This presentation highlights the process and time investment of preparation work and its relevance to museum curation and preparator careers.

18. Umniah Moshi

B.S. Biology

Microbiome Responses to a Field-Scale Olivine Deployment for Carbon Removal

Faculty Mentor: Dr. Gustavo Ramirez

Marine enhanced rock weathering (mERW) has emerged as a promising ocean-based carbon dioxide removal strategy, yet its ecological impacts in real coastal environments remain poorly understood. In May–June 2023, 8,200 tons of olivine sand were deployed along nearshore berms in Duck, North Carolina, creating one of the first field-scale tests of mERW. Using paired olivine-exposed and control sites, this study integrates sediment geochemistry, seawater carbonate chemistry, and microbial community sequencing to assess ecological responses to olivine dissolution. We evaluate shifts in microbial community composition and their associations with changes in alkalinity and mineral chemistry. These results provide critical empirical insight into how coastal microbial ecosystems respond to mineral-based ocean alkalinity enhancement, informing the safe and responsible deployment of mERW as a scalable climate mitigation strategy.

19. Ashley Maritato

M.S. Biology

Don't be obtuse: Elysia obtusa is five cryptic, ghostly species of sea slugs

Faculty Mentor: Dr. Patrick Krug

Sea slugs in genus Elysia sequester functional chloroplasts from their algal diet (kleptoplasty). However, studies regarding kleptoplasty are compromised by the high proportion of cryptic species in this group. To address this gap, we investigated a nominal pair of species from the Atlantic and Pacific that are poorly known, using genetic and morphological data. We sequenced two mitochondrial and three nuclear genes, and compared external morphology and internal anatomy of the radula for samples of nominal E. obtusa (Pacific) and E. flava (Caribbean). Phylogenetic analyses and radular imaging indicate “E. obtusa" is a complex of at least five externally similar species, four of which co-occur in the hotspot of New Caledonia. E. flava, described from the Caribbean, was also sampled in the Mediterranean and in Hawaii, suggesting repeated introductions. These findings show how biodiversity in heterobranchs remains highly underestimated by traditional systematics, and increase the recognized species richness of Elysia.

20. Roberto Ponce

M.S. Biology

International and Citizen Collaboration Reveals Unexpected Biodiversity of Sea Slug genus Ercolania Trinchese, 1872.

Faculty Mentor: Dr. Patrick Krug

DNA barcoding and surveys incorporating citizen science reveal an underestimation of marine biodiversity. This complicates research and hinders conservation efforts. Sea slugs, a hyperdiverse group whose similar morphology masks distinct lineages, are often treated as a single taxon. Resolving this diversity requires global collaboration. Sea slug genus Ercolania Trinchese, 1872, illustrates this cryptic biodiversity. Molecular analyses reveal that Ercolania is polyphyletic and needs taxonomic revision. This project utilizes global collaboration to obtain specimens and conduct morphological, ecological and phylogenetic analyses. Specimens came from research collections, government-sponsored expeditions, and citizen scientists. This effort yielded over 30 undescribed taxa, resurrected forgotten species, and at least three new candidate genera. Future work will involve a taxonomic survey of Ercolania-morph species found on websites such as iNaturalist. Morphological, ecological, and molecular data from these slugs will help develop a revised taxonomy, serve as a model for other cryptic lineages, and improve research and conservation.

21. James Che

B.S. Biochemistry

Improving Recombinant DAFP-1 Purification Through Optimized Heat Treatment

Faculty Mentor: Dr. Xin Wen

Antifreeze proteins (AFPs) have valuable industrial applications, and the hyperactive AFP DAFP-1 from Dendroides canadensis is commonly produced in Escherichia coli. Conventional purification relies on chemical lysis alone, which often results in co-purification of host proteins. This study focuses on evaluating heat treatment as a supplementary purification method for DAFP-1. Cell lysates were heat-treated at 70 °C, 80 °C, and 90 °C for a fixed duration, followed by treatment at 75 °C for extended time intervals. Protein samples were analyzed using SDS-PAGE to assess purity and protein retention. Results showed that increasing temperature enhanced the removal of heat-labile host proteins, with excessive temperatures leading to partial DAFP-1 loss. Time-dependent treatment at 75 °C achieved improved purity while preserving protein integrity. Overall, SDS-PAGE analysis demonstrated that controlled heat treatment can effectively enhance DAFP-1 purification efficiency and may be integrated into existing expression workflows.

22. Rachelle Soriano

B.S. Biochemistry

Determination of single cell bacterial viability using surface plasmon resonance microscopy (SPRm)

Faculty Mentor: Dr. Yixian Wang

Pseudomonas aeruginosa (PA) is a highly antibiotic-resistant bacterium that causes healthcare associated infections. Current research for alternative PA therapies require labeling, possibly altering the natural function of the PA membrane. We adapt surface plasmon resonance microscopy (SPRm) to determine the viability of single PA cells, monitoring the micromotions of bacteria in real-time with high throughput. A gold chip was modified with functional groups, linking PA to the sensor surface. SPR signals of live individual PA were recorded in and compared. PA was completely adhered to the amine-terminated gold chip but loosely adhered to the alcohol-terminated chip. Electric field modulation at varying voltages was attempted to facilitate micromotion for both chips but failed. Future work will attempt micromotion recordings with the alcohol-terminated chip. This research aims to establish PEM as a label-free method to indicate cell survival and is supported by the URISE #5T34GM145503-02 and the NSF CAREER AWARD (CHE-2045839) grants.

23. Jungeun Choi, Hannah Mohammadi & Samantha Imperio

B.S. Biology. Microbiology option
Protecting Skin Cells from Freezing Injury Using Combined Antifreezes.
Faculty Mentor: Dr. Xin Wen

DAFP-1, correlated with enhanced freeze tolerance. Inspired by this strategy, we evaluated the combined cryoprotective effects of glycerol and DAFP-1 on human keratinocytes (HaCaT). Cells were treated with varying glycerol (2–5%) and DAFP-1 (0–50 μg/mL) concentrations and frozen at −20 °C for 6 h. Cell viability was assessed using a resazurin-based metabolic assay. Increased glycerol concentration significantly improved post-thaw survival. DAFP-1 exhibited concentration-dependent effects, enhancing viability at low doses, particularly with 5% glycerol, suggesting a synergistic interaction. These findings indicate that combining glycerol with low concentrations of DAFP-1 may improve cellular resistance to freeze-induced injury and highlight a potential strategy for mitigating frostbite-related skin damage.

24. Kevin Vazquez

B.S. Biochemistry
Imaging Nanoplastic Induced Membrane Damage in SH-SY5Y Neuronal Cells
Faculty Mentor: Dr. Yixian Wang

Plastics are ubiquitous in daily life and can enter the human body through processes such as ingestion and inhalation. Previous studies have demonstrated that organic polymers, including polyethylene (PE) and styrene–butadiene rubber (SBR), are present in the brain and have quantified their concentrations. Although research has shown that nanoplastics negatively impact human health, there remains a need to image the extent of damage they cause to neuronal cells. In this experiment, SBR nanoplastics were produced from tire material to investigate their effects on SH-SY5Y neuroblastoma cell membranes. Cell surface topography was mapped using scanning ion conductance microscopy (SICM), which enables high-quality imaging without damaging the cell surface. Overall, the images revealed pore-like structures in the membranes of live cells that were exposed to nanoplastics treatment for 24 hours and then fixed. These findings highlight potential mechanisms of membrane disruption relevant to neurotoxicity and environmental exposure.

26. Alexcia Garcia, Caden Nugyen & Janida Williams

B.S. Biology
High Fold Stability of a Beetle Antifreeze Protein Limits Trypsin Digestion
Faculty Mentor: Dr. Xin Wen

Antifreeze proteins (AFPs) help organisms survive freezing temperatures by preventing ice crystal growth and may be useful for preserving cells at low temperatures. This study examines the stability of the beetle antifreeze protein Dendroides canadensis antifreeze protein-1 (DAFP-1) by testing its resistance to digestion by trypsin. DAFP-1 was compared with bovine serum albumin (BSA) and lysozyme as control proteins. Native and heat-treated proteins were incubated with trypsin at 37 °C and analyzed using SDS-PAGE and native gel electrophoresis. BSA and lysozyme showed significant digestion, especially after heat treatment, while DAFP-1 remained intact in both native and denatured conditions. Native gels confirmed that DAFP-1 maintained its structure. These findings suggest that DAFP-1 has unusually stable protein folding, supporting its potential use in biological preservation.

27. Gilda Vazquez

M.S. Biological Sciences
Investigating roles for RNAs bound to Rbp2 in regulating the circadian clock in Synechococcus elongatus
Faculty Mentor: Dr. Susan Cohen

Cyanobacteria are photosynthetic prokaryotes that possess a circadian clock that allows them to coordinate biological activity over the course of the day. Synechococcus elongatus, the primary model system, have a circadian clock driven by the KaiA, KaiB, and KaiC proteins that interact to regulate cellular physiology throughout the day. KaiC has been shown to interact with RNA-binding protein 2 (Rbp2) where disruption of rbp2 leads to a long circadian period and decreased KaiC localization. Our model predicts that RNA binding by Rbp2 at night is needed for clock complex localization to the membranes. We identified RNA molecules bound to Rbp2 in the early night. We propose overexpression and deletion of each RNA to determine its effect on the clock. A MS2 tagging system will be used to assess interactions and localization of each RNA. Our results will elucidate which RNAs are required for clock regulation and localization.

28. Lesly Nunez

M.S. Biology
Investigating how Rbp2 associates with KaiC to regulate the circadian clock in cyanobacteria
Faculty Mentor: Dr. Susan E Cohen

Cyanobacteria are the only prokaryotes with a robust and rigorously tested circadian clock. In S. elongatus, the model system used, the core oscillator is comprised of

KaiABC proteins which regulates rhythms of metabolism and physiology.
Rbp2 is an RNA binding protein that has been showed to be involved in clock regulation. Deletion of rbp2 results in various phenotypes including long period rhythms of gene expressions and decreased KaiC localization at night. Our work aims to identify how Rbp2 associates with KaiC. We aim to determine which other proteins may be required to mediate the association between Rbp2 and KaiC using both co-purification and fluorescence microscopy.

29. Parker Saikley

B.S. Microbiology
Examining the Role of Rbp2 in Circadian Clock Regulation in Cyanobacteria
Faculty Mentor: Dr. Susan Cohen

Circadian rhythms coordinate biological processes in gene expression and cellular behavior across an approximately 24-hour period. In cyanobacteria, circadian rhythms are driven by a well-defined core oscillator, making Synechococcus elongatus the model organism for elucidating the molecular details of the clock. The core oscillator consists of KaiA, KaiB, and KaiC proteins, which drive gene expression, cell division regulation, and allow natural transformation. Using fluorescent fusion proteins, we identified that during the day, KaiC is diffused throughout the cell, while at night, KaiC is localized to the cell pole. Recent evidence indicated that RNA-binding protein Rbp2 is required for maintaining KaiC's localization to the cell pole. Loss of rbp2 results in longer circadian rhythms and decreased localization of KaiC. We are interested in how RNA(s) influence the KaiC-Rbp2 interaction. Analysis of Rbp2-R42A-F44A-F46A, a disrupted RNA-binding mutant, shows that Rbp2 localization to the poles is significantly reduced.

30. Zander Milburn

M.S. Biology
Identifying RNA(s) bound to RNA binding protein 2, Rbp2, that function to regulate the circadian clock in cyanobacteria
Faculty Mentor: Dr. Susan Cohen

Circadian rhythms synchronize biological processes with Earth's rotation. In the cyanobacterium Synechococcus elongatus PCC 7942, circadian regulation is driven by the KaiABC oscillator, which controls global gene expression through rhythmic phosphorylation and dephosphorylation of KaiC. Recent studies have identified RNA-binding protein 2 (Rbp2) as an important component of the circadian system, though its precise role remains unclear. Rbp2 is a eukaryotic-like RNA-binding protein that directly interacts with KaiC, and deletion of rbp2 leads to pronounced circadian defects. Mutations that impair RNA-binding activity result in long-period rhythms, indicating that RNA binding is critical for Rbp2 function. Using CLIP-seq and differential expression analyses across circadian timepoints, my work identifies RNAs whose association with Rbp2 changes over the day–night cycle. These RNAs show distinct temporal patterns, with subsets enriched during daytime or nighttime, suggesting that Rbp2 dynamically coordinates RNA interactions in a time-dependent manner to support robust circadian regulation.

31. Bianca Pacheco

M.S. Biology
Investigating the roles for DNA replication and DNA damage response in the regulation of the circadian clock in cyanobacteria
Faculty Mentor: Dr. Susan Cohen

Circadian rhythms, regulated by a 24-hour biological clock, are essential for coordinating the temporal programs of cellular physiology. Deregulation of these essential processes has been implicated in health issues. The model organism Synechococcus elongatus possesses the simplest circadian oscillator encoded by the kaiA, kaiB, and kaiC genes, which drives global rhythms of gene expression, chromosome compaction, and regulates key processes such as cell division. Previously CRISPR interference (CRISPRi), was used to investigate how essential genes contribute to circadian regulation where reduced expression of DnaN, the β-clamp of the replicative DNA polymerase, was found to have a lengthened circadian period compared to the wild type. dnaN has not previously been implicated in circadian regulation, suggesting that DNA replication can influence clock function. Our future work will assess drug sensitivity in CRISPRi mutants using DNA damaging agents to determine whether disruption in DNA replication influences circadian robustness.

32. Daniel Yang

B.S. Biology
Refinement of undergraduate teaching lab manual: Multiple Heavy Metal Detection via Anodic Stripping Voltammetry
Faculty Mentor: Dr. Yixian Wang

Heavy metals are pollutants that spread across the environment at alarming rates. Thus, ways to detect heavy metals have also been improved, such as the use of electrochemical methods to detect heavy metals in parts per billion and trillions. Such methods include square wave voltammetry, which is inexpensive, simple, and portable due to the emergence of screen-printed electrodes. Our goal was to teach incoming CSULA students the methods of such an experiment, as well as document/image the reaction that takes place, allowing for further improvements. The current manual we have developed was carried out in Fall 2025 to achieve better results than the previous year, as well as showing steady improvements in sensitivity/accuracy while pinpointing

problems that we need to tackle. Such improvements include the use of regular, non-mercury coated electrodes to hasten the process, as well as exact pH values the test should be run at.

33. Cristina Hurtado

B.S. Biology, Physiology option
Development and Study of Azure A conjugated Beta-Cyclodextrins for Singlet Oxygen Generation
Faculty Mentor: Dr. Andres Aguilar

Many dyes used in therapeutic research, such as Azure A, become more effective when bound to a protective carrier molecule. Mono-O6-B-CD, a protective carrier, is a ring-shaped molecule composed of seven linked glucose subunits, featuring a hydrophilic exterior and a hydrophobic interior cavity. Azure A is an organic dye compound that exhibits cationic properties and contains an amino group, which can act as a nucleophile. The goal is to investigate how Azure A interacts with B-cyclodextrin at a molecular level and to determine how their complex influences the dye's behavior. This molecule could potentially be utilized for photodynamic therapy, a treatment that relies on light-activated molecules such as Azure A to convert oxygen in tissues into reactive oxygen species (ROS). These ROS can damage and destroy target cells, including cancer cells, resulting in the death of harmful tissues.

34. Jafet Canales

B.S. Biology, Physiology option
Functional Analysis of Planar Cell Polarity Proteins in Zebrafish Development
Faculty Mentor: Dr. Andrew Aman

Individual cells that constitute multicellular organisms self-organize into functional anatomy through cellular and molecular mechanisms that we do not understand. Developmental biology explores the molecular systems underlying various intricate cellular events that form and maintain anatomy. One of these molecular systems is Planar Cell Polarity (PCP). PCP entails cellular asymmetry, in which one side of a cell differs from the other, and this asymmetry has profound impacts on development. To advance our understanding of organismal function of individual PCP molecules, I am functionally screening predicted PCP proteins by mutating genes encoding PCP components using CRISPR microinjections in zebrafish, a model vertebrate that shares many fundamental molecular mechanisms of development with other vertebrates, including humans. A thorough understanding of molecular mechanisms that drive development could help develop novel disease interventions and advance the pioneering of regenerative medicine.

35. Jasmine Ly

B.S. Biology, Molecular, Cellular, and Developmental (MCD)
Effects of symbiotic algae, Chlorella vulgaris, on Hydra viridissima using an aposymbiotic Hydra viridissima model
Faculty Mentor: Dr. Andrew Aman

Hydras, named after the Greek mythological multi-headed beast, are small, freshwater animals belonging to the phylum Cnidaria. First documented in 1702 by Antoni van Leeuwenhoek, hydras have been intensely studied for their regenerative abilities and used to understand tissue healing and repair. One species of hydra, Hydra viridissima, expresses a green pigment due to its symbiotic relationship with the green algae, Chlorella vulgaris. To study the impact of photosynthetic symbionts on animal physiology, we are testing various antibiotics at different dosages and incubation times to create aposymbiotic hydras. Once we have a reliable protocol for generating aposymbiotic hydras, they will be used to investigate the impact of the algal symbiont on regenerative abilities, life span, and robustness in comparison to the symbiotic hydras. These findings can aid in understanding the biology of photosynthetic organisms and their pathways and used as a guide to understand coral bleaching caused by climate change.

36. Brian Le

M.S. Biology, Physiology option
The Role of Angiogenesis in Zebrafish Skin Maturation
Faculty Mentor: Dr. Andrew Aman

The zebrafish is a highly efficient model for studying the molecular mechanisms behind post-embryonic development in vertebrates due to their highly conserved pathways, genetic manipulability, compatibility for imaging, and quick regeneration times. Previous literature has shown thyroid hormone (TH) signaling to be a major contributing pathway in post-embryonic skin development. Because TH is distributed via the bloodstream, we aim to elucidate the potential contributions of post-embryonic vasculature development (angiogenesis) to skin maturation. We hypothesize that angiogenesis is a key developmental process upstream of dermal stratification. We then intend to manipulate angiogenesis with inhibitor drugs and assay skin development. Live confocal imaging will be leveraged to capture the spatiotemporal dynamics of both processes, providing insight into better understanding previously unknown mechanisms driving zebrafish skin development.

38. Samantha Avalos

Educational Specialist (Ed.S.), School Psychology
An Analysis of Intersectionality and School Safety for a Black Female Student with a Specific Learning Disability
Faculty Mentor: Dr. Sara Manchanda

This single-case qualitative study explores how the intersectional identities of a 16-year-old Black female student with a Specific Learning Disability shape perceptions of school safety. Integrating Disability Critical Race Theory and Bronfenbrenner's Ecological Systems Theory, the research examines her experiences during the COVID-19 pandemic. Findings reveal that the chronosystem shift to remote learning increased instructional barriers, while the return to in-person schooling re-exposed the participant to systemic violence. While the student's intersecting identities became targets for social posturing, fracturing peer dynamics, and increased vulnerability to victimization, her microsystem provided critical buffers. Vital protective factors (e.g., maternal advocacy, case manager support, and inclusive peer dynamics) mitigated the impact of systemic stigma. Macrosystemic factors (e.g., disability stigma) further adversely impacted her identity and safety perceptions. This study highlights the utility of analyzing student self-identity from an integrated theoretical lens.

39. Violet Brianna Tirado

M.A. Communicative Disorders, Speech-Language Pathology emphasis
The Effect of Visual Feedback on Identifying Dialect-Based Speech Sound Production Differences From Production Errors
Faculty Mentor: Dr. Ian D. Morton

Graduate-level coursework in Communication Sciences and Disorders (CSD) now emphasizes the identification of speech sound differences due to dialect differences rather than speech sound errors. Our study examines the effectiveness of a visual feedback paradigm in increasing clinicians' identification of language-specific speech sound differences from speech sound errors. CSD graduate students listened to three types of voiceless stop consonant productions: (1) Chicano English stop consonants, (2) Mainstream American English stop consonants, and (3) productions of stop consonants with voicing errors. CSD graduate students who received instruction with the visual feedback paradigm condition were better at distinguishing between the three types of voiceless stop consonant productions than students who did not receive instruction with the visual feedback paradigm condition.

40. Chantelle Lopez

B.A. English
Racial Melancholia and Emotional Repression in Asian American Immigrants
Faculty Mentor: Dr. Mark Wild

For this research project, I will look at the effects of racial melancholia and emotional repression in Asian and Asian American immigrants. I will use literature written by Asian American immigrants, which detail their personal experiences of growing up in the United States as an Asian American. My list of literature includes John Okada's No-No Boy, Elaine Castillo's America Is Not The Heart: A Novel, Gene Luen Yang's American Born Chinese, Jeanne Wakatsuki Houston and James D. Houston's Farewell to Manzanar. To supplement this list, I will also be using secondary sources that are geared more towards the theory aspect of my research, which mostly includes affect theory. This list will include David L. Eng and Shinhee Han's Racial Melancholia, Racial Dissociation: On the Social and Psychic Lives of Asian Americans, Melissa Gregg and Gregory J. Seigworth's The Affect Theory Reader, and Sara Ahmed's The Cultural Politics of Emotion.

41. Matthew Lowry

M.A. Anthropology
Los Angeles waterways before the Owens Valley Aqueduct: the construction and use of the zanjas and its effects
Faculty Mentor: Dr. Amira Ainis

Water management is one of the biggest issues for the area around what is now Los Angeles and has been since the Spanish first arrived and established El Pueblo de Nuestra Señora la Reina de los Angeles del Río de Porciúncula(Los Angeles) in 1781. The first thing that the settlers of Los Angeles did was build the Zanja Madre before they built the settlement. The zanja system provided water for the agricultural fields and remained the primary domestic water supply until 1904. My thesis provides a diachronic examination of the development over time of the zanja system that allowed Los Angeles to grow into the city it is today. Using GIS tools and archival and archeological sources, my thesis tracks these changes to explore the impacts of this pivotal water management system from an interdisciplinary perspective, focusing on its effects on the populations and landscapes of Los Angeles.

43. Jonathan Federico Sanchez Gutierrez

B.S. Mechanical Engineering
Calibration and Application of a Glass Channel for Laminar Flame Speed Studies
Faculty Mentor: Dr. Jeffrey Santner

The experimental setup uses a glass channel designed with a narrow rectangular entrance to ensure laminar flow and a trapezoidal end section where ignition occurs. The fuel mixture for initial calibration is a methane-to-air ratio, chosen because of the extensive published theoretical and experimental data available for methane. Once this calibration phase is successfully completed, the objective is to experiment with unique and less-studied fuel-to-air ratios to gather new data. The results for methane will be validated against published measurements and simulations. The goal is for the data to agree with the literature under standard conditions, while any observed discrepancies will be analyzed to refine the experimental method for testing novel mixtures.

45. Frida Melgar & Elizabeth Miranda

B.S. Civil Engineering
Toward the Incorporation of Microclimate Influences in Hydrologic Design
Faculty Mentors: Dr. Joseph Lucey-Renteria and Dr. Pouya Vahmani

As climate change intensifies precipitation patterns, understanding rainfall variability at local scales is increasingly critical for infrastructure design and flood risk assessment. While engineers routinely design for precipitation, local climate variations (microclimates) are often overlooked. Microclimates have been identified in various regions, but studies have yet to account for their influence on hydrologic design. This study aims to develop a metric to identify microclimates and quantify the influence of microclimate considerations on hydrologic design. Seasonal, daily, and hourly precipitation, wind speed, wind direction, temperature, and relative humidity patterns were explored. A metric created from standardized values was used to distinguish microclimates. Future work will estimate precipitation events of equal return period in each microclimate in a preliminary design scenario to quantify the influence of microclimates.

46. Christian Mendoza

B.S. Civil Engineering
Evaluating Ferrous Iron for Perchlorate and Chlorate Reduction in Groundwater Systems
Faculty Mentor: Dr. Arezoo Khodayari

Perchlorate and chlorate are naturally occurring and anthropogenic ions that contaminate environmental systems. Exposure through contaminated water sources inhibits the thyroid gland's ability to uptake iodine, leading to metabolic disruption. In this study, we investigate the interaction between perchlorate/chlorate and iron to explore low-cost and effective bioremediation strategies for contaminated water sources. Batch reactor experiments containing perchlorate and chlorate with ferrous iron [Fe(II)] were conducted over a range of concentrations and pH conditions. Reactors were continuously mixed under anoxic conditions to simulate groundwater environments. Iron colorimetric analysis was used to assess perchlorate/chlorate reduction and the corresponding oxidation of Fe(II). Preliminary results indicate a decrease in pH over time, with perchlorate/chlorate reduction occurring slowly over a seven-day period. Future work will focus on continuous-flow experiments through simulated groundwater media to better represent subsurface conditions.

47. Alvaro Hernandez

M.S. Material Science and Engineering
Implementation of Metal Organic Frameworks in Lithium Metal Batteries
Faculty Mentor: Dr. Yangyang Liu

Lithium metal batteries are a ubiquitous aspect of modern technologies because of lithium's high energy density and ability to be applied in small spaces. However, issues arise because of the consumption of lithium in a battery due to side reactions, dendritic growth, and improper formation of lithium's solid electrolyte layer (SEI). With MOF's highly ordered and porous nature, the issue of dendritic growth and improper SEI formation can be mitigated by giving lithium

ions proper channels to migrate and deposit. Four different nanoparticle MOFs with anionic natures will be synthesized and be tested by incorporating them into the polyvinyl difluoride (PVDF) membranes of lithium ion batteries through cyclic voltammetry.

48. Andres Lopez

M.S. Material Science and Engineering
Evaluating Ferrous Iron for Perchlorate and Chlorate Reduction in Groundwater Systems
Faculty Mentor: Dr. Chris Bachman

Aqueous redox flow batteries (ARFB) are form of energy storage using two reservoirs and a flow pump where the active components interact between a membrane. This project attempts to produce a quality battery while also being environmentally friendly, a source of long-term energy, and more cost effective than currently available systems using lithium-ion batteries. The analytes of interest are Anthraquinone disulfonic acid combined with ferrocyanide in a sodium solution. These analytes are capable of electron transfer in ARFB. These systems can store renewable energy during a time when energy production from renewable sources slows down. ARFB faces challenges such as lower energy density. The testing methods include Cyclic Voltammetry, electrochemical impedance and Galvanostatic cycling with potential limitations.

49. Ilana Moreno

M.S. Material Science and Engineering
Additive manufacturing of composite polymer electrolytes (CPEs): A literature review
Faculty Mentor: Dr. Maritza Sanchez

Solid-state batteries (SSBs) have the potential to replace liquid-electrolyte batteries by demonstrating improved safety and reduced environmental impact. Recent advancements in solid electrolyte research demonstrate the feasibility of mass-producing composite polymer electrolytes (CPEs) through additive manufacturing (AM) by printing polymer matrices and incorporating lithium salt fillers. CPEs have shown improved ionic conductivity and mechanical stability with the addition of lithium salts; however, incorporation strategies and the influence of polymer choice on infill patterns remain underexplored, and studies are largely limited to polylactic acid (PLA). This review will examine strategies for incorporating lithium salts and designing polymer infills in CPEs made from polyvinylidene fluoride (PVDF), polyethylene oxide (PEO), and thermoplastic polyurethane (TPU), addressing current limitations and potential approaches.

50. Tommy Taing

M.S. Material Science and Engineering
Utilizing Zr-based MOFs as Separators for Sodium Ion Batteries
Faculty Mentor: Dr. Yangyang Liu

Sodium ion batteries are an alternative to lithium-ion batteries that avoids using limited Li resources in favor of Na. This project focuses on synthesizing Zr-based metal-organic frameworks (MOFs), which are tunable, porous, crystalline materials, to function as the separator in sodium ion batteries. Using Zr as the metal node and terephthalic acid as the ligand, the synthesized CAU-26 MOF would act as a separator by providing a framework that is sturdy enough to prevent contact between the cathode and the anode. The testing and optimization of the separator material could improve the performance and longevity of the battery, with the framework ideally being chemically stable with good thermal stability under load. Since separators typically have low ionic conductivity, the Zr-based MOFs could lead to improved performance and allow sodium batteries to be a competitive alternative to lithium batteries.

51. Alyssa Madewell

B.S. Mechanical Engineering
Effects of Nanoconfinement Geometry on Water Structure and Dynamics in Carbon Nanotube Systems
Faculty Mentor: Dr. Travis Hu

Understanding water behavior under nanoscale confinement is critical for the rational design of nanofluidic, filtration, and desalination systems. In this study, molecular dynamics (MD) simulations were performed using the Large-Scale Atomic/Molecular Massively Parallel Simulator (LAMMPS) to investigate how nanoconfinement geometry influences the structural organization and molecular mobility of water confined within carbon nanotube (CNT) systems. Water molecules were modeled using the TIP4P water model and confined within CNTs of varying geometries to examine density distribution, molecular ordering, hydrogen bonding, and water–nanotube interactions relative to bulk water behavior. The results demonstrate that nanoscale confinement induces pronounced deviations from bulk water properties, including altered density profiles and anisotropic molecular organization that are strongly dependent on confinement geometry. These findings highlight the critical role of geometric confinement in governing water behavior at the molecular scale providing fundamental insights for the optimization of carbon-based nanomaterials for water purification, desalination, and nanoscale transport applications.

52. Zane Price & Daniel Castillo-Lalyre

B.S. Mechanical Engineering
A Deployable Oscillating Heat Pipe for Thermal Management
Faculty Mentor: Dr. Jim Kuo

This presentation describes this past years' development and evaluation of a CubeSat oscillating heat pipe (OHP) designed for stowage and deployment within a spacecraft. The project consisted of two primary efforts: mechanical design and manufacturing, and thermal analysis and testing. On the mechanical side, we designed and fabricated key components required for deployment, including a custom

bending tool, deployable hinges, and nitinol tubing. In parallel, the thermal performance of the OHP was assessed through both numerical simulations using Thermal Desktop and physical laboratory testing. The results from these efforts are presented, including final mechanical hardware and measured thermal behavior. Together, these findings address the central research question of the project: whether an OHP can function effectively after full deployment in a CubeSat-relevant configuration.

53. Boris Lagutin

B.S. Mechanical Engineering
Torque Linear Propulsion Engine
Faculty Mentor: Dr. Charles Liu

Torque Linear Propulsion Engine (TLPE) is based on Newton's third law. The engine electromotors apply torques on inertial masses, and inertial masses apply the same torques on the electromotors. In this way, a thrust is created, likely (not exactly though) butterfly swimming style. The engine can generate a thrust in any environment (on rigid surfaces, on water surface, in air, in space etc.) in any chosen direction of motion. It can have various applications. One of them is to propel aircraft to remove space garbage that orbits the Earth and is a looming danger to its habitants.

54. Derreck Soriano

B.S. Electrical Engineering
Changes in phase lag index and clinical depression scores due to transcranial magnetic stimulation
Faculty Mentor: Dr. Deborah Won

We investigated the relationship between changes in neural associativity, as measured by phase lag index (PLI) between pairs of surface electroencephalographic (EEG) electrodes, and the changes due to repetitive transcranial magnetic stimulation (rTMS) in major depressive disorder (MDD), as measured on a standard clinical scale (MADRS).
Surface EEG was acquired from 28 patients receiving rTMS treatment for MDD. EEG and MADRS scores were acquired pre- and post-treatment (after 36 sessions). PLI and Pearson's correlation coefficients were computed using custom-written MATLAB code
We found very weak to no for the theta, beta, and gamma bands, but dMADRS was moderately correlated (r=0.33) in the delta band and moderately anti-correlated (r=-0.34) in the alpha band. Our results, even with variability in rTMS settings, indicate that rTMS is effecting changes in neural connectivity and that those changes may in turn be related to the clinically observed changes in MDD, according to the MADRS scores.

55. Hector Gomez-Cano & Aaron Garcia

B.S. Mechanical Engineering
Biogas Combustion Behavior
Faculty Mentor: Dr. Jeffrey Santner

The objective is to investigate biogas combustion behavior. We mapped the flame stability regions for surrogate biogas with varying equivalence ratio, total flow rate, and burner diameter. This measurement is useful in the design of commercial burners to directly use renewable biogas without expensive upgrading. In future work, we plan to measure pollutant emissions.

56. Alynne Wong

M.S. Mechanical Engineering
Bioinspired Jellyfish
Faculty Mentor: Dr. Salvador Rojas

Soft actuators are flexible devices that generate motion using flexible materials and have demonstrated significant advantages in a variety of robotic applications. However, their use in bioinspired underwater robotics remains relatively limited. Bioinspired robotics is important because it replicate and adapt to designs found in nature, which can enable systems that can better interact with the environment. Given that much of the ocean remains unexplored, the development of a bioinspired soft robotic jellyfish has the potential to advance underwater research and exploration. My research explores the development of a bio-inspired soft actuator that mimics jellyfish-like movement. To keep the system compact, the design will rely on minimal electronics. I have already fabricated a mold for the soft actuator and cast it using silicone. The current focus is on improving the actuator design based on the initial fabrication results.

57. Dervin Lopez & Je Beatriz

B.S. Mechanical Engineering
Origami-inspired/Bioinspired Jellyfish
Faculty Mentor: Dr. Salvador Rojas

This project explores structures capable of morphing using a combination of flat tiles and pneumatic pouches, forming a Miura-ori pneumatic system to create a bioinspired jellyfish. It aims to generate controlled movement while reducing the need for external actuators. Airtight pouches will be embedded within flat panels, enabling distributed pneumatic actuation while also maintaining a low profile configuration. The design and experimental evaluation will highlight the system's potential for deployable and adaptive structures that can be reconfigured based on specific objectives. In this application, the project will support a bioinspired robotic system capable of exploring diverse ecosystems while minimizing its impact on the environment and its fauna.

58. Jiewu Zheng

M.S. Electrical Engineering
Dexterous Hands Research - New Graduate
Faculty Mentor: _____

This independent research project explores the design and development of dexterous robotic hands for manipulation tasks. The study focuses on integrating software-based

simulation with real-world component assembly and fabrication to evaluate design choices and control strategies. Initial work includes modeling fingers electrical control and grasp behaviors in simulation environments, followed by the fabrication and assembly of physical prototypes using accessible components. The goal is to understand the relationship between simulated performance and physical implementation, and to identify challenges in translating virtual designs into functional robotic hardware. This project represents an early-stage exploration in robotic manipulation research.

61. Adrienne Limqueco & Beth Santana

M.S. Nutritional Science
Fear, Food, and Federal Policy Change: How Los Angeles County Food Pantries Navigate New Landscapes
Faculty Mentor: Dr. Kathryn Hillstrom

Food pantries play critical roles in addressing food insecurity in communities impacted by federal level policy changes. This study examined practices and organizational adaptations in food pantries in response to changes in federal nutrition and immigration policies. A cross-sectional, web-based survey was administered to pantry personnel across Los Angeles County. 135 pantries were contacted, with 55 responses collected in late 2025 (40.7% response rate). Most pantries operated walk-up distribution models (60%) and were nonprofit organizations or affiliated with churches. While half of respondents reported no change in food quantity and most reported stable food quality, 71% reported increased client demand. Sixty percent reported that immigration policies impacted operations, primarily through increased fear among clients, which necessitated alternative pickup methods. Many pantries implemented operational changes, including client education, partnerships with immigration advocacy organizations, and modified intake procedures. Findings highlight the adaptive role of food pantries amid growing demand and policy-driven challenges.

62. Celeste Aguilar

M.S. Nutritional Science
Use of social cognitive theory based intervention to improve relationship with food and cooking skills among college students
Faculty mentor: Dr. Michele Nicolo

College students frequently encounter barriers to healthy eating, including limited cooking skills, and competing academic and work demands. This project is a six-week kitchen based nutrition education program presented at Long Beach City College (LBCC) using instructional strategies grounded in Social Cognitive Theory of behavioral change, including observational learning, skill practice, and goal setting. Enrolled LBCC students will participate in weekly sessions focused on meal planning, portion control, label reading, and practical cooking techniques applicable to limited kitchen environments. Sessions include live demonstrations, hands-on cooking activities and group discussions to support skill development and confidence in preparing meals. The program aims to demonstrate how modeling kitchen behaviors can impact students' relationship with foods, cooking skills, and meal planning. We hypothesize that interactive learning will improve these behaviors measured by self reported evaluation.

63. Kendra Hensley

B.S. Nutrition and Dietetics
Byte-Sized Nutrition
Faculty Mentor: Dr. Kathryn Hillstrom

Visual design plays a key role in how people perceive and interpret food. Byte-Sized Nutrition presents twelve 16×16 pixel icons of seasonal fruits and vegetables, each accompanied by a corresponding recipe, accessible through a QR code to support further exploration. The pixel icons are designed for instant recognition through color and simplicity, keeping the focus on visuals rather than text. This project is designed for young adults with limited nutrition literacy, who are visually oriented and digitally fluent. Rather than aiming to directly change dietary behavior, the goal is to increase engagement and approachability toward healthy foods through colorful visual cues. Evaluation focuses on interaction with the QR code linking to a digital collection of simple, healthy recipes, and a brief optional user feedback survey assessing overall response to the visuals. This project demonstrates that minimal digital imagery can serve as an accessible and innovative tool for nutrition education.

65. Marissa Winfrey

M.S. Nutritional Science
Antimicrobial Activity of Chitosan Coating with Nisin and Trans-cinnamaldehyde Against Listeria innocua on Apples and Bell Peppers
Faculty Mentor: Dr. Sunil Mangalassary

Listeria monocytogenes is a foodborne pathogen capable of causing severe illness and has been associated with outbreaks involving fresh produce. This study aims to evaluate the efficacy of chitosan-based edible coatings containing the antimicrobial compounds nisin and trans-cinnamaldehyde in reducing Listeria contamination on apples and bell peppers. Chitosan is a natural polysaccharide with inherent antimicrobial activity and excellent coating properties. Apples and bell peppers will be inoculated with a non-pathogenic strain of Listeria, Listeria innocua, to contaminate the surface. Different combinations of antimicrobial coating solutions will be uniformly applied to the produce surfaces. All samples will be sealed in plastic bags and stored at refrigeration temperature for 14 days. Bacterial counts, pH, and color will be assessed on days 0, 7, and 14. It is expected that the edible coatings used in this study will significantly reduce the Listeria population without adversely affecting other qualities.

66. Melody Coleman & Kimberly Stayman

B.A. Biochemistry

Epidemiology of Hypertension in Adults in Los Angeles County: An Analysis of 2023 Health Survey Data

Faculty Mentor: Dr. Ndifreke Etim

This report explains the epidemiology of hypertension within adults in Los Angeles County using 2023 LA County Health Survey data. This analysis examines demographic trends which include geographic district, age, and gender identity. Hypertension prevalence is different by gender identity with adult men ranked the highest at (31.5%) and transgender females at (30.8%). Prevalence is shown to increase with age at 3.5% among adults ages 18-24 to 57.5% among adults 65 and older. All supervisorial districts show a high rate in hypertension prevalence. For example, district 3 has a rate of 25.2% being the lowest while district 1 has a 31.3% risk of hypertension prevalence. These findings line up with other studies/data that show hypertension risk increases with age and environmental exposures. Public health implications should include interventions that focus on high-risk demographic groups to address hypertension prevention.

67. Kiara Ortega

B.S. Nursing

Supplementary Culturally Tailored Interventions to Improve Chronic Disease Management Among Patients With Limited English Proficiency

Faculty Mentor: Dr. Ayman Tailakh

Patients with limited English proficiency (LEP), particularly within Hispanic/Latino communities, experience disproportionately high rates of chronic diseases such as type 2 diabetes and hypertension, often compounded by barriers to effective health education and self-management. This study examines the importance of implementing supplementary, culturally tailored interventions alongside standard patient care to improve chronic disease control and prevention among LEP patients. Using a targeted intervention consisting of a Spanish-language, culturally tailored digital storytelling video, this project focuses on Hispanic adults with poorly controlled diabetes recruited through community-based mobile health units. The study explores whether culturally and linguistically concordant education enhances patient understanding, attitudes, and willingness to adopt health-promoting behaviors. Findings from this work aim to highlight the role of culturally responsive nursing and public health interventions in reducing health disparities, improving patient outcomes, and decreasing preventable hospital utilization.

68. Mary Gars, Marissa Gonzalez, Joana Hernandez & Leilani Hilliard

B.S. Nursing

Nursing Burnout – From Nursing School to Patient Care

Faculty Mentor: Dr. Stacey A. Warner

Nurse-to-patient ratios and workload-related stress are associated with increased rates of nurse burnout and turnover. A literature review was conducted utilizing CINAHL and PubMed to examine acute care nurses and nurse-to-patient ratios on burnout levels and turnover rates. Eleven (n = 11) quantitative studies were reviewed. The review identified adequate staffing, supportive workplace measures, and burnout prevention as strategies to reduce rates of nurse burnout and turnover in the acute care specialty. Studies suggest early leadership education in nursing schools to reduce future nursing burnout by facilitating leadership development, advocacy, and communication. Further evaluation of nursing student leadership engagement is recommended.

69. Melody Kashani, Hilla Lasry, Faith Hernandez & Elizabeth Anaya

B.S. Nursing

Passive Leg Raise as a Bedside Tool for Guiding Fluid Management in Septic Shock

Faculty Mentor: Dr. Tanja Baum Low

Septic shock is a life-threatening condition that often requires rapid fluid resuscitation, yet excessive fluid administration can lead to serious complications. This literature review examines four clinical studies evaluating the use of passive leg raise as a bedside method to predict fluid responsiveness in adults with septic shock. Passive leg raise temporarily shifts blood toward the heart, simulating a fluid bolus without administering intravenous fluids. Across the studies reviewed, changes in stroke volume during passive leg raise consistently identified patients who were likely to benefit from additional fluids. The findings suggest that passive leg raise may help guide safer, more individualized fluid management and reduce unnecessary fluid administration. These findings suggest potential benefits for hospital implementation, particularly as further research continues to support its use.

71. Vanessa Avelino, Inca Stienhans & C. Kenobi Donart

M.A. Psychology

Understanding associations between trauma and gynecological symptoms: The contributions of trauma type and mental health

Faculty Mentor: Dr. Yvette Z. Szabo

Gynecological symptoms, like painful menstruation or sex, are common among trauma survivors and may be explained by mental health symptoms. This online study

builds on previous research by focusing on trauma type (sexual, other, none) and penetrative vs. non-penetrative sexual trauma. Participants (n = 171; Mage = 20.10; 83.26% Hispanic/Latine) completed questionnaires on trauma, gynecological symptoms, and mental health. Results showed no differences in gynecological symptoms by trauma exposure (yes/no), p = .68, or trauma type (p = .086). However, women reporting penetrative abuse reported higher symptoms compared to nonpenetrative abuse or no abuse, (p <.05). Trauma history correlated with poorer mental health (p < .001) and poorer mental health correlated with gynecological symptoms (p < .001). Mediation analyses suggested mental health may be one pathway connecting trauma to gynecological symptoms, primarily penetrative sexual trauma. These findings highlight the importance of trauma-informed gynecological care and mental health referrals.

73. Cesar Eruviel Varela

B.S. Chemistry

Measuring the Cyclodextrin Effects on the Partition Coefficients of Organic Compounds via Proton NMR

Faculty Mentor: Dr. Brenda Andrade-Rounds

Cyclodextrins are cyclic oligosaccharides with hydrophobic cavities that enable inclusion complex formation with organic molecules, often enhancing aqueous solubility of a given species. This study investigates how β-cyclodextrin alters octanol–water partition coefficients (log P) of organic compounds using a proton NMR based methodology to calculate these proper values. Log P values were determined by integrating analyte signals in mixed aqueous and octanol systems, allowing solubility changes to be quantified via phase separation. Acetone exhibited up to an 11.3% solubility increase in the presence of β-cyclodextrin, while xylazine showed an 81.5% showcasing that cyclodextrin can interact with simple and complex compounds of varied properties. Xylazine's solubility enhancement is especially notable given its prevalence in illicit drug mixtures and resistance to naloxone, highlighting potential pharmaceutical applications. Correlating log P shifts with host–guest interactions provides insight into structure–function relationships governing

cyclodextrin-mediated solubility changes.

74. Anay Rosas

B.S. Chemistry

More Than Antifreeze: How DAFP-1 Enhances Enzyme Performance

Faculty Mentor: Dr. Xin Wen

Yeast alcohol dehydrogenase (yADH) is a conformationally labile enzyme whose catalytic activity is influenced by environmental conditions and protein stabilization. Bovine serum albumin (BSA) is used to preserve yADH activity in vitro; however, the antifreeze protein DAFP 1, beetle hemolymph, enhances activity to a greater extent. The mechanism underlying this enhancement remains unclear. The effects of DAFP-1 were examined on yADH kinetics using spectrophotometric assays that monitor NADH formation across varying ethanol concentrations. yADH exhibited Michaelis–Menten behavior with kinetic parameters consistent with literature values. In the presence of DAFP 1, an increase in initial velocity was observed with no evidence of substrate inhibition, indicating an increase in apparent maximal velocity without significant changes in substrate affinity. These findings suggest that DAFP 1 enhances yADH activity by stabilizing catalytically competent conformations rather than altering substrate binding. Our results highlight antifreeze proteins as specific and effective modulators of enzyme activity and stability.

75. Brandon Bautista

B.S. Biology

Suppression of Ice Crystal Growth Rates by an Ice-Binding Protein

Faculty Mentor: Dr. Xin Wen

Ice crystal formation during freezing poses a major challenge for preserving biomaterials as uncontrolled crystal growth can disrupt protein structure and reduce catalytic activity. Antifreeze proteins (AFPs), a class of ice-binding proteins evolved in cold-adapted organisms, inhibit ice growth by binding to ice crystal surfaces and represent promising natural cryoprotectants. A recombinant ice-binding protein from a fire-colored beetle (rIBP) was recently shown to protect enzymes and cells under freezing conditions, however, its ice growth inhibition potency has not been quantitatively characterized. Here, we examine the effect of rIBP on ice crystal growth kinetics. In control samples, ice grains coarsened over 0–60 min, whereas nanomolar concentrations of rIBP strongly suppressed grain growth. Analysis of cubic crystal radius versus time revealed a reduced growth constant in the presence of rIBP, suggesting that rIBP is an effective ice growth inhibitor and highlighting its potential for enhancing cryopreservation.

76. Elise Hastie

B.S. Chemistry

Development of Cyclodextrin-Based Nanosponges (CDNSs) For Molecular Sequestration in Complex Environments

Faculty Mentor: Dr. Brenda Andrade Rounds

Cyclodextrins (CDs) are naturally occurring cyclic oligosaccharides comprised of multiple glucose units linked by α-1,4-glucosidic linkages. Shaped like truncated cones, CDs have a hydrophobic inner cavity and hydrophilic outer surface, giving them the unique ability to be both soluble in water and form inclusion complexes with relatively hydrophobic guest molecules. This project aims to prepare net-like cyclodextrin nanosponges (CDNSs) by crosslinking amine-perfunctionalized β-CD building blocks with EDTA-dianhydride via ring-opening or with glutaraldehyde via reductive amination. The per-amino β-CD building block was synthesized in three steps, and all intermediates were characterized using Proton (1H) and Carbon-13 (13C) Nuclear Magnetic Resonance (NMR). The chemical composition, surface morphology, thermal stability, crystallinity, and particle size of the synthesized nanosponge materials will be probed using ATR-FTIR, SEM, TGA, PXRD, and DLS, respectively. The application of these targets is versatile and includes pH-responsive drug delivery and adsorption of persistent organic pollutants from water.

77. Lidia Garcia Marroquin

M.S. Chemistry
Exploring Possible U-to-C RNA Editing of MECP2 Nonsense Mutations in Rett Syndrome Using Designer PPR–DYW–KP6 Proteins
Faculty Mentor: Dr. Michael L. Hayes

Rett syndrome is an X-linked neurodevelopmental disorder caused by recurrent C→T nonsense mutations in MECP2 that introduce premature stop codons. This project explores the use of designer pentatricopeptide repeat proteins with DYW domains (dPPR-DYW) to catalyze specific RNA edits. We designed four synthetic PPR-DYW editors targeting the most common pathogenic alleles (R168*, R255*, R270*, R294*) by applying a combinatorial PPR code to program sequence specific recognition and position the DYW:KP6 catalytic domain for U→C correction. Editors were cloned into bacterial expression vectors with matched MECP2 targets in the 3′ UTR and will be screened in triplicate E. coli cultures using RT-PCR and Sanger sequencing. Preliminary findings will indicate allele specific U→C conversion. Mammalian delivery vectors will be prepared for validation in human cells. This work establishes design principles for programmable U→C RNA editing and highlights PPR-based editors as promising therapeutic tools for correcting Rett-associated nonsense mutations, and beyond.

78. Angel Vo

B.A. Sociology, Geography minor
Post-fire coastal plumes following the Eaton and Palisades Fires in Southern California
Faculty Mentors: Dr. Jingjing Li and Dr. Alireza Farahmand

Southern California is a wildfire-prone region where wildfires increasingly affect terrestrial and coastal environments. Wildfires in coastal regions can have significant environmental impacts, including increased runoff, sediment yields, and contaminants that affect downstream coastal systems. This study investigates the presence and spatial distribution of coastal plumes following the 2025 Eaton and Palisades Fires. The Eaton Fire burned 4,021 acres and destroyed 9418 structures in Eaton Canyon and Altadena, the Palisades Fire burned 23,448 acres in the Santa Monica mountains and destroyed 6,837 structures. Together, these are the two most destructive wildfires in Los Angeles history. Using satellite imagery from Landsat 8-9 and Sentinel 2A and 2B, we analyze post-fire surface conditions in coastal waters adjacent to Pacific Palisades and the port of Long Beach to identify plumes in those coastal waters. This study contributes to current research and how satellite imagery can improve our understanding of wildfire impacted coastal plumes.

76. Erik Weisner

M.S. Geology, Hydrogeology option
Modeling Post-Wildfire Stream Runoff from the Bobcat Fire in the Los Angeles Basin
Faculty Mentors: Dr. Jingjing Li and Dr. Alireza Farahmand

As wildfires increase in frequency and intensity, understanding their hydrologic impacts is increasingly important. One major concern is enhanced surface runoff from storms, which can lead to flooding and mudslides even after a fire has been extinguished. The Bobcat Fire, one of the largest fires in California history, burned 115,997 acres of the Angeles National Forest in the San Gabriel Mountains, which lasted from September to November in 2020. In this study, we utilized the Army Corps of Engineers' Hydrologic Engineering Center Hydrologic Modeling System (HEC-HMS) to simulate post-fire hydrologic responses and assess changes in surface runoff in the following years. The model results show that post-fire soil conditions have higher curve numbers and runoff ratios, resulting in more overall runoff compared to pre-fire conditions. This highlights the lasting hydrologic effects of wildfires and the necessity of long-term environmental and resource planning in fire-affected watersheds.

80. Ismael Sandoval

B.A. Anthropology
From AIRS to CrIS: Weekly Near-Surface Atmospheric Mapping for Early Drought Detection Across CONUS
Faculty Mentor: Dr. Alireza Farahmand

The Atmospheric Infrared Sounder (AIRS) onboard the Aqua satellite has been operational since 2002 and is approaching decommissioning. It is our project's goal to support the transition to next-generation climate remote sensing systems, including the Cross-track Infrared Sounder (CrIS) instrument. We aim to develop an algorithm capable of generating weekly-average maps of relative humidity, temperature, and vapor pressure deficit (VPD) that support early drought detection across the Continental United States (CONUS). Our work focuses on methods for monitoring drought indicators using satellite atmospheric data. We seek to improve drought detection by comparing weekly near-surface atmospheric data from AIRS with NUCAPS data derived from the CrIS instrument. This work can assist disaster monitoring of droughts and can contribute to efforts to prevent catastrophic impacts on human populations.

81. Shruti Soman

M.S. Environmental and Geospatial Sciences
Utilizing Satellite-Based SWOT and OPERA Data to Improve Surface Water Extent Detection of Lakes
Faculty Mentors: Dr. Jingjing Li and Dr. Alireza

Farahmand

The Surface Water and Ocean Topography (SWOT), a collaboration between NASA and the Centre National d'Etudes Spatiales (CNES) was launched on December 16, 2022. SWOT delivers highly precise water storage change data every 21 days for hydrology applications. However, due to its shorter operational timeline and longer revisit time it is essential to combine SWOT with another satellite - OPERA (Observational Products for End-Users from Remote Sensing Analysis). OPERA DSWx-S1, Dynamic Surface Water Extent, uses Sentinel 1A/B as its source data and provides cloud-free images. OPERA DSWx-S1 is a 100 m raster produced every 6-12 days that can be used to interpolate the surface-water extent between SWOT overpasses. This provides insight into the relationship between surface area and water depth and facilitates volume change estimation over time. This study focuses on the wet season of four natural lakes in California - Clear Lake, Eagle Lake, Mono Lake, and Lake Tahoe.

82. Joshua Pool

M.S. Environmental Science
Flood Susceptibility Mapping in the Los Angeles River Watershed Using Random Forest
Faculty Mentor: Dr. Alireza Farahmand

Flooding in Southern California is influenced by interactions among topography, land cover, and precipitation. This study develops a flood susceptibility assessment for the Los Angeles River watershed using a Random Forest classification approach. A flood inventory consisting of observed flood locations and randomly generated non-flood points was used to train the model alongside six predictor variables: elevation, slope, topographic wetness index, distance to streams, impervious surface percentage, and maximum one-year total precipitation. Model outputs were applied to spatial predictor layers to generate flood susceptibility maps representing the distribution of flood-prone conditions across the watershed. The results illustrate how machine-learning methods can be used to integrate multiple environmental variables for regional-scale flood susceptibility mapping in an urban watershed.

83. Doroteo Manriquez

M.S. Materials Science and Engineering
Creating Vacancies in Metal-Organic Frameworks by Ligand Truncation Strategy for Clean Energy Storage and Carbon Capture
Faculty Mentor: Dr. Yangyang Liu

Energy production sources have been a topic of interest due to the drastic effects some of them can have on the earth. Burning fossil fuels has been a major contributor to energy production, but also greenhouse gases and global warming. Using hydrogen, which produces just water upon complete combustion would be an ideal energy source. However, current infrastructure cannot maintain efficiency using just hydrogen. An alternative, until the infrastructure catches up, would be using the cleanest fossil fuel methane. An issue with both hydrogen and methane is storage, which can only be done in high pressure, or subzero temperatures. Two novel metal-organic frameworks (MOFs) were created to solve gas storage issues. CLSA-1 and CSLA-2 are copper based MOFs with V-shaped ligands. They were characterized using x-ray diffraction, and gas sorption. Their dynamic breakthrough capabilities were also measured for carbon dioxide.

84. Kaycee Willis

M.S. Materials Science and Engineering
A Novel Photo-Responsive Covalent-Organic Framework for Direct Air Capture of Carbon Dioxide
Faculty Mentor: Dr. Yangyang Liu

Direct air capture (DAC) of carbon dioxide is one proposed solution to combat rising atmospheric CO2 levels, which contribute to climate change. Due to their high porosity and tunability, covalent-organic frameworks (COFs) are promising candidates for DAC of CO2. CO2 molecules can be adsorbed by the COF and then released using high temperature or low pressure, which is energy intensive. To lower the energy requirements of the adsorption-desorption cycle, this study aims to create a photo-responsive COF. The entry of CO2 can be controlled by photo-responsive ligands acting as a gate, which are opened and closed with light irradiation. Synthesis of this photo-responsive COF linker is underway and is being characterized through nuclear magnetic resonance spectroscopy (NMR). In future work, complete synthesis of the photo-responsive COF will be undertaken and studied with multiple techniques including gas adsorption capacity isotherms and breakthrough analysis (BTA) to determine dynamic and competitive CO2 capture.

85. Madison Ngo

B.S. Biochemistry
Modified Plasmonic Electrochemical Sensors for the Sensitive Detection of Dopamine
Faculty Mentor: Dr. Yixian Wang

Dopamine is a monoamine neurotransmitter that plays roles in controlling memory, mood, and other bodily functions. It is attractive due to its association with neurodegenerative diseases such as Parkinson's and Alzheimer's disease. Electrochemical dopamine sensors are commonly used for their cost-effective setup. However, these techniques are used for bulk detection

and lack spatial resolution. The current study investigates two dopamine sensors using surface plasmon resonance microscopy (SPRm), a spatially resolved imaging technique. A monolayer containing negatively charged acid was deposited onto a bare gold substrate. Dopamine concentration is detected via its polymerization, catalyzed by applying a potential bias of +0.2 V. Graphene oxide was deposited on a second bare gold substrate by spin-coating and drop-casting. Both sensors yielded calibration curve linearities greater than 0.99, showing concentration dependence. Our future goal is to image the real-time release of dopamine from PC-12 (rat adrenal) cells.

86. Marilyn Heidecker

B.S. Biochemistry
Untargeted Analysis of a Late Classic Period Maya Femur by Solid Phase Microextraction (SPME)
Faculty Mentor: Dr. Petr Vozka

Solid phase microextraction (SPME) headspace analysis of a Late Classic Period (AD 600-900) Maya, red-painted human femur from the Cueva de Sange, Dos Pilas, Guatemala, reveals the presence of a complex organic binder associated with mortuary pigment application. The binder consists of degraded lipids and terpenoid resins. Saturated fatty acids, long-chain aldehydes, alcohols, and esters indicate aged fats or drying oils. Monoterpenes, sesquiterpenoids, and aromatized diterpenes suggest pine or copal-type resins, compounds which have not previously been fully characterized by our methods. The combination of these compounds supports the interpretation of perfumed ointments rather than simple pigment dusting, consistent with historical accounts of scented mortuary dressings.

87. Michelle Rodriguez-Vergara

B.S. Natural Science
What's in the Water? An Accessible Undergraduate Laboratory Experiment For Extracting Microplastics from Environmental Water Samples
Faculty Mentor: Dr. Petr Vozka

As microplastics continue to pollute our water, air, soil, beaches, and food, it is essential to raise awareness of the threat they pose not only to our bodies but also to our ecosystems. The purpose of this study is to develop an accessible lab experiment for undergraduate students to extract microplastics utilizing salt-based density separation, filtration, and hydrogen peroxide digestion from three prepared water samples: the LA River, the ocean, and tap water. The samples underwent density separation to separate light material from the heavy organic matter. The light-material flotation is then collected, filtered, and digested to remove organic matter, thereby uncovering the microplastics present in the sample. The retrieved microplastics are then analyzed and weighted to determine the recovery rate. Creating an accessible, cost-efficient way for students to learn about microplastics and their impact on the environment enables the community to raise awareness of a critical issue we face.

88. Prisha Mitra & Kamyrn Flade

B.S. Biology
Assessing PAH Exposure in Seaside Sparrows After the Deepwater Horizon Oil Spill
Faculty Mentor: Dr. Petr Vozka

On April 20, 2010, the Deepwater Horizon oil rig explosion caused the largest oil spill in U.S. history, releasing about 3.19 million barrels of oil into the Gulf of Mexico. Much of this oil spread through marine and coastal environments, exposing wildlife to harmful chemicals. One group of these chemicals, polycyclic aromatic hydrocarbons (PAHs), is toxic to wildlife and humans. In collaboration with Cal Poly Pomona, this study examines PAH levels in the livers of seaside sparrows collected from affected areas. We will use two-dimensional gas chromatography time-of-flight mass spectrometry (GC×GC–TOF/MS) to identify and measure PAHs. Earlier analyses found many alkanes and aromatic hydrocarbons at the collection sites. This study focuses on detecting the 16 PAHs identified by the U.S. Environmental Protection Agency. To improve accuracy, methods will first be tested using chicken liver samples with added PAHs, along with extraction and advanced GC×GC–MS techniques to better detect complex compounds.

89. Bruno Bitencourt

M.S. Physics
Stellar Formation: Learning how our own solar system evolved through the study of IRAS 04166+2706.
Faculty Mentor: Dr. Susan Terebey

A protostar is what we call a young star that is in its formation stage, and is still accreting mass from the gas cloud it resides in. The particular protostar this project is concerned with is called IRAS 04166+2706, it is located in the Taurus molecular cloud complex which is around 156 parsecs away from us, and it is among one of the youngest protostars. Additionally, this protostar is characterized by jet outflows, which means that it is actively accreting matter around the center. We simulate the protostar using the RadChemT software to compare with previous data from the Atacama Large Millimeter Array (ALMA). Doing so will shed light on the protostar's mass, as well as its astrochemical composition – which could in turn help us understand better the origin of molecules important for life during this stage of a star system's evolution.

90. Sergio Gomez

M.S. Physics
The Hybrid Chemistry of Protostar CB68
Faculty Mentor: Dr. Susan Terebey

Protostars are star-like objects not yet hot enough to fuse hydrogen at their cores. They follow their own evolutionary track before becoming main sequence stars, through accretion of gas from the surrounding medium. CB68 (IRAS-16544-1604) is a low mass, class 0 protostar, in a relatively isolated region of space 150 parsecs away. It is further characterized by a compact disk embedded within a large envelope of gas and dust, which feeds its growth. A distinguishing factor of CB68 is its astrochemistry, as it hosts a "hot corino" — a warm and compact region rich in organic molecules — while its outer envelope is shown to have warm carbon-chain chemistry. These aspects of CB68 make an ideal example of a class 0 protostar, and our goal is to study the system through simulation in order to compare it to actual observations from the Atacama Large Millimeter Array (ALMA) radio telescope.

91. Amanda Miloserny

M.S. Physics and Astronomy
Examining and Simulating Protostar IRAS-15398-3359 to Provide Clues to the Origin of Life
Faculty Mentor: Dr. Susan Terebey

Protostars are star-like objects within the earliest stages of stellar evolution and experience accretion and infall of matter from the surrounding medium that is composed of dust and gas. Their study informs our understanding of how our Sun and solar system formed. We use observational data from the Atacama Large Millimeter Array (ALMA), a radio interferometer telescope based in Chile, to study the protostar IRAS 15398-3359. Competing theories propose that IRAS 15398-3359 will continue to gain material thus eventually forming a star, or instead will stall at its current mass, resulting in a failed star known as a brown dwarf. We describe simulations using the RadChemT software package to generate a realistic model of the gas motion around IRAS 15398-3359. The model will be compared with ALMA observations to determine the ultimate fate of this protostar.

93. Koelle Rahman

M.S. Physics
Cross Section Measurements of Toluene (C7H8) with FTIR for Titan's stratosphere
Faculty Mentor: Dr. Karine Le Bris

We measured mid-infrared absorption cross-sections of toluene (C7H8) in support of remote observations of Titan's atmosphere. Because multiple hydrocarbon species, including ethane (C2H6), propyne (C3H4), benzene (C6H6) have already been detected in Titan's atmosphere1, photochemistry models2 predict the formation of related compounds. As a result, toluene is considered a plausible candidate for detection. However, the lack of high-resolution laboratory spectroscopy at cold temperatures hinders its detection. We collected and processed existing data of absorption spectra of toluene at three temperatures (240 K, 278 K, and 298 K) and acquired under varying experimental parameters (resolution, sample pressure, N2 broadening pressure) using a high-resolution Fourier transform spectrometer (Bruker IFS 125 HR) at the Jet Propulsion Laboratory. Integrated cross-section was also computed from cross-section. We will present the methodology, validity, and preliminary results of this work and discuss directions for future research.

94. Randy Muñoz

M.S. Physics
Analyzing Circulation Patterns in Mars' Upper Atmosphere Through Ultraviolet Nightglow Observations
Faculty Mentor: Dr. Emilie Royer

Studying the effects of global-scale weather patterns in the upper Martian atmosphere (70-90 km) is critical in improving models that both advance our understanding of Mars' atmospheric dynamics and our ability to forecast climate conditions on the planet. Ultraviolet spectra from the Mars Atmospheric and Volatile Evolution (MAVEN) spacecraft's Imaging Ultraviolet Spectrograph (IUVS) have recently enabled the study of wave patterns in emissions caused by the recombination of atomic N and O—an effective tracer of the planet's circulation patterns. Here we describe our preliminary work analyzing these patterns, paying particular attention to their connection with season, local time, latitude, and altitude. In studying these relationships, we have identified the existence of wave structures in Mars' mesosphere. Future analysis will work to trace the origin of these waves and place tighter quantitative constraints on their behavior, thus allowing us to better understand Mars' atmospheric transport mechanisms and improve existing climate models.

95. Julia Ryen Johnston

M.S. Physics
Cosmic Wear and Tear: What Far-UV Phase Curves Reveal About Rhea
Faculty Mentor: Dr. Emilie Royer

We use far-ultraviolet (FUV) observations from the Cassini Ultraviolet Imaging Spectrograph (UVIS) to derive reflectance spectra of Saturn's icy moon Rhea. The UVIS recorded signal includes both reflected solar radiation from Rhea's surface and significant background contributions from Ly-α (Hydrogen) emissions. By accounting for this and other background sources, we aim to obtain accurate surface reflectance values, which will

be sorted according to the satellite's phases to construct the first far-UV disk-integrated phase curves of Rhea at 180 nm. The resulting phase curve will provide new information on the surface composition, scattering properties, and weathering state of Rhea, contributing to a deeper understanding of exogenic processing and its role in shaping the Saturnian system. Rhea is located at the far end of the E-ring of Saturn and acts as a long-term environmental archive of Saturn system processes, recording exogenic modification more noticeably than other mid-size satellites of the E-ring.

96. Ernesto Ramirez Jr.

M.S. Physics
Radial Velocities and Spectral Classifications of High Mass X-Ray Binary Companion Star Candidates in M33
Faculty Mentor: Dr. Margaret Lazzarini

High mass X-ray binaries (HMXBs) are star systems 8 times the mass of our own Sun where a black hole or neutron star accretes material from the companion star. I present optical spectroscopy of candidate companion stars in the nearby spiral galaxy M33. The candidate companion sources were identified at X-ray wavelengths from the Chandra X-ray Observatory and at optical wavelengths from the Hubble Space Telescope. The Keck/DEIMOS spectrograph provided further data on our HMXB candidates. I determined the spectral types and measured radial velocities of our candidate companion stars. From the stellar spectra I was able to determine the spectral classification by the presence of Helium lines and measured radial velocities from Helium and Hydrogen (H-α and H-ß) lines. I identify several systems with observed radial velocity shifts over the course of our observations, making them very strong HMXB companion star candidates.

97. Ethan Potter

M.S. Physics
Studying the Star Formation History of Sextans A Using HST Photometry
Faculty Mentor: Dr. Margaret Lazzarini

Galaxies serve as fundamental components of the universe, and their function can be better understood by investigating their star formation history, defined as the rate at which stars form over cosmic time. One way to do this is through multi-band photometry, which measures stellar brightness across various wavelengths of light. In this presentation, I outline the scope of my master's thesis, which centers on the dwarf irregular galaxy Sextans A, a low-metallicity member of the Local Group. I will analyze the star formation history of Sextans A using stellar photometry of two regions imaged by the Hubble Space Telescope. By examining this history, I aim to provide insight into the timing and efficiency of star formation within the galaxy. Ultimately, my research aims to enhance our understanding of galaxy evolution and the physical processes that govern star formation in low-metallicity environments.

98. Luis Eduardo Olague Rodriguez

M.S. Physics
Finding gravitational lens candidates using data from the Euclid mission
Faculty Mentor: Dr. Margaret Lazzarini

A gravitational lens is a massive object that curves space-time around it, causing light from distant sources to be deflected and magnified. Strong gravitational lensing is a powerful tool for the study of cosmology and galaxy evolution; however, a significant number of gravitational lenses remain undiscovered in current surveys. This project aims to identify new gravitational lens candidates using the Early Release Observations from the Euclid mission. It is estimated that around a hundred lenses remain to be detected, with a realistic target of identifying approximately 100–200 high-quality candidates. To achieve this goal, advanced machine learning models will be developed and optimized to efficiently filter large imaging datasets and improve candidate classification. The methodology includes training, validation, and refinement of supervised learning algorithms applied to Euclid data. The expected outcome is a catalog of gravitational lens candidates suitable for follow-up studies.

99. Yabo Ogunduyile

B.S. Physics
Into the Thick of It: Searching for Heavily Obscured Supermassive Black Holes with Chandra
Faculty Mentor: Dr. Margaret Lazzarini

Large galaxies often host a supermassive black hole (SMBH), this central region known as an active galactic nucleus (AGN). The growth history of SMBHs across cosmic time is crucial to understanding galactic and SMBH evolution. Our ability to study this coevolution is hindered by a fraction of heavily obscured AGN that exist within reservoirs of obscuring gas and dust. I present a method of searching for heavily obscured AGN in the local universe (>100 Mpc) using data from the Chandra X-ray Observatory. We can study the physical processes within AGN by analyzing their X-ray spectrum. Obscured AGN exhibit intense iron emission lines in their X-ray spectra. We created images of galaxies isolating light near the wavelength of these Iron lines to reveal hidden AGN. Initial results suggest our method is an effective way to identify obscured AGN, advancing the AGN census and our understanding of galactic and SMBH evolution.