

UC **SANTA BARBARA**  
Summer Sessions

2023 RESEARCH MENTORSHIP PROGRAM  
RESEARCH SYMPOSIUM  
**PROCEEDINGS**



## 2023 Research Symposium Schedule

Wednesday, August 2

Time	Talk
9:00 AM	<b>Opening Remarks</b>
9:04 AM	<b>Jinao (Michael) Wang</b> Scalable Quantum Ground State Preparation of the Heisenberg Model: A Variational Quantum Eigensolver Approach
9:16 AM	<b>Lana Wong</b> Exploring Critical Phenomenon in the Transverse Field Ising Model Using Variational Quantum Algorithms
9:28 AM	<b>Soyeon Kim</b> Training Neural Network Models for Audience Behavior in Free Locomotion with Imitation and Reinforcement Learning
9:40 AM	<b>William Deng</b> Analyzing User Sentiment in a AR Performance With Virtual Audiences
9:52 AM	<b>Don Tran</b> Gate-Electric Field Dependence of Zigzag Graphene Nanoribbon Twistronics
10:04 AM	<b>Jackson Ibarra</b> Uncharted Intelligence: Exploring OpenAI's Impact on the Future of Safety and Society
10:16 AM	<b>Sarah Yun</b> Investigating the Impact of Hispanic Cultural Stigmas and the Theory of Planned Behavior on Mental Health Help-Seeking Intentions
10:28 AM	<b>Intermission</b>
10:48 AM	<b>Kashvi Jain</b> The Evolution of Online Hate: How Decades of Tactical and Technological Innovation Created a Hate Epidemic
11:00 AM	<b>Tianjian (Tillman) Si</b> Cyberhate Unleashed: How Governmental and Corporate Inaction Created the Modern White Power Movement
11:12 AM	<b>Alex Zhang</b> More than "Sellouts" and "Uncle Toms": Understanding Right-Wing Activists From Minority Backgrounds
11:24 AM	<b>Arin Parsa</b> Recurrent Neural Networks for Baseball Analytics: A Shift towards Accurate Strategic Positioning
11:36 AM	<b>Christopher Chen</b> Optimization of UAV Flight Paths for the Early Detection of Wildfires
11:48 AM	<b>Michelle Jiang</b> Applying a Probabilistic Coverage Model to Strategic Positioning in Baseball
12:00 PM	<b>Lunch Break – on your own</b>

## 2023 Research Symposium Schedule

Wednesday, August 2

Time	Talk
1:35 PM	<b>Opening Remarks</b>
1:38 PM	<b>Carter Capetz</b> Tensorized Physics-Informed Neural Network for Solving Nonlinear PDEs
1:50 PM	<b>Rohan Shankar</b> Retrieval of Remotely Sensed Tropospheric NO <sub>2</sub> Data Using Tensor Completion
2:02 PM	<b>Subha Vadlamannati</b> Tensor Decomposition for Compression Of Multimodal Dual-Encoder Deep Neural Networks
2:14 PM	<b>Rohan Sontakke</b> The Role of Personal Control, Self-Efficacy, and Group Size in Motivating Collective Environmental Action
2:26 PM	<b>Kelly C. Tanaka</b> Optical Characterization of Polar Superconductors Using Raman Spectroscopy
2:38 PM	<b>Alan Zhong</b> Investigating the Role of <i>AdoR</i> in ATP Chemoreception and Feeding Behavior in <i>Drosophila melanogaster</i>
2:50 PM	<b>Keyao Xia</b> Investigating the Molecular Basis of ATP Peripheral Detection in <i>Drosophila melanogaster</i> Using Proboscis Extension Reflex
3:02 PM	<b>Shivani A. Swaminathan</b> Investigating the Cellular Basis of Otopetrin Mediated Regulation of Drinking Behavior in <i>Drosophila melanogaster</i> Using Drinking Assays
3:14 PM	<b>Intermission</b>

## 2023 Research Symposium Schedule

Wednesday, August 2

Time	Talk
3:34 PM	<b>Sean Guo</b> Elucidating Spatiotemporally Oscillating Pattern Dynamics in Repressilator Reaction-Diffusion Models
3:46 PM	<b>Sierra Sun</b> Synthesizing Ketimide-Protected Iron Clusters Using Metal Reducing Agents
3:58 PM	<b>Andrew Liang</b> Empowering the Visually Impaired: Applying Machine Learning to Improve Blurry Image Interpretation and Recognition
4:10 PM	<b>Emma Shen</b> Using Spatial Audio to Improve Navigation in High-Stress Conditions: An Ambulatory Virtual Reality Study
4:22 PM	<b>Melody Yu</b> Privacy-Preserving Network Verification System Scalable for Internet Infrastructures
4:34 PM	<b>Sucheer Maddury</b> On the Performance of Secure Graph Algorithms in Detecting Routing Loops on Large-Scale Network Topologies
4:46 PM	<b>Justin Chen</b> Language Change in Transgender Reddit Communities
5:00 PM	<b>End of Day 1</b>

## 2023 Research Symposium Schedule

Thursday, August 3

Time	Talk
9:00 AM	<b>Opening Remarks</b>
9:04 AM	<b>Aryaman Rtunjay</b> Impact of Disease Mutations on Amyotrophic Lateral Sclerosis Through Molecular Dynamics Studies of Tar DNA-Binding Protein 43
9:16 AM	<b>Gautam Bhooma</b> Modeling Aggregates of Wild-Type and Mutated Tau Proteins Implicated in Alzheimer's Disease
9:28 AM	<b>Cloris Shi</b> Decision Bias in Recognition Memory: How Memory-Selective Neurons Encode Criterion Shifts
9:40 AM	<b>Joanne Zhao</b> Characterizing the Roles of the Medial Temporal Lobe and Medial Frontal Cortex During Memory-Based Decision Making
9:52 AM	<b>Raymond Zou</b> Recognition Memory and Visual Discrimination: Distinguishing Responses of Confidence-Selective Neurons
10:04 AM	<b>Ethan Liu</b> The Consequences of Asynchronous Communication in Distributed Optimization Networks and Federated Learning
10:16 AM	<b>Jack S. Ke</b> Inter-Vehicle Communication Structures for Platoons of Autonomous Vehicles
10:28 AM	<b>Intermission</b>
10:48 AM	<b>Amy Cao</b> The Balancing Act of Blockchain Security: The Fee and Liquidity Trade-off in Decentralized Exchanges
11:00 AM	<b>Camilla Yen</b> Slippage Tolerance in Decentralized Exchanges: Exploring Trader Behavior
11:12 AM	<b>Junting (Justin) Wang</b> Slippage Tolerance in Decentralized Exchanges: Analysis From the Attacker Perspective
11:24 AM	<b>Joleen Pan</b> From Doubt to Confidence: Exploring the Impact of Social Support and Self-Care in Managing Impostor Phenomenon Among Graduate Students
11:36 AM	<b>Joseph Z. Shen</b> Reconciling Meaning and Religion: Exploring the Role of Faith in the Pursuit of Meaning
11:48 AM	<b>Yunzhong (Jason) Mao</b> Vanity of Vanities: Tolstoy, Finitude, and the Meaning of Life
12:00 PM	<b>Shreyes Balachandran</b> Rewriting History: The White Supremacist Project to Control American Education
12:15 PM	<b>Lunch Break – on your own</b>

## 2023 Research Symposium Schedule

Thursday, August 3

Time	Talk
<b>1:40 PM</b>	<b>Opening Remarks</b>
1:43 PM	<b>QingYi (Mia) Zhang</b> Understanding the Role of Environmental Factors in Albatross Movements
1:55 PM	<b>Rianne Ke</b> Identifying Critical Road Segments in Laguna Hills Using Graph Theory
2:07 PM	<b>Yutong (Katherine) Ke</b> Exploring Variability in the Movement Pattern of Turkey Vultures in Relationship to Environmental Factors
2:19 PM	<b>Advait Alluri</b> Robust Human Action Recognition Using 3D Skeletal Joint Data: Feature Compression and Geometric Machine Learning
2:31 PM	<b>Anna Zhong</b> Optimized Object Classification Model Inspired by Foveation and Attention Mechanisms in Human Vision
2:43 PM	<b>Caleb Liu</b> ReLeFT: Using Reinforcement Learning to Find Fixation Points in Foveated Models
2:55 PM	<b>Hunter L. Rohovit</b> Towards More Efficient Human Action Recognition with Optimal Feature Extraction and Geometric Machine Learning Approaches
<b>3:10 PM</b>	<b>Intermission</b>
<b>3:30 PM</b>	<b>Poster Session</b> Engineering Sciences Building Courtyard
<b>5:00 PM</b>	<b>End of Day 2</b>



**2023 Research Symposium Schedule**

Friday, August 4

Time	Talk
<b>9:00 AM</b>	<b>Opening Remarks</b>
9:04 AM	<b>Harshil Pathri</b> Investigating the Effects of Zeeman Shifts on the Spin Microemulsion Phase in Spin-Orbit Coupled Bose-Einstein Condensates
9:16 AM	<b>Lillian Zhong</b> Stability of a Spin Microemulsion Phase in Spin-Orbit Coupled Bose-Einstein Condensates Under Confinement
9:28 AM	<b>Donovan Sappet</b> Developing a Protocol for Single Electron GaAs Quantum Dot Thermometry at Millikelvin Temperatures
9:40 AM	<b>Kelley Ariel Gonzalez</b> Characterizing Mirror Mount Stability for Laser Optics
9:52 AM	<b>Katelyn Guo</b> Optimizing Noise Reduction Filters to Improve Clarity in Ultrasound Liver Images
10:04 AM	<b>Yixuan Lin</b> Pictoforte: Constructing Electronic Instruments Based on Image Border Properties
10:16 AM	<b>Adarsh Iyer</b> Expressive Symbolic Regression for Interpretable Models of Discrete-Time Dynamical Systems
<b>10:28 AM</b>	<b>Intermission</b>
10:48 AM	<b>Jacob Winefeld</b> From Flowing to Clogged: Experiments With Cohesive Grains in a Silo
11:00 AM	<b>Jonathan Xue</b> Simulating Cohesive Granular Flow and Dilatancy Through Silos
11:12 AM	<b>Hailey Van</b> Collapse of a Two-Dimensional Granular Column: Influence of Polymers on Interparticle Cohesion
11:24 AM	<b>Jonathan Tafoya</b> Using Genetically Engineered MRI Reporters to Sense Human Aquaporin-Based Protease Activity
11:36 AM	<b>Ryan Davis</b> Genetically Engineering Ion Transporters for MRI-Based Detection of Protease Activity
11:48 AM	<b>Grace Punzalan</b> Characterizing the Microbiome of Pelagic <i>Sargassum</i> Using Bacterial Ribosomal RNA Sequencing
12:00 PM	<b>Ashley Y. Yu</b> Using Genetic Analysis to Identify Marine Fungi Contributing to Iron Acquisition in Pelagic <i>Sargassum</i> Holobiont
<b>12:15 PM</b>	<b>Lunch Break – on your own</b>

## 2023 Research Symposium Schedule

Friday, August 4

Time	Talk
1:40 PM	<b>Opening Remarks</b>
1:43 PM	<b>Andrew Wen</b> Colonialism and Relationality: An Analysis of Settler Logics in the Santa Barbara Chinese Community
1:55 PM	<b>Chase Kim</b> Transpacific Rhizomatic Migration: An Analysis of Settler Desire and Identity Formation in Korean-Latin American Literature
2:07 PM	<b>Jessica Li</b> The Untold Editor of Chicana Feminist Literature: Historicizing Norma Alarcón
2:19 PM	<b>Sophia Lau</b> Acting on the Cyber-Stage: Conservative Online Identity Within Alternative Social Networks
2:31 PM	<b>Fiona Yan</b> Digital Forensics: An Exploratory Analysis of Work-Life Boundary Management in Postpandemic Fully Remote Organizations
2:43 PM	<b>Edward Gao</b> Elucidating the Possibility of Quantum Processing in the Brain: An Exploration of Calcium Phosphate Nucleation
2:55 PM	<b>Xavier Lem</b> Elucidating the Impact of Nuclear Spin On Biochemical Aggregation Processes
3:07 PM	<b>Intermission</b>



## 2023 Research Symposium Schedule

Friday, August 4

Time	Talk
3:27 PM	<b>Chowon (Lucy) Kim</b> A Mathematical Model of 1 Host and 2 Microbiomes Coevolution: Dynamics of Extinction, Cyclic Coexistence, and Stable Coexistence
3:39 PM	<b>James Lian</b> Computational Invasion Networks: Modeling Coevolutionary Holobiont Dynamics in Complex Systems
3:51 PM	<b>Kaival S. Shah</b> Gaussian Survivorship Functions for Optimal Offspring Size Resource Distribution Using Nonlinear Optimization
4:03 PM	<b>Victor Zhou</b> The Evolution of Optimal Resource Distribution With Respect to Transgenerational Effects
4:15 PM	<b>Elise Chiu</b> Using Electrospray Ionization to Prepare Optimal Spinach-Extracted Chlorophyll for Gas-Phase Spectroscopic Analysis of Energy Harvesting Properties
4:27 PM	<b>April Y. Wen</b> Identification and Characterization of Different Tau Seeding Species from Human Alzheimer's Disease Patients
4:45 PM	<b>End of Day 3</b>
5:30 PM	<b>RMP Closing Event</b> Goleta Beach – Area D