

THE UNIVERSITY OF OKLAHOMA HONORS COLLEGE PROUDLY PRESENTS



36TH ANNUAL UNDERGRADUATE RESEARCH DAY

April 13, 2024 | Thurman J. White Forum Building | Norman, Oklahoma



HONORS COLLEGE
The UNIVERSITY of OKLAHOMA

SESSION I: 9:00-10:30 A.M.

AEROSPACE AND MECHANICAL ENGINEERING ROOM B1

Michael Burkhart sponsored by Prof. Chung-Hao Lee,
“Experimentally Characterizing the Viscoelastic Properties
of the Tricuspid Valve Chordae Tendineae”

Bethany Hutto sponsored by Prof. Scott Harvey,
“Effects of a Laterally Loaded Arch for Vertical Isolation in
a Rolling Pendulum Isolation System”

Caden Matthews sponsored by Prof. Diogo Merguizo Sanchez,
“Effects of Hall Thrusters and Orbital Resonances on Low Earth
Orbit Starlink Satellite Constellations”

Audrey Richardson sponsored by Prof. Robert Nairn,
“Evaluation of Macroinvertebrate Community Structure in an
Urbanized Stream: Bishop Creek, Norman, Oklahoma”

BIOMEDICAL ENGINEERING 1 ROOM B2

Ridwan Aminul sponsored by Prof. Tahrira Rouf,
“The Effect of Graphene Quantum Dots on the Cell Proliferation
of Astrocytes for Traumatic Brain Injury (TBI) and Neurological
Disorder Treatment”

Airyel Calderon sponsored by Prof. Tahrira Rouf,
“Studying the Function of Graphene Quantum Dots on Chondrocyte
Cell Proliferation for Cartilage Regeneration”

Bornface Mutembei sponsored by Prof. Qinggong Tang,
“Multi-parameter Characterization of Multicellular Cancer
Spheroids Using OCT, Texture and Spatial Parameters and
Machine Learning Models for Anticancer Drug Screening”

Carter Oostmeyer sponsored by Prof. Michael Detamore,
“Peptides for the re-differentiation of chondrocytes”

SESSION I: 9:00-10:30 A.M. (CONT.)

ELECTRICAL ENGINEERING AND COMPUTER SCIENCE ROOM B3

Caleb Emesiani sponsored by Prof. Mike Banad,
“Real-Time Traffic Monitoring with Neuromorphic Computing:
Leveraging BrainChip Akida for Intelligent Sensing”

Tiffany Le sponsored by Prof. Dimitris Diochnos,
“On Certified Adversarial Robustness via Randomized Smoothing”

Noah Pursell sponsored by Prof. Anindya Maiti,
“Future Framed: Crafting Commercially Viable Art with Generative AI”

Emma Stubby sponsored by Prof. Sina Khanmohammadi,
“Functional Connectivity Disruptions in Alzheimer’s Disease:
A Maximum Flow Perspective”

Luke Terry sponsored by Prof. Samuel Cheng,
“Leveraging Musical Structures to Improve Generative Music Models”

Lucia Torres sponsored by Prof. Justin Metcalf,
“Got Jam? Anti-Jamming Technique for Radar Using POMDP”

Pundit Vorakitolan sponsored by Prof. Jessica Ruyle,
“An Optimization Algorithm for a Large Space-Based Scanning Reflectarray”

ENGINEERING PATHWAYS 1 ROOM B4

Sydney Etchieson sponsored by Prof. Jude Okolie,
“Predicting the Capacitance of Activated Carbon-Based Electrodes
in Supercapacitors with Machine learning”

Sadie Prigmore sponsored by Prof. Jude Okolie,
“Cushion Gas Consideration for Underground Hydrogen Storage”

Brooke Rogachuk sponsored by Prof. Jude Okolie,
“Comparative analysis of Pyrolysis and Gasification Fischer
Tropsch for the Production of Sustainable Aviation Fuel”

Emma Smith sponsored by Prof. Jude Okolie,
“Understanding Economic and Environmental Assessment
of Subsurface Hydrogen Production Technology Through
a Spreadsheet-Based Activity Integrated with Virtual Reality”

SESSION I: 9:00-10:30 A.M. (CONT.)

MICROBIOLOGY ROOM B5

Rachel Baker sponsored by Prof. Mojgan Padash,
“Therapeutic Potetial of a Novel Drug Target for HPV-Induced Cancer Using a Drosophila Model”

Joshua Cuozzo sponsored by Prof. Carolyn Ibberson,
“The Impact of Microbe-Microbe Interactions on the Essential Genome of *S. aureus* within a Polymicrobial Cystic Fibrosis Model”

Elena Hollopeter sponsored by Prof. Mojgan Padash,
“Evaluating the Therapeutic Potential of Proteasome Inhibition for HPV Cancers Using a Drosophila Model”

Haley Jackson sponsored by Prof. Wei Qin,
“The Effect of the Ammonium Transporter Gene on the Growth of *Nitrosospira Multififormis*”

Anna Rockwood sponsored by Prof. Kara B. De León,
“Expression of the Biofilm-Forming Protein DVU1545 in *Desulfovibrio vulgaris* Hildenborough Under Environmental Stress”

PSYCHOLOGY AND PERSONALITY ROOM B6

Delaney Fulp presenting with Megan Waldron, sponsored by Prof. Charlie Rioux,
“Sensory Profile of the Highly Sensitive Personality”

Keane Hauck sponsored by Prof. Jenel Cavazos,
“ChatGPT Goes to College: Understanding Students’ Usage and Perceptions of Artificial Intelligence in the Classroom”

Gina Herring sponsored by Prof. Mauricio Carvalho,
“African American and Mental Health Services Utilization: The Role of Self-Reliance and Self-Stigma.”

Corbin Walls sponsored by Prof. Sid Ellington,
“Why Do We Give? Insights from Donor Informedness”

SESSION II: 10:45 A.M. - 12:00 P.M.

CHEMICAL AND PETROLEUM ENGINEERING ROOM B1

Faisal AlSaqabi sponsored by Prof. Mashhad Fahes,
“Utilizing Petroleum Rock Characterization Techniques
to Study the Properties of Concrete towards Developing
Greener Concrete Technologies”

Hayden McCray sponsored by Prof. Reza Foudazi,
“Comparing Optical Tensiometry Methods for Determining the
Surface Tension of Perfluorooctanoic Acid (PFOA)”

Sphindile Mtetwa sponsored by Prof. Mashhad Fahes,
“Establishing a Protocol for the Study of the Effectiveness
of Enhanced Oil Recovery Techniques”

Cole Pool sponsored by Prof. Reza Foudazi,
“Effects of Sodium Fluoride on Pluronic-Water Lyotropic Liquid
Crystals”

BIOMEDICAL ENGINEERING 2 ROOM B2

Jermaine Bucknor presenting with Aaron Tran,
sponsored by Prof. Han Yuan,
“Automated Pipeline Analysis of fMRI Data in Brain
Tumor Patients and Healthy Controls”

Mia Gonzales sponsored by Prof. John R. Clegg,
“Chemotherapy-Induced Apoptosis and Senescence of
Blood-Brain Barrier Cells”

Hunter Helvey sponsored by Prof. John R. Clegg,
“Evaluating Chemotherapeutic Release from a Nanocomposite Hydrogel,
for Future Application in Glioblastoma Multiforme”

Derek Madden sponsored by Prof. Han Yuan,
“Functional Connectivity in Brain Glioma Patients as
a Predictor for Surgical Outcomes”

Ibraheem Mian presenting with Intouch Limvaree,
sponsored by Prof. Han Yuan,
“Comparing Resting-State Functional Magnetic Resonance
Imaging and Wada Test Memory Lateralization in Epileptic Patients”

SESSION II: 10:45 A.M. - 12:00 P.M. (CONT.)

ENGINEERING PATHWAYS 2 ROOM B4

Nathan Ewert sponsored by Prof. Javeed Kittur,
“Understanding the Current Mentorship Capabilities of
Near-Peer Teaching Assistants for Engineering Courses”

Omar Garcia sponsored by Prof. Javeed Kittur,
“Engineering Doctoral Students’ Perceptions on their Preparation to Teach”

Hudson Harris sponsored by Prof. Javeed Kittur,
“Generative Artificial Intelligence: a Systematic Literature Review”

An Nguyen sponsored by Prof. Javeed Kittur,
“Using Reinforcement Learning to Optimize Performance of AI Agents
in Racing Games in Engineering Education: A Systematic Literature Review”

Hoc Nguyen sponsored by Prof. Javeed Kittur,
“Breaking the Stigma: Fostering Mental Health Resilience in
Engineering- A Systematic Literature Review”

Mohammad Sajawal sponsored by Prof. Javeed Kittur,
“Developing an Instrument to Measure Engineering Students’
Perspectives on the Use of ChatGPT”

Akshay Singh sponsored by Prof. Javeed Kittur,
“Genomic Insight: A User-Friendly Approach to Predicting Health
Outcomes in Cancer Patients”

BIOLOGY ROOM B5

Andrew Hojjat sponsored by Prof. James Thompson Jr.,
“Genetic Modifiers of Cell Death and Symmetry”

Israel Lugo sponsored by Prof. Lara Souza,
“Plant-pollinator Interaction in Urban Green Spaces”

Elisabeth Moore sponsored by Prof. Caryn Vaughn,
“What Underlies Morphological Variation in Freshwater Mussel Shells?”

Mark Nagykaldi sponsored by Prof. Karl Hambright,
“Identifying Cyanobacteria Blooms”

SESSION II: 10:45 A.M. - 12:00 P.M. (CONT.)

BIOLOGY (CONT.) ROOM B5

Erik Pascual-Rosales sponsored by Prof. Heather Ketchum,
“The Effect of Abiotic Factors on Blow Fly Community
Composition in Central Oklahoma”

Jayden Thomas sponsored by Prof. Lara Souza,
“Effect of Drought on Root Functional Traits”

HEALTH AND DISEASE ROOM B6

**Corinne Bell sponsored by Prof. Darcy Huismann, MS, CGC
& Danielle Goyette, MA,**
“Assessment of Genetic Counseling Deaf Patients for Both
the Patient and Provider”

Beth Felkner sponsored by Prof. Tyler Ransom,
“Something in the Air?: Predictive Modeling of the Relationship
Between Air Quality and Educational Attainment”

Ivy Jeffries sponsored by Prof. Elena Bessarabova,
“The Role of Death Awareness and Message Framing in
Skin Cancer Prevention Among Black American Populations”

Christopher Johnson sponsored by Prof. Fabio de Sa e Silva,
“Navigating Vaccine Hesitancy: Insights and Strategies from
Healthcare Professionals During the COVID-19 Era in Oklahoma”

Montana McCay sponsored by Prof. Christopher Black,
“Diurnal Effects of Exercise on Markers of Muscle Damage
in Healthy College Age Individuals”

Catherine Tramel sponsored by Prof. Tassis Hirschfield,
“Impacts of Type-One Juvenile Diabetes on Family Dynamics and Stress”

SESSION III: 1:15. - 2:30 P.M.

LANGUAGE STUDIES ROOM B1

Mackenzie Cozort sponsored by Prof. Ryan Kasak,
“Linguistic Ideologies in Language Contact Situations:
The Case of ‘Portuñol’”

**Evie Jackson presenting with Guin Nalewajk sponsored
by Prof. Julianna Kershen,**
“Deeper Learning: Descriptions of Apprenticeship in ELA Learning”

Justice Neasbitt sponsored by Prof. Joey Williams,
“Classical Greek Historians and Spies”

Katherine Orr sponsored by Prof. Dustin Condren,
“Soviet Black Markets: How Secondary Economies in
Soviet Ukraine and Satellite Romania Affected Individual
and Political Culture”

Heather Utt sponsored by Prof. Emily Johnson,
“Unlawful Faith”

CULTURE, MEDIA, AND INTERNATIONAL STUDIES ROOM B4

Morgan Chen sponsored by Prof. Afshin Marashi,
“A Troublemaker Through and Through: The Evolution
and Implications of Taiwanese Nationalism Since 1895”

Natalia Fabry Lochmatter sponsored by Prof. Misha Klein,
“Where are you from?”

Jordan Lawson sponsored by Prof. Jonathan Hills,
“3D Printed Habitat Research”

Jacquelyn Simmons sponsored by Prof. Joanna Hearne,
“Pure Blood”

Emma Stone sponsored by Prof. Xiaochen Angela Zhang,
“The Effect of Gen Z’s Social Issue Activism, Motivations, and
New Media Usage On Brand Activism”

Marshall Washington sponsored by Prof. Darcie DeAngelo,
“Reality Shifting in Online Communities: Voluntary Plural
Selfhood versus Mental Health Disorders”

SESSION III: 1:15. - 2:30 P.M. (CONT.)

PHYSICAL SCIENCES ROOM B5

Nadeem Akbar presenting with Collin Campbell, sponsored by Prof. Madalina Furis,
“Linear Dichroism and Absorption Characterization of Solution-cast, Penwritten Organic Semiconductor Thin Films”

Vignesh Anand sponsored by Prof. Ulrich Hansmann,
“Stability of Amylin and CGRP Oligomers in the Presence of SARS-CoV-2 Fragments”

Lucy Coleman sponsored by Prof. Shanteri Singh,
“Synthesis of Novel Tryprostatin Analogs Containing Chemoselective Functionality Using Prenyltransferase Enzymes”

Kristen Duong sponsored by Prof. Susan Schroeder
“Differential Gene Expression and RNA Methylation in *S. lycopersicum* During Drought and Tobacco Mosaic Virus Infection”

William McCraine sponsored by Prof. Sarah W.M. George,
“Tracing the Origins of the Strata that Host the Ogallala Aquifer”

Sydney Schafer presenting with Peter Sadler and Priya George sponsored by Prof. Thirumalai Venkatesan, “Breathomics: A Frontier in Non-Invasive Pandemic Monitoring and Diagnostic Innovation”



SPECIAL THANKS

The Honors College gives special thanks to Phi Beta Kappa and Phi Kappa Phi for providing funding for awards.

Undergraduate Research Day would be impossible without the time and effort of the judges.

THURMAN J. WHITE FORUM BUILDING

