



UNIVERSITY of
ROCHESTER

Kearns Summer Research Symposium



July 28th, 2023
Feldman Ballroom

The David T. Kearns Center for Leadership and Diversity at the University of Rochester strives to expand the educational pipeline through the doctoral degree for low-income, first-generation college, and underrepresented minority students.

Transforming lives through educational opportunity

Schedule Overview & Sessions

9:00 am: **Welcome & Opening**

Dr. Beth Olivares, Dean for Diversity, Executive Director, Kearns Center

9:20 am: **Panel Discussion A**

Moderator: Demetrious Dowdell, Ph.D. Student, Institute of Optics,
University of Rochester

Presenters: Sara Moore (Physics & Astronomy)

Henry Howard (McNair)

Jordynn Foster (TMCF)

10:00 am: Break

10:10 am: **Oral Presentation Block A**

11:15 am: Break

11:30 pm: **Poster Presentation Block A**

12:30 pm: Lunch

1:15 pm: **Panel Discussion B**

Moderator: Micah Williams, President of GSOC, Ph.D. Student, Department
of English, University of Rochester

Presenters: Kelly Andersen & Priscilla Omotara (ECE)

Lili Seoror (MMM)

Sarah Boyer (Chemistry)

1:45 pm: Break

1:55 pm: **Oral Presentation Block B**

3:10 pm: Break

3:20 pm: **Poster Presentation Block B**

4:25 pm: **Closing**

Melissa Raucci, Assistant Director, College Programs, Kearns Center

Oral Presentation Block A

10:10 - 11:15 am

Douglass 401:

Kendal Jordan (McNair)
Zakilya Brown (McNair)
Shahzoda Nasimjonova (McNair)
Lalita Dahal (McNair)
Mystie Parker (McNair)
Jennasea Licata (McNair)
Taylor Franks (TMCF)

Douglass 403:

Ashley Bao & Kaleb Newman (MMM)
Sophia Caruana & Shaojia (Emily) Lu (MMM)
Sophia Cao (MMM)
A'nya Carr & Destiny Medaris (ECE)
Alejandro Chavez-Mayoral (ECE)
Avery Fuller (ECE)
Trinity King (ECE)

Humanities Conference Room D:

Maria Ahmed (Chemistry)
Kate Custer (Chemistry)
Georgia Hollingsworth (Chemistry)
Nicolas Kaltenhauser (Chemistry)
Grace Barner (Physics & Astronomy)
Layton Borst (Physics & Astronomy)
Delaney Cummins (Physics & Astronomy)
Caleb Jennings (Physics & Astronomy)
David Kong (Physics & Astronomy)

Oral Presentation Block B

1:55 - 3:10 pm

Douglass 401:

Aaliyah Dorsey (McNair)
Deziree Garrick (McNair & LEAF)
Dariel Guerra (McNair)
Janiah Piper (McNair)
Winifred Dorlean (McNair)
Manuel Gonzalez (McNair)
Rebecca Fraser (TMCF)
Toyin Harris (TMCF)

Douglass 403:

Jesus Diaz (MMM)
Andrew Liu & Julia Hootman (MMM)
Sangeetha Ramanuj (MMM)
Manogna Jonnalagadda (ECE)
Olivia Lucia (ECE)
Maya Petterson (ECE)
Jonathan Vazquez (ECE)

Humanities Conference Room D:

Christopher Leiter (Chemistry)
Destinee McGlone (Chemistry)
Julia Shoemaker (Chemistry)
Madeline Wahl (Chemistry)
Caz Wood (Chemistry)
Nathan Mangus (Physics & Astronomy)
Ellie McGee (Physics & Astronomy)
Maddy Ramsey (Physics & Astronomy)
Nathaniel Santiago (Physics & Astronomy)
Degraj Suberi (Physics & Astronomy)
Josiah Tusler (Physics & Astronomy)



Poster Presentation Block A

11:30 am - 12:30 pm

(1) Using Machine Learning to Detect Large Galaxies

Sara Moore, Mentor: Segev BenZvi

(2) Measuring Spin Current in Heisenberg XXZ Model

Henry Howard, Mentor: Gabriel Landi

(3) Super Resolution of Optical Imaging

Jordynn Foster, Mentor: Nick Vamivakas

(4) Depressive Symptoms Affect on Learning and Memory in a Rewarding Environment

Kendal Jordan, Mentor: Benjamin Suarez-Jimenez

(5) Visual and Tactile Sensory Processing in Individuals with Autism and Comorbid Attention-Deficit/Hyperactivity Disorder

Zakilya Brown, Mentor: Emily Isenstein

(6) Neurophysiology of Perceptual Closure Abilities in Neurotypical Children and Adults

Shahzoda Nasimjonova, Mentor: John J. Fox

(7) Mapping the Microscopic Localization of Splenic Diffuse Red Pulp Lymphoma

Lalita Dahal, Mentor: Richard Burack

(8) Exploring Age Related Coding Regions for Mouse, Human, and Bats

Mystie Parker, Mentor: Vera Gorbunova

(9) Generation of Nanobody Library using Yeast Surface Display Methods

Jennasea Licata, Mentor: John Lueck

(10) Satellite DNA (satDNA) Knockdown and Its Affect on Male Drosophila Melanogaster Fertility

Taylor Franks, Mentor: Amanda Larracuenta

(11) Real-Time ASL Communication Technologies to Mitigate Language Deprivation

Ashley Bao & Kaleb Newman, Mentor: Zhen Bai

(12) Continual Learning in Deep Neural Networks of Audio-Visual Data

Sophia Caruana & Shaojia (Emily) Lu, Mentor: Christopher Kanan

(13) Analyzing Videos of 3D Printing from a Depth Camera

Sophia Cao, Mentor: Sreepathi Pai

(14) Pain Perception in Mice: A Machine Learning Approach

A'nya Carr & Destiny Medaris, Mentor: Jiebo Luo

(15) Machine Learning Analysis of Olfactory-Guided Food Seeking Behavior

Alejandro Chavez-Mayoral, Mentor: Julian Meeks

Poster Presentation Block A (Continued)

(17) Validation of Microglial Priming via IBA1 Expression in HIVNanoLucCHME5 Cell Line

Trinity King, Mentor: Stephen Dewhurst

(18) Incorporation of Methionine Sulfide During Translation

Maria Ahmed, Mentor: Sina Ghaemmaghami

(19) Quantifying Oxygenated Functional Groups on Hydrophilic Carbon Fiber Paper for Sustainable Technologies

Kate Custer, Mentor: Astrid Müller

(20) Biomolecular Detection Based on Brewster's Angle Straddle Interferometry

Georgia Hollingsworth, Mentor: Lewis Rothberg

(21) Attempted synthesis of allylic aryl amines via a palladium-catalyzed reaction

Nicolas Kaltenhauser, Mentor: Shauna Paradine

(22) Defining Galaxy Morphology Using Machine Learning

Grace Barner, Mentor: Kelly Douglass

(23) Movement of Vortices in a Bose-Einstein Condensate

Layton Borst, Mentor: Nicholas Bigelow

(24) Searching for Strong Gravitational Lenses in DESI Spectra

Delaney Cummins, Mentor: Segev BenZvi

(25) Construction of an Improved Magneto-Optical Trap

Caleb Jennings, Mentor: Nicholas Bigelow

(26) Simulating Particle Transport in ICF Reactions

David Kong, Mentor: Varchas Gopaldaswamy

(27) Optimizing Coupling Efficiency for Soliton Generation

Emily Deveyra (STEM Scholar), Mentor: William Reninger

(28) Fabry-Perot Cavity Optimization

John Caruso (CCI), Mentor: Mitesh Amin

(29) Utilizing NPoM Cavities to Create Strong Coupling

Cheyenne Valles (CCI), Mentor: Nick Vamivakas

(30) Synthesis of CoN₅H₂ Catalyst for Energy Conversion Reactions

Işıl Ayaz (iScholar), Mentor: Kara Bren

(31) Cavity QED Hamiltonian for Arbitrary Coupling Strength

John Alejandro Montilla Ortega (iScholar), Mentor: Mike Taylor

(32) Raman Spectroscopy of PTCDA Sensitizer

Sneha Samanta, Mentor: David McCamant

Poster Presentation Block B

3:20 pm - 4:20 pm

- (1) Investigating the Stiffness in the Brains of Mice with Batten Disease using Shear Wave Elastography**
Kelly Andersen & Priscilla Omotara, Mentor: Marvin Doyley
- (2) Modeling Brain Responses During Naturalistic Music Performance**
Lili Seoror, Mentor: Elise Piazza
- (3) Synthesis and Characterization of Poly N-Isopropylacrylamide-co-Acrylic Acid for Biosensing Applications**
Sarah Boyer, Mentor: Benjamin Miller
- (4) Positive Functioning in African American Families: Maternal and Paternal Romantic Attachment as Moderators of Associations between Local Educational Opportunity and Positive Interparental Conflict**
Aaliyah Dorsey, Mentor: Melissa Sturge-Apple
- (5) Black Feminist Kinship in the City of Rochester**
Deziree Garrick, Mentor: Katherine Mariner
- (6) Mediated Memory, United States Propaganda, and Cuban State Run Media in an Analysis of the US Embargo on Cuba**
Dariel Guerra, Mentor: Molly Ball
- (7) Media's Black Representation**
Janiah Piper, Mentors: Joel Burges & Tanya Bakhmetyeva
- (8) Synthesis of NHC Ligands for Amide Bond Activation**
Winifred Dorlean, Mentor: Rose C. Kennedy
- (9) Understanding MOT Lockbox Circuitry**
Manuel Gonzalez, Mentor: Nicholas Bigelow
- (10) Nanoparticle Thin Film Fabrication and Characterization**
Rebecca Fraser, Mentor: Todd Krauss
- (11) BeeTrap: Nurturing AI Literacy through Analysis-Based Learning and Embodied Interaction for Young Learners**
Toyin Harris, Mentor: Zhen Bai
- (12) Evaluating Structure from Motion for 3D Printing Quality Control**
Jesus Diaz, Mentor: Sreepathi Pai
- (13) Public Perceptions of Synthetic Cooling Agents in E-Cigarettes on Twitter**
Andrew Liu & Julia Hootman, Mentor: Dongmei Li
- (14) Using Natural Language Processing to Interpret Music-Evoked Autobiographical Memories**
Sangeetha Ramanuj, Mentor: Elise Piazza
- (15) Quantification of the changes in vascularization during bone healing using Spatial Frequency Domain Imaging**
Manogna Jonnalagadda, Mentor: Regine Choe

Poster Presentation Block B (Continued)

(16) Optimization of STED microscopy to measure the subcellular localization of KRIT1

Olivia Lucia, Mentor: Angela Glading

(17) Robot Assisted Ultrasound Imaging

Maya Petterson, Mentor: Thomas Howard

(18) Community Detection Algorithm Comparison in Networks

Jonathan Vazquez, Mentor: Gonzalo Mateos

(19) Scale of Synthesis of Four Monolayer CdSe Nanoplatelets

Christopher Leiter, Mentor: Todd Krauss

(20) Peptide Self-Assembly Scaffolds for Multivalent Display

Destinee McGlone, Mentor: Bradley Nilsson

(21) Synthesis and Catalytic Activity of NHC-Pyridine Nickel Complex

Julia Shoemaker, Mentor: Rose C. Kennedy

(22) Investigating the ability for ligand-less spinel metal oxide nanocrystals containing cobalt to degrade model pollutants through photocatalysis

Madeline Wahl, Mentor: Kathryn Knowles

(23) Catalytic Dehydration of Alcohols by Zinc FOX Complexes

Caz Wood, Mentor: William Jones

(24) Simulating the Rayleigh-Taylor Instability

Nathan Mangus, Mentor: Petros Tzeferacos

(25) Modeling Ion Electron Heat Exchange through the Coulomb Logarithm

Ellie McGee, Mentor: Petros Tzeferacos

(26) IQ Mixer Correction for Superconducting Qubits

Maddy Ramsey, Mentor: Machiel Blok

(27) Tuning Neutrino Multi-Nucleon Knockout Models

Nathaniel Santiago, Mentor: Kevin McFarland

(28) Reconstructing the Microstructure of Neutrino Beams at MINERvA

Degraj Suberi, Mentor: Chris Marshall

(29) Solar Parameters and Their Effect in the Deep Underground Neutrino Experiment (DUNE)

Josiah Tusler, Mentor: Chris Marshall

(30) Designing Hydrogen-Bonding Motifs to Program Hierarchical Self-Assembly

Basil Aliyas (iScholar), Mentor: Benjamin Partridge

(31) Copper-catalyzed aminooxygenation of heteroaryl alkenes

Neively Tlapale Lara (iScholar), Mentor: Shauna Paradine

(32) Including Electron Correlation Effects in Laser Induced Transport

Jhoan Alexis Fernandez Sanchez (iScholar), Mentor: Ignacio Gustin



KEARNS

SUMMER UNDERGRADUATE
RESEARCH EXPERIENCE

Transforming lives through
educational opportunity

Presenters are members of the following undergraduate research programs:

Centers for Chemical Innovation (CCI)

iScholars: Summer Research Program for International Undergraduate Students

Local Ethnography and Archiving Fellowship (LEAF)

NSF REU Chemistry Research for Medicine and Energy

NSF REU Computational Methods for Understanding Music, Media, and Minds (MMM)

NSF REU Imaging in Medicine and Biology for Underrepresented Minorities (ECE)

NSF REU Physics & Astronomy

Ronald E. McNair Post-Baccalaureate Achievement Program

STEM Scholars

Thurgood Marshall College Fund (TMCF)

The David T. Kearns Center would like to thank the deans, directors, and faculty of the various departments that mentored and supported students throughout the summer. Thank you to our generous sponsors: United States Department of Education, National Science Foundation, and the Deans' Office: Arts, Sciences & Engineering.

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