Undergraduate Research Fair

Thursday, April 22, 2021
2:00–5:00 p.m. CT

VIRTUAL EVENT

KEYNOTE SPEAKER

2:00 p.m. Becoming and Interrogating: Perspectives from a Critical Race Researcher in STEM Education
Luis Leyva, Assistant Professor of Mathematics Education, Peabody College, Vanderbilt University, Director of the PRISM (Power, Resistance & Identity in STEM Education) Research Lab

BREAKOUT SESSION

A link to the breakout session will be sent to registered attendees via email.

3:00–3:20 p.m. Student Research: Find Your Group!
Vanderbilt Student Volunteers for Science, Vanderbilt Scientific Immersion and Mentorship

The Vanderbilt Undergraduate Research Fair is sponsored by the Office of Immersion Resources, the Vanderbilt Undergraduate Summer Research Program, the Office of the Provost, and the Littlejohn and Goldberg families.

For more information on undergraduate research, please visit the Undergraduate Research website at vanderbilt.edu/undergraduate-research. Contact the Office of Immersion Resources with questions: immersion@vanderbilt.edu.
### Partner Offices and Programs

<table>
<thead>
<tr>
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<th>Email</th>
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</thead>
<tbody>
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*Note: Asterisks denote the Campus Partner is hosting Zoom drop-in visits during the event.*
<table>
<thead>
<tr>
<th>Group: 1a</th>
<th>Block: 2:20-3:00</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Fiona Cherry ’23 Chemistry</td>
<td>Using Guest-Host Chemistry of Cyclodextrin to Optimize siRNA-Nanoparticle Stability</td>
</tr>
<tr>
<td>2 Andres Dones ’22 Neuroscience</td>
<td>Mouse Model for Hereditary Angioedema</td>
</tr>
<tr>
<td>3 Matthew Gothard ’21 Mechanical Engineering</td>
<td>Design of a Soft Robotic System for Weight Sensation in Virtual Reality</td>
</tr>
<tr>
<td>4 Seok Hee Hong ’23 Computer Science, Mathematics</td>
<td>Acoustic Neuromas Detection with Generative Adversarial Networks</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Group: 1b</th>
<th>Block: 3:20-4:00</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 Minna Apostolova ’22 Biochemistry and Chemical Biology</td>
<td>The Impact of Extracellular Matrix Stiffness on Cancer Cell Growth</td>
</tr>
<tr>
<td>6 Cassandra Atzrodt ’23 Biochemistry and Chemical Biology</td>
<td>The Interaction of High-Fat Diet and Ethanol in the Progression of Fatty Liver Disease</td>
</tr>
<tr>
<td>7 Alice Ding ’22 Biomedical Engineering, Mechanical Engineering</td>
<td>Modeling the Effects of Bipolar Helical Cuff Electrodes in Vagus Nerve Stimulation</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Group: 1c</th>
<th>Block: 4:00-4:40</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 Cameron Deal ’24 Human and Organizational Development</td>
<td>Nashville Climate Policy: A Systems Thinking Analysis</td>
</tr>
<tr>
<td>9 Connor Lehmacher ’22 Educational Studies, Mathematics</td>
<td>Cut Lines in Asymptotic Cones</td>
</tr>
<tr>
<td>10 Kevin Liu ’22 Biochemistry and Chemical Biology, Spanish</td>
<td>Evaluating the Correlation Between Fluid Shear Stress and Chemotherapy Resistance in Colorectal Cancer Cells</td>
</tr>
<tr>
<td>11 Kaelon McNeece ’23 Mechanical Engineering</td>
<td>Design and Validation of a Mid-Infrared Metabolic Rate Sensor</td>
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</tbody>
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*designates an Immersion Vanderbilt project

*All times are Central time
Zoom Room 2

12 Nyssa Kantorek ’21
Neuroscience

The Effectiveness of Green Spaces on the Integrity of Birdsong in Nashville
Mentor: Professor Nicole Creanza, Biological Sciences

2:20-2:30

13 Ethan Nguyen ’23
Computer Science; Mathematics

CircleNet: Optimized Biomedical Object Detection Using Circle Representations
Mentor: Professor Yuankai Huo, Computer Science and Computer Engineering

2:40-2:50

14 Reethi Padmanabhan ’23
Biomedical Engineering

Varying ECM Confinement Results in Differential Migratory Behavior of Metastatic Breast Cancer Subpopulations
Mentor: Professor Cynthia Reinhart-King, Biomedical Engineering

2:50-3:00

15 Asia Miller ’22
Biological Sciences

Characterizing the Microbiome of Nasonia
Mentor: Professor Seth Bordenstein, Biological Sciences

3:20-3:30

16 Jesse Oler ’21
Neuroscience

Diurnal Cortisol and Hippocampal Volume in Individuals With Schizophrenia
Mentor: Professor Jennifer Blackford, Psychiatry and Behavioral Sciences

3:30-3:40

17 Jared Plotkin ’21
Neuroscience

The Pancreatic Hormone Amylin Regulates Cocaine-Induced Behaviors
Mentor: Professor Brad Grueter, Anesthesiology

3:40-3:50

18 Brennen Keuchel ’23
Human and Organizational Development; Molecular and Cellular Biology

Understanding the Role of the IP3R in Aging Using Probabilistic RNA-Seq Analysis
Mentor: Professor Kristopher Burkewitz, Cell and Developmental Biology

3:50-4:00

19 Stephanie Molitor ’21
Biomedical Engineering

Characterizing the Role of Lower Limb Dominance During Locomotion
Mentor: Professor Karl Zelik, Mechanical Engineering

4:00-4:10

20 Ally Questell ’23
Biomedical Engineering; Environmental Sociology

Investigating the Role of Stiffness on Metastatic Breast Cancer Progression in the Bone Marrow Microenvironment
Mentor: Professor Marjan Rafat, Chemical and Biomolecular Engineering

4:10-4:20

21 Hannah Anderson ’22
Physics

Angular Power Spectrum in Heavy Ion Collisions from Simulations
Mentor: Professor Victoria Greene, Physics

4:20-4:30

22 Andy Du ’23
Mechanical Engineering

Large-Scale Nanosphere-Assisted Lithography
Mentor: Professor Jason Valentine, Mechanical Engineering

4:30-4:40
<table>
<thead>
<tr>
<th>Group: 3a</th>
<th>Block: 2:20-3:00</th>
</tr>
</thead>
</table>
| 23 Simrin Ponamgi '24  
Computer Science | **The Lyrical Password Generator**  
Mentor: Shirish Singh, Computer Science, Columbia University  
2:30-2:40 |
| 24 Madelynn Roche '22  
Education Studies;  
Mathematics | **Surfaces with Braided Boundaries in Blow-ups of $D^2 \times D^2$**  
Mentor: Professor Thomas Mark, Mathematics,  
University of Virginia  
2:40-2:50 |
| 25 Joseph Sexton '23  
Psychology; Medicine,  
Health, and Society | **Suicide in the Elderly: Epidemiological Insights and Evolutionary Perspectives**  
Mentor: Dr. David Isaacs, Neurology  
2:50-3:00 |
| 26 Jared Robinson '22  
Medicine, Health, and  
Society | **Lipid Identification and Analysis with SLIM**  
Mentor: Professor Katrina Leaptrot, Chemistry  
4:00-4:10 |
| 27 Heng Sun '22  
Biomedical Engineering;  
Mathematics | **Development of a Comprehensive Open-Source Radiofrequency Pulse Design Library for Magnetic Resonance Imaging**  
Mentor: Professor William Grissom, Biomedical Engineering  
4:10-4:20 |
| 28 Benjamin Wong '22  
Human & Organizational Development; Molecular and Cellular Biology;  
Medicine, Health, and Society | **Generation of a Nanoluciferase Cell Reporter via CRISPR-Cas9 Endogenous Gene-Tagging of Mcl-1 in Triple-Negative Breast Cancer**  
Mentor: Professor Craig Duvall, Biomedical Engineering  
4:20-4:30 |
| 29 Tiara Oldfield '23  
Chemical Biology;  
Communication of Science and Technology | **Evaluating Novel Rad-Pathway Inhibitor Rigosertib Plus PD-1 in Melanoma Cells**  
Mentor: Professor Ann Richmond, Pharmacology  
4:30-4:40 |
| Group: 3c | Block: 4:00-4:40 |
| 30 Sophia Viner '23  
Mechanical Engineering | **Conformal 3D Printing of Energetic Materials with a Robotic Arm**  
Mentor: Professor Kevin Galloway, Mechanical Engineering  
2:20-2:30 |
| 31 Elijah Sheridan '22  
Physics; Mathematics | **Improving the Probing of Axion-Like Particles at the Large Hadron Collider**  
Mentor: Professor Alfredo Gurrola, Physics  
2:30-2:40 |
| 32 Alexandra Feeley '22  
Computer Engineering;  
Mathematics | **Effects of Temperature and Supply Voltage on Soft Errors for 7-nm Bulk FinFET Technology**  
Mentor: Professor Bharat Bhuva, Electrical Engineering and Computer Engineering  
2:40-2:50 |