

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

Offices/Programs	Website	Email
Career Center	vanderbilt.edu/career	careercenter@vanderbilt.edu
Center for Digital Humanities	vanderbilt.edu/digitalhumanities	vanderbilt.edu/digitalhumanities/contact
Collaborative for STEM Education and Outreach (CSEO)	vanderbilt.edu/cseo	cseo@vanderbilt.edu
Data Science Institute	vanderbilt.edu/datascience	datascience@vanderbilt.edu
Global Education Office (GEO)*	vanderbilt.edu/geo	geo@vanderbilt.edu
Jean and Alexander Heard Libraries*	library.vanderbilt.edu	library.vanderbilt.edu/about/contact
Health Professions Advisory Office (HPAO)	vanderbilt.edu/hpao	hpao@vanderbilt.edu
Research on Conflict and Collective Action (ROCCA) Lab	lab.vanderbilt.edu/rocca	vanderbiltroccalab@gmail.com
Robert Penn Warren Center for the Humanities	vanderbilt.edu/rpw_center	rpw.center@vanderbilt.edu
The SyBBURE Searle Undergraduate Research Program*	sybbure.org/program	sybbure@vanderbilt.edu
Vanderbilt Institute of Nanoscale Science and Engineering (VINSE)	vanderbilt.edu/vinse	vinse@vanderbilt.edu
Vanderbilt Scientific Immersion and Mentorship (SIM)	studentorg.vanderbilt.edu/sim	sim@vanderbilt.edu
Vanderbilt Summer Science Academy (VSSA)	medschool.vanderbilt.edu/vssa	vssa@vanderbilt.edu
Vanderbilt Undergraduate Research Journal (VURJ)	vurj.vanderbilt.edu	vurj@vanderbilt.edu
the Wond'ry*	vanderbilt.edu/thewondry	thewondry@vanderbilt.edu
Writing Studio	vanderbilt.edu/writing	writing.studio@vanderbilt.edu

* Note: Asterisks denote the Campus Partner is hosting Zoom drop-in visits during the event.

Group: 1a | Block: 2:20-3:00

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| 1 | Fiona Cherry '23
Chemistry |  Using Guest-Host Chemistry of Cyclodextrin to Optimize siRNA-Nanoparticle Stability
<i>Mentor: Professor Craig Duvall, Biomedical Engineering</i> | 2:20-2:30 |
| 2 | Andres Dones '22
Neuroscience |  Mouse Model for Hereditary Angioedema
<i>Mentor: Dr. David Gailani, Pathology, Microbiology, and Immunology</i> | 2:30-2:40 |
| 3 | Matthew Gothard '21
Mechanical Engineering | Design of a Soft Robotic System for Weight Sensation in Virtual Reality
<i>Mentor: Professor Nilanjan Sarkar, Mechanical Engineering</i> | 2:40-2:50 |
| 4 | Seok Hee Hong '23
Computer Science;
Mathematics | Acoustic Neuromas Detection with Generative Adversarial Networks
<i>Mentor: Professor Ipek Oguz, Computer Science and Computer Engineering</i> | 2:50-3:00 |

Group: 1b | Block: 3:20-4:00

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| 5 | Minna Apostolova '22
Biochemistry and
Chemical Biology | The Impact of Extracellular Matrix Stiffness on Cancer Cell Growth
<i>Mentor: Dr. Mary Philip, Medicine</i> | 3:20-3:30 |
| 6 | Cassandra Atzrodt '23
Biochemistry and
Chemical Biology | The Interaction of High-Fat Diet and Ethanol in the Progression of Fatty Liver Disease
<i>Mentor: Dr. John Stafford, Medicine</i> | 3:30-3:40 |
| 7 | Alice Ding '22
Biomedical Engineering;
Mechanical Engineering | Modeling the Effects of Bipolar Helical Cuff Electrodes in Vagus Nerve Stimulation
<i>Mentor: Professor Michael Miga, Biomedical Engineering</i> | 3:40-3:50 |

Group: 1c | Block: 4:00-4:40

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| 8 | Cameron Deal '24
Human and Organizational
Development

Anton Kozyrev '24
Undeclared | Nashville Climate Policy: A Systems Thinking Analysis
<i>Mentors: Hanes Motsinger, the Word'ry; Professor David Owens, Management</i> | 4:00-4:10 |
| 9 | Connor Lehmacher '22
Educational Studies;
Mathematics |  Cut Lines in Asymptotic Cones
<i>Mentor: Professor Mark Sapir, Mathematics</i> | 4:10-4:20 |
| 10 | Kevin Liu '22
Biochemistry and Chemical
Biology; Spanish | Evaluating the Correlation Between Fluid Shear Stress and Chemotherapy Resistance in Colorectal Cancer Cells
<i>Mentor: Professor Michael King, Biomedical Engineering</i> | 4:20-4:30 |
| 11 | Kaelon McNeece '23
Mechanical Engineering |  Design and Validation of a Mid-Infrared Metabolic Rate Sensor
<i>Mentor: Professor Christina Marasco, Biomedical Engineering</i> | 4:30-4:40 |

Zoom Room 2

 designates an Immersion Vanderbilt project *All times are Central time

Group: 2a | Block: 2:20-3:00

- 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

Group: 2b | Block: 3:20-4:00

- 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

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Group: 2c | Block: 4:00-4:40

- 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

Zoom Room 3

 designates an Immersion Vanderbilt project *All times are Central time

Group: 3a | Block: 2:20-3:00

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| 23 | Simrin Ponamgi '24
Computer Science | The Lyrical Password Generator
<i>Mentor: Shirish Singh, Computer Science, Columbia University</i> | 2:30-2:40 |
| 24 | Madelynn Roche '22
Education Studies;
Mathematics | Surfaces with Braided Boundaries in Blow-ups of $D^2 \times D^2$
<i>Mentor: Professor Thomas Mark, Mathematics, University of Virginia</i> | 2:40-2:50 |
| 25 | Joseph Sexton '23
Psychology; Medicine,
Health, and Society | Suicide in the Elderly: Epidemiological Insights and Evolutionary Perspectives
<i>Mentor: Dr. David Isaacs, Neurology</i> | 2:50-3:00 |

Group: 3c | Block: 4:00-4:40

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| 26 | Jared Robinson '22
Medicine, Health, and
Society | Lipid Identification and Analysis with SLIM
<i>Mentor: Professor Katrina Leaptrot, Chemistry</i> | 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
<i>Mentor: Professor William Grissom, Biomedical Engineering</i> | 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
<i>Mentor: Professor Craig Duvall, Biomedical Engineering</i> | 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
<i>Mentor: Professor Ann Richmond, Pharmacology</i> | 4:30-4:40 |

Zoom Room 4

 designates an Immersion Vanderbilt project *All times are Central time

Group: 4a | Block: 2:20-3:00

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| 30 | Sophia Viner '23
Mechanical Engineering | Conformal 3D Printing of Energetic Materials with a Robotic Arm
<i>Mentor: Professor Kevin Galloway, Mechanical Engineering</i> | 2:20-2:30 |
| 31 | Elijah Sheridan '22
Physics; Mathematics | Improving the Probing of Axion-Like Particles at the Large Hadron Collider
<i>Mentor: Professor Alfredo Gurrola, Physics</i> | 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
<i>Mentor: Professor Bharat Bhava, Electrical Engineering and Computer Engineering</i> | 2:40-2:50 |