



NU-MRSEC Research Experience for Undergraduates
and Research Experience for Teachers

Closing Symposium

Wednesday, August 10 and Thursday, August 11, 2022

Ford Motor Company Engineering Design Center, rm 1350, 2133 Sheridan Rd., Evanston, IL

Wednesday, August 10, 2022

12:55 p.m. Opening Remarks, Kathleen Stair, REU Program Director

1:00 p.m. *"Synthesizing High Molecular Weight, Low Dispersity Bottlebrush Polymer Ensembles"*
Matthew Lucia, REU, Chemical Engineering, Columbia University
Prof. Mitchell Wang, Supervising Faculty; Ruiqi Xiao, Mentor

1:15 p.m. *"Salmonella enterica 1,2-propanediol Utilization Bacterial Microcompartment Encapsulation of Core Proteins via Fluorescence Microscopy"*
Lydia Taylor, REU, Materials Science and Eng., University of Illinois, Urbana-Champaign
Prof. Danielle Tullman-Ercek, Supervising Faculty; Carolyn Elaine Mills, Mentor

1:30 p.m. *"Incretin Polypeptides for Diabetes Treatment"*
Anna Davis, REU, Chemistry, Duke University
Prof. Nathan Gianneschi, Supervising Faculty; Omar Ebrahim, Mentor

1:45 p.m. *"Metal-loaded Dihydroxynaphthalene for Chemical Warfare Agent Degradation"*
Rudolph DiMura, REU, Biophysics, State University of New York at Geneseo
Prof. Nathan Gianneschi, Supervising Faculty; Zofia Siwicka, Mentor

2:00 p.m. *"Thiazole-based Fluorescent Boxes"*
Audrey Stemen, REU, Chemistry, University of West Florida
Prof. Fraser Stoddart, Supervising Faculty

2:15 p.m. *"Bacterial Microcompartment Encapsulation of Core Proteins via Fluorescence Microscopy"*
Samuel Swartzendruber, REU, Materials Science and Engineering, University of Minnesota
Prof. Samuel Stupp, Supervising Faculty; Simon Egner and Liam Palmer, Mentors

2:30 p.m. Break

2:45 p.m. *"Optical and Electronic Properties of 2D Materials in Correlation with Photodetectors"*
Nicolas Hornsby, REU, Mathematics and Physics, Grambling State University
Prof. Lincoln Lauhon and Prof. Pierre Darancet, Supervising Faculty; Ting Ching Chu, Mentor

- 3:00 p.m. *"Exploring Semiconducting Properties of Ternary Oxides for Photoelectrochemical Cells"*
Hannah Umoeke, REU, Biomedical Engineering, University of Texas at Arlington
Prof. Mark C. Hersam, Supervising Faculty; Vinod Sangwan, Mentor
- 3:15 p.m. *"Chirality and Handedness Sorting of Single-Walled Carbon Nanotubes"*
Bridget Denzer, REU, Chemical and Biological Engineering, Princeton University
Prof. Mark C. Hersam, Supervising Faculty; Anushka Dasgupta, Mentor
- 3:30 p.m. *"Chemical Functionalization of Monolayer Transition Metal Dichalcogenides (TMDs)"*
Dana Kachman, REU, Electrical Engineering, Johns Hopkins University
Prof. Mark C. Hersam, Supervising Faculty; Anushka Dasgupta, Mentor
- 3:45 p.m. *"Automated Identification and Study of Few-layered vdW Antiferromagnetic Materials"*
Manuel Rodriguez Tiscanero, REU, Physics, University of Texas at Arlington
Prof. Mark C. Hersam, Supervising Faculty; Tyler Gish, Mentor
- 4:00 p.m. *"Using Transfer Learning to Establish Process-Structure-Property Links"*
Michael Clark, REU, Biomedical and Health Sciences Eng., North Carolina State University
Prof. Wei Chen, Supervising Faculty; Umar Farooq Ghumman and Jie Chen, Mentors

Thursday, August 11, 2022

- 8:30 a.m. *"Structural Changes in 3D Printed Foods and Freeze Casting Products"*
Irina Stan, RET, Lakes Community High School, Lake Villa, IL
Prof. David Dunand, Supervising Faculty; John Misiaszek and Samuel Pennell, Mentors
- 8:45 a.m. *"Liquid Gallium Embrittlement of AlSi10Mg Alloy with Micron-sized Grains Processed by Laser Power-bed Fusion"*
Brandon Fisher, REU, Electrical Engineering, Jackson State University
Prof. David Dunand, Supervising Faculty; John Misiaszek, Mentor
- 9:00 a.m. *"Analysis of crack-surface for elastomers using transfer learning"*
Martin Pieters, RET, Illinois Institute of Technology
Prof. Wei Chen and Prof. Kenneth Shull, Supervising Faculty; Yaxin Cui, Farooq Ghumman, and Jie Chen, Mentors
- 9:15 a.m. *"Optimization of Hybrid Silicone Elastomers"*
Victoria Chang, REU, Chemical Engineering, Oregon State University
Prof. Kenneth Shull, Supervising Faculty; Anthony Silvaroli, Mentor
- 9:30 a.m. *"Magneto-responsive Dynamic Epoxy Composites"*
Nethmi Hewage, REU, Chemistry, Iowa State University
Prof. Kenneth Shull, Supervising Faculty; Broderick Lewis and Qifeng Wang, Mentors
- 9:45 a.m. *"Precision Additive Manufacturing with an Ultrasonic Texturing Tool"*
Henry Sottrel, REU, Physics, Carleton College
Prof. Ping Guo, Supervising Faculty; Malachi Landis, Mentor

- 10:00 a.m. Break
- 10:15 a.m. *"Additive Manufacturing (3D Printing) of 17-4 Precipitation Hardening (PH) Steel"*
Tochukwu Anyigbo, REU, Materials Science and Engineering, Arizona State University
Prof. David Seidman, Supervising Faculty; Amir Farkoosh, Mentor
- 10:30 a.m. *"Investigating the Effect of Part Geometry and Toolpath Sequencing on Melt Pool Temperatures for Open-loop Process Control in Laser Powder Bed Fusion"*
Ryan Zhou, REU, Materials Science and Engineering, Georgia Institute of Technology
Prof. Jian Cao, Supervising Faculty; Conor Porter, Mentor
- 10:45 a.m. *"Probing Local Thermal Properties of Grain Boundaries with Optical Pump-probe Techniques"*
Gregory Moller, REU, Chemical Engineering, Florida State University
Prof. Oluwaseyi Balogun, Supervising Faculty; Baojie Lu, Mentor
- 11:00 a.m. *"Sintering Techniques for Ceramic Processing"*
Taylor McCall, REU, Chemistry, Grambling State University
Prof. Sossina Haile, Supervising Faculty; Isaac Dyer, Mentor
- 11:15 a.m. *"Proton Transport in Off-stoichiometric Solid Acid Electrolytes"*
Fabian Williams, REU, Chemical Engineering, University of Minnesota – Twin Cities
Prof. Sossina Haile, Supervising Faculty; Grace Xiong, Mentor
- 11:30 a.m. *"Layered Metal Sulfide Ion Exchangers (MSIEs) for Lanthanide Capture"*
Athena Butler-Christodoulou, REU, Materials Science and Engineering, Texas A&M University
Prof. Mercouri Kanatzidis, Supervising Faculty; Michael Quintero and Richard Godsel, Mentors
- 11:45 a.m. *"Computation-Assisted Discovery of New Multiferroic and Spin Liquid 2D Kagome Materials"*
Julia Bauer, REU, Physics, Davidson College
Prof. James Rondinelli, Supervising Faculty; Alexandru Georgescu