

# Research Experiences for Undergraduates Symposium

Alexandria, VA • October 27–28, 2019



**Council on Undergraduate Research**  
Washington, DC



*About the cover* (clockwise): REU student Taylor Burns measures a flounder as part of her experiment (photo by E. Woodward, UNC Institute of Marine Sciences); REU participant Jerry Harness operates the main telescope at the Prairie View Solar Observatory (photo by PVS0); the team from Grand Valley State University's REU at the Mathematical Association of America's "Math Jeopardy" (photo by MAA)

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## **Planning Committee**

**Liljana Babinkostova**, professor  
Department of Mathematics  
Boise State University

**John Hranitz**, professor  
Department of Biological and Allied Health Sciences  
Bloomsburg University

**Valentin Soloiu**, Allen E. Paulson Distinguished Chair  
Department of Mechanical Engineering  
Georgia Southern University

## **CUR National Office Staff**

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Office Assistant

## 2019 REU Symposium Schedule

Westin Alexandria—October 27–28, 2019

### Sunday, October 27

1:00 pm–3:00 pm    Registration and Check-in  
Location: Edison D

3:00 pm–4:15 pm    Welcome and Keynote Presentation  
Location: Edison D

Lindsay Currie, Executive Officer, Council on Undergraduate Research

Keynote Presentation:

DaNa L. Carlis, National Oceanic and Atmospheric Administration  
Research, Meteorologist / Weather Portfolio Advisor and Program  
Manager

4:15 pm–4:30 pm    Orientation to the next day's activities  
Location: Edison D

4:30 pm–6:00 pm    Faculty Reception  
Location: Hopkins

Student Reception  
Location: Wright

6:00 pm–            Dinners—explore Alexandria (students will have the opportunity to  
join groups for dinner—sign up during registration and check-in)

## Monday, October 28, 2019

### *Poster Sessions*

7:00 am–8:00 am Breakfast

**8:30 am–9:30 am Poster Session 1**  
Physics; Engineering I; Mathematical Sciences

9:30 am–9:45 am Switch Groups/Break

**9:45 am–10:45 am Poster Session 2**  
Computer and Information Science and Engineering; Engineering II

10:45 am–11:00 am Switch Groups/Break

**11:00 am–12:00 pm Poster Session 3**  
Astronomical Sciences; Biological Sciences I; Earth Science

12:00 pm–12:15 pm Switch Groups/Break

**12:15 pm–1:15 pm Poster Session 4**  
Biological Sciences II; Chemistry

1:15 pm–1:30 pm Switch Groups/Break

**1:30 pm–2:30 pm Poster Session 5**  
Materials Research; Atmospheric Sciences and Geospace; Social,  
Behavioral, and Economic Sciences; Education and Human Resources

2:45 pm–3:15 pm Closing Session

Lunch to be served on a “grab and go” basis (i.e., boxed lunches) to ensure that everyone has a chance to eat. Will be open for several hours to accommodate all.

Have some time before or after presenting your poster?  
Be sure to check out professional development sessions  
(see next page), or attend another poster session to speak with  
other students engaged in research in other disciplines!

**Monday, October 28, 2019**  
***Professional Development Sessions***

**Session 1|9:00 am–10:00 am**

For Students:

***Interview Techniques to Stand Out from the Crowd***—Patrick Algyer, CVA,  
Chief Strategist and Founder, Encore Engagement Solutions  
Room: Wright

For Faculty:

***NSF REU Program Update***—R. Corby Hovis, Program Director, Education and Human  
Resources  
Room: Banneker

**Session 2|10:15 am–11:15 am**

For Students:

***Undergraduate Scholarships through the Barry Goldwater Scholarship and Excellence  
in Education Foundation***—John Mateja, President, Barry Goldwater Scholarship and  
Excellence in Education Foundation  
Room: Wright

For Faculty:

***REU and RET: Impacts on Undergraduate Students, Graduate Student Mentors and  
Teachers***—Alisa Leckie, Interim Assistant Dean for Partnerships and Outreach, and  
Associate Professor, Georgia Southern University  
Room: Banneker

**Session 3|11:45 am–12:45 pm**

For Students:

***Writing a Personal Statement***—Janice DeCosmo, Associate Vice Provost for  
Undergraduate Research; Associate Dean of Undergraduate Academic Affairs, University of  
Washington; President, Council on Undergraduate Research  
Room: Wright

*For Faculty—Visits to NSF: Please schedule directly with your program director.*

**Session 4| 1:15 pm–2:15 pm**

For Students:

***Preparing for Professional Life: Resume Building and Networking***—  
Rebecca Jones, Associate Professor, Department of Chemistry & Biochemistry,  
George Mason University  
Room: Banneker

*For Faculty—NSF Visits: Please schedule directly with your program director*

**Poster Session 1**  
**Location: Edison D**

**NSF Division: Physics**

**Poster Number: 1**

**Title:** Spectroscopic Characterization of Tetragonal Tin Dioxide

**Presenter(s):** Ben Concepcion

**REU Site:** REU Site in Physics at Howard University

**Host Institution:** Howard University

**Grant Number:** 1659224

**Principal Investigator / Faculty Mentor:** Prabhakar Misra

**Poster Number: 2**

**Title:** Extinction Monitor for Mu2e-II

**Presenter(s):** Cassandra Little

**REU Site:** Summer Undergraduate Research in Physics and Astrophysics at the University of Michigan

**Host Institution:** University of Michigan

**Grant Number:** 1852239

**Principal Investigator / Faculty Mentor:** Myron Campbell

**Poster Number: 3**

**Title:** Synthesis and Characterization of  $\text{AlFe}_{2-x}\text{Co}_x\text{B}_2$

**Presenter(s):** Jesus Botello-Esquivel

**REU Site:** Physics at Miami University

**Host Institution:** Miami University

**Grant Number:** 1757575

**Principal Investigator / Faculty Mentor:** Herbert Jaeger | Mahmud Khan

**Poster Number: 4**

**Title:** A Deep Learning Approach to Source Localization and Seabed Classification using Pressure Time-Series from a Vertical Line Array

**Presenter(s):** Mason C. Acree

**REU Site:** Physics at Brigham Young University

**Host Institution:** Brigham Young University

**Grant Number:** 1757998

**Principal Investigator / Faculty Mentor:** Jean-Francois Van Huele | Traci Neilsen

**Poster Number: 5**

**Title:** A Wedge Mechanical Polishing Procedure for TEM Preparation of Skyrmion Materials

**Presenter(s):** Avery Perrine

**REU Site:** Center for Emergent Materials Research Experience for Undergraduates

**Host Institution:** OSU

**Grant Number:** 1420451

**Principal Investigator / Faculty Mentor:** David W. McComb



**Poster Number: 6**

**Title:** Studying Spatially Extended Gamma-Ray Sources with VERITAS

**Presenter(s):** Gabriela Torrini

**REU Site:** An Inclusive REU Program in Physics and Astronomy at the University of Utah

**Host Institution:** University of Utah

**Grant Number:** 1659494

**Principal Investigator / Faculty Mentor:** Jordan Gerton | David Kieda

**Poster Number: 7**

**Title:** Aging Inconsistencies of Ferroelectric Partially Deuterated Potassium Dihydrogen Phosphate

**Presenter(s):** Otto Schwarm

**REU Site:** From the Cosmos to the Living Cell—Scientific Tools and Best Practices for Successful Careers in Physics

**Host Institution:** University of Illinois at Urbana-Champaign

**Grant Number:** 1659598

**Principal Investigator / Faculty Mentor:** Matthias Grosse Perdekamp | Eugene Colla

**Poster Number: 8**

**Title:** Measuring Diffusion Length in Single Crystal Halide Perovskites

**Presenter(s):** Spencer Weeden

**REU Site:** UC Davis Physics REU Program

**Host Institution:** UC Davis

**Grant Number:** 1852581

**Principal Investigator / Faculty Mentor:** Nicholas Curro | Dong Yu

### **NSF Division: Engineering**

**Poster Number: 9**

**Title:** Separation of Azeotropic Hydrofluorocarbon Mixtures Using Ionic Liquids

**Presenter(s):** Abby Harders

**REU Site:** IDEA Incubator for Porous Materials: Integrating Discovery, Engineering, and Art

**Host Institution:** University of Kansas

**Grant Number:** 1852308

**Principal Investigator / Faculty Mentor:** Mark Shiflett

**Poster Number: 10**

**Title:** Localized Bioimpedance Measurements during Adduction and Abduction of the Vocal Folds in Healthy Participants

**Presenter(s):** Alexis Ramirez

**REU Site:** Engineering Sensors, Systems, and Signal Processing for Speech Pathology

**Host Institution:** The University of Alabama

**Grant Number:** 1852161

**Principal Investigator / Faculty Mentor:** Todd Freeborn

**Poster Number: 11**

**Title:** Evaluating Dependence of Mechanical Properties of Human Brain Tissue on Vasodilation Using Magnetic Resonance Elastography

**Presenter(s):** Mary Kramer

**REU Site:** Frontiers in Biomedical Imaging

**Host Institution:** University of Illinois at Urbana-Champaign

**Grant Number:** 1757837

**Principal Investigator / Faculty Mentor:** Andrew M. Smith | Bradley P. Sutton

**Poster Number: 12**

**Title:** Collision Avoidance System for Multicopter UAVs Using Optical Flow

**Presenter(s):** Natallia Urieva

**REU Site:** Research Experience for Undergraduates in UAV Technologies

**Host Institution:** California State Polytechnic University, Pomona

**Grant Number:** 1560478

**Principal Investigator / Faculty Mentor:** Subodh Bhandari

**Poster Number: 13**

**Title:** Exploring the Relationship between Birth Defects and Air Pollutants in Nueces County

**Presenter(s):** Riley Ramirez

**REU Site:** Integrating Research in Sustainable Energy and the Environment across Disciplines (IR-SEED)

**Host Institution:** Texas A&M University–Kingsville

**Grant Number:** 1757812

**Principal Investigator / Faculty Mentor:** Hua Li

**Poster Number: 14**

**Title:** Photoacoustic Spectroscopy for Measurements of Cytochrome-C-Oxidase

**Presenter(s):** Karen Rius

**REU Site:** Wellman-HST Summer Institute for Biomedical Optics

**Host Institution:** Massachusetts General Hospital

**Grant Number:** 1852430

**Principal Investigator / Faculty Mentor:** Walfre Franco

**Poster Number: 15**

**Title:** Synthesis, Characterization, and Application of Activated Carbon Prepared from Diverse Algae Precursors

**Presenter(s):** Dylan Koch

**REU Site:** Environmental Engineering Solutions for Pollution Prevention

**Host Institution:** University at Buffalo–State University of New York

**Grant Number:** 1852243

**Principal Investigator / Faculty Mentor:** John D. Atkinson

**Poster Number: 16**

**Title:** Identifying Vulnerable Networks in Mouse Models of Late Onset of Alzheimer's Disease

**Presenter(s):** Jordan Shuff

**REU Site:** REU for Meeting Grand Challenges

**Host Institution:** Duke University

**Grant Number:** 1659615

**Principal Investigator / Faculty Mentor:** Carmen Rawls | Alexandra Badea

**Poster Number:** 17

**Title:** Hybrid Energy Storage System for Powered Wheelchairs

**Presenter(s):** Michelle Jamie Karabin

**REU Site:** American Student Placements in Rehabilitation Engineering (ASPIRE)

**Host Institution:** University of Pittsburgh—Human Engineering Research Laboratories (HERL)

**Grant Number:** 1560174

**Principal Investigator / Faculty Mentor:** Rory A. Cooper

**Poster Number:** 18

**Title:** Imprintable Shape Memory Polymer Glassy Thermosets

**Presenter(s):** Bryan Schellberg

**REU Site:** Advancing Human Health from Nano to Network

**Host Institution:** University of Rochester

**Grant Number:** 1559970

**Principal Investigator / Faculty Mentor:** Beth Olivares | Mitch Anthamatten

**Poster Number:** 19

**Title:** Effect of Posttranslational Modifications on Claudin-19 Tight Junction Protein

**Presenter(s):** Carolina Almonte

**REU Site:** Interactive Biomaterials

**Host Institution:** Syracuse University

**Grant Number:** 1757749

**Principal Investigator / Faculty Mentor:** James Henderson | Shikha Nangia

### **NSF Division: Mathematical Sciences**

**Poster Number:** 20

**Title:** Mathematical Modeling and Optimal Control for Malaria Transmission Using Sterile Mosquitoes Technique and Bed Nets

**Presenter(s):** Logan Rose

**REU Site:** Computational Modeling and Simulation in the Applied Sciences

**Host Institution:** Middle Tennessee State University

**Grant Number:** 1757493

**Principal Investigator / Faculty Mentor:** Wandu Ding

**Poster Number:** 21

**Title:** Mathematical Modeling of Intermittent Androgen Suppression Therapy in Prostate Cancer

**Presenter(s):** Justin Bennett

**REU Site:** Applied Mathematics and Computational Modeling in the Greater Phoenix Area

**Host Institution:** Arizona State University

**Grant Number:** 1757663

**Principal Investigator / Faculty Mentor:** Wenbo Tang | Yang Kuang

**Poster Number:** 22

**Title:** A Family of Multi-Dimensional Continued Fractions: TRIP Maps

**Presenter(s):** Rose Dong

**REU Site:** Williams College SMALL

**Host Institution:** Williams College

**Grant Number:** 1659037

**Principal Investigator / Faculty Mentor:** Thomas Garrity

**Poster Number:** 23

**Title:** A Network Flow Model of Non-Cash Value Transfer in Illicit Transactions

**Presenter(s):** Nicholas P. Silva

**REU Site:** Security Printing and Anti-Counterfeiting Technology

**Host Institution:** South Dakota School of Mines and Technology

**Grant Number:** 1852336

**Principal Investigator / Faculty Mentor:** Grant Crawford | Saurav Kumar Dubey

**Poster Number:** 24

**Title:** The Ring Learning with Errors Problem: Smearing Condition and Spectral Distortion

**Presenter(s):** Ariana Chin

**REU Site:** Complexity across Disciplines

**Host Institution:** Boise State University

**Grant Number:** 1659872

**Principal Investigator / Faculty Mentor:** Liljana Babinkostova

**Poster Number:** 25

**Title:** Material Wear Data Science

**Presenter(s):** Julianna Bernardi

**REU Site:** Research Experiences for Undergraduates in Industrial Mathematics and Statistics

**Host Institution:** Worcester Polytechnic Institute

**Grant Number:** 1757685

**Principal Investigator / Faculty Mentor:** Burt S. Tilley | Randy Paffenroth

**Poster Number:** 26

**Title:** Sum Index and Difference Index of Simple Graphs

**Presenter(s):** Kedar Karhadkar | Eugene Henninger-Voss | Emily Robinson

**REU Site:** Research Challenges of Experimental and Computational Mathematics

**Host Institution:** Moravian College

**Grant Number:** 1852378

**Principal Investigator / Faculty Mentor:** Nathan Shank | Eugene Fiorini

## **Poster Session 2**

**Location: Edison D**

### **NSF Division: Computer and Information Science and Engineering**

**Poster Number:** 1

**Title:** Unmanaged Aerial Robot Navigation for Exploring Unknown Environments Using Reinforcement Learning

**Presenter(s):** Jacob Adkins

**REU Site:** Mathematical Modeling in Environmental, Biological, and Other Sciences

**Host Institution:** Bethune-Cookman University

**Grant Number:** 1755561

**Principal Investigator / Faculty Mentor:** Seenith Sivasundaram | Juan Calderon

**Poster Number: 2**

**Title:** Deep Geometric Recovery for Dimension Reduction

**Presenter(s):** Jessica Bader

**REU Site:** Data Science Research for Healthy Communities in the Digital Age

**Host Institution:** Worcester Polytechnic Institute

**Grant Number:** 1852498

**Principal Investigator / Faculty Mentor:** Elke Rundensteiner

**Poster Number: 3**

**Title:** Automated Dynamic Detection of Self-Hiding Behavior

**Presenter(s):** Luke Baird

**REU Site:** Networked Cyber-Physical Systems

**Host Institution:** Wichita State University

**Grant Number:** 1659396

**Principal Investigator / Faculty Mentor:** Vinod Namboodiri | Zhiyong Shan

**Poster Number: 4**

**Title:** Anomaly Detection of Security, Privacy Attacks Disrupting Users Immersive Experience in Virtual Reality Learning Environments

**Presenter(s):** Benjamin Frailey

**REU Site:** REU in Consumer Networking Technologies

**Host Institution:** University of Missouri–Columbia

**Grant Number:** 1659134

**Principal Investigator / Faculty Mentor:** Prasad Calyam

**Poster Number: 5**

**Title:** Eye Tracking as an Input Modality for Individuals with Vision Impairments

**Presenter(s):** Natalie Maus

**REU Site:** Computational Sensing for Human-Centered AI

**Host Institution:** Rochester Institute of Technology

**Grant Number:** 1851591

**Principal Investigator / Faculty Mentor:** Cecilia O. Alm | Kristen Shinohara

**Poster Number: 6**

**Title:** Augmenting Social-Communicative Behaviors between Hearing Parents and Deaf Children

**Presenter(s):** Yoona Oh

**REU Site:** Computational Methods for Understanding Music, Media, and Minds

**Host Institution:** University of Rochester

**Grant Number:** 1659250

**Principal Investigator / Faculty Mentor:** Ajay Anand | Zhen Bai

**Poster Number: 7**

**Title:** Sustainable Energy and Localized Future (SELF) Dataset Development

**Presenter(s):** Francesca Giardine

**REU Site:** Summer Undergraduate Program in Engineering Research at Berkeley (SUPERB)

**Host Institution:** UC Berkeley

**Grant Number:** 1659833

**Principal Investigator / Faculty Mentor:** John Canny | Daniel Kammen

**Poster Number: 8**

**Title:** Privacy Preserving Inference with Convolutional Neural Network Ensemble

**Presenter(s):** Alexander Xiong

**REU Site:** Research Experience for Undergraduates in Big Data Security and Privacy

**Host Institution:** California State Polytechnic University, Pomona

**Grant Number:** 1758017

**Principal Investigator / Faculty Mentor:** Tingting Chen

**Poster Number: 9**

**Title:** Machine Learning for Energy Segmentation and Forecasting

**Presenter(s):** Dominique Smith

**REU Site:** Sensor, Signal and Information Processing (SenSIP) Devices and Algorithms

**Host Institution:** Arizona State University

**Grant Number:** 1659871

**Principal Investigator / Faculty Mentor:** Andreas Spanias

**Poster Number: 10**

**Title:** Creating A Human-Like Agent Model for Interactive Negotiation Tasks

**Presenter(s):** Tristan Onek

**REU Site:** Research in Interactive Virtual Experiences

**Host Institution:** University of Southern California (Institute for Creative Technologies)

**Grant Number:** 1852583

**Principal Investigator / Faculty Mentor:** Ron Artstein | Gale Lucas

**Poster Number: 11**

**Title:** Tweets as a Predictor of Primary Political Outcomes

**Presenter(s):** Sarah Townsend

**REU Site:** Big Data Analytics at Oklahoma State University

**Host Institution:** Oklahoma State University

**Grant Number:** 1659645

**Principal Investigator / Faculty Mentor:** Christopher Crick | KM George

**Poster Number: 12**

**Title:** Towards Silent Speaker Recognition Based on Micro-Doppler Signature of Articulatory Movement Using mmWave Radar

**Presenter(s):** Jenna Ryan

**REU Site:** Research Experiences in Pervasive Computing for Smart Health, Safety, and Well-Being

**Host Institution:** Temple University

**Grant Number:** 1757533

**Principal Investigator / Faculty Mentor:** Jamie Payton | Bo Ji

**Poster Number: 13**

**Title:** The Power of the Merge: Using Communication Complexity to Understand Circuit Complexity

**Presenter(s):** Shoshana Simons

**REU Site:** DIMACS REU in Algorithms from Foundations to Applications

**Host Institution:** Rutgers University

**Grant Number:** 1852215

**Principal Investigator / Faculty Mentor:** Lazaros Gallos | Robert Robere

**Poster Number:** 14

**Title:** IoT-Enabled Smart Mobility Devices for Aging and Rehabilitation

**Presenter(s):** Nafisa Nawal Mostofa

**REU Site:** Research Experiences on Internet of Things (IoT)

**Host Institution:** University of Central Florida

**Grant Number:** 1852002

**Principal Investigator / Faculty Mentor:** Damla Turgut

**Poster Number:** 15

**Title:** Risk Assessments and Measurements of Privacy Leaks within Google's Ads Data Hub

**Presenter(s):** Miguel Fuentes

**REU Site:** Research in Industrial Projects for Students

**Host Institution:** Institute for Pure and Applied Mathematics

**Grant Number:** 1440415

**Principal Investigator / Faculty Mentor:** Susana Serna

**Poster Number:** 16

**Title:** A Comparison of the Reliability between Traditional Machine Learning Techniques and Deep Learning in the Classification of Breast Cancer

**Presenter(s):** Jacob Richard

**REU Site:** Software Safety and Reliability: Research and Application

**Host Institution:** University of Texas at Dallas

**Grant Number:** 1757828

**Principal Investigator / Faculty Mentor:** W. Eric Wong

## **NSF Division: Engineering**

**Poster Number:** 17

**Title:** Exploring New Cathode Materials to Enable High-Energy Magnesium Batteries

**Presenter(s):** Elyssa Ferguson

**REU Site:** Nanoscale Materials Science and Engineering at Vanderbilt University

**Host Institution:** Vanderbilt University

**Grant Number:** 1560414

**Principal Investigator / Faculty Mentor:** Clare McCabe | Cary Pint

**Poster Number:** 18

**Title:** Characterization of Neural Differentiation by Dendrogram Visualization of Single Cell Time Course Analysis

**Presenter(s):** Malukah Ajose

**REU Site:** Multi-Scale Systems Bioengineering

**Host Institution:** University of Virginia

**Grant Number:** 1560282

**Principal Investigator / Faculty Mentor:** Timothy E. Allen | Eli Zunder

**Poster Number: 19**

**Title:** Allelic Specificity Landscapes of Peptide/Hla Complexes Using a Comparative Modeling Approach with Backbone Flexibility

**Presenter(s):** Hailey Wallace

**REU Site:** Rosetta Commons REU: A Cyberlinked Program in Computational Biomolecular Structure & Design

**Host Institution:** Johns Hopkins University

**Grant Number:** 1659649

**Principal Investigator / Faculty Mentor:** Jeff Gray | Nikoloas Sgourakis

**Poster Number: 20**

**Title:** Computational Mutagenesis and Analysis to Optimize the Structure of ABA Receptor PYR1

**Presenter(s):** Justin Nwafor

**REU Site:** Rosetta Commons REU: A Cyberlinked Program in Computational Biomolecular Structure & Design

**Host Institution:** Johns Hopkins University

**Grant Number:** 1659649

**Principal Investigator / Faculty Mentor:** Jeff Gray | Timothy Whitehead

**Poster Number: 21**

**Title:** Characterizing Skeletal Microstructure with High-Resolution Nondestructive 3D X-Ray Microscopy

**Presenter(s):** Katie Baldrige

**REU Site:** NNCI: North Carolina Research Triangle Nanotechnology Network (RTNN) REU

**Host Institution:** North Carolina State University

**Grant Number:** 1542015

**Principal Investigator / Faculty Mentor:** Jacob Jones | Jacque Cole

**Poster Number: 22**

**Title:** Structural Analysis of CFRP Adhesive Bonds with Embedded Electrodes

**Presenter(s):** Daniel Cantrell

**REU Site:** REVAMP: Research Experience for Student Veterans in Advanced Manufacturing and Entrepreneurship

**Host Institution:** Georgia Tech Manufacturing Institute, Georgia Institute of Technology

**Grant Number:** 1359019

**Principal Investigator / Faculty Mentor:** Chuck Zhang | Billyde Brown

**Poster Number: 23**

**Title:** Electrical-Based Screening of Radiation Failure Modes in Transistor-Based Memory for Space Applications

**Presenter(s):** James Cannon

**REU Site:** UTChattSat: An Interdisciplinary CubeSat Research and STEM Education Platform at the University of Tennessee at Chattanooga

**Host Institution:** University of Tennessee at Chattanooga

**Grant Number:** 1757777

**Principal Investigator / Faculty Mentor:** Daniel Loveless



**Poster Number:** 24

**Title:** Innovative Combustion Strategy with n-butanol for the Drastic Engine Reduction of NO<sub>x</sub> and Soot Emissions

**Presenter(s):** Cesar Carapia

**REU Site:** Research in Green-Engineered New Transportation Technologies (URGENT)

**Host Institution:** Georgia Southern University

**Grant Number:** 1262947

**Principal Investigator / Faculty Mentor:** Valentin Soloiu

**Poster Number:** 25

**Title:** Evaluation of DNA-NT Performance for Ovarian Cancer Screening

**Presenter(s):** Maya Horenstein

**REU Site:** Summer Undergraduate Fellowship in Sensor Technologies—SUNFEST

**Host Institution:** University of Pennsylvania

**Grant Number:** 1659190

**Principal Investigator / Faculty Mentor:** Jan Van der Spiegel | Charlie Johnson

**Poster Number:** 26

**Title:** Mechanical Engineering of Rocket Payloads and Cold Sensors

**Presenter(s):** Hazel Lou Goleman

**REU Site:** Multimessenger Astrophysics

**Host Institution:** Rochester Institute of Technology

**Grant Number:** 1659740

**Principal Investigator / Faculty Mentor:** Joshua Faber | Michael Zemcov

### **Poster Session 3 Location: Edison D**

#### **NSF Division: Astronomical Sciences**

**Poster Number:** 1

**Title:** Solid-State Nanopore for the Detection of Biosignatures on Ocean Worlds

**Presenter(s):** Madeline Garner

**REU Site:** Life in the Universe—Astronomy and Planetary Science at the SETI Institute

**Host Institution:** SETI Institute

**Grant Number:** 1758024

**Principal Investigator / Faculty Mentor:** Matthew Tiscareno | Kathryn Bywaters

**Poster Number:** 2

**Title:** Interplanetary Scintillation Measurements at Arecibo Observatory in Support of Parker Solar Probe 2nd Encounter (April 4, 2019)

**Presenter(s):** Megan Kenny

**REU Site:** Research in Radio/Radar Astronomy and Atmospheric Sciences at Arecibo Observatory

**Host Institution:** Universidad Ana G. Mendez–Cupey Campus / Arecibo Observatory

**Grant Number:** 1559849

**Principal Investigator / Faculty Mentor:** Andres Diaz | Alessandra Abe Pacini

**Poster Number: 3**

**Title:** Where is the Action? Galaxy Evolution and Environment at Redshift 1

**Presenter(s):** April Horton

**REU Site:** Astronomy in Hawaii

**Host Institution:** Institute for Astronomy, University of Hawaii

**Grant Number:** 1560413

**Principal Investigator / Faculty Mentor:** Nader Haghighipour | Roy Gal

**Poster Number: 4**

**Title:** Classification of X-Ray Binary Stars with Machine Learning

**Presenter(s):** Olive Koren

**REU Site:** The Keck Northeast Astronomy Consortium

**Host Institution:** Wesleyan University

**Grant Number:** 1559865

**Principal Investigator / Faculty Mentor:** Seth Redfield | Roy Kilgard

**NSF Division: Biological Sciences**

**Poster Number: 5**

**Title:** Context-Aware Word Embedding Models Significantly Improve Prediction of Human Conceptual Similarity Relationships

**Presenter(s):** Tyler Giallanza

**REU Site:** Princeton Neuroscience Institute Summer Internship Program

**Host Institution:** Princeton University

**Grant Number:** 1757554

**Principal Investigator / Faculty Mentor:** Edwin Clayton | Jonathan Cohen

**Poster Number: 6**

**Title:** Characterizing the Role of Piccolo Splice Variants in Calcium-Mediated Insulin Secretion in Pancreatic Beta-Cells

**Presenter(s):** Gerald Bush

**REU Site:** RENAU: Research Experience for Native American Undergraduates

**Host Institution:** Fort Lewis College

**Grant Number:** 1757953

**Principal Investigator / Faculty Mentor:** Megan Paciaroni | Steven D. Fenster

**Poster Number: 7**

**Title:** Fluorescent Labeling in the Mycobacterial Periplasm

**Presenter(s):** Alison Farinas

**REU Site:** Interdisciplinary Research Training across Biology, Physics, and Engineering

**Host Institution:** Yale University

**Grant Number:** 1755494

**Principal Investigator / Faculty Mentor:** Corey O'Hern | Hesper Rego

**Poster Number: 8**

**Title:** Analysis of CRISPR-Based Chromosome Labeling with Computer Vision and Machine Learning Techniques

**Presenter(s):** Erin Haus

**REU Site:** Training and Experimentation in Computational Biology (TECBio)

**Host Institution:** University of Pittsburgh

**Grant Number:** 1659611

**Principal Investigator / Faculty Mentor:** Joseph Ayoob | Jianhua Xing

**Poster Number: 9**

**Title:** Physiological and Demographic Response of the Eastern Mosquito Fish *Gambusia holbrooki* to Variations in Food Quality

**Presenter(s):** Samiris Suleiman Orozco

**REU Site:** Coastal Ecosystems: From the Everglades to Coral Reefs

**Host Institution:** Florida International University

**Grant Number:** 1852123

**Principal Investigator / Faculty Mentor:** Rita Teutonico | Alex E. Mercado-Molina

**Poster Number: 10**

**Title:** An Investigation of Congenital Agenesis of the *Corpus Callosum*

**Presenter(s):** Alexis Delgado

**REU Site:** Scientific Computing for Structure in Big or Complex Datasets

**Host Institution:** University of Miami

**Grant Number:** 1659144

**Principal Investigator / Faculty Mentor:** Burton Roseberg | Lucina Uddin

**Poster Number: 11**

**Title:** Habitat Heterogeneity and Fish Communities Relative to Debris Dams in East Fork Indian Creek, Menifee County, KY

**Presenter(s):** Thomas Rafael Bustamante

**REU Site:** Disturbance Ecology in Central Appalachia

**Host Institution:** Eastern Kentucky University

**Grant Number:** 1559980

**Principal Investigator / Faculty Mentor:** David Brown | Sherry Harrel

**Poster Number: 12**

**Title:** Escape from Sal-catraz: Evading Antibody-Mediated Motility Arrest

**Presenter(s):** Elizabeth Weyer

**REU Site:** Networked Projects in Cell and Molecular Biology at the Wadsworth Center

**Host Institution:** Wadsworth Center

**Grant Number:** 1757170

**Principal Investigator / Faculty Mentor:** Matthew Kohn | Nicholas Mantis

**Poster Number: 13**

**Title:** Effects of Environmental Biotic Factors on Seedling Survival

**Presenter(s):** Dayna De La Cruz

**REU Site:** Harvard Forest Program in Forest Ecology: Ecological Data-Model Fusion and Environmental Forecasting

**Host Institution:** Harvard University

**Grant Number:** 1459519

**Principal Investigator / Faculty Mentor:** Aaron Ellison | Jaclyn Matthes

**Poster Number: 14**

**Title:** Why Are You Hungry? The Story of Upd2/Leptin and You

**Presenter(s):** Lorenzo Smith

**REU Site:** BioTechnology Sequencing-Based Undergraduate Research Experience (BIT SURE)

**Host Institution:** North Carolina State University

**Grant Number:** 1659225

**Principal Investigator / Faculty Mentor:** Patricia Estes

**Poster Number: 15**

**Title:** Visible Light Induced H<sub>2</sub> Production in a Recombinant *Escherichia coli* Coupled with Vanadosilicate AM-6 Photocatalyst

**Presenter(s):** Bianca Boschetti

**REU Site:** Multisite REU in Synthetic Biology

**Host Institution:** Simmons University

**Grant Number:** 1852150

**Principal Investigator / Faculty Mentor:** Jennifer Canfield | Mariam Ismail

**Poster Number: 16**

**Title:** Lizard Egg Predation by Marsh Crabs: Effects of Microhabitat and Crab Density on Egg Survival

**Presenter(s):** Andrew DeSana

**REU Site:** Warm-Water Aquatic Ecology

**Host Institution:** Auburn University

**Grant Number:** 1658694

**Principal Investigator / Faculty Mentor:** Alan Wilson | Daniel Warner

**Poster Number: 17**

**Title:** Genetic Variation in Pre-Dawn Stomatal Conductance in Switchgrass (*Panicum virgatum*): Climate and Trait Associations

**Presenter(s):** Tia Brown

**REU Site:** Research Experiences for Undergraduates in Coastal Biology on Florida's First Coast

**Host Institution:** University of North Florida

**Grant Number:** 1852488

**Principal Investigator / Faculty Mentor:** Matthew R. Gilg | Michael Aspinwall

**Poster Number: 18**

**Title:** Host Plants Alter Wing Patterns in Nymphalid Butterflies

**Presenter(s):** Shalom Entner

**REU Site:** Ecology and Evolutionary Biology at the University of Virginia's Bland Experimental Farm

**Host Institution:** University of Virginia

**Grant Number:** 1659816

**Principal Investigator / Faculty Mentor:** Kyle Haynes | Rebecca Forkner

**Poster Number: 19**

**Title:** Optogenetic Activation of Rho Family GTPases in *Drosophila* Axon Guidance

**Presenter(s):** Robert Shackelford | Jordon Winn

**REU Site:** REU Program in Molecular Genetics and Cell Biology

**Host Institution:** The University of Chicago

**Grant Number:** 1659490

**Principal Investigator / Faculty Mentor:** Aaron Paul Turkewitz | Robert Carrillo

**Poster Number: 20**

**Title:** Characterizing the Terrestrial Flatworm *Bipalium kewense* as a Viable and Important Model Organism in Which to Study Regeneration

**Presenter(s):** Juliana Benitez | Maja Johnson

**REU Site:** Teamwork in Biology Inquiry: From Molecules to Organisms

**Host Institution:** Northeastern University

**Grant Number:** 1757443

**Principal Investigator / Faculty Mentor:** Wendy Smith | James Monaghan

**Poster Number: 21**

**Title:** Invasive Plants and Bird Nesting Success in Missouri River Riparian Forests

**Presenter(s):** Jacob Myers

**REU Site:** Sustainable RIVER (Remediating InVasives to Encourage Resilience)

**Host Institution:** University of South Dakota

**Grant Number:** 1560048

**Principal Investigator / Faculty Mentor:** Meghann Jarchow | David Swanson

**Poster Number: 22**

**Title:** Abiotic Factors Affect Habitat Quality in the Arizona Toad

**Presenter(s):** Erasmo Rocha

**REU Site:** Place-Based Research and Training in Biology and Environmental Science on the Colorado Plateau

**Host Institution:** Northern Arizona University

**Grant Number:** 1757626

**Principal Investigator / Faculty Mentor:** Liza Holeski | Matthew O'Neill

**Poster Number: 23**

**Title:** The Use of Small Unmanned Aerial Systems (sUAS) in the Referential Identification of Invasive Vegetation Within the Old Woman Creek Estuarine Reserve

**Presenter(s):** Caleb Keoho

**REU Site:** Addressing Environmental Challenges and Proposing Sustainable Solutions at the Lake Erie Land-Lake Interface

**Host Institution:** University of Toledo

**Grant Number:** 1852245

**Principal Investigator / Faculty Mentor:** Jeanine Refsnider | Richard Becker

**Poster Number:** 24

**Title:** Investigating Mitochondrial Structure and Function in the Rare X-linked Intellectual Disability Disorder, MEHMO Syndrome

**Presenter(s):** Amanda Anqueira-Gonzalez

**REU Site:** Center for Neural Science Summer Undergraduate Research

**Host Institution:** Center for Neural Science, New York University

**Grant Number:** 1460880

**Principal Investigator / Faculty Mentor:** Chiye Aoki | Eric Klann | Megan Kate Elder

### **NSF Division: Earth Science**

**Poster Number:** 25

**Title:** Role of Mechanical Properties of Sediments in the Formation of Landward versus Seaward Verging Thrust Faults at Accretionary Prisms

**Presenter(s):** Madeline Hunt

**REU Site:** Earth Science on Volcanic Islands (ESVI)

**Host Institution:** University of Hawai'i at Mānoa

**Grant Number:** 1560196

**Principal Investigator / Faculty Mentor:** Bridget Smith-Konter | Garrett Ito

**Poster Number:** 26

**Title:** Decolorization Effects of Glutathione in Chlorogenic Acid-Lysine Solutions for Enhanced Consumer Acceptability

**Presenter(s):** Kenninsy Bahena

**REU Site:** Summer Undergraduate Research Fellowship in Earth and Environmental Sciences (SURFEES)

**Host Institution:** Chapman University

**Grant Number:** 1757991

**Principal Investigator / Faculty Mentor:** Christopher S. Kim | Lilian Were

### **Poster Session 4**

**Location: Edison D**

### **NSF Division: Biological Sciences**

**Poster Number:** 1

**Title:** Heterotrimeric G-proteins Regulate Heat Stress Response in *Arabidopsis thaliana*

**Presenter(s):** Anastasiya Andriyash

**REU Site:** Research Experiences in Plant Science at the Danforth Center

**Host Institution:** Donald Danforth Plant Science Center

**Grant Number:** 1659812

**Principal Investigator / Faculty Mentor:** Sona Pandey

**Poster Number: 2**

**Title:** Elucidating the Impact of Transketolase in Epilepsy

**Presenter(s):** Honour Williams

**REU Site:** Training in Redox Biology

**Host Institution:** University of Nebraska–Lincoln

**Grant Number:** 1757951

**Principal Investigator / Faculty Mentor:** Lovell Agwarambgo

**Poster Number: 3**

**Title:** The Effect of Muscadine Grape Extract (MGE) Treatment on Macrophage Activity in Skeletal Muscle after Injury

**Presenter(s):** Macaiah Sheffield

**REU Site:** Engineering New REU Approaches to Challenges in MultiTERM

**Host Institution:** Wake Forest University School of Medicine

**Grant Number:** 1659663

**Principal Investigator / Faculty Mentor:** Anthony Atala | Tracy Criswell

**Poster Number: 4**

**Title:** Does Herbivory Present a Major Cost to Temperate Nitrogen Fixing Trees across the Fixer Phylogeny?

**Presenter(s):** Ava Adler

**REU Site:** Translational Ecology for Undergraduates

**Host Institution:** Cary Institute of Ecosystem Studies

**Grant Number:** 1559769

**Principal Investigator / Faculty Mentor:** Alan R. Berkowitz | Sarah Batterman

**Poster Number: 5**

**Title:** Dysregulation of Chondrocyte Differentiation via Different Sources of Reactive Oxygen Species

**Presenter(s):** Jonathan Lewis

**REU Site:** Research Experiences for Undergraduates in Genetic and Biochemical Mechanisms of Prokaryotic and Eukaryotic Organisms

**Host Institution:** Louisiana State University–New Orleans

**Grant Number:** 1659752

**Principal Investigator / Faculty Mentor:** Fern Tsien | Martin Ronis

**Poster Number: 6**

**Title:** Assessment and Comparison of the Biofouling Communities in the Maryland Coastal Bays

**Presenter(s):** Sulaiman Abdul-Aziz

**REU Site:** Research Experience for Undergraduates in Marine and Estuarine Sciences

**Host Institution:** University of Maryland–Eastern Shore

**Grant Number:** 1757795

**Principal Investigator / Faculty Mentor:** Paulinus Chigbu | Brad Stevens

**Poster Number: 7**

**Title:** Surveying Historical Patterns of Vegetation Change (1929–2019) in the Upper East River Valley Using RMBL's Archival Herbarium Records

**Presenter(s):** Karla Alvarado

**REU Site:** Research Training in Place-Based Field Research

**Host Institution:** Rocky Mountain Biological Laboratory

**Grant Number:** 1755522

**Principal Investigator / Faculty Mentor:** Jennifer Reithel and Ian Billick | C. F. Williams

**Poster Number:** 8

**Title:** Soil Health as Affected by Land Management

**Presenter(s):** Grace Johnson

**REU Site:** Restoring Cattle Ranches for Sustainable Land and Water Resources

**Host Institution:** Tarleton State University

**Grant Number:** 1658984

**Principal Investigator / Faculty Mentor:** Christopher Higgins | Barbara Bellows

**Poster Number:** 9

**Title:** Where Are My Bacterial Symbionts? An Examination of Early Life History Stages of the Solitary Ascidian *Phallusia philippinensis*

**Presenter(s):** Jessica Eddie Anjain

**REU Site:** Environmental Biology for Pacific Islanders

**Host Institution:** University of Hawai'i at Mānoa

**Grant Number:** 1659889

**Principal Investigator / Faculty Mentor:** Michael G. Hadfield

**Poster Number:** 10

**Title:** Characterizing the Role of the mir-44 MicroRNA Family in Egg-Laying Behavior of *Caenorhabditis elegans*

**Presenter(s):** Clairine Larsen

**REU Site:** Interdisciplinary Undergraduate Summer Research in Biology

**Host Institution:** Marquette University

**Grant Number:** 1659595

**Principal Investigator / Faculty Mentor:** Allison Abbott

**Poster Number:** 11

**Title:** Phenotypic and Genome Editing Analysis of Stickleback Morphology

**Presenter(s):** James Wilson

**REU Site:** Integrating Biology from Molecules to Ecosystems

**Host Institution:** University of California, Berkeley

**Grant Number:** 1758007

**Principal Investigator / Faculty Mentor:** Gian Garriga | Craig Miller

**Poster Number:** 12

**Title:** A Parasitoid Puzzle: Phylogenetic Relationships of Labeninae Wasps (*Ichneumonidae*)

**Presenter(s):** Marissa Sandoval

**REU Site:** Natural History Research Experiences

**Host Institution:** National Museum of Natural History, Smithsonian Institution

**Grant Number:** 1560088

**Principal Investigator / Faculty Mentor:** Gene Hunt | Bernardo Santos

**Poster Number:** 13

**Title:** Identifying the Key Methanogens Utilizing Quaternary Amines

**Presenter(s):** Alexia Page-Boyd

**REU Site:** Ecology of Human-Dominated Landscapes

**Host Institution:** Miami University



**Grant Number:** 1460518  
**Principal Investigator / Faculty Mentor:** David Berg | D.J. Ferguson

**Poster Number:** 14  
**Title:** Characterization of a Novel and Unexpected Class of Cobalamin-Binding Radical S-adenosylmethionine Methylases  
**Presenter(s):** Olivia Peduzzi  
**REU Site:** Catalysis and Motion  
**Host Institution:** The Pennsylvania State University  
**Grant Number:** 1659679  
**Principal Investigator / Faculty Mentor:** Squire J. Booker

**Poster Number:** 15  
**Title:** Synergistic Effects of UVA and UVB Radiation on Moon Jellyfish Proliferation and Potential Coping Mechanisms  
**Presenter(s):** Lauren E. Johnson  
**REU Site:** Interdisciplinary Research Experiences in Coastal Plain Science  
**Host Institution:** Georgia Southern University  
**Grant Number:** 1757536  
**Principal Investigator / Faculty Mentor:** Jose C. Colon-Gaud | Laura Treible

**Poster Number:** 16  
**Title:** Genetic and Molecular Basis of Social Behavior  
**Presenter(s):** Nazaret Montejano  
**REU Site:** Program in Molecular Biosciences at the University of Oregon  
**Host Institution:** University of Oregon  
**Grant Number:** 1758015  
**Principal Investigator / Faculty Mentor:** Peter O'Day

**Poster Number:** 17  
**Title:** Understanding the Relationships between Species within the Human Nasal Microbiota  
**Presenter(s):** McKinley Croteau  
**REU Site:** Integrated Science for Society (IS2)  
**Host Institution:** Boston College  
**Grant Number:** 1560200  
**Principal Investigator / Faculty Mentor:** Babak Momeni

### **NSF Division: Chemistry**

**Poster Number:** 18  
**Title:** Detection and Quantification of Interfacial Capping Agents for Metal-Organic Frameworks via X-Ray Photoelectron Spectroscopy  
**Presenter(s):** Angela Bui  
**REU Site:** Membrane Biochemistry and Bioinspired Synthesis  
**Host Institution:** Worcester Polytechnic Institute  
**Grant Number:** 1659529  
**Principal Investigator / Faculty Mentor:** Arne Gericke | Ronald L. Grimm

**Poster Number: 19**

**Title:** Identification of Honey Using CRAFT Interface and Cross-Referencing to Elucidate Distinctions in Sugar Composition

**Presenter(s):** Willmar Guzman Ulloa

**REU Site:** REU Training Site: Molecular Biophysics

**Host Institution:** Princeton University

**Grant Number:** 1659726

**Principal Investigator / Faculty Mentor:** Jannette Carey | Istvan Pelczer

**Poster Number: 20**

**Title:** Charting the Dissociation Pathway of a Manganese-Based PhotoCORM with 2D-IR Spectroscopy

**Presenter(s):** Alexander F. Thome

**REU Site:** Undergraduate Inquiry at the Forefront of Energy, Environmental, and Biochemical Research

**Host Institution:** University of Minnesota

**Grant Number:** 1851990

**Principal Investigator / Faculty Mentor:** Steven Kass | Aaron M. Massari

**Poster Number: 21**

**Title:** Electrostatic Influence on the Electrode/Electrolyte Interface via Electrode Surface Modification

**Presenter(s):** Vanessa Zambrano

**REU Site:** Clean Energy Bridge to Research

**Host Institution:** University of Washington

**Grant Number:** 1559787

**Principal Investigator / Faculty Mentor:** Christine Luscombe | Cody Schlenker

**Poster Number: 22**

**Title:** Functional Characterization of Structural Genomics Proteins in the Haloacid Dehalogenase Superfamily Using Computed Chemical Properties

**Presenter(s):** Manuel Pina

**REU Site:** Research Opportunities in Biological and Chemical Catalysis

**Host Institution:** Northeastern Chemistry

**Grant Number:** 1757078

**Principal Investigator / Faculty Mentor:** George O'Doherty | Mary Jo Ondrechen

**Poster Number: 23**

**Title:** Light-Induced Excited Spin State Trapping in Thiazole-Based Fe(II) Complexes

**Presenter(s):** Paola Lopez Rivera

**REU Site:** Sunshine Institute for the Interaction of Light with Matter

**Host Institution:** Florida State University, Department of Chemistry and Biochemistry

**Grant Number:** 1659661

**Principal Investigator / Faculty Mentor:** Edwin F. Hilinski | Michael Shatruk

**Poster Number:** 24

**Title:** Surface Ligand Engineering for Environmentally Stable All-Inorganic CsPbI<sub>3</sub> Perovskite Nanocrystals

**Presenter(s):** Rachel E. Weiss

**REU Site:** Undergraduate Research in Chemistry at Syracuse University

**Host Institution:** Syracuse University

**Grant Number:** 1659775

**Principal Investigator / Faculty Mentor:** Michael Sponsler | Weiwei Zheng

**Poster Number:** 25

**Title:** Synthesis & Palladium Catalyzed Rearrangement of N-Alloc-N-Allyl Ynamides into Complex Nitriles

**Presenter(s):** Reagan Dreiling

**REU Site:** Mountains and Minds: Next Generation Chemistry for Materials and Catalysts

**Host Institution:** Montana State University

**Grant Number:** 1852214

**Principal Investigator / Faculty Mentor:** Sharon Neufeldt | Matthew Cook

**Poster Number:** 26

**Title:** Plasma Activated Water (PAW): Process Development and Evaluation of Antimicrobial Properties

**Presenter(s):** Thomas Wells

**REU Site:** Utilizing Plants for Innovative Research (UPIR)-Cultivating the Next Generation of Scientists and Engineers

**Host Institution:** Kettering University

**Grant Number:** 1560169

**Principal Investigator / Faculty Mentor:** Lihua Wang | Susan Farha

## **Poster Session 5**

**Location: Edison D**

### **NSF Division: Materials Research**

**Poster Number:** 1

**Title:** Empirical Modeling of Trigonal Distortions in Perovskites

**Presenter(s):** Olivia Ann Wander

**REU Site:** Materials for Society

**Host Institution:** Boise State University

**Grant Number:** 1658076

**Principal Investigator / Faculty Mentor:** Rick Ubic

**Poster Number:** 2

**Title:** Optimization of Antimicrobial Coatings for Food Contact Surfaces

**Presenter(s):** Annika Hysten

**REU Site:** Creative Approaches to Materials Design and Processing

**Host Institution:** University of Missouri–Columbia

**Grant Number:** 1757936

**Principal Investigator / Faculty Mentor:** Heather K. Hunt

**Poster Number: 3**

**Title:** Investigating the Order-to-Disorder Transition Temperature for Asymmetric Core-Shell Bottlebrush Copolymers

**Presenter(s):** Emily Ness

**REU Site:** Science and Engineering in Nanomaterials

**Host Institution:** University of Minnesota

**Grant Number:** 1852044

**Principal Investigator / Faculty Mentor:** David Blank | Mahesh Mahanthappa

**Poster Number: 4**

**Title:** Leaching of Low Glass Transition Temperature (T<sub>g</sub>) Polymers from Gels into Colloidal Packings

**Presenter(s):** Stefani Millan-Higuera

**REU Site:** Structure of Matter

**Host Institution:** Laboratory for Research on the Structure of Matter (LRSM) at the University of Pennsylvania

**Grant Number:** 1659512

**Principal Investigator / Faculty Mentor:** Arjun Yodh | Daeyeon Lee

**Poster Number: 5**

**Title:** Synthesis of Colloidal Copper Phosphide (Cu<sub>3</sub>P) Nanocrystals Using Aminophosphine Precursor

**Presenter(s):** Alejandro Franco

**REU Site:** Molecular Engineering Materials Center

**Host Institution:** University of Washington

**Grant Number:** 1719797

**Principal Investigator / Faculty Mentor:** Daniel Gamelin | Vincent Holmberg

**Poster Number: 6**

**Title:** Vapor Phase Polymerized PEDOT/Cellulose Paper for Application in Flexible and Disposable Supercapacitor

**Presenter(s):** Hendrick Lopez-Beltran

**REU Site:** Renewable Energy Generation and Storage

**Host Institution:** Binghamton University–State University of New York

**Grant Number:** 1658990

**Principal Investigator / Faculty Mentor:** Jeffrey M. Mativetsky | William E. Bernier

**Poster Number: 7**

**Title:** Growth and Optical Characterization of Antiferromagnetic PtMn Thin Films

**Presenter(s):** Lauren Gorman

**REU Site:** Illinois Materials Research Science and Engineering Center REU

**Host Institution:** University of Illinois at Urbana-Champaign

**Grant Number:** 1720633

**Principal Investigator / Faculty Mentor:** Nadya Mason | Kathleen Oolman

## **NSF Division: Atmospheric Sciences and Geospace**

**Poster Number:** 8

**Title:** Water Purification Methods That Can Be Used in Haiti

**Presenter(s):** Kehinde Adekoya

**REU Site:** Weather, Climate, and Society

**Host Institution:** University of South Florida

**Grant Number:** 1659754

**Principal Investigator / Faculty Mentor:** Jennifer Collins | Javier Cuevas

## **NSF Division: Social, Behavioral, and Economic Sciences**

**Poster Number:** 9

**Title:** Agent-Based Modeling of Hand, Foot, and Mouth Disease

**Presenter(s):** Alexandra Eguiluz

**REU Site:** Summer Undergraduate Research for Students who are Deaf or Hard-of-Hearing in Applying Mathematical and Statistical Methods to Problems from the Sciences (REU at NTID)

**Host Institution:** Rochester Institute of Technology / National Technical Institute for the Deaf

**Grant Number:** 1659299

**Principal Investigator / Faculty Mentor:** Bonnie Jacob

**Poster Number:** 10

**Title:** Factors That Influence the Understanding of Regional Dialects and Nonnative Accents

**Presenter(s):** Jada Hudgins

**REU Site:** The Science of Language and the Language of Science

**Host Institution:** Ohio State University

**Grant Number:** 1757020

**Principal Investigator / Faculty Mentor:** Kathryn Campbell-Kibler | Rachael Holt

**Poster Number:** 11

**Title:** Geophysical Survey of Two Eighteenth-Century Cemeteries on St. Eustatius

**Presenter(s):** Katherine Rodriguez

**REU Site:** Exploring Globalization through Archaeology

**Host Institution:** Texas State University

**Grant Number:** 1757702

**Principal Investigator / Faculty Mentor:** Todd Ahlman | Nicholas Herrmann

**Poster Number:** 12

**Title:** The Mediating Role of Impairment on the Relationship between ADHD and Depression in Adolescents

**Presenter(s):** Lizzie Wilson

**REU Site:** Treatment Related Research for Youth with Social, Emotional, and Behavioral Problems

**Host Institution:** Ohio University

**Grant Number:** 1659455

**Principal Investigator / Faculty Mentor:** Fran Wymbs | Steve Evans

**Poster Number: 13**

**Title:** Effects of Variation and Methodology in the Acquisition of Subject-Verb Agreement by Dominican Spanish-Speaking Preschoolers

**Presenter(s):** Yerania Poline

**REU Site:** Intersection of Linguistics, Language, and Culture

**Host Institution:** LIU-Brooklyn

**Grant Number:** 1659607

**Principal Investigator / Faculty Mentor:** Isabelle Barriere

**Poster Number: 14**

**Title:** An Interdisciplinary Examination of Critical Crash Causation Factors among Risky Drivers

**Presenter(s):** Maya Thirkill

**REU Site:** Injury Science REU Site

**Host Institution:** The Children's Hospital of Philadelphia

**Grant Number:** 1757462

**Principal Investigator / Faculty Mentor:** Flaura Winston | Thomas Seacrist

**Poster Number: 15**

**Title:** Sorry to Bother You: The Art of Code-Switching between African American English and Standard American English in Higher Education

**Presenter(s):** Brianna Bazile

**REU Site:** Increasing Diversity in the Linguistic Sciences through Research on Language and Social Mobility

**Host Institution:** University of California, Santa Barbara

**Grant Number:** 1757654

**Principal Investigator / Faculty Mentor:** Anne H. Charity-Hudley

**Poster Number: 16**

**Title:** Deterrence of Hope: US Immigration Policies and the Asylum Process in El Paso

**Presenter(s):** Daniel Alejandro Avitia-Pacheco

**REU Site:** Collaborative Research: Undergraduate Research in Immigration Policy and Border Communities

**Host Institution:** New Mexico State University and University of Texas-El Paso

**Grant Number:** 1659195

**Principal Investigator / Faculty Mentor:** Neil Harvey

**Poster Number: 17**

**Title:** Parental Dysfunction and Support in Ukraine

**Presenter(s):** Victoria Knutson

**REU Site:** Effects of Political Upheaval and Ethnic Discord on the Mental Health of a Population

**Host Institution:** Dordt College

**Grant Number:** 1560078

**Principal Investigator / Faculty Mentor:** Nathan Tintle | Luralyn Helming

**Poster Number:** 18

**Title:** One World or Many Islands?: Collectivism/Familism Positively, but Individualism Negatively, Predict Compassion

**Presenter(s):** Megan Wynecoop

**REU Site:** Psychophysiology of Compassion

**Host Institution:** Northern Arizona University

**Grant Number:** 1659888

**Principal Investigator / Faculty Mentor:** C. Chad Woodruff

### **NSF Division: Education and Human Resources**

**Poster Number:** 19

**Title:** The Complexity of Engaging Third Graders with Word Problems

**Presenter(s):** Savanna Hoffman

**REU Site:** Preparing Aspiring Teachers to Hypothesize Ways to Assist Young Students (PATHWAYS)

**Host Institution:** Salisbury University

**Grant Number:** 1658968

**Principal Investigator / Faculty Mentor:** Randall Groth | Claudia Burgess

**Poster Number:** 20

**Title:** Students' Perspectives of Social Impact in the Physics Discipline

**Presenter(s):** Krystina Williamson

**REU Site:** Research Experiences for Undergraduates in Model-Based Reasoning in STEM Education at the Rochester Institute of Technology

**Host Institution:** Rochester Institute of Technology

**Grant Number:** 1757477

**Principal Investigator / Faculty Mentor:** Leslie Wright | Benjamin Zwickl

## Speaker Biographies

*Alphabetical by last name*

**Patrick Algyer, CVA**, is the chief strategist and founder of Encore Engagement Solutions. He has been both a member and staff member at various associations and nonprofits throughout his entire career. He specializes in disrupting the norm with the goal of making volunteers, members, and association staff successful. He is passionate about the industry and looks forward to opportunities to network and connect with peers to improve the industry and the member experience.

**Liljana Babinkostova** is a professor in the Department of Mathematics at Boise State University. Her research efforts concern mathematical problems in the area of cybersecurity and game theory, ranging from highly theoretical to the most practical of efforts. She routinely engages undergraduate students in her research. Babinkostova is one of the lead faculty members that developed the Idaho Conference on Undergraduate Research as well as an undergraduate research program at her institution. She currently serves as a councilor in the Mathematics Division of the American Association for the Advancement of Science–Pacific Division (AAAS-PD). She is also involved in the Idaho Diversity Network established by Idaho EPSCoR as part of its efforts in supporting STEM in Idaho. Babinkostova is the principal investigator for the NSF REU Site Complexity across Disciplines (CAD), a program in interdisciplinary mathematics research and the Research Experience in Mathematics for Young Scientists (REMYS), the MAA research program for high school students.

Meteorologist **DaNa Carlis** serves as a program manager at NOAA’s Office of Weather and Air Quality (OWAQ). At OWAQ, he manages the Earth Prediction Innovation Center (EPIC) and Next Generation Global Prediction System (NGGPS) programs. Carlis attended Howard University where he obtained a bachelor’s of science degree in chemistry (2000), as well as a MS (2002) and PhD (2007) in atmospheric sciences. During his time at Howard, he was a research assistant in an analytical chemistry lab and a Research Experiences for Undergraduate summer intern at the City University of New York. In 2007, Carlis was the second African American male to receive his PhD in atmospheric sciences from Howard University. His dissertation focused on modeling island-scale airflow regimes over Maui and implementing semi-operational MM5 and WRF models over the Hawaiian Islands. He began his career as a graduate student in NOAA’s Graduate Sciences Program through the NOAA Office of Education. He has held positions at the National Weather Service as a weather forecast model (Global Forecast System Model) developer and as a policy adviser to NOAA senior leadership. In 2016, he joined NOAA Research as weather portfolio adviser. Carlis has published papers in peer-reviewed journals and wrote the children’s book *MIT: Meteorologist in Training* (2016). For his scientific achievements, Carlis was inducted into the Booker T. Washington High School Distinguished Hall of Fame Class of 2018.



**Lindsay Currie** is the executive officer of the Council on Undergraduate Research. She has more than a decade of experience in nonprofit management and community engagement, focusing on empowering communities. She previously served as director of stakeholder engagement for the Regulatory Affairs Professionals Society in Rockville, MD (2015–summer 2019), and as CUR’s director of communications and membership (2010–2015), building membership and volunteer service significantly in both positions. She is a frequent speaker on strategies for increasing involvement by members in nonprofit organizations.

**Janice DeCosmo** is the associate vice provost for undergraduate research, associate dean of undergraduate academic affairs, and an affiliate faculty member in the Department of Earth and Space Sciences at the University of Washington. She is also the 2019–2020 president of the Council on Undergraduate Research. DeCosmo earned a BS in physics from the University of Iowa in 1979 and a PhD in atmospheric sciences from the University of Washington in 1991, specializing in atmosphere-ocean interaction. She oversees the UW’s Center for Experiential Learning and Diversity, which includes undergraduate research, service learning, leadership, and scholarship programs. DeCosmo developed the UW undergraduate research program, which had more than 8,000 participants in 2018, and oversees the Mary Gates Endowment for Students, a \$20-million fund dedicated to supporting undergraduates to do research, scholarship, and innovative projects. Still engaged in working directly with students, she is also involved in higher education policy in the state of Washington, focused on transfer from two-year to four-year institutions and the development of new academic programs.

**R. Corby Hovis** is a senior program director in the Directorate for Education and Human Resources at the National Science Foundation (NSF) in Arlington, VA, where he has worked since 1997. At NSF, Hovis is the NSF-wide coordinator for the Research Experiences for Undergraduates (REU) program, the federal government’s oldest and largest grant program supporting research experiences for students. He also coordinates the participation of community colleges in NSF’s programs supporting cybersecurity education such as the Advanced Technological Education (ATE) program, which sponsors four major centers for cybersecurity education. Before coming to NSF, he served on the faculty of Valparaiso University in Indiana and as science editor at *Encyclopædia Britannica* in Chicago. He received his BA in physics and English from Wake Forest University and his PhD from Cornell University in astronomy and the history and philosophy of science. From September 2009 through August 2010, he served on special assignment from NSF as an American Council on Education (ACE) Fellow in the Office of the President at The Ohio State University.

**John M. Hranitz** is a professor in the Department of Biological and Allied Health Sciences at Bloomsburg University of Pennsylvania. In 2013, he worked with faculty and administration to create the Center for Undergraduate Research at Bloomsburg University and has served three years as its director. Hranitz also served as an interim director of the Office of Research and Sponsored Programs at Bloomsburg University for three years. Prior to joining Bloomsburg University, Hranitz was a faculty member in the Department of Biology at the University of Central Oklahoma for nine years, where his collaborations led to his participation in NSF-REU Site grants for 10 years. He earned bachelor’s and master’s

degrees in biology from Bloomsburg University and a doctorate in zoology from Mississippi State University.

**Rebecca M. Jones**, a former undergraduate researcher at The Ohio State University, earned her PhD in inorganic chemistry from the University of Cincinnati and joined the faculty of Austin Peay State University in 2004. While earning tenure at APSU, she created the Office of Undergraduate Research in 2010 and was appointed director. She relocated to George Mason University in January 2012 to become assistant director of OSCAR, where she administered student programs such as the Undergraduate Research Scholars Program and the Undergraduate Student Travel Fund. In September 2015, she transitioned to a term associate professorship in chemistry at GMU and program lead for the STEM Accelerator initiative. She serves as secretary for the Mason chapter of Sigma Xi and is an active member of the American Chemical Society, AAAS, and the Council on Undergraduate Research.

**Alisa Leckie** is an associate professor and interim dean for partnerships and outreach at Georgia Southern University. Her work focuses on program evaluation, education of culturally and linguistically diverse students, and disciplinary literacy. A past program evaluator for REU-URGENT and RET-ENERGY projects, she is conducting an evaluation on school discipline for a local school district. She is also working with local school districts to help them address the growing numbers of English learners in their classrooms through collaborative coaching and the modification of materials and assessments for emergent English learners. Leckie serves as associate chair for the university's Institutional Review Board and co-chairs the National Youth-at-Risk Conference.

**John Mateja**, president of the Goldwater Foundation, earned his bachelor's and PhD degrees from the University of Notre Dame in nuclear physics in 1972 and 1976 respectively. Throughout his career, he has been a staunch advocate for the involvement of undergraduates in research, serving as president of the Council on Undergraduate Research in 1993. He has held faculty and administrative positions at Tennessee Technological University and Murray State University. In addition, he has held administrative positions at Argonne National Laboratory, Department of Energy, and the National Science Foundation. Mateja has been named a Fellow of the Council on Undergraduate Research and of the American Physical Society for his work to reform undergraduate education.

**Valentin Soloiu** is the Allen E. Paulson Distinguished Chair and professor at Georgia Southern University. He has 30 years of teaching and research experience in higher education and has authored more than 100 papers, 30 technical studies, and nine textbooks and instruction manuals. His research is in combustion instabilities, emissions, and NVH in internal combustion and jet engines. He is the principal investigator for NSF REU and RET grants, and his research has been supported also by the Department of Energy, Environmental Protection Agency, Federal Aviation Administration, and Oak Ridge National Laboratory. He is a Councilor in the Council of Undergraduate Research's Engineering Division and Distinguished Associate of the ASME Engine Division (ICEF).

## **Student Opportunities**

### **Posters on the Hill**

Each spring, the Council on Undergraduate Research (CUR) hosts an annual undergraduate poster session on Capitol Hill. This event assists members of Congress and their staff members with understanding the importance of undergraduate research, as they interact directly with the students involved in these programs. This unique opportunity for students and faculty mentors has a positive impact on the future of federal funding for undergraduate research. Submissions for 2020 will close on November 5, 2019. For more information, please visit <https://bit.ly/2020-POTH>

### **National Conference on Undergraduate Research**

The National Conference on Undergraduate Research (NCUR), established in 1987, is dedicated to promoting undergraduate research, scholarship, and creative activity in all fields of study by sponsoring an annual conference for students. For more information on this year's event, please visit <https://bit.ly/NCUR2020-Gen>. NCUR 2020 will be hosted by Montana State University Bozeman on March 26–28, 2020. The deadline to apply is December 6, 2019.

### **Student Journal Forum**

CUR offers a new online community, Student Journals, for students, faculty members, librarians, administrators, and others involved in the operation of student research journals to share best practices and information, ask and answer questions, and participate in other networking and support opportunities related to student research journals. To join this community, contact Elizabeth Foxwell (SPUR@cur.org).

## Faculty Opportunities

### **CUR Biennial 2020**

At the 2020 CUR Biennial Conference at Purdue University on June 27–30, 2020, faculty, administrators, staff, academic and community partners, and policymakers will share models of undergraduate research activities from a wide variety of settings and disciplines, organized by the following themes:

- Assessment in Undergraduate Research
- Diversity and Inclusion in Undergraduate Research
- Integrating and Building Undergraduate Research into Curriculum and Coursework
- New Models and Settings for Undergraduate Research

Abstracts may be submitted for oral and poster presentations until November 22, 2019. To submit an abstract or to learn more about the biennial conference, visit the Biennial Conference webpage (<https://bit.ly/2020-CUR-Biennial-Main>).

### **National Conference on Undergraduate Research**

In addition to promoting undergraduate research, scholarship, and creative activity in all fields of study, the National Conference on Undergraduate Research (NCUR) features popular Faculty-Administrator Network (FAN) sessions, which are professional development presentations, demonstrations, and workshops related to the practice and scholarship of undergraduate research, experiential learning, and related high-impact educational practices. Especially encouraged are active, hands-on sessions and presentations focused on evidence-based best practices. The abstract submission deadline is December 6, 2019. For further details, visit the NCUR 2020 FAN Sessions webpage (<https://bit.ly/2020NCUR-FanSessions>).