Research Experiences for Undergraduates Symposium

Council on Undergraduate Research

Hilton, Arlington, VA
October 23-24, 2016
Council on Undergraduate Research

The Council on Undergraduate Research (CUR), founded in 1978, is a national organization of more than 10,000 individual members and 700 institutional members. Our primary advocacy is in support of faculty and undergraduate students engaged in research. We achieve our vision through the efforts of our membership that is organized in 13 divisions: arts and humanities, biology, chemistry, education, engineering, geosciences, health sciences, mathematics and computer science, physics and astronomy, psychology, social sciences, an at-large division that serves administrators and other disciplines, and a division for directors of undergraduate research programs.

CUR believes that faculty members enhance their teaching and contribution to society by remaining active in research and by involving undergraduates in research. CUR provides support for faculty, administrator, and student development, and our publications and outreach activities are designed to share successful models and strategies for establishing and institutionalizing undergraduate research programs, and improving and assessing the research environment at their institutions. We also provide a growing number of services and programs directly engaging undergraduate students, including the National Conference on Undergraduate Research, Posters on the Hill, the Registry of Undergraduate Researchers, and the special REU Symposium that you are now attending!

CUR's leadership also works with agencies and foundations to enhance research opportunities for faculty and students. We proactively provide information on the importance of undergraduate research to state legislatures, private foundations, government agencies, and the U.S. Congress. CUR welcomes faculty, staff, students, and administrators from all academic institutions and affiliated non-profit associations.
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Planning Committee

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2016 REU Symposium Schedule
Hilton Arlington
950 N Stafford St, Arlington, VA 22203
October 23-24, 2016

Sunday, October 23
2:30-4:30pm  Registration and Check-In
4:30-5:30pm  Welcome and Keynote
   Welcome: Dr. Elizabeth Ambos, Executive Officer, Council on Undergraduate Research
   Keynote speakers: Dr. Sally O’Connor, Program Director, National Science Foundation;
   Dr. John Barthell, Provost, University of Central Oklahoma
   Location: Gallery I, II, & III

5:30-6:15pm  Lite Dinner
6:15-8:00pm  Networking

Monday, October 24
7:30-9:00am  Breakfast

9:15-10:15am  Group 1/Workshop 1
   Switch Groups/break
10:30-11:30am Group 2/Workshop 2

11:30-1:00pm Lunch (Gallery I, II, & III)

1:00-2:00pm  Group 3/Workshop 3
   Switch Groups/break
2:15-3:15pm  Group 4/Workshop 4

3:15-4:00pm  Closing Session/Wrap-up

Poster groups 1 & 2 will go to NSF atrium at 9:00. Group 1 sets up, group 2 attends poster session. Switch at 10:15.

Poster groups 3 & 4 will go to NSF atrium at 12:45. Group 3 sets up, group 4 attends poster session. Switch at 2:00.
Student Poster Sessions

Monday, October 24 | National Science Foundation Atrium

9:15-10:15 | Session 1
Astronomical Sciences (1-5); Atmospheric and Geospace Sciences (6-8); Biological Sciences group 1 (9-16); Earth Sciences (17-20); Education and Human Resources (21-23); Ocean Sciences (24); and Social, Behavioral, and Economic Sciences (25-35)

10:30-11:30 | Session 2
Biological Sciences Group 2 (1-10); Chemistry (11-24), and Materials Research (25-32)

12:30-1:30 | Session 3
Computer & Information Sciences and Engineering group 1 (1-7); and Engineering (8-35)

1:45-2:45 | Session 4
Computer & Information Sciences and Engineering group 2 (1-9); Mathematical Sciences (10-23); and Physics (24-33)

Concurrent Workshops

Session 1 | 9:15AM-10:15AM
Student Session
Applying for Graduate School Support from NSF, Dr. Susan Brennan, Program Director, Graduate Research Fellowship Program, National Science Foundation
Room: Gallery I

Faculty Session
NSF REU Program Update, Dr. R. Corby Hovis, Program Director, Education and Human Resources
Room: Da Vinci/Matisse

Session 2 | 10:30AM-11:30AM
Student Session A:
Undergraduate Scholarships through the Barry Goldwater Scholarship and Excellence in Education Foundation
Dr. John Mateja, President of the Barry Goldwater Scholarship and Excellence in Education Foundation
Room: Da Vinci/Matisse

Student Session B:
Post-Baccalaureate Fellowships at ASEE, Ms. Rachel Levitin, Program Manager, American Society for Engineering Education
Faculty Session

**Effective Strategies for NSF REU Renewal: A Principal Investigator Brainstorming Session**
Dr. Liljana Babinkostova, Professor of Mathematics, Boise State University and Dr. Valentin Soloiu, Allen E. Paulson Distinguished Chair of Mechanical Engineering, Georgia Southern University.

Room: Renoir

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Session 3/12:30-1:30PM

**Student Session**

**Applying for Graduate School Support from NSF**, Dr. Ty Mitchell, Program Director, Graduate Research Fellowship Program, National Science Foundation

Room: Gallery I

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**Faculty Session**

**How to Recruit and Retain Students from Underrepresented Groups in your NSF REU Program**, Dr. R. Michael Ceballos, Professor of Biology, University of Arkansas at Fayetteville

Room: Da Vinci/Matisse

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Session 4/1:45 PM-2:45PM

**Student Session**

**Smithsonian Internships and Fellowship Opportunities**, Ms. Karen Carter, Program Specialist, Smithsonian Office of Fellowships and Internships

Room: Gallery I

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**Faculty Session**

**Effective Practices for NSF REU Site Operation and Assessment**
Dr. Charles Sullivan, Program Officer, Undergraduate Education, National Science Foundation and Dr. Amanda Simcox, Program Director, Division of Biological Infrastructure, National Science Foundation.

Room: Da Vinci/Matisse
NSF Division: Astronomical Sciences

1-1
Title: Rampart Craters and Their Connection with the Sub-Surface Composition of the Pluto System
Presenter(s): Spencer Devins
REU Site: CURE (Consortium for Undergraduate Research Experiences)
Host Institution: Los Angeles City College
Grant #: 1460538
Principal Investigator/ Faculty Mentor: Dr. Paul McCudden and Dr. Bonnie Buratti

1-2
Title: The Arecibo Galaxy Environment Survey
Presenter(s): Ashley Ann Iguina
REU Site: REU Site: Research in Radio/Radar Astronomy and Atmospheric Sciences at Arecibo Observatory
Host Institution: Arecibo Observatory
Grant #: 1559849
Principal Investigator/ Faculty Mentor: Dr. Hilda M. Colon and Dr. Robert Minchin

1-3
Title: An M2FS Spectroscopic Study of Young Low-Mass Stars in Orion OB1
Presenter(s): Jacqueline Loernics
REU Site: Research Experiences for Undergraduates in Astronomy at Cerro Tololo Inter-American Observatory (2012-2016)
Host Institution: AURA/National Optical Astronomy Observatory/Cerro Tololo Inter-American Observatory
Grant #: 1062976
Principal Investigator/ Faculty Mentor: Dr. Nicole Van der Bliek and Dr. Cesar Briceño

1-4
Title: Understanding the Earth’s Composition through Neutrino Oscillations
Presenter(s): Beverly Lowell
REU Site: Preparing a Diverse Workforce through Interdisciplinary Astrophysics Research
Host Institution: Northwestern University CIERA
Grant #: 1359462
Principal Investigator/ Faculty Mentor: Dr. Vassiliki Kalogera, and Dr. Aaron Geller

1-5
Title: Camera development for the Cherenkov Telescope Array
Presenter(s): Roberto J Moncada
REU Site: REU Site for Astronomy and Astrophysics at UW-Madison: 2016 and beyond
Host Institution: University of Wisconsin - Madison
Grant #: 1560016
Principal Investigator/ Faculty Mentor: Dr. Justin Vandenbroucke
NSF Division: Atmospheric and Geospace Sciences

1-6
Title: IT-SPINS ADACS and Trajectory Analysis
Presenter(s): Chace Carlson
REU Site: Solar Physics / Astronomy & Space Physics
Host Institution: MSU Physics Department
Grant #: 1156011
Principal Investigator/ Faculty Mentor: Dr. Dave Klumpar

1-7
Title: Making Silica-rich Rocks without Plate Tectonics or Water by Partial Melting of a Primitive Meteorite
Presenter(s): Emma Sosa
REU Site: Natural History Research Experiences
Host Institution: National Museum of Natural History, Smithsonian Institution
Grant #: 156088
Principal Investigator/ Faculty Mentor: Dr. Gene Hunt

1-8
Title: Validation of Satellite-based Measurements of Precipitable Water Vapor at Two Unique Arctic Locations
Presenter(s): Pyxie Star
REU Site: REU Site: Regional Atmospheric Chemistry: State-of-the-art Measurement and Modeling in the Pacific Northwest
Host Institution: Washington State University
Grant #: 1461292
Principal Investigator/ Faculty Mentor: Dr. Shelley Pressley

NSF Division: Biological Sciences

1-9
Title: Historic Drought in California is associated with Fungal-Induced Dieback in a Keystone Chaparral Species
Presenter(s): Natalie M. Aguirre
REU Site: Biological Response to Stress -- Molecular, Cellular, Ecological
Host Institution: Pepperdine University
Grant #: 1560352
Principal Investigator/ Faculty Mentor: Dr. Jay L Brewster

1-10
Title: Informatics Tools for Quantifying Intratumor Heterogeneity in Multiplexed Fluorescence Tissue Data
Presenter(s): Alex Andonian
REU Site: Training and Experimentation in Computational Biology: Simulation and Visualization of Biological Systems at Multiple Scales
Host Institution: University of Pittsburgh
1-11
Title: Diversity of Spore-Forming Bacteria in Soil from the Boulder Creek Critical Zone Observatory Site (CZO)
Presenter(s): Scott-Wesley Bean
REU Site: Research Experience for Community College Students in Critical Zone Science
Host Institution: University of Colorado/Cooperative Institute for Research in Environmental Sciences
Grant #: 1461281
Principal Investigator/ Faculty Mentor: Dr. Lesley K Smith

1-12
Title: Determining the role of skin-specific microtubule stabilization and mechanical resistance in paclitaxel-induced peripheral neuropathy
Presenter(s): Leah Rose Krevens Brieger
REU Site: Comparative Approaches in Cellular, Molecular, and Environmental Biology
Host Institution: MDI Biological Laboratory
Grant #: 1460495
Principal Investigator/ Faculty Mentor: Dr. Paulyn Cartwright

1-13
Title: Bioaccumulation of $^{137}$Cs in Florida Green Watersnakes (Nerodia floridana) from Three Wetlands on the Savannah River Site
Presenter(s): Marty Kyle Brown
REU Site: REU Radioecology
Host Institution: University of Georgia
Grant #: 1460940
Principal Investigator/ Faculty Mentor: Dr. J Vaun McArthur and Dr. Tracey D Tuberville

1-14
Title: Interacting Effects of Light and Pharmaceuticals on Stream Biofilms
Presenter(s): Yashoma Boodhan
REU Site: Translational Ecology for Undergraduates
Host Institution: Cary Institute of Ecosystem Studies
Grant #: 1559769
Principal Investigator/ Faculty Mentor: Dr. Alan R. Berkowitz and Dr. Emma Rosi-Marshall

1-15
Title: The role of temperature in roosting behavior of female greater sac-winged bats (Saccopteryx bilineata)
Presenter(s): Erica Cecilia Carcelen
REU Site: La Selva Biological Station (Costa Rica) Site REU
Host Institution: Organization for Tropical Studies
Grant #:
Principal Investigator/ Faculty Mentor: Dr. Martina Nagy
1-16
Title: Parentage analysis of ex-situ reintroductions of the federally endangered, self-incompatible Ziziphus celata
Presenter(s): Caitlyn Foye
REU Site: Botany and Conservation Biology Research at the Missouri Botanical Garden
Host Institution: Missouri Botanical Garden
Grant #: 1559962
Principal Investigator/ Faculty Mentor: Dr. Wendy L. Applequist

2-1
Title: HIV-1 inhibition by the N-terminal fragment of Heterogeneous Nuclear Ribonucleoprotein U (hnRNPU) in 293T-REx cells
Presenter(s): Andrea Margarete Gade
REU Site: SURFing the Interface of Chemistry and Biology
Host Institution: The Scripps Research Institute - Florida
Grant #: 1359369
Principal Investigator/ Faculty Mentor: Dr. Katrin Karbstein

2-2
Title: Individual territorial site selection and growth rate of juvenile steelhead trout (Oncorhynchus mykiss) under the influence of a dominance hierarchy
Presenter(s): Suzan Homsombath
REU Site: Rroulou'sik - American Indian Students in Natural Resources
Host Institution: Humboldt State University
Grant #: 1559943
Principal Investigator/ Faculty Mentor: Dr. Matthew Johnson, and Dr. Darren Ward

2-3
Title: Quantitative Trait Loci (QTL) Analysis on Bioethanol Production in Neurospora Crassa
Presenter(s): Deval M Jhaveri
REU Site: REU Site: Computational Biology Summer Research Experience at Rutgers - Camden
Host Institution: Rutgers University Camden, 311 N. 5th Street, Camden, NJ. 08102
Grant #: 1559868
Principal Investigator/ Faculty Mentor: Dr. Benedetto Piccoli and Dr. Kwangwon Lee

2-4
Title: Regulation of PTF1A, TFAP2A, and LIM1 in Differentiating Horizontal Cell Progenitors
Presenter(s): Christine Li
REU Site: REU Site: Research in Biology
Host Institution: City College of New York
Grant #: 1156512
Principal Investigator/ Faculty Mentor: Dr. Mark Emerson
2-5
Title: Identifying the role of TRPV1 in cannabinoid mediated suppression of vasotocin endocytosis in the medullary reticular formation of Taricha granulosa
Presenter(s): Lauren J Merlino
REU Site: CAREER: An integrated research-education program to uncover rapid cellular mechanisms by which stress-steroids facilitate context-appropriate behaviors
Host Institution: Willamette University
Grant #: 1351129
Principal Investigator/ Faculty Mentor: Dr. Emma Coddington

2-6
Title: Determining Requirements for Acquisition of New CRISPR Immunity Elements in Escherichia Coli
Presenter(s): Sarah Montgomery
REU Site: REU Site: Networking Basic Research for Collaborative Biological Discovery
Host Institution: Wadsworth Center
Grant #: 1359413
Principal Investigator/ Faculty Mentor: Dr. Joseph Wade and Dr. Matthew Kohn

2-7
Title: Mechanisms of UV-induced Skin Repair in a Regenerative Vertebrate
Presenter(s): Briana Lino and Jorge Murillo
REU Site: Biological Inquiry: From Molecules to Organisms
Host Institution: Northeastern University
Grant #: 1460628
Principal Investigator/ Faculty Mentor: Dr. Wendy Smith

2-8
Title: Characterization of the Anti-fungal Activity of a Monomeric Plant Defense in: MtDef5B
Presenter(s): Blake Oakley
REU Site: Research Experiences in Plant Science at the Danforth Center
Host Institution: Donald Danforth Plant Science Center
Grant #: 1156581
Principal Investigator/ Faculty Mentor: Dr. Shannon G. Rapp

2-9
Title: Resistance to Drought in Four New England Hardwood Species
Presenter(s): Nathan A Stephansky
REU Site: REU Site: A Forest full of Big Data: the Harvard Forest Summer Research Program in Ecology
Host Institution: Harvard University
Grant #: 1459519
Principal Investigator/ Faculty Mentor: Dr. Aaron M Ellison and Dr. Brett Huggett
2-10
**Title:** Notch Signaling in Cellular Proliferation  
**Presenter(s):** Denicka Wilson  
**REU Site:** REU Site: Research Experience for Underrepresented Minority Undergraduates in Basic Science and Genetic Research at Louisiana State University Health Sciences Center (LSUHSC)  
**Host Institution:** Louisiana State University Health Sciences Center (LSUHSC)  
**Grant #:** 1359140  
**Principal Investigator/ Faculty Mentor:** Dr. Fern Tsien and Dr. Judy Crabtree

2-11
**Title:** Mapping out Phase Diagrams of Halide Double Perovskites  
**Presenter(s):** Liana Alves  
**REU Site:** Ohio State University MRSEC REU Program  
**Host Institution:** Ohio State University/Center for Emergent Materials, an NSF MRSEC  
**Grant #:** 1420451  
**Principal Investigator/ Faculty Mentor:** Dr. P. Chris Hammel and Dr. Patrick Woodward

2-12
**Title:** Metabolic Engineering in Cyanobacteria: Utilizing Quorum Sensing to Control Production of 2,3-Butanediol  
**Presenter(s):** Julie Beauchamp  
**REU Site:** UC Davis ChemEnergy REU  
**Host Institution:** University of California, Davis  
**Grant #:** 1560479  
**Principal Investigator/ Faculty Mentor:** Dr. Annaliese Franz

2-13
**Title:** Anthropogenic Debris Consumption by Wetland Fishes  
**Presenter(s):** Amber Clay and Ric DeSantiago  
**REU Site:** Climate Change Across The Various Scales of System Organization  
**Host Institution:** University of San Diego  
**Grant #:** 1460645  
**Principal Investigator/ Faculty Mentor:** Dr. Sonia I. Zarate

2-14
**Title:** Bimetallic Interactions of Lutetium and Dysprosium Paired with Group 10 Metals  
**Presenter(s):** Sarah Dotzler  
**REU Site:** Challenges for the 21st Century  
**Host Institution:** University of Minnesota Department of Chemistry  
**Grant #:** 1359181  
**Principal Investigator/ Faculty Mentor:** Dr. Steven Kass
2-15
Title: Solar Hydrogen Production Using Vitamin C as a Surface Modifier
Presenter(s): Thorn Dramstad
REU Site: REU Site: Weak chemical bonds yield strong research experiences in Materials Chemistry at the University of South Dakota
Host Institution: University of South Dakota/Department of Chemistry
Grant #: 1460872
Principal Investigator/ Faculty Mentor: Dr. Ranjit Koodali

2-16
Title: Correlation between Hammett Parameters and Nitrile IR Absorption in Benzonitrile
Presenter(s): Jaime Alvarez Duque
REU Site: REU Site: Snapshots of Chemistry -- Visualization of Processes at the Molecular Level
Host Institution: University of Southern California
Grant #: 1156836
Principal Investigator/ Faculty Mentor: Dr. Peter Z. Qin

2-17
Title: Nanostructured Plasmonic Antenna for Studying Local Redox Reaction and Photo-Induced Charge Transfer Events
Presenter(s): Jeremy L Hitt
REU Site: REU Site: Research Experiences for Undergraduates in Chemistry at The University of Alabama
Host Institution: The University of Alabama
Grant #: 1358971
Principal Investigator/ Faculty Mentor: Dr. John B. Vincent

2-18
Title: DFT Investigations of C-H Activating Metal-Nitrido Complexes
Presenter(s): Olivia A. Hull
REU Site: Undergraduate Research Opportunities at the Interface of Computational and Experimental Chemistry at the University of North Texas
Host Institution: University of North Texas
Grant #: 1461027
Principal Investigator/ Faculty Mentor: Dr. LeGrande M. Slaugh

2-19
Title: Base-Catalyzed Umpolung Reaction between Acyl Hemimercaptal and Aldehyde Electrophiles
Presenter(s): Leslie Leiva
REU Site: Summer Undergraduate Research Opportunity in Chemistry (SUROC) at UNC Chapel Hill
Host Institution: University of North Carolina at Chapel Hill
Grant #: 1460874
Principal Investigator/ Faculty Mentor: Dr. Jeffrey Johnson
2-20
**Title:** Engineering Increased Ketosteroid Isomerase Activity into a Mycobacterium Tuberculosis Protein through Predictive Computational Methods  
**Presenter(s):** Gabriel Felix Levine  
**REU Site:** REU Site: Research Opportunities in Biological and Chemical Catalysis  
**Host Institution:** Northeastern University  
**Grant #:** 1262734  
**Principal Investigator/ Faculty Mentor:** Dr. Mary Jo Ondrechen and Dr. Carla Mattos

2-21
**Title:** Incorporating the Effect of Electronic Polarization in Classical Molecular Simulations of Proteins  
**Presenter(s):** Heather Morgan  
**REU Site:** An Interdisciplinary Undergraduate Research Experience in Chemistry at Oklahoma State University  
**Host Institution:** Oklahoma State University  
**Grant #:** 1559874  
**Principal Investigator/ Faculty Mentor:** Dr. Chris Fennell

2-22
**Title:** Bond Dissociation Energies of Diatomic Molecules MSe and MSi (M= Ti, Zr, Hf, V, Nb, Ta) Using Resonant Two-Photon Ionization Spectroscopy  
**Presenter(s):** Thomas Persinger  
**REU Site:** Catalysis in a Collaborative REU Program at the University of Utah  
**Host Institution:** University of Utah  
**Grant #:** 1358740  
**Principal Investigator/ Faculty Mentor:** Dr. Janis Louie

2-23
**Title:** Indium Phosphide Quantum Dot-Based FRET Probe for the Analysis of Phosphatase Activity  
**Presenter(s):** Rebecca K Pontius  
**REU Site:** Research Experience for Undergrads in Advanced Chemical Sensing and Imaging  
**Host Institution:** University of Maryland Baltimore County  
**Grant #:** 1460653  
**Principal Investigator/ Faculty Mentor:** Dr. Zeev Rosenzweig

2-24
**Title:** Self-Assembly of Monolayers on Graphene with Pyrene and Cyclodextrin Derivatives  
**Presenter(s):** Emily Swanson  
**REU Site:** REU Site: Challenges for the 21st Century  
**Host Institution:** University of Minnesota Department of Chemistry  
**Grant #:** 1359181  
**Principal Investigator/ Faculty Mentor:** Dr. Steven Kass
NSF Division: Computer and Information Science and Engineering

3-1
**Title:** Software Safety in Autonomous Cars: Emerging Research and Technology  
**Presenter(s):** Andrew Berry  
**REU Site:** Software Safety: Research, Practice and a Path Forward  
**Host Institution:** University of Texas at Dallas  
**Grant #:** 1461149  
**Principal Investigator/ Faculty Mentor:** Dr. Eric Wong

3-2
**Title:** Efficient Computation of the Random Walk Fundamental Tensor using Low Rank Perturbations  
**Presenter(s):** Alejandro Buendia  
**REU Site:** REU Site: Computational Methods for Discovery Driven by Big Data  
**Host Institution:** University of Minnesota, Twin Cities  
**Grant #:** 1460620  
**Principal Investigator/ Faculty Mentor:** Dr. Daniel Boley

3-3
**Title:** Active Vehicular Authentication  
**Presenter(s):** Angela Burton  
**REU Site:** Research on Security of Mobile Devices and Wireless Networks  
**Host Institution:** New York Institute of Technology  
**Grant #:** 1559652  
**Principal Investigator/ Faculty Mentor:** Dr. Jonathan Voris and Dr. Ziqian (Cecilia) Don

3-4
**Title:** Technologically Observable Psychophysiological Correlates with Video-based Online Learning  
**Presenter(s):** Ashley Edwards  
**REU Site:** Computational Sensing  
**Host Institution:** Rochester Institute of Technology  
**Grant #:** 1559889  
**Principal Investigator/ Faculty Mentor:** Dr. Cecilia O Alm and Dr. Reynold Bailey

3-5
**Title:** Automated Extraction of Regulated Information Types using Hyponymy Relations  
**Presenter(s):** Morgan Evans  
**REU Site:** REU Site: Interdisciplinary Software Engineering  
**Host Institution:** Carnegie Mellon University  
**Grant #:** 1560137  
**Principal Investigator/ Faculty Mentor:** Dr. Joshua Samuel Sunshine and Dr. Travis Breaux
3-6
**Title:** An Exploratory Study of Language Vagueness in Website Privacy Policies  
**Presenter(s):** Nicole Lee Fella  
**REU Site:** Research Experiences in the Internet of Things  
**Host Institution:** University of Central Florida  
**Grant #:** 1560302  
**Principal Investigator/ Faculty Mentor:** Dr. Damla Turgut

3-7
**Title:** Configuring and Controlling a Software Defined Network with a Pica8 Switch  
**Presenter(s):** Jason Palmer Loux  
**REU Site:** Enhancing Undergraduate Experience in Mobile Cloud Computing  
**Host Institution:** Temple University  
**Grant #:** 1460971  
**Principal Investigator/ Faculty Mentor:** Dr. Jie Wu

4-1
**Title:** Empowering Older Adult Creative Groups Using Maker Technology  
**Presenter(s):** Samantha A Whitman and Olivia Kathleen Richards  
**REU Site:** Proactive Health Informatics  
**Host Institution:** Indiana University  
**Grant #:** 1560276  
**Principal Investigator/ Faculty Mentor:** Dr. Katie A Siek and Dr. Ben A. Jelen

4-2
**Title:** Discrete Logarithm and Minimum Circuit Size Problem  
**Presenter(s):** Michael Rudow  
**REU Site:** DIMACS REU in Computing Theory and Applications Impacting Society  
**Host Institution:** Rutgers University  
**Grant #:** 1559855  
**Principal Investigator/ Faculty Mentor:** Dr. Lazaros Gallos

4-3
**Title:** Collision Avoidance Algorithms For Unmanned Aerial Vehicles Using Computer Vision  
**Presenter(s):** Hani Sedaghat-Pisheh  
**REU Site:** REU Site on Smart UAVs  
**Host Institution:** Auburn University  
**Grant #:** 1540326  
**Principal Investigator/ Faculty Mentor:** Dr. Saad Biaz and Dr. Richard Chapman
4-4
Title: Enhancing Tangible Tokens Through Additive Manufacturing and Capacitive Sensing
Presenter(s): Marc Delarosa and Alexandre Siqueira
REU Site: Interdisciplinary Research Experience in Computational Sciences
Host Institution: Louisiana State University
Grant #: 1560410
Principal Investigator/ Faculty Mentor: Dr. Jesse Allison and Dr. Brygg Ullmer

4-5
Title: Meta Information Extraction Framework for Text Mining of Unstructured Adverse Event Narratives
Presenter(s): Amber Wallace and Vimig Socrates
REU Site: REU SITE: Data Science Research for Safe, Sustainable and Healthy Communities
Host Institution: Worcester Polytechnic Institute
Grant #: 1560229
Principal Investigator/ Faculty Mentor: Dr. Elke A Rundensteiner

4-6
Title: Online Concurrent Open Shop Scheduling
Presenter(s): Pascal Sturmfels and Kevin Sun
REU Site: Combinatorics and Algorithms for Real Problems
Host Institution: University of Maryland at College Park, Dept of Comp Sci
Grant #: 1560193
Principal Investigator/ Faculty Mentor: Dr. William Gasarch and Dr. Samir Khuller

4-7
Title: Smart Buoys for the NU MONET: Bridging the Internet between Land and Sea
Presenter(s): Andrew Tu
REU Site: MRI: Development of the Northeastern University Marine Observatory NETwork (NU MONET)
Host Institution: Northeastern University
Grant #: 1428567
Principal Investigator/ Faculty Mentor: Dr. Stefano Basagni

4-8
Title: Visualizing and Troubleshooting Massive Science Applications with ELK
Presenter(s): Anna Yannakopoulos
REU Site: DISC: Data Intensive Scientific Computing
Host Institution: University of Notre Dame
Grant #: 1560363
Principal Investigator/ Faculty Mentor: Dr. Douglas Thain
Title: Radio Receiver Design for Unmanned Aerial Wildlife Tracking
Presenter(s): Daniel Webber
REU Site: Engineers for Exploration
Host Institution: University of California, San Diego
Grant #: 1560162
Principal Investigator/ Faculty Mentor: Dr. Ryan Kastner, Dr. Curt Schurgers

NSF Division: Earth Sciences

Title: Assessment of Macroinvertebrate and Water Quality Responses to Stream Restoration
Presenter(s): Stephanie Estell
REU Site: REU Site: Evaluating the Effectiveness of Stream Restoration Projects Based
Host Institution: Oklahoma State University
Grant #: 1358908
Principal Investigator/ Faculty Mentor: Dr. Garey Fox and Dr. Andy Dzialowski

Title: Coupling Extremes in Climate Data to ENSO Events
Presenter(s): Ryan Jourdain and Adrian Hernandez
REU Site: REU Site: Summer Undergraduate Research Fellowships in Earth and Environmental Sciences (SURFEES)
Host Institution: Chapman University
Grant #: 1359500
Principal Investigator/ Faculty Mentor: Dr. Christopher Kim and Dr. Hesham El-Askary

Title: Evaluating the Importance of Regolith Heterogeneity on Catchment Hydrology in Garner Run, Susquehanna Shale Hills Critical Zone Observatory, Pennsylvania, USA
Presenter(s): Perri Silverhart
REU Site: Collaborative Research: Introducing Critical Zone Science to Students and Teachers
Host Institution: The Pennsylvania State University
Grant #: 1263212
Principal Investigator/ Faculty Mentor: Dr Timothy Stapler White

Title: Magnetic Susceptibility: Correlations with Clay Content and Apparent Diffusion Coefficients Controlling Electrical Double Layer Polarization
Presenter(s): Tonian Robinson
REU Site: Dynamic Urban Environmental Science and Sustainability (DUESS)
Host Institution: Rutgers University, Newark
Grant #: 1459228
Principal Investigator/ Faculty Mentor: Dr. Alexander E Gates and Dr. Lee Slater
NSF Division: Education and Human Resources

1-21
**Title:** Correlating Professional Noticing and Attitudes Towards Mathematics
**Presenter(s):** Meredith Davis and Mallory Bickett
**REU Site:** REU Site: Supporting Undergraduate Research Fellows In Timely STEM Education Research Via the University of Kentucky's STEM Education Research Laboratory
**Host Institution:** University of Kentucky
**Grant #:** 1156848
**Principal Investigator/ Faculty Mentor:** Dr. Molly Fisher

1-22
**Title:** Products of Third Grade Multiplicative Thinking and Reasoning
**Presenter(s):** Silviya Gallo
**REU Site:** Preparing Aspiring Teachers to Hypothesize Ways to Assist Young Students (PATHWAYS)
**Host Institution:** Salisbury University
**Grant #:** 1356001
**Principal Investigator/ Faculty Mentor:** Dr. Randall E Groth

1-23
**Title:** The Forensic Value of Trace Metals in Cement
**Presenter(s):** Rachael Messier
**REU Site:** REU SITE: INTERDISCIPLINARY RESEARCH ON SUSTAINABLE INFRASTRUCTURE MATERIALS
**Host Institution:** Worcester Polytechnic Institute
**Grant #:** 1359064
**Principal Investigator/ Faculty Mentor:** Dr. Aaron Richard Sakulich

NSF Division: Engineering

3-8
**Title:** A Constraint Satisfaction Problem Approach to High-Entropy Alloy Design
**Presenter(s):** Anas Abu-Odeh
**REU Site:** Multifunctional Materials
**Host Institution:** Texas A&M University
**Grant #:** 1461202
**Principal Investigator/ Faculty Mentor:** Dr. Raymundo Arroyave

3-9
**Title:** Energy Interactions in Homogeneously Sheared Magnetohydrodynamic Flows
**Presenter(s):** Diane Collard
**REU Site:** Aerospace Experience Research Opportunities for Undergraduates (AERO-U)
**Host Institution:** Texas A&M University Aerospace Engineering Dept.
**Grant #:** 1157070
**Principal Investigator/ Faculty Mentor:** Dr. Sharath S. Girimaji, and Dr. Jacques C. Richard
3-10
Title: Computational Design of Polymer Nanocomposites for UAV Materials
Presenter(s): Julie Duetsch
REU Site: REU SITE: Summer Internships in Composites for Extreme Performance
Host Institution: North Carolina State University
Grant #: 1460935
Principal Investigator/ Faculty Mentor: Dr. Mark Pankow and Dr. Melissa Pasquinelli

3-11
Title: Polyhydroxy Fullerene Encapsulated Particles for Preventing UV-Induced Skin Cancer
Presenter(s): Celia Dunn
REU Site: An Immersive Research Engineering Training Program for Undergraduates
Host Institution: Cleveland Clinic, Department of Biomedical Engineering
Grant #: 1358579
Principal Investigator/ Faculty Mentor: Dr. Vijay Krishna

3-12
Title: 3D Scanning Technology for Assessment of Aging Bridges
Presenter(s): Ryan Enos
REU Site: REU Site: Research Experience in Cyber and Civil Infrastructure Security: Fostering Innovation
Host Institution: University of Connecticut
Grant #: 1461165
Principal Investigator/ Faculty Mentor: Dr. Arash Esmaili Zaghi

3-13
Title: Influence of Posture on Thoracoabdominal Organs Among 5th, 50th and 95th Percentile Male Subjects
Presenter(s): Katelyn Greene
REU Site: REU Site: Imaging and Mechanics-based Projects on Accidental Cases of Trauma (IMPACT)
Host Institution: Wake Forest University School of Medicine
Grant #: 1559700
Principal Investigator/ Faculty Mentor: Dr. Joel Stitzel

3-14
Title: Micro-patterning on Soft Substrates for Controlled Cell Stretching
Presenter(s): Sydney Maria Gustafson
REU Site: Integrated Bioengineering Research, Education, and Outreach Experiences for Females and Underrepresented Minorities at WPI
Host Institution: Worcester Polytechnic Institute
Grant #: 1156821
Principal Investigator/ Faculty Mentor: Dr. Kristen Billiar
3-15
Title: Fabrication of Nanoscale Devices for the Detection of Bose Einstein Condensation
Presenter(s): Kaeli Hughes
REU Site: Research Experience for Undergraduates in Nanoscale Science & Engineering
Host Institution: International Inst for Nanotechnology at Northwestern University
Grant #: 1359004
Principal Investigator/ Faculty Mentor: Dr. Emily Allyn Weiss

3-16
Title: Model of Hepatitis C Viral Dynamics through Deterministic and Stochastic Methods
Presenter(s): Milby H. Griggs Hutaff
REU Site: Research Experience for Undergraduates with a Focus on Community College Students
Host Institution: Rice University
Grant #: 1461248
Principal Investigator/ Faculty Mentor: Dr. Carolyn Nichol

3-17
Title: Mapping Lithium Distribution in Thin-Film All-Solid-State Batteries by Time-of-Flight Secondary-Ion Mass Spectrometry
Presenter(s): Zinab Jadidi
REU Site: Summer Engineering Research Experiences in Transportation Electrification
Host Institution: University of Maryland
Grant #: 1559845
Principal Investigator/ Faculty Mentor: Dr. Marina Leite

3-18
Title: Application of HEC-HMS in North Buffalo Creek Watershed
Presenter(s): Akosua Johnson
REU Site: Engineering Modeling and Computational Research
Host Institution: North Carolina A&T State University
Grant #: 1560385
Principal Investigator/ Faculty Mentor: Dr. Manoj Jha

3-19
Title: Analog Quantum Simulation of a Quantum Kicked Top
Presenter(s): Hannah Knaack
REU Site: Research in Optics
Host Institution: University of Arizona
Grant #: 1460723
Principal Investigator/ Faculty Mentor: Dr. R. John Koshnel
3-20
Title: Computerized Diagnosis of Breast Cancer through Machine Learning and Infrared Spectroscopy
Presenter(s): Matthew A Kavanaugh
REU Site: REU Site Discoveries in Bioimaging
Host Institution: University of Illinois at Urbana-Champaign
Grant #: 1461038
Principal Investigator/ Faculty Mentor: Dr. Stephen Boppart

3-21
Title: Single Pulse Shock Tube Study of the Jet Fuel JP-10
Presenter(s): Ninoshka Fiorella and Llontop Lozano
REU Site: High Pressure Ring Contraction of Cyclic Hydrocarbons, Supplement
Host Institution: University of Illinois at Chicago
Grant #: 1510039
Principal Investigator/ Faculty Mentor: Kenneth Brezinsky

3-22
Title: Additive Manufacturing of Wheel Chair Wheels
Presenter(s): Maureen E Burke and Devin Mallett
REU Site: Collaborative Research: Collaborative RET Site - Inspiring Next Generation High-skilled Workforce in Advanced Manufacturing and Materials
Host Institution: University of Dayton
Grant #: 1405923
Principal Investigator/ Faculty Mentor: Dr. Margaret Pinnell

3-23
Title: Dry Transfer and Characterization of Graphene Nanoribbons
Presenter(s): Bryan Manuele
REU Site: Advancing California Community College Students through Engineering Research
Host Institution: University of California, Berkeley
Grant #: 1461157
Principal Investigator/ Faculty Mentor: Dr. Jeffrey Bokor and Dr. Lea K. Marlor

3-24
Title: The Future of Bamboo as a Building Material
Presenter(s): Zoey M. Craun and Mary Allen Mullins
REU Site: Innovative Engineering Using Renewable Resources
Host Institution: The University of Alabama
Grant #: 1559867
Principal Investigator/ Faculty Mentor: Dr. Susan Burkett
3-25
Title: Adaptive Biological Microscope
Presenter(s): Kylee O'Dell
REU Site: Integrated Nanomanufacturing
Host Institution: Boston University
Grant #: 1461152
Principal Investigator/ Faculty Mentor: Dr. Helen Fawcett

3-26
Title: Sensors and Dynamics Parameters Integration for Decreased Human Interaction in Fly/Drive-By-Wire Navigation with Advanced Configurations
Presenter(s): Deborah Adekemi Ojo
REU Site: Undergraduate Research in Green-Engineered New Transportation Technologies
Host Institution: Georgia Southern University
Grant #: 1262947
Principal Investigator/ Faculty Mentor: Dr. Valentin Soloiu

3-27
Title: Establishing a Mathematical Model to Estimate Knee Joint Loading During Gait
Presenter(s): Oluwajomiloju A Olaode
REU Site: REU Site: Dare to BE FIRST - Biomechanical Engineering Foundations in Impactful Research, Science & Technolog
Host Institution: University of Delaware
Grant #: 1460757
Principal Investigator/ Faculty Mentor: Dr. Xin Lu

3-28
Title: Visualization of Volumetric Flows Using Plenoptic Background Oriented Schlieren System
Presenter(s): Adam O'Neill
REU Site: NSF REU Site: Multi-physics of Active Systems and Structures
Host Institution: Florida State University
Grant #: 1560337
Principal Investigator/ Faculty Mentor: Dr. Chiang Shih and Dr. Louis Cattafesta

3-29
Title: Distribution and Toxicity of Nano-Polystyrene in Developing Zebrafish (Danio rerio)
Presenter(s): Jordan Avery Pitt
REU Site: Research Experiences for Undergraduates in Environmental Implications of Nanotechnology
Host Institution: Duke University-Center for Environmental Implications of Nanotechnology (CEINT)
Grant #: 1359131
Principal Investigator/ Faculty Mentor: Dr. Glenda T. Kelly
3-30
Title: 3-D Printed Properties of Interfaces in Fatigue
Presenter(s): Marsalis P Pullen
REU Site: Manufacturing and Techno-Entrepreneurship
Host Institution: Tennessee Tech University - Center for Mfg Research
Grant #: 1461179
Principal Investigator/ Faculty Mentor: Dr. Joseph J Rencis

3-31
Title: Environmental Fate Prediction via Atom-Based Computer Simulations
Presenter(s): Thalia Quinn
REU Site: REU Site: Summer Academy in Sustainable Manufacturing
Host Institution: Wayne State University
Grant #: 1461031
Principal Investigator/ Faculty Mentor: Dr. Jeremy Rickli

3-32
Title: 3D Printed Piezoresistive Pressure Sensor
Presenter(s): Griselda Saucedo
REU Site: Interdisciplinary Micro/Nano Manufacturing Program Addressing Challenges Today (IMPACT)
Host Institution: University of Louisville
Grant #: 1542164
Principal Investigator/ Faculty Mentor: Dr. Kevin Walsh and Dr. Douglas Jackson

3-33
Title: Surface Plasmon Resonance Imager Using a Coded-Aperture Sensor
Presenter(s): Cameron J Spitzfaden
REU Site: A Multidisciplinary Research Experience in Engineered Bioactive Interfaces and Devices
Host Institution: University of Kentucky
Grant #: 1460486
Principal Investigator/ Faculty Mentor: Dr. Kimberly Anderson and Dr. Todd Hastings

3-34
Title: Study of Copper Removal from Water Using Yersiniabactin on Activated Carbon
Presenter(s): Amanda Sun
REU Site: Environmental Engineering Solutions for Pollution Prevention
Host Institution: State University of New York at Buffalo
Grant #: 1559989
Principal Investigator/ Faculty Mentor: Dr. John D. Atkinson
Title: Fractal Patterning of Microfliers and Growth of Black Silicon for Enhanced Optical Absorption
Presenter(s): Kensei Yee
REU Site: REU Supplement: EAGER: Opto-Radiometric Powered Untethered MEMS Microfliers
Host Institution: University of Illinois at Chicago
Grant #: 1620282
Principal Investigator/ Faculty Mentor: Dr. Igor Paprotny

NSF Division: Materials Research

Title: High modulus and Conductivity Polymer Electrolyte Membranes
Presenter(s): Jesus G Au
REU Site: UMN MRSEC REU Site in Nanomaterials
Host Institution: University of Minnesota MRSEC
Grant #: 1559833
Principal Investigator/ Faculty Mentor: Dr. Phil J Engen and Dr. David A Blank

Title: Low Cost Portable Biosensors Made from Low Cost Porous Silicon Annular Bragg Resonators
Presenter(s): Yasmin M. Graham
REU Site: Nanoscale Materials Science and Engineering at Vanderbilt University
Host Institution: Vanderbilt University
Grant #: 1263182
Principal Investigator/ Faculty Mentor: Dr. Clare McCabe

Title: Effects of Orientational Control on Multifunctional Properties of Multilayer Graphene Nanoplatelets in an Epoxy Matrix
Presenter(s): Johnathan Guillen
REU Site: Interdisciplinary Research Experience for undergraduates interested in Materials Science and Engineering
Host Institution: Oklahoma State University
Grant #: 1460943
Principal Investigator/ Faculty Mentor: Dr. Ranji Vaidyanathan and Dr. Raman P. Singh

Title: TEM Imaging of mRNA-Gold Nanoparticles Internalized in Human Islet Cells in Biocompatible Graphene Liquid Cells
Presenter(s): Meagan Ouy
REU Site: The Summer Diabetes Research Program at UIC
Host Institution: University of Illinois at Chicago/Bioengineering
Grant #: 959470
Principal Investigator/ Faculty Mentor: Dr. Tolou Shokuhfar
2-29
Title: Structure and Properties of Novel Ceramic Membranes for Flow Batteries
Presenter(s): Eden Rivers
REU Site: Clean Energy Bridge to Research
Host Institution: University of Washington
Grant #: 1559787
Principal Investigator/ Faculty Mentor: Dr. Janice DeCosmo

2-30
Title: Hybrid Perovskites for Photovoltaics
Presenter(s): Natalie Schwab
REU Site: REU Site: Materials for Energy & Sustainability
Host Institution: Boise State University
Grant #: 1359344
Principal Investigator/ Faculty Mentor: Dr. Rick Ubic

2-31
Title: Non-native Amino Acids for Electronic Organic Materials and Application
Presenter(s): Christina Tao
REU Site: Materials Connection REU
Host Institution: University of California - Riverside
Grant #: 1359136
Principal Investigator/ Faculty Mentor: Dr. Ludwig Bartels

2-32
Title: Developing planar lipid bilayer techniques to supplement atomic force microscopy for single molecule structural biology investigations
Presenter(s): Miles Thies
REU Site: Research Experience for Undergraduates in Materials and Modeling
Host Institution: University of Missouri
Grant #: 1359430
Principal Investigator/ Faculty Mentor: Dr. Gavin King

NSF Division: Mathematical Sciences

4-10
Title: Characterizing Noise in a Mathematical Model of the Adipogenic Transcriptional Network
Presenter(s): Erin Elizabeth Angelini
REU Site: Distributed REU in the Mathematical Biosciences
Host Institution: The Ohio State University
Grant #: 1461163
Principal Investigator/ Faculty Mentor: Dr. Martin Golubitsky and Dr. Alexandra Jilkine
4-11
**Title:** Global Dynamics of a Cancer Stem Cell Treatment Model  
**Presenter(s):** Robert Dougherty-Bliss  
**REU Site:** Winthrop University REU: Bridging Applied and Theoretical Mathematics  
**Host Institution:** Winthrop University  
**Grant #:** 1358534  
**Principal Investigator/ Faculty Mentor:** Dr. Kristen Abernathy and Dr. Zachary Y Abernathy

4-12
**Title:** A Game of Edge Removal on Graphs  
**Presenter(s):** Alisa Ediger  
**REU Site:** Challenges of Identifying Integer Sequences Using the OEIS  
**Host Institution:** Muhlenberg College  
**Grant #:** 1560019  
**Principal Investigator/ Faculty Mentor:** Dr. Eugene Fiorini Jr. and Dr. Nathan Shank

4-13
**Title:** Performance Comparison of Intel Xeon Phi Knights Landing  
**Presenter(s):** Ishmail A Jabbie  
**REU Site:** Interdisciplinary Program in High Performance Computing  
**Host Institution:** University of Maryland, Baltimore County (UMBC)  
**Grant #:** 1460652  
**Principal Investigator/ Faculty Mentor:** Dr. Matthias K Gobbert

4-14
**Title:** A Statistical and Geographical Analysis of Rocky Mountain Fever in Oklahoma  
**Presenter(s):** Monica Christine Jackson  
**REU Site:** SPIRAL at Morgan State University  
**Host Institution:** American Statistical Association  
**Grant #:** 1560332  
**Principal Investigator/ Faculty Mentor:** Dr. Sabin White

4-15
**Title:** Comparative Analysis of Linear and Nonlinear Dimension Techniques on Mass Cytometry Data  
**Presenter(s):** Nathan T. Jekel  
**REU Site:** Modeling and Simulation in Systems Biology  
**Host Institution:** UConn Health, Center for Quantitative Medicine  
**Grant #:** 1460967  
**Principal Investigator/ Faculty Mentor:** Dr. Reinhard Laubenbacher
4-16
Title: Modeling Optimal Oyster Reef Placement in the Chesapeake Bay
Presenter(s): Alex Schoen and Mary H Korendyke
REU Site: Emerging Scholars Program REU
Host Institution: St. Mary's College of Maryland
Grant #: 1560301
Principal Investigator/ Faculty Mentor: Dr. Sandy Ganzell

4-17
Title: Measuring Human Ageing through Mathematical Analysis of Genomic Data
Presenter(s): Jaylen M Lee
REU Site: Diverse Undergraduate Research Experiences in Statistics
Host Institution: Lamar University
Grant #: 1560332
Principal Investigator/ Faculty Mentor: Dr. Kumer P Das

4-18
Title: Characterizing Administrative Data Quality – A New Tool
Presenter(s): Adrienne Elizabeth Rogers
REU Site: Diverse Undergraduate Research Experiences in Statistics
Host Institution: American Statistical Association and Virginia Tech
Grant #: 1560332
Principal Investigator/ Faculty Mentor: Dr. Stephanie S Shipp

4-19
Title: Constructing Networks to Analyze the Aggregation and Deformation of the Short-range Cluster
Presenter(s): Gabriella Studt
REU Site: Mathematics, Applied Mathematics, and Statistics-REU (MAPS-REU)
Host Institution: University of Maryland University College Park
Grant #: 1359307
Principal Investigator/ Faculty Mentor: Dr. Kasso Okoudjou and Dr. Maria Cameron

4-20
Title: Anomalous Primes and the Elliptic Korselt Criterion
Presenter(s): Gregory K Taylor
REU Site: Complexity Across Disciplines
Host Institution: Boise State University
Grant #: 1359425
Principal Investigator/ Faculty Mentor: Dr. Liljana Babinkostova
4-21
**Title:** Demographic Modeling of Indiana Bat Population Subject to Stress by Wind Energy  
**Presenter(s):** Tiffany Tu  
**REU Site:** University of Wisconsin - La Crosse REU in Mathematical Ecology  
**Host Institution:** University of Wisconsin - La Crosse  
**Grant #:** 1559663  
**Principal Investigator/ Faculty Mentor:** Dr. Eric Eager

4-22
**Title:** The Secure-Domination Number of the Balanced Full Binary Tree with 2n leafs  
**Presenter(s):** John Weeks  
**REU Site:** Research Experience for Undergraduates in Algebra and Discrete Mathematics at Auburn University  
**Host Institution:** Auburn University  
**Grant #:** 1560257  
**Principal Investigator/ Faculty Mentor:** Dr. Overtoun Jenda

4-23
**Title:** Closed Forms of Recursive Polynomial Sequences and Combinatorial Identities  
**Presenter(s):** Alex Wilson  
**REU Site:** REU Site: REU in Discrete and Applied Mathematics  
**Host Institution:** Michigan State University  
**Grant #:** 1559776  
**Principal Investigator/ Faculty Mentor:** Dr. Robert W Bell and Dr. Aklilu Zeleke

**NSF Division: Ocean Sciences**

1-24
**Title:** Under the Sea: An Unusual Antibiotic Iodinated Compound  
**Presenter(s):** Christine Jasmine  
**REU Site:** Aquatic Chemical Ecology  
**Host Institution:** Georgia Institute of Technology  
**Grant #:** 1559923  
**Principal Investigator/ Faculty Mentor:** Dr. Frank Stewart

**NSF Division: Physics**

4-24
**Title:** Calculating Optical Properties of Delafossite Nitrides from First Principles  
**Presenter(s):** Timothy J Alderson  
**REU Site:** REU Site: Research Experiences for Undergraduates in Physics and Astronomy at The University of Toledo  
**Host Institution:** University of Toledo  
**Grant #:** 1262810  
**Principal Investigator/ Faculty Mentor:** Dr. Richard E Irving
4-25
Title: Late-Time Phase Transitions and Scalar Field Interactions with the Cosmic Neutrino Background
Presenter(s): Jason Arakawa
REU Site: Physics Research in America's Historic Triangle
Host Institution: College of William and Mary
Grant #: 1359364
Principal Investigator/ Faculty Mentor: Dr. Irina Novikova

4-26
Title: Understanding Limbless Locomotion in Granular Media
Presenter(s): Kelimar Diaz
REU Site: REU Site: Broadening participation in undergraduate research in physics: A multi-institutional REU program.
Host Institution: School of Physics/Georgia Institute of Technology
Grant #: 1560165
Principal Investigator/ Faculty Mentor: Dr. Daniel Goldman, and Dr. Jennifer E. Curtis

4-27
Title: Investigation of Battery Performance with the Addition of Gold Nanoparticles to LiFePO4 Cathode Material
Presenter(s): Morgan K Githinji
REU Site: REU Site in Physics at Howard University
Host Institution: Howard University
Grant #: 1358727
Principal Investigator/ Faculty Mentor: Dr. Prabhakar Misra, and Dr. Quinton L Williams

4-28
Title: The Dynamics of Aging in Ferroelectric Deuterated Potassium Dihydrogen
Presenter(s): Rochel Hecht
REU Site: REU Site: Applying the Tools of Physics - From the Cosmos to the Living Cell
Host Institution: University of Illinois Urbana-Champaign
Grant #: 1359126
Principal Investigator/ Faculty Mentor: Dr. Kevin Pitts

4-29
Title: Engineered Protein Nanopore for Targeted Drug Delivery
Presenter(s): Celina Hsieh
REU Site: Interactive Biomaterials
Host Institution: Syracuse University
Grant #: 1460784
Principal Investigator/ Faculty Mentor: Dr. Liviu Movileanu
Title: AC Field Chamber - Extending the Reach of Dark Matter Detectors
Presenter(s): Nicholas Hulstrand
REU Site: Summer Research Experience for Undergraduates in Physics
Host Institution: Rensselaer Polytechnic Institute
Grant #: 1560266
Principal Investigator/ Faculty Mentor: Dr. Peter Persans

Title: Improving Light Collection Efficiency in HAWC Detector Tanks
Presenter(s): Jonah Kudler-Flam
REU Site: REU Site in Physics and Optics at Rochester
Host Institution: University of Rochester
Grant #: 1460352
Principal Investigator/ Faculty Mentor: Dr. Arie Bodek

Title: Bringing Modern Machine Learning Techniques to NO&$\#957;$A Event Classification
Presenter(s): Russell Pekala
REU Site: Physics and Astronomy at University of Minnesota
Host Institution: University of Minnesota
Grant #: 146014
Principal Investigator/ Faculty Mentor: Dr. Alex Kamenev

Title: Optimizing a Convolutional Visual Network to Identify Neutrino Interactions
Presenter(s): Jordan D Potter
REU Site: Physics and Astronomy at University of Minnesota
Host Institution: University of Minnesota
Grant #: 146014
Principal Investigator/ Faculty Mentor: Dr. Marvin Marshak

Title: Comparison of Models of South Pole Ice for the IceCube Neutrino Observatory
Presenter(s): Roman Gradford, Lorena Mezini, and Kristine Romich
REU Site: Research In Neutrino Astrophysics at the University of Wisconsin-River Falls
Host Institution: University of Wisconsin-River Falls
Grant #: 1460752
Principal Investigator/ Faculty Mentor: Dr. Suruj Seunarine
NSF Division: Social, Behavioral, and Economic Sciences

1-25
Title: Dual Language Learners and the Informal Science Experience
Presenter(s): Lindsay Ann Bankole
REU Site: The Science of Language and the Language of Science
Host Institution: Ohio State University
Grant #: 1461039
Principal Investigator/ Faculty Mentor: Dr. Laura Wagner

1-26
Title: A Nuclear Impact: Examining the Aftermath of the Chernobyl Nuclear Disaster on the Nearby Ukrainian Population
Presenter(s): Matt Bolt
REU Site: Effects of political upheaval and ethnic discord on the mental health of a population
Host Institution: Dordt College
Grant #: 1560078
Principal Investigator/ Faculty Mentor: Dr. Nathan L Tintle and Dr. Luralyn Helming

1-27
Title: Racism-Related Coping and Depressive Symptoms: Exploring Gender Differences among African Americans
Presenter(s): Breanna Brock
REU Site: Social Disparities in Health, Health Behaviors and Access to Care
Host Institution: Institute for Health, Health Care Policy and Aging Research, Rutgers University
Grant #: 1460354
Principal Investigator/ Faculty Mentor: Dr. Jane E Miller

1-28
Title: An Evaluation of the Effectiveness of the Pedestrian Intersection Safety Index to Predict Pedestrian Fatalities in Florida
Presenter(s): Jack Cordes
REU Site: Cyber-HealthGIS - Multidisciplinary Research Experiences in Spatial Dynamics of Health
Host Institution: Texas A&M University
Grant #: 1560106
Principal Investigator/ Faculty Mentor: Dr. Daniel W Goldberg

1-29
Title: Collaborative Research Center for American Indian Health: An Application of the Competing Values Framework
Presenter(s): Reijuana Harley
REU Site: Social-Behavioral Research Training in American Indian Community-Based Projects
Host Institution: Sanford Research
Grant #: 1559899
Principal Investigator/ Faculty Mentor: Dr. DenYelle Kenyon
1-30
Title: Moral Injury and Stress Response Patterns in Veterans
Presenter(s): Emily Ferrell and John Huyser
REU Site: Collaborative Research: Training Diverse Undergraduate Teams of Veterans and Non-Veterans to Conduct Trauma Research with Veterans
Host Institution: Syracuse University
Grant #: 1559793
Principal Investigator/Faculty Mentor: Dr. Brooks B Gump and Dr. Matthew Dykas

1-31
Title: Cultural Hybridity and Greek Colonization: A Case Study of Himera Utilizing Strontium Isotope Analysis
Presenter(s): Adam Kazmi
REU Site: Collaborative Research: Immersive Research in the Bioarchaeology of Greek Colonization, Sicily, Italy
Host Institution: University of Georgia, University of Northern Colorado
Grant #: 1560227
Principal Investigator/Faculty Mentor: Dr. Laurie Reitsema and Dr. Britney Kyle

1-32
Title: Integrating Cognitive Diagnostic Modeling into the AP-CAT
Presenter(s): Katlynn Kennedy
REU Site: REU Site: Computational Social Science at the University of Notre Dame
Host Institution: University of Notre Dame
Grant #: 1560089
Principal Investigator/Faculty Mentor: Dr. Paul R Brenner

1-33
Title: Consistently off the Mark: Examining Structure in the Cybervetting Process
Presenter(s): Kaleena Rachel Odd
REU Site: REU Site: Advancing Psychological Research with Technology
Host Institution: Western Kentucky University
Grant #: 1460942
Principal Investigator/Faculty Mentor: Dr. Amber N. Schroeder

1-34
Title: Intersecting Identities and Land Meanings: BMP Use Among Non-Operating Landowners
Presenter(s): Clare Salerno
REU Site: Linking Applied Knowledge in Environmental Sustainability
Host Institution: University of Wisconsin-Stout
Grant #: 1357387
Principal Investigator/Faculty Mentor: Dr. Chris Ferguson
Title: Understanding Personal Hidden Obstacles to Enhance Physical Activity Participation
Presenter(s): Brianna Vernoa
REU Site: Training in Basic and Applied Psychological Science: The Research Experience for Undergraduate Students at Baruch College
Host Institution: Baruch College
Grant #: 1559883
Principal Investigator/ Faculty Mentor: Dr. Daniele Artistico

REUS 2016 Speakers’ Biographies
Alphabetical by last name

Elizabeth L. Ambos is Executive Officer for the Council on Undergraduate Research (CUR). CUR (http://www.cur.org) supports and facilitates high-quality undergraduate student-faculty collaborative research and scholarship. Over 700 institutions and 10000 individuals belong to CUR, an international non-profit organization. Prior to becoming CUR's Executive Officer in May 2012, Beth Ambos served for six years as Assistant Vice Chancellor for Research Initiatives and Partnerships for the 23-campus California State University system. A geophysicist by training, Beth Ambos has also held several appointments at California State University, Long Beach, including Associate Vice President for Research and External Support, Graduate Dean, Associate Dean, and Professor of Geological Sciences in the College of Natural Sciences in Mathematics. She holds a bachelor's degree in geology from Smith College, and Master's and PhD in marine geology and geophysics from University of Hawaii at Mānoa.

Liljana Babinkostova Liljana Babinkostova is an Associate Professor in the Department of Mathematics at Boise State University. Her research efforts concern problems in topology, game theory and cryptography, 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 is a councilor in the Mathematics Division of AAAS-PD, and in the Mathematics and Computer Science Division of CUR. Babinkostova serves as the PI for the NSF REU Site: Complexity Across Disciplines (CAD), a program in interdisciplinary mathematics research and PI for the MAA Site: Research Experience in Mathematics for Young Scientists, a program for high school students.

Dr. John F. Barthell is the Provost and Vice President of Academic Affairs at the University of Central Oklahoma (UCO). He served previously as the Dean of the College of Mathematics and Science (seven years) as well as the Associate Dean (one year) of the same college; he also served one year as an assistant dean in the Joe C. Jackson College of Graduate Studies and Research (UCO). As Dean and Provost, his focus has been on producing a learning model that supports the teacher-scholar role for faculty members. He is an elected Councilor for the Council on Undergraduate Research (CUR) and serves on the National Science Foundation (NSF) Biology "Research Experiences for Undergraduates" (REU) Leadership Council. Dr. Barthell is the Principal Investigator of an REU grant centered in the Republic of Turkey and is the author of over 50 articles pertaining to ecology, natural history, and topics relating to high-impact educational practices.
Susan Brennan is Program Director for NSF’s Graduate Research Fellowship Program and Professor of Psychology with joint appointments in Computer Science and Linguistics at Stony Brook University in NY. She is a cognitive scientist who studies psycholinguistics, spoken dialogue, verbal and nonverbal communication, and the human use of technology. She received a Ph.D. in psychology from Stanford University, a Master of Science from MIT (from what is now the Media Lab), and a B.A. from Cornell University in anthropology. She is passionate about graduate education and was once a Graduate Research Fellow.

Karen Carter is a Program Specialist at the Office of Fellowships and Internships since May 2013. Her focus is on outreach and recruitment for internships and fellowships, with a particular emphasis on diversity. Prior to the Smithsonian, Karen worked for almost 20 years at George Mason University where she taught in the School of Social Impact and Innovation (SSII), an undergraduate interdisciplinary degree program, as well as in Women and Gender Studies. Karen served as the Director of Experiential Learning in SSII, where she oversaw Mason’s Center for Field Studies and the SSII Internship Program. She also served as the Associate Director of Mason’s Women and Gender Studies Program. Karen holds a B.A. in Psychology, a M.A. in Liberal Studies (emphasis on Philosophy and Museum Studies), and is A.B.D. in the Cultural Studies Ph.D. program, all from Mason.

Ruben Michael Ceballos is a Professor of Biology at The University of Arkansas (Fayetteville). He is a co-director of the Minority Institute Astrobiology Collaborative (MIAC) and the Bioenergy Research Collaborative-Microorganisms As Renewable Energy Sources (BRC-MARES). The Ceballos Lab studies extreme and exotic microorganisms and the potential for microbes and their proteins to be used in biotechnology. As a PI on multiple international REU Site projects funded by the U.S. National Science Foundation and research project funded by NASA, Dr. Ceballos has conducted research with students and international collaborators on a variety of topics in the countries of Norway, Mexico, India, Costa Rica, El Salvador, and Malaysia. These projects span a broad range of topics including studies of bioactive properties and anti-microbial properties of tribal-use plants and the impacts of anthropogenic drivers on biodiversity in tribal regions. The Ceballos Lab is a highly interdisciplinary laboratory that provides unique opportunities for students from groups that have been historically underrepresented in the sciences.

Karla Heidelberg is an Associate Professor Teaching in the Marine Environmental Biology section of the Department of Biological Sciences at the University of Southern California. She received her Ph.D. from the University of Maryland in Marine Science. Before joining USC, she was an AAAS Science Policy Fellow at the US Department of State Office of Oceans Affairs followed by being appointed as the Global Programs coordinator for the J. Craig Venter Institute, where she coordinated an around-the-world research expedition to evaluate marine microbial diversity. Her research program at USC focuses on biodiversity and genomic underpinnings of tropical, temperate and polar marine microbial communities. She is a recipient of the USC Steven B. Sample USC Teaching and Mentoring Award, and in 2014 was appointed as the Director of the Environmental Studies Program. Heidelberg serves as the PI on an NSF REU Site: Ocean Coastal Zone Sustainability through the USC Wrigley Institute for Environmental Studies.
R. Corby Hovis is a senior program director in the Directorate for Education and Human Resources at the National Science Foundation (NSF) in Arlington, Virginia, where he has worked since 1997. At NSF, Dr. 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 currently sponsors four major centers for cybersecurity education. Before coming to NSF, he served on the faculty of Valparaiso University in Indiana and, at the same time, as science editor at Encyclopædia Britannica in Chicago. He received his PhD from Cornell University in both astronomy and the history and philosophy of science, and he received his BA in physics and English from Wake Forest University. 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. John also served as an Interim Director of the Office of Research and Sponsored Programs at Bloomsburg University for three years. Before joining Bloomsburg University, John was 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.

Rachel Levitin is the Program Manager for the National Defense Science and Engineering Graduate (NDSEG) Fellowship Program – which is administered by the American Society for Engineering Education (ASEE) – and has worked in some capacity as a member of the NDSEG Program Team since November 2009. Miss Levitin is a graduate of the American University (B.A. Journalism, 2009) where she has served as a mentor to undergraduate students in the School of Communications for four years.

John Mateja 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, has held administrative positions at Argonne National Laboratory, Department of Energy, and the National Science Foundation. Today, John is the President of the Goldwater Foundation. John has been named a Fellow of the Council on Undergraduate Research and of the American Physical Society for the work he has done to help change undergraduate education.
Sally O'Connor is a Program Director in the Division of Biological Infrastructure (DBI) at the National Science Foundation (NSF). NSF is the US agency that funds fundamental research and education in all fields of science, technology, engineering and mathematics (STEM). Since 2002, Dr. O’Connor has managed the Research Experience for Undergraduates (REU) Sites program in the biosciences. She also serves as BIO representative to a few NSF-wide working groups including the Partnership for International Research and Education (PIRE) and the Experimental Program to Stimulate Competitive Research (EPSCoR) programs. During 2010-2012, she served as Acting Deputy Division Director in DBI. Prior to coming to NSF, Dr. O’Connor was a full professor at Xavier University in New Orleans, LA, and Director of the Center for Environmental Programs. She worked in environmental programs at both Xavier University and Tulane University. While at Xavier, she ran programs funded by the US Department of Energy, US Environmental Protection Agency, NASA, Mellon Foundation, and other public and private agencies. Dr. O’Connor received a PhD in chemistry at the University of Illinois at Chicago, where she received an Illinois State Scholarship. She held an instructor postdoctoral position at the University of Virginia in Charlottesville, in the Department of Chemistry.

Amanda Simcox is a professor in the department of Molecular Genetics at Ohio State University. She received her Ph. D. from the University of Sussex. Her lab studies development, growth control, and molecular evolutionary biology using Drosophila as a model. Simcox teaches an upper division course to biology majors, which integrates science and society and a service-learning class. In the service-learning class, undergraduates present a hands-on DNA whodunit workshop to 10th grade biology students in urban public high schools in Columbus. She is currently on assignment at the National Science Foundation, working in the Division of Biological Infrastructure (DBI) in the Biology Directorate (BIO). Her primary responsibility is in the Research Experience for Undergraduates sites program (BIO REU). Simcox was also the PI of an REU program for many years. At NSF, she is also a member of the National Science Foundation Research Traineeship (NRT) working group. The NRT supports innovative graduate training programs which are focused on interdisciplinary research and training for a broad range of STEM careers.

Dr. Valentin Soloiu, Professor, is the Distinguished Allen E. Paulson Chair in Georgia Southern University. His research is in sprays, combustion & emissions and NVH in automotive and aerospace engines. He is the author of 11 textbooks and instruction manuals and 140 peer reviewed, journal conference proceedings and technical studies.

Charles Sullivan earned a B.A. degree in zoology from the University of Maine at Orono and graduate degrees from the University of Maryland, College Park. After a postdoctoral fellowship in developmental biology at the University of Virginia, Dr. Sullivan joined the Department of Biology at Grinnell College in Iowa. During his 30 year career, he taught courses in introductory biology, cell biology, and developmental biology and served two terms as Department Chair. Dr. Sullivan also supervised nearly 100 independent projects ranging from guided readings to lab-based research on the formation of sensory structures (such as the lens in the eye) in chicken and frog embryos. His research and teaching efforts have been supported by NIH (AREA), Research Corporation, and NSF (ILI, CCLI, MRI, and ROA). Dr. Sullivan served as a rotating Program Director at NSF from 2011-2015 and helped manage the Research Experiences for Undergraduates (REU) program in the Biological Sciences Directorate and the Undergraduate Biology Education track of the Research Coordination Networks program (RCN-UBE). He recently returned to NSF in the Division of Undergraduate Education.
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