UNIVERSITY OF SOUTH CAROLINA
Office of Research

# 2021 Virtual Summer Research Symposium

**Thursday, July 29 from 1:30 – 3:00 pm**

***Sponsored by the Office of the Vice President for Research***

https://event.sc.edu/2021SummerSymposium

## Innovative STEM Research

1 - Printing of High Strength Aluminum Alloys via Laser Powder Bed Fusion Additive Manufacturing
**Bill Luong**, UofSC Columbia, Mechanical Engineering - Senior
Mentors: Dr. Lang Yuan, UofSC Columbia, Mechanical Engineering
Dr. Andrew Gross, UofSC Columbia, UofSC Columbia, Mechanical Engineering
Mr. Tianyu Zhang, UofSC Columbia, Mechanical Engineering

2 - Development of an in-vitro muscle atrophy model to evaluate small molecule treatments targeting peroxisome proliferator-activated receptors (PPAR)
**Samantha McCarthy**, UofSC Columbia, Biomedical Engineering – Junior
Mentors: Dr. Michael Gower, UofSC Columbia, Chemical Engineering
Ms. Candice Cheung, UofSC Columbia, Biomedical Engineering

### NERR Internship

3 - Crassostrea virginica as a foundation species: assessing the impact of fishery harvest on oyster reef communities in North Inlet, South Carolina
**Maggie Pelton**, UofSC Columbia, Marine Science - Senior
Mentor: Robert Dunn UofSC Columbia, Baruch Institute for Marine and Coastal Sciences

### Neuroscience Internship

4 - Role of raphe gabaergic neurons in leptin-regulated food intake: effect of L-allylglycine on GABA content
**Christa Joby**, College of Charleston, Charleston, SC, Biology with a concentration in Molecular Biology - Sophomore
Mentors: Dr. Claudia Grillo, UofSC Columbia, School of Medicine, Pharmacology, Physiology and Neuroscience
Mr. Nicholas Maxwell, UofSC Columbia, School of Medicine, Pharmacology, Physiology and Neuroscience Department
Dr. Lawrence Reagan, UofSC Columbia School of Medicine, Pharmacology, Physiology and Neuroscience Department

5 - Role of raphe gabaergic neurons in leptin-regulated food intake: effect of L-allylglycine on GAD67 content
**Maya Wright**, College of Charleston, Charleston, SC, Public Health - Senior
Mentors: Dr. Claudia Grillo, UofSC Columbia, School of Medicine, Pharmacology, Physiology and Neuroscience
Mr. Nicholas Maxwell, UofSC Columbia, School of Medicine, Pharmacology, Physiology and Neuroscience Department
Dr. Lawrence Reagan, UofSC Columbia School of Medicine, Pharmacology, Physiology and Neuroscience Department

### SCHC Science Undergraduate Research Program (SURF) Program

Mathematical Modeling of Pituitary Organogenesis
6 - Mathematical Modeling of Pituitary Organogenesis
**Reid Taylor**, UofSC Columbia, Mathematics - Senior
Mentor: Dr. Paula Vasquez, UofSC Columbia, Mathematics
Dr. Shannon Davis UofSC Columbia, Biological Sciences

## Integrated Academia-Industry REU in Smart Structure Technologies

7 - Developing Efficient Models for Shape Optimization using Heuristic Algorithms and Machine Learning
**Jillian Doyle**, University of Virginia, Charlottesville, VA, Mechanical Engineering - Senior
**Carissa Church**, Coastal Carolina University, Conway, SC, Engineering Science – Senior
Mentor: Dr. Zhaoshuo Jiang, San Francisco State University, San Francisco, CA Civil Engineering

8 - Using Resonance to Mechanically Amplify Floor Vibrations and Improve Force Estimation and Event Localization (FEEL)
**Zoe Haynes**, University of California Berkeley, Berkeley, CA, Civil Engineering - Junior
**Melanie McCloy**, Princeton University, Princeton, NJ, Civil Engineering - Senior
Mentor: Dr. Juan Caicedo, UofSC Columbia, Civil Engineering

9 - Validation of Fall Identification with FloorX
**Pressley Perry**, University of South Carolina, Columbia, SC, Civil Engineering - Senior
**Anthony Washington**, Florida State University, Tallahassee, FL, Civil Engineering – Junior
Mentor: Dr. Juan Caicedo, UofSC Columbia, Civil and Environmental Engineering

10 - Factors Influencing Footfall Vibration Analysis
**Karly Vial**, Oregon State University, Corvallis, OR, Civil Engineering - Senior
**Chase Hibbard**, University of Oklahoma, Norman, OK, Civil Engineering - Senior
Mentors: Dr. Zhaoshuo Jiang, San Francisco State University, San Francisco, CA, Civil Engineering
Dr. Juan Caicedo, UofSC Columbia, Civil and Environmental Engineering

11 - The Efficiency Comparison of Building HVAC Systems
**Jessica Winkler**, The University of Oklahoma, Norman, OK, Architectural Engineering - Junior

Mentor: Dr. Zhaoshuo Jiang, San Francisco State University, San Francisco, CA, Civil Engineering

## Magellan Scholar Program

12 - Development of Computational Models for Polymer Scission
**Marie Burns**, UofSC Columbia, Chemical Engineering - Junior
Mentor: Dr. Andreas Heyden, UofSC Columbia, Chemical Engineering

13 - EEG Correlates of Emotional Face Processing
**Allison Granger**, UofSC Columbia, Experimental Psychology - Senior
Mentor: Prof. Jessica Green, University of South Carolina, Columbia, Psychology

14 - Experimental Speciation: Sexual and Gametic Reproductive Isolation
**Graham McLaughlin**, UofSC Columbia, Biological Sciences – Senior
Mentor: Dr. Brian Hollis, University of South Carolina, Columbia, Biological Sciences

15 - Characterizing the Role of Estradiol in Neural Systems Underlying Social Stress Susceptibility in Female Rats
**Sarah Mott**, UofSC Columbia, Psychology – Senior
Mentor: Dr. Susan Wood, UofSC School of Medicine, Columbia, Pharmacology, Physiology & Neuroscience

## McNair Junior Fellows Program

16 - Continuous Electrochemical Synthesis of 2-Octanone from 1-Octene
**Jamie Brannon**, UofSC Columbia, Chemical Engineering - Senior
Mentors: Dr. Benjamin Meekins, UofSC Columbia, Chemical Engineering
Dr. Shimpalee Sirivatch, UofSC Columbia, Chemical Engineering

17 - Optimizing Naval Power Systems for Transient and Steady-State Conditions
**Davis Hobbs**, UofSC Columbia, Electrical Engineering/Mathematics - Junior
Mentor: Dr. Kristen Booth, UofSC Columbia, Electrical Engineering

18 - Development of an In Vitro Model of Muscle Atrophy for Screening of Small Molecule Therapeutics Targeting Retinoic Acid Receptors (RARs)
**Tristan Marchena**, UofSC, Columbia, Biomedical Engineering - Senior
Mentors: Dr. Michael Gower, UofSC Columbia, Chemical Engineering, Biomedical Engineering
Ms. Candice Cheung, UofSC Columbia, Biomedical Engineering

19 - The Anhydrous Electrolysis of Hydrogen Chloride to Hydrogen and Chlorine Gas
**Nikolai Mukhin**, UofSC Columbia, Chemical Engineering – Senior
Mentors: Dr. Benjamin Meekins, UofSC Columbia, Chemical Engineering
Dr. Sirivatch Shimpalee, UofSC Columbia, Chemical Engineering
Mr. Kris Likit-anurak, UofSC, Columbia, Chemical Engineering

20 - PLC-Based Automation Systems in SMART Manufacturing
**Theodros Tarekegne**, UofSC Columbia, Mechanical Engineering - Senior
Mentors: Dr. Ramy Harik, UofSC Columbia, Mechanical Engineering
Dr. Clint Saidy, UofSC Columbia, Future Factories

## REU: Applied Computational Robotics

21 - Learning Discrete World Models for Learning and Planning
**Bruce Brasseur**, USC Beaufort, Beaufort, SC, Computational Science and Mathematics - Junior
Mentors: Dr. Forest Agostinelli, UofSC Columbia, Computer Science and Engineering
Dr. Pooyan Jamshidi, UofSC Columbia, Computer Science and Engineering

22 - Semantic Mapping of Underwater Caves: Deep Learning of Underwater Speleothems and other Structures
**Devon Gardner**, New College of Florida, Sarasota, FL, Computer Science - Senior
Mentors: Dr. Ioannis Rekleitis, UofSC Columbia, Computer Science and Engineering
Mr. Bharat Joshi, UofSC Columbia, Computer Science and Engineering

23 - Online IMU-based registration of range data for USVs operating under waves
**Jiwon Hur**, University of La Verne, La Verne, CA, Computer Science - Junior
Mentors: Prof. Ioannis Rekleitis, UofSC Columbia, Computer Science and Engineering
Mr. Marios Xanthidis, UofSC Columbia, Computer Science and Engineering

24 - A Surprise Guided Causal Structure and Transfer Learning in Robotic Manipulation Tasks
**Madelyn Khoury**, University of Virginia, Charlottesville, VA, Computer Science - Sophomore
Mentors: Dr. Pooyan Jamshidi, UofSC Columbia, Computer Science and Engineering
Dr. Forest Agostinelli, UofSC Columbia, Computer Science and Engineering
Dr. Jason O'Kane, UofSC Columbia, Computer Science and Engineering

25 - An Analytical Approach to Finding Critical Points in Multi-Robot Visibility-Based Pursuit-Evasion Problems
**Ryan Lumbert**, Winthrop University, Rock Hill, SC, Computer Science and Mathematics - Senior
Mentors: Dr. Jason O'Kane, UofSC Columbia, Computer Science and Engineering
Dr. Trevor Olsen, UofSC Columbia, Computer Science and Engineering

26 - Novel Algorithmic Coverage Method for Environment Sampling with a Autonomous Surface Vehicle
**Jason Raiti**, Florida State University, Tallahassee, FL, Computational Science - Senior
Mentor: Dr. Ioannis Rekleitis, UofSC Columbia, Computer Science and Engineering

27 - Evader Movement in Visibility-Based Pursuit-Evasion
**Jenna Strassburger**, Rose-Hulman Institute of Technology, Terre Haute, IN, Software Engineering - Sophomore
Mentors: Dr. Jason O'Kane, UofSC Columbia, Computer Science and Engineering
Dr. Trevor Olsen, UofSC Columbia, Computer Science and Engineering

28 - Motion Tracking for Globally Controlled Self-Reconfigurable Magnetic Modular Cubes
**Conlan Taylor**, University of Houston, Houston, TX, Electrical Engineering - Senior
Mentors: Dr. Jason O'Kane, UofSC Columbia, Computer Science and Engineering
Dr. Aaron Becker, University of Houston, Houston, TX, Electrical and Computer Engineering

## REU: Disparities in the Criminal Justice System

29 - Demographic Characteristics of Persons Killed by Police
**Malika Barbie Odera**, University of North Dakota, Grand Forks, ND, Criminal Justice and Psychology – Junior
**Jesse Malone**, Ball State University, Muncie, IN, Criminal Justice - Junior
**Ethan Reynolds**, Radford University, Radford, VA, Criminal Justice - Junior
Mentors: Prof. Robert Brame, UofSC Columbia, Criminology & Criminal Justice
Mr. Qassim Bolaji, UofSC Columbia, Criminology & Criminal Justice
Ms. Hadley Wellen, UofSC Columbia, Criminology & Criminal Justice

30 - Pandemic Justice: A Grounded Theory Examination of Disparities in Virtual Bond Hearings
**Ashley Rodriguez**, George Mason University, Fairfax, VA, Criminology - Senior
**Alyssa Powell**, University of Cincinnati, Cincinnati, OH, Criminal Justice - Senior
**Inglish Hills**, Spelman College, Atlanta, GA, Sociology - Senior
Mentors: Dr. Christi Metcalfe, UofSC Columbia, Criminology and Criminal Justice
Mr. Avery Worrell, UofSC Columbia, Criminology and Criminal Justice
Mr. Philip Berry, UofSC Columbia, Criminology and Criminal Justice

31 - Exploring the Relationship between Race, Drugs, and Motherhood Identity for Incarcerated Mothers
**Sophia Shaiman**, Temple University, Philadelphia, PA, Criminal Justice and Psychology - Senior
**Blandine Soivilien**, University of Massachusetts – Dartmouth, North Dartmouth, MA, Crime and Justice Studies - Senior
**Kaniz Chowdhury**, Wayne State University, Detroit, MI, Criminal Justice and Political Science - Senior
Mentors: Dr. Barbara Koons-Witt, UofSC Columbia, Criminology and Criminal Justice
Ms. Deanna Cann, UofSC Columbia, Criminology and Criminal Justice
Ms. Albina Laskovtsov, UofSC Columbia, Criminology and Criminal Justice

## REU: Engineering Medical Advances at the Interface of Experiments and Computation

32 - Modeling Interactions between Cationic Facial Amphiphilic Polymers and Lipid Membranes using Monte Carlo Simulations
**Abisha Fenn**, North Carolina State University, Raleigh, NC, Electrical Engineering - Sophomore
Mentors: Dr. Mark Uline, UofSC Columbia, Biomedical Engineering, Chemical Engineering
Dr. Chaunbing Tang, UofSC Columbia, Chemistry and Biochemistry

33 - Computational analysis of coronary artery bypass graft configuration
**Mary Gale**, Georgia Institute of Technology, Atlanta, GA Biomedical Engineering – Senior
Mentor: Dr. John Eberth, UofSC Columbia, School of Medicine, Biomedical Engineering, Cell Biology and Anatomy

34 - Modelling Surface Chemistry of Gold Nanoparticles for Targeted Inhibition of Amyloid-β Aggregation
**Miguel Hernandez**, Florida Institute of Technology, Melbourne, FL, Biomedical Engineering - Junior
Mentors: Dr. Mark Uline, UofSC Columbia, Biomedical Engineering, Chemical Engineering
Dr. Melissa Moss, UofSC Columbia, Biomedical Engineering, Chemical Engineering

35 - Mechano-regulation of protein CDK8 in Vasculature
**Mimi Jung**, University of Rochester, Rochester, NY, Biomedical Engineering – Senior
Mentor: Dr. Susan Lessner, UofSC Columbia, School of Medicine Columbia, Cell Biology and Anatomy, Biomedical Engineering

36 - Facially-amphiphilic cationic antimicrobial agents derived from bile acids
**Rani Kumar**, Georgia Institute of Technology, Atlanta, GA, Biomedical Engineering - Junior
Mentors: Dr. Chuanbing Tang, UofSC Columbia, Chemistry and Biochemistry
Mrs. Leman Kurnaz, UofSC Columbia, Chemistry and Biochemistry

37 - Mechanistic Insight into the Modulation of Amyloid-β Aggregation by Polymer-Functionalized Nanoparticles
**Paige Schiebel**, Trine University, Angola, IN, Biomedical Engineering - Junior
Mentors: Dr. Melissa Moss, UofSC Columbia, Chemical Engineering, Biomedical Engineering
Mrs. Mihyun Waugh, UofSC Columbia, Biomedical Engineering
Ms. Brittany Watson, UofSC Columbia, Biomedical Engineering

38 - Systematic review of rodent sleep scoring methods: A comparison between expert hand scoring, decision tree, and neural networks
**Zach Tentor**, The Catholic University of America, Washington DC, Biomedical Engineering - Junior
Mentors: Dr. Ana Pocivavsek, UofSC Columbia, School of Medicine, Pharmacology, Physiology and Neuroscience
Ms. Katie Rentschler, UofSC Columbia, School of Medicine, Pharmacology, Physiology and Neuroscience

## SC Advancing Diversity in Aging Research

39 - The Role of Antibiotics in Early Onset Colorectal Cancer (EOCEC) in a Mouse Model of CRC
**Damien George**, Claflin University, Orangeburg, SC, Biology - Senior
Mentor: Dr. Maria Marjorette Pena, UofSC Columbia, Biological sciences

40 - Aryl Hydrocarbon Receptor (AhR) ligands (TCDD) - regulated immune suppression/ inflammation
**Rehgan Miller**, Claflin University, Orangeburg, SC, Biology - Senior

Mentor: Dr. Narendra Singh, UofSC, Columbia, School of Medicine, Pathology, Microbiology, and Immunology

41 - Racial Differences in Comorbid conditions and Prevention Strategies for Vascular Dementia Cases in South Carolina
**Majayla Page**, Claflin University, Orangeburg, SC, Biology - Senior
Mentors: Dr. Maggi Miller, UofSC Columbia, Epidemiology and Biostatistics
Ms. Nicohle Nasrallah, UofSC Columbia, Biostatistics

42 - Examining the Effects of a High-Sugar Diet on Aging Ovaries in Drosophila melanogaster
**Anshel Ross**, Claflin University, Orangeburg, SC, Biology - Senior
Mentor: Dr. Alissa Richmond Armstrong, UofSC Columbia, Department of Biological Sciences

## SC Alliance for Minority Participation

43 - Viscoelastic Matrix Mechanics in Hydrogels with Varying Cell-Matrix Interactions and Remodeling
**Morgan Armstrong**, UofSC Columbia, Biomedical Engineering - Senior
Mentor: Dr. Tarek Shazly, UofSC Columbia, Biomedical Engineering, Mechanical Engineering

44 - Investigation of the Role of Ing4 in Developmental Hematopoiesis
**Jordan Flemming**, UofSC Columbia, and Molecular Biology - Senior
**Alyssa Franklin**, UofSC Columbia, Biochemistry and Molecular Biology - Senior
Dr. Katie Kathrein, UofSC Columbia, Biological Sciences

45 - Can targeting growth associated mRNAs into sensory axons enhance growth on inhibitory substrates?
**Tashiba Lampkin**, UofSC Columbia, Biology - Senior
Mentors: Dr. Jeff Twiss, UofSC Columbia, Biological Sciences
Dr. Terika Smith, UofSC Columbia, Biological Sciences

46 - Modularization of Ceramic Hollow Fiber Membrane Technology for Air Separation
**Ronald Scott**, UofSC Columbia, Mechanical Engineering - Junior
Mentors: Dr. Xingjian Xue, UofSC Columbia, Mechanical Engineering
Mr. Yun Gan, UofSC Columbia, Mechanical Engineering

## SMART Program

47 - Maternal Care: A qualitative study on the role of the Pharmacist
**Moji Awe**, UofSC Columbia, Pharmaceutical Sciences - Senior
**Caitlin Dreher**, UofSC Columbia, Pharmacy- Senior
Mentor: Dr. Tisha Felder, UofSC Columbia, Nursing

48 - Elucidating the black coral microbiome using amplicon sequencing
**Yessenia Becerra**, USC Beaufort, Beaufort, SC, Biology – Senior
Mentor: Dr. Mercer Brugler, USC Beaufort, Beaufort, SC, Natural Sciences

49 - Effects of p-glycoprotein on C. elegans intestinal development
**Diamond Braxton**, USC Upstate, Spartanburg, SC, Biology - Senior
**MaKenna DeYoung**, USC Upstate, Spartanburg, SC, Biology – Sophomore
Mentor: Dr. Scott Tanner, USC Upstate, Spartanburg, SC, Natural Sciences & Engineering

50 – In vitro effects of Indole-3-Carbinol on anti-CD40 Activated Splenocytes
**Amaya Calloway**, UofSC Columbia, Biology – Junior
Mentors: Dr. Brandon Busbee, UofSC Columbia, School of Medicine, Pathology Microbiology & Immunology
Dr. Kiesha Wilson, UofSC Columbia, School of Medicine, Pathology Microbiology & Immunology

51 - Examine the effects of 3,3′-diindolymethane (DIM) treatment on cellular metabolism
**Antwon Cannon**, Claflin University, Orangeburg, SC, Psychology - Junior
Mentors: Dr. Mitzi Nagarkatti, UofSC Columbia, School of Medicine, Pathology, Microbiology, and Immunology
Mr. Bryan Holloman, UofSC Columbia, School of Medicine, Pathology, Microbiology, and Immunology

52 - Explore the immunological changes associated with Th22 activation
**Kira Chiles**, University of North Carolina at Charlotte, Charlotte, NC, Exercise Science (Pre-Med) - Junior
Mentors: Dr. Brandon Busbee, UofSC Columbia, School of Medicine, Pathology, Microbiology, and Immunology
Mr. Bryan Holloman, UofSC Columbia, School of Medicine, Pathology, Microbiology, and Immunology

53 - Comparing Principal Component analysis to a traditional approach to variable selection
**Christian Dunlap**, UofSC Columbia, Statistics and Economics - Sophomore
Mentors: Dr. Jan Eberth, UofSC Columbia, Epidemiology and Biostatistics
Ms. Anja Zgodic, UofSC, Columbia, Epidemiology and Biostatistics

54 - Student Accountability in Theatre Arts
**Amiya English**, USC Upstate, Spartanburg, SC, Theatre Performance - Senior
**Maddyson Potts**, USC Upstate, Spartanburg, SC, Theatre Performance – Sophomore
Mentor: Prof. Laura Rikard, USC Upstate, Spartanburg, SC, Theatre

55 - Deep Sea Genomics: Elucidating the molecular mechanism behind extreme longevity in black corals
**Jicayla Johnson-Rosemond**, USC Beaufort, Beaufort, SC, Biology - Senior
Mentor: Dr. Mercer Brugler, USC Beaufort, Beaufort, SC, Marine Biology

56 - Invitro effects of CBD on SEB Activated Splenocytes
**Alanna Langford**, UofSC Columbia, Public Health - Senior
Mentors: Dr. Xiaoming Yang, UofSC Columbia, School of Medicine, Pathology, Microbiology and Immunology

Dr. Kiesha Wilson, UofSC Columbia, School of Medicine, Pathology, Microbiology and Immunology

57 - Exploratory Aging Research
**Tamara Pendarvis**, USC Beaufort, Bluffton, SC, Sociology- Senior
Mentor: Prof. Summer Roberts, USC Beaufort, Bluffton, SC, Sociology
Not available to present live

58 - Elucidating the Role of 2-(1' H-indole-3'-carbonyl)-thiazole-4-carboxylic acid methyl ester (ITE) on Immune Cell Differentiation
**Saibriyya Pou**, Clemson University, Clemson, SC, Biological Sciences - Senior
Mentors: Dr. Mitzi Nagarkatti, UofSC Columbia, School of Medicine, Pathology, Microbiology, and Immunology
Ms. Alkeiver Cannon, UofSC Columbia, School of Medicine, Pathology, Microbiology, and Immunology