

2021 SURF SYMPOSIUM

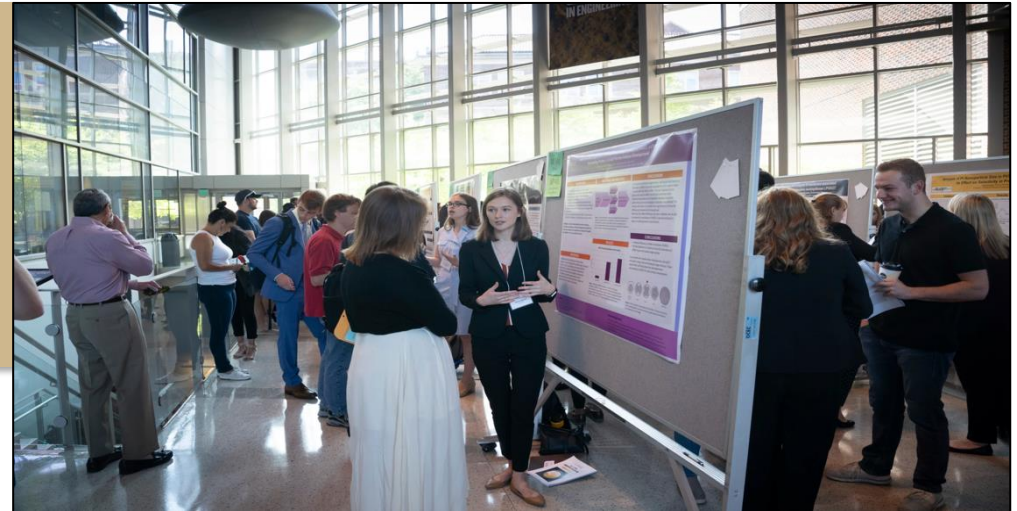
29-30 July 2021

Hosted By:



College of Engineering

ENGINEERING
UNDERGRADUATE RESEARCH OFFICE



The **SURF Symposium** provides a great opportunity for the Purdue community to learn more about the interesting and innovative research conducted by undergraduates in various labs across campus. This event highlights the scholarly work of SURF students in the following research areas:

- Additive Manufacturing & Energetic Materials
- Biological Signaling
- Biological Simulation & Technology
- Biomedical Sensing & Imaging
- Cellular Biology
- Chemical Catalysis & Synthesis
- Composites & Structural Materials
- Composite Materials & Alloys
- Computer Architecture
- Deep Learning & Cyber Security
- Engineering the Built Environment
- Environmental Characterization
- Fabrication & Robotics
- Fluid Modeling & Simulation
- Genetics
- Human Factors & Education
- IOT for Agriculture
- Machine Learning
- Material Modeling & Simulation
- Medical Science & Technology
- Nanotech: Fluids & Chemicals
- Sensors & Microsystems

	July 29 10:00 AM EDT	July 29 2:00 PM EDT	July 30 10:00 AM EDT	July 30 2:00 PM EDT
A	Composites & Structural Materials	Composite Materials & Alloys	Material Modeling & Simulation 1	Material Modeling & Simulation 2
B	Cellular Biology 1	Genetics	Environmental Characterization 1	Environmental Characterization 2
C	Human Factors & Education	Biomedical Sensing & Imaging	Cellular Biology 2	Machine Learning: Applications in Science & Engineering
D	Biological Simulation & Technology	Fluid Modeling & Simulation 2	Additive Manufacturing & Energetic Materials	Biological Signaling
E	Nanotechnology: Fluids & Chemicals 1	Engineering the Built Environment	Medical Science & Technology	Fabrication & Robotics
F	Computer Architecture	Machine Learning: Applications in Health & Safety	IOT for Agriculture	Deep Learning & Cyber Security
G	Fluid Modeling & Simulation 1	Nanotechnology: Fluids & Chemicals 2	Sensors & Microsystems	Chemical Catalysis & Synthesis

Questions related to attending sessions:

Call 765-280-2413 or 765-314-3688
Email <eur@purdue.edu>

Add all your sessions to:

[Google Calendar](#)
[Calendar File Download](#)

To attend a session/s, please click on the corresponding **Zoom** links listed under each session below



9:00-9:30	Students Check In
9:30- 10:00	Welcome and Ground Rule Discussion
10:00-11:30	Composites & Structural Materials (Session A) Click Zoom Link
10:00-10:15 SURF ID: 109	Nanostructural Characterization of Hydration, Porosity and Mechanical Deformation of Human Bone <i>Aaron J. Barker, PI: Dr. John Howarter</i>
10:15-10:30 SURF ID: 113	The Bio-based Future of Carbon Fiber <i>Shawn N. Belongia, PI: Dr. Jonathan Wilker</i>
10:30-10:45 SURF ID: 130	Morphology and Composition of Non-traditional Pozzolans <i>Nicholas M. Christ, PI: Dr. Jan Olek</i>
10:45-11:00 SURF ID: 132	Effect of Nano-TiO ₂ on the Hydration Kinetics, Porosity, and Microstructure of Concrete Containing Slag Cement <i>Elena Cruz, PIs: Dr. Miriam Velay-Lizancos and Dr. Jan Olek</i>
11:00-11:15 SURF ID: 254	254: Forensic Investigation of Concrete <i>Bibigul Zhaksybay, PI: Dr. Jan Olek</i>
11:15-11:30 SURF ID: 131	131: A Better Bone to Stand on: Microstructural Simulation of Fracture Behaviour in Human Bone <i>Gregory L. Cook Jr, PI: Dr. John Howarter</i>

10:00-11:30	Cellular Biology 1 (Session B) Click Zoom Link
10:00-10:15 SURF ID: 145	Role of Locus Coeruleus - Norepinephrine System in Novelty Stimulus Recognition <i>Catherine Gervais, PI: Dr. Alexander Chubykin</i>
10:15-10:30 SURF ID: 159	Simulating Cell Migration in a Mechanical Perspective <i>DeVon Young Herr, PI: Dr. Taeyoon Kim</i>
10:30-10:45 SURF ID: 198	Mechanisms of Cell Division under Physiological Conditions <i>Morgan H. Moses, PI: Dr. Taeyoon Kim</i>
10:45-11:00 SURF ID: 202	Characterizing the Role of Fungal Cdc14 Phosphatases in Response to Cell Wall Stress <i>Noelle Naughton, PI: Dr. Mark Hall</i>
11:00-11:15 SURF ID: 227	Epstein Barr Virus Activation in Stomach Cancer Cells <i>Kunming Shao, PI: Dr. Majid Kazemian</i>
11:15-11:30 SURF ID: 245	Cdc14 Phosphatase Stimulation by an Intramolecular Substrate-Mimicking Motif <i>Benjamin T. Waddey, PI: Dr. Mark Hall</i>

10:00-11:30	Human Factors & Education (Session C) Click Zoom Link
10:00-10:15 SURF ID: 107	Understanding and Reducing Major Industrial Plant Disasters <i>Ashley R. Bagadiong, PI: Dr. Ray A. Mentzer</i>
10:15-10:30 SURF ID: 125	Understanding the Influence of Work-Integrated Learning Experiences on Students' Identity Formation in Engineering <i>Andrea (Lili) Castillo, PI: Dr. Allison Godwin</i>

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10:30-10:45 SURF ID: 242	Developing an Automatic Student Program Analysis Software with American Fuzzy Lop and Django <i>Dalilah Vaquera, PI: Dr. Yung-Hsiang Lu</i>
10:45-11:00 SURF ID: 187	Empowering Secondary School Girls in Rural Senegal: Validation of the Assessment for STEM Self-beliefs <i>Nafissa A. Maiga, PI: Dr. Jennifer DeBoer</i>
11:00-11:15 SURF ID: 220	The Impact of COVID-19 on Traditional and Transformative Transportation in Selected Indiana Cities <i>Dale Robbennolt, PI: Dr. Konstantina Gkritza</i>
11:15-11:30 SURF ID: 231	The Situational Awareness and Decision-Making Analysis of Experienced Nurses <i>Anand Shroff, PI: Dr. Denny Yu</i>

10:00-11:15	Biological Simulation & Technology (Session D) Click Zoom Link
10:00-10:15 SURF ID: 117	Mathematical modelling of various gut microbiota in response to various mono- and disaccharides <i>Amanda Blankenberger, PI: Dr. Mohit Verma</i>
10:15-10:30 SURF ID: 182	Optimization of Ultrasound and Photoacoustic Vascular Imaging <i>Olivia Loesch, PI: Dr. Craig Goergen</i>
10:30-10:45 SURF ID: 197	Effective and Rapid LAMP Sensor to Detect BRD <i>Giuditta Monti, PI: Dr. Mohit Verma</i>
10:45-11:00 SURF ID: 225	Ethanol Effects on Embryonic Zebrafish BMP Signaling as a Model for Fetal Alcohol Spectrum Disorders <i>Zoe Elise Schardan, PI: Dr. David Umulis</i>
11:00-11:15 SURF ID: 259	Maturing Chondrocyte Seeded Scaffolds Using a Dynamic Mechanobioreactor System <i>Clarisse M. Zigan, PI: Dr. Deva Chan</i>

10:00-11:30	Nanotechnology: Fluids & Chemicals 1 (Session E) Click Zoom Link
10:00-10:15 SURF ID: 108	A Thermal Analysis of Common Pharmaceutical Reagents Using an ARSST Calorimeter <i>Michael T. Bai, PI: Dr. Ray Mentzer</i>
10:15-10:30 SURF ID: 219	The Effect of Inverse Opal Composition and Pore Size on Photocatalysis <i>Paige M. Rich, PI: Dr. David Warsinger</i>
10:30-10:45 SURF ID: 226	Tuning Properties of Nanoclusters and Their Mass Spectrometric Analysis <i>Lidya Sertse, PI: Dr. Julia Laskin</i>
10:45-11:00 SURF ID: 212	Rheological Characterization of Highly Loaded Alumina-Polymer Suspension for Thermal Paste 3D Printing <i>Pattiya Pibulchinda, PI: Dr. Kendra Erk</i>
11:00-11:15 SURF ID: 121	Design and Manufacturing of Bio-inspired Nanocomposites for Radiative Cooling <i>Jennifer Lynn Cahillane, PI: Dr. Xiulin Ruan</i>
11:15-11:30 SURF ID: 150	Simulation of Nanofluid Flow through Nozzle of an Inkjet 3D Printer <i>Amy Guo, PI: Dr. Xiulin Ruan</i>

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10:00-11:15	Computer Architecture (Session F) Click Zoom Link
10:00-10:15 SURF ID: 103	Trace-driven Simulation for AMD GPUs Using Accel-Sim <i>Weili An, PI: Dr. Timothy Rogers</i>
10:15-10:30 SURF ID: 106	Compression Techniques for Trace Parsing in GPU Simulation <i>Emile J. Béz, PI: Timothy Rogers</i>
10:30-10:45 SURF ID: 170	SAFE: Secure Architectural Framework Enhancements <i>Frederick J. Kepler, PI: Dr. Mark Johnson</i>
10:45-11:00 SURF ID: 174	Reducing the Run-Time Memory of Accel-Sim <i>Harikesh Kumar, PI: Dr. Timothy Rogers</i>
11:00-11:15 SURF ID: 244	Development of Rust Based Low-Level Virtual Machine for AFTx06 Chip for Development of Sample Applications <i>Nicholas Verastegui, PI: Dr. Mark Johnson</i>
10:00-11:30	Fluid Modeling & Simulation (Session G) Click Zoom Link
10:00-10:15 SURF ID: 119	Simulations to Better Characterize Ionization Coefficient for Gas Breakdown Calculations <i>Cameron Buerke, PI: Dr. Allen Garner</i>
10:15-10:30 SURF ID: 221	Controlled Ice Nucleation: Effect of Relative Humidity on Nucleation Event <i>Josiah L. Rockey, PI: Dr. Alina Alexeenko</i>
10:30-10:45 SURF ID: 184	Development of Continuous Flow Synthesis of Active Pharmaceutical Ingredient in Shortage—Step One <i>Corryn Lytle, PI: Dr. David Thompson</i>
10:45-11:00 SURF ID: 199	Vortex Bursting Under Dynamic Adjustment of Angle of Attack <i>Chandler James Moy, PI: Dr. Sally Bane</i>
11:00-11:15 SURF ID: 223	Mathematical Model Development for Superstructure Optimization of Shale Gas Processing Systems <i>Yan M. Saltar, PI: Dr. Maeve Drummond</i>
11:15-11:30 SURF ID: 156	Lyophilization Post-Processing Data Software <i>Hallie Renee Harrison, PI: Dr. Alina Alexeenko</i>

1:00-1:30	Students Check In
1:30-2:00	Welcome and Ground Rule Discussion
2:00-3:30	Composite Materials & Alloys (Session A) Click Zoom Link
2:00-2:15 SURF ID: 136	Quantifying the Springback in Polymer Composite Preforms using a Novel Forming Technique <i>Carson M. Denoo, PI: Dr. Jan-Anders Mansson</i>
2:15-2:30 SURF ID: 160	Shear Angle and Other Methods of Analysis for the Fabric Draping Experiment <i>Karina Hollis-Brau, PI: Dr. Dianyun Zhang</i>
2:30-2:45 SURF ID: 192	An Automated Approach to Measuring Shear in Composite fabrics <i>Olivia McLaurin, PI: Dr. Dianyun Zhang</i>
2:45-3:00 SURF ID: 205	Microstructural Characterization of Spark Plasma Sintered Al-SiC-Graphite by 3D X-ray Tomography <i>Caitlin A. O'Brien, PI: Dr. Nikhilesh Chawla</i>
3:00-3:15 SURF ID: 209	Design and Analysis of Four-Point Bending Fixture for Fatigue Specimen <i>Michael R. Pardo, PI: Dr. Michael Sangid</i>
2:15-3:30 SURF ID: 230	Design and Validation of Manufacturing Method for Discontinuous Prepreg Fibers with Controlled Orientation <i>Jennifer Short, PI: Dr. Jan-Anders Mansson</i>
2:00-3:30	Genetics (Session B) Click Zoom Link
2:00-2:15 SURF ID: 157	Determining the Role of MicroRNAs in Epithelioid Hemangioendothelioma <i>Samuel L. Hartzler, PI: Dr. Jason Hanna</i>
2:15-2:30 SURF ID: 166	Investigating Roles of Fumarase in Response to Double-Stranded DNA Breaks <i>Avery Ellen Hurst, PI: Ann Kirchamaier</i>
2:30-2:45 SURF ID: 175	Novel Peptides in Polymer-Mediated Gene Delivery for Targeted Treatment of Cancer Cells <i>Zachary E. Lamantia, PI: Dr. Marxa Figueiredo</i>
2:45-3:00 SURF ID: 207	Characterization of the DNA Cleavage Activity of the <i>Torulospora delbrueckii</i> Weird HO Endonuclease <i>Tara M. Paarlberg, PI: Dr. Frederick Gimble</i>
3:00-3:15 SURF ID: 218	Investigating the Cap Helix of STE14 via Mutagenesis <i>Karthik Raja Ravichandran, PI: Dr. Christine Hrycyna</i>
2:15-3:30 SURF ID: 229	Investigation of Dog Coat Color Variants in Novel Cream Boxers <i>Regan E. Sherman, PI: Dr. Kari Ekenstedt</i>

29th Afternoon Session

2:00-3:30	Biomedical Sensing & Imaging (Session C) Click Zoom Link
2:00-2:15 SURF ID: 123	Adapting a Lambda Phage DNA Calibration Technique for Routine Use with Magnetic Tweezers <i>Bianca C. Caminada, PI: Dr. Kenneth Ritchie</i>
2:15-2:30 SURF ID: 129	Directed Enzyme Deposition with Poly(O-Aminophenol) onto Platinum Black Microelectrode Arrays for Multi-Analyte Amperometric Biosensors <i>Zein Chehab, PI: Dr. Hyowon (Hugh) Lee</i>
2:30-2:45 SURF ID: 188	Studying the Role of Transcription Factors Clock and Cycle in Fruit Fly Photoreceptor Neurons <i>Makayla N. Marlin, PI: Dr. Vikki Weake</i>
2:45-3:00 SURF ID: 164	Designing Folate-Targeted Conjugates to Accelerate Kidney Clearance <i>Roxanne Huff, PI: Dr. Philip Low</i>
3:00-3:15 SURF ID: 235	A Semi-Automatic Pipeline for the Characterization of Synapses <i>Hailey M. Szadowski, PI: Dr. Chongli Yuan</i>
2:15-3:30 SURF ID: 214	Glycosylation Reactions Utilizing Tetrafluoropyridyl Donors <i>Dalton D. Polley, PI: Dr. Abram Axelrod</i>

2:00-3:30	Fluid Modeling & Simulation 2 (Session D) Click Zoom Link
2:00-2:15 SURF ID: 190	Permeability Characterization and Machine Learning <i>Noah D. Martin, PI: Dr. Dianyun Zhang</i>
2:15-2:30 SURF ID: 243	Stable Static Liquid Positions in Toroidal Propellant Tanks <i>Don-Terry Veal, Jr., PI: Dr. Steven Collicott</i>
2:30-2:45 SURF ID: 137	Identifying and Resolving Issues with the Hollow Cathode Emitter and SPT-100 Hall Effect Thruster <i>Aditya H. Desai, PI: Dr. Alexey Shashurin</i>
2:45-3:00 SURF ID: 153	Experimental Investigation of Optimal Winglets Design on Wake and Efficient Performance of Horizontal Axis Model Wind Turbines <i>Maison Hackett, PI: Dr. Luciano Castillo</i>
3:00-3:15 SURF ID: 162	Systematic Study of the Viscosity of Room Temperature Ionic Liquids on the Electrochemical Performance of Redox Active Species <i>Danny M. Hristov, PI: Dr. Julia Laskin</i>
2:15-3:30 SURF ID: 252	Membrane Heat Exchanger for Air Cooling and Dehumidification <i>Songhao Wu, PI: Dr. James Braun</i>

2:00-3:30	Engineering the Built Environment (Session E) Click Zoom Link
2:00-2:15 SURF ID: 126	Design and Modeling of a Dome Structure for Extra-Terrestrial Habitat Testbed <i>Guillermo Castro Martinez, PI: Dr. Davide Ziviani</i>
2:15-2:30 SURF ID: 127	Mobile Air Quality Sensors and the Internet of Things <i>Daniel J Ceglie, PI: Dr. Greg Michalski</i>

29th Afternoon Session

2:30-2:45 SURF ID: 191	Development of a Cost Model for the Evaluation of Extra-Terrestrial Habitats <i>Kathleen Martinus, PI: Dr. Shirley Dyke</i>
2:45-3:00 SURF ID: 193	Mobile Air Quality Sensing and Internet of Things <i>Pankaj Meghani, PI: Dr. Greg Michalski</i>
3:00-3:15 SURF ID: 213	Characterizing Combustion of Solid Rocket Propellants using Laser Absorption Spectroscopy <i>Raghav Poddar, PI: Dr. Christopher Goldenstein</i>
3:15-3:30 SURF ID: 247	Simulation of Hazardous Scenarios of a Deep-Space Habitat with a Cyber-Physical System <i>Linzhe Wang, PI: Dr. Amin Maghareh</i>

2:00-3:15	Machine Learning: Applications in Health & Safety (Session F) Click Zoom Link
2:00-2:15 SURF ID: 101	Examining Human Safety Technology Interactions in a High-Risk Work Environment: Assessment of Neuro-Psychophysiological Responses in a Mixed Reality. <i>Wahab W. Akanbi, PI: Dr. Sogand Hasanzadeh</i>
2:15-2:30 SURF ID: 146	A Demographic Networked SIHRVD Model for COVID-19 Spread in the U.S. <i>María E. Gibbs, PI: Dr. Philip E. Paré</i>
2:30-2:45 SURF ID: 178	Predicting Mental Workload during Semi-Autonomous Driving using Physiological and Driving Performance Measures <i>Justin S Lee, PI: Dr. Brandon Pitts</i>
2:45-3:00 SURF ID: 167	Predicting Lifting Risks from Pressure Exerted by Various Hand Regions <i>Jiachen Jiang, PI: Dr. Denny Yu</i>
3:00-3:15 SURF ID: 246	Epidemic Mitigation with Limited Resources <i>Avik Wadhwa, PI: Dr. Philip E. Paré</i>

2:00-3:30	Nanotechnology: Fluids & Chemicals 2 (Session G) Click Zoom Link
2:00-2:15 SURF ID: 158	Mussel-Inspired Underwater Hot Melt Adhesives: Introducing Catechol Chemistry to Thermoplastic Polymer Systems <i>Morgan R. Heidingsfelder, PI: Dr. Jonathan Wilker</i>
2:15-2:30 SURF ID: 186	Capillary Based Microfluidics for Droplet Generation <i>Jack J. Maher, PI: Dr. Arezoo Ardekani</i>
2:30-2:45 SURF ID: 201	Characterization of Concentrated Surfactant Solutions Through Rheological Response <i>Bradley K. Nance, PI: Dr. Kendra Erk</i>
2:45-3:00 SURF ID: 210	Effect of Chemistry on Surface Mechanical Properties of Polymer Lung Surfactants <i>Sungwan Park, PI: Dr. You-Yeon Won</i>
3:00-3:15 SURF ID: 224	Investigation of Epoxy Curing Dynamics in a Laminar Flow <i>Gabriella Schalm, PI: Dr. Tian Li</i>
2:15-3:30 SURF ID: 258	Virtual Reality Animations of Blood Flow in a Vessel Network <i>Jiahao Zhu, PI: Dr. Hector Gomez</i>

9:00-9:30 Students Check In
 9:30- 10:00 Welcome and Ground Rule Discussion

10:00-11:15 Material Modeling & Simulation 1 (Session A)
[Click Zoom Link](#)

10:00-10:15 Multiphysics Simulation Guided Optimization of Acoustically Tensioned Metastable Fluid Detectors
 SURF ID: 111
Troy M. Barlow, PI: Dr. Rusi Taleyarkhan

10:15-10:30 Laser-Based Profilometry of the Centrifugally Tensioned Metastable Fluid Detector
 SURF ID: 168
William T. Kelley, PI: Dr. Rusi Taleyarkhan

10:30-10:45 Verification of a Deterministic Solver to the Full Boltzmann Equation
 SURF ID: 237
Allison Taylor, PI: Dr. Alina Alexeenko

10:45-11:00 Incorporating A Series Resistor into Microscale Breakdown Theory
 SURF ID: 249
James C. Welch III, PI: Dr. Allen Garner

11:00-11:15 Statistics of Dislocation Line Orientation Distributions as Tests for CDD Plasticity Theories
 SURF ID: 239
Jose M. Torres López, PI: Dr. Anter El-Azab

10:00-11:15 Environmental Characterization 1 (Session B)
[Click Zoom Link](#)

10:00-10:15 Effects of Plant Characteristics and Hydrological Gradients on the Soil Environment in Agricultural Wetlands
 SURF ID: 118
Jackson T Brady, PI: Dr. Sara McMillan

10:15-10:30 Toxicity of a "Forever Chemical" in an Estuarine Fish: Does Salinity Mediate the Toxicity of Perfluorooctanesulfonic Acid (PFOS)?
 SURF ID: 120
Lucy E. Burcham, PI: Maria Sepúlveda

10:30-10:45 Chlorine Decay in a New Home Water Softener
 SURF ID: 135
Katharine R. Del Real, PI: Dr. Andrew Whelton

10:45-11:00 Microbiological Water Quality During Commissioning of a New Plumbing System
 SURF ID: 144
Catherine Fleming, PI: Dr. Andrew Whelton

11:00-11:15 Quantification of Recent Shoreline Movement Along Lake Michigan's Southern Coast
 SURF ID: 238
Hannah R. Tomkins, PI: Cary Troy

10:00-11:15 Cellular Biology 2 (Session C)
[Click Zoom Link](#)

10:00-10:15 Discovery of New Targets on Tumor Infiltrating Immune Cells by Single-Cell Sequencing
 SURF ID: 105
Maansi Asthana, PI: Philip Low

10:15-10:30 Development of an Elastin-Like Polypeptide Fusion Protein for Enhanced Detection and Imaging of Non-Muscle Invasive Bladder Cancer
 SURF ID: 112
Brooke D. Barnett, PI: Dr. David Thompson

10:30-10:45 Application of Machine Learning to Identify Mechanobiologic Parameters for a Computational Breast-Conserving Surgery Model
 SURF ID: 155
Zachary J. Harbin, PI: Dr. Adrian Buganza-Tepole

30th Morning Session

10:45-11:00 Antitumor Ability of Engineered Neutrophils Against Solid Breast Cancer
 SURF ID: 165
Sydney N. Hummel, PI: Dr. Xiaoping Bao

11:00-11:15 Development of a Breast Surgical Computational Model: Evaluation of Tumor-to-breast Volume Ratio on Surgical Outcomes
 SURF ID: 195
Carly Mendenhall, PI: Dr. Sherry L. Voytik-Harbin

10:00-11:15 Additive Manufacturing & Energetic Materials (Session D)
[Click Zoom Link](#)

10:00-10:15 Studying the Effect of Reactive Component Orientation Using Multi-view Dynamic X-Ray Imaging
 SURF ID: 115
Hayden Bilbo, PI: Dr. Steven Son

10:15-10:30 Artificial Aging and Microstructural Characterization of an Additively Manufactured Aerospace Aluminum Alloy with Ceramic Additions
 SURF ID: 152
Krish N. Gupta, PI: Dr. Nikhilesh Chawla

10:30-10:45 N-Amination and Oxidation: 1-amino-3,5-dinitro-1,2,4-triazole and 1-methoxy-5-nitrotetrazole
 SURF ID: 177
Janine Lee, PI: Dr. Davin Piercey

10:45-11:00 Dynamic Mechanical Characterization of Additive Manufactured Mock Gun Propellants
 SURF ID: 185
Jalen R. Macatangay, PI: Dr. Weinong Chen

11:00-11:15 Electrochemical Synthesis of 1,2,3-triazoles
 SURF ID: 248
Natthakan Welaha, PI: Dr. Davin Piercey

10:00-11:30 Medical Science & Technology (Session E)
[Click Zoom Link](#)

10:00-10:15 Towards Osteoarthritis Special Translation
 SURF ID: 141
Stephen R. Douglas, PI: Dr. Deva Chan

10:15-10:30 Analyzing Objective and Subjective Metrics of Surgeon Ergonomics
 SURF ID: 147
Alexis A. Gies, PI: Dr. Denny Yu

10:30-10:45 Evaluation of the Novel Automated Segmentation Algorithm of Trabecular and Cortical Region
 SURF ID: 176
Hyunseo Lee, PI: Dr. Deva Chan

10:45-11:00 An Adaptable Prosthetic Limb: Discovery of Product-Application Fit, Conceptualization, and Design Inception
 SURF ID: 216
Shivani Pranatharthi Haran, PI: Dr. Justin Weibel

11:00-11:15 Evaluating Finger Flexor Tendon Fatigue Using High-Frequency Ultrasound Based Strain Algorithms
 SURF ID: 134
Andrew J. Darling, PI: Dr. Craig Goergen

11:15-11:30 RF Reader for Battery-less RFID Tag in Implanted Neural Recorder
 SURF ID: 256
Ruichao Zhang, PI: Dr. Saeed Mohammadi

30th Morning Session**10:00-11:30 IOT for Agriculture (Session F)****Click [Zoom Link](#)**

- 10:00-10:15**
SURF ID: 122
Analyzing Efficacy of Nitrogen-fixing Biological Amendments in Maize using Agronomic Metrics and Experimental IoT LiDAR
Rebecca E.H. Caldbeck, PI: Dr. Tony Vyn
- 10:15-10:30**
SURF ID: 163
Precision Agriculture: Autonomous Corn Leaf Sampling
Brian B. Huang, PI: Dr. David Cappelleri
- 10:30-10:45**
SURF ID: 171
Atmospheric Correction: Comparison of the Empirical Line Method with Radiative Transfer Models on Hyperspectral Data
Nicole M. Kozel, PI: Dr. Melba Crawford
- 10:45-11:00**
SURF ID: 204
ISOBlue Lite: Collecting Data from Agricultural Vehicles Using a Raspberry Pi
Zachary T. Neel, PI: Dr. James Krogmeier
- 11:00-11:15**
SURF ID: 222
Path Loss Using Low-Power Wireless Communication Techniques in Digital Agriculture Applications
Chris Alejandro Rodriguez, PI: Dr. James Krogmeier
- 11:15-11:30**
SURF ID: 255
Single- and Multi-UAV Trajectory Optimization and Simulation
Jiecheng Zhang, PI: Dr. David Love

10:00-11:30 Sensors & Microsystems (Session G)**Click [Zoom Link](#)**

- 10:00-10:15**
SURF ID: 183
Near-infrared Sensor Model Development
Derek Lynn, PI: Dr. Gintaras Reklaitis
- 10:15-10:30**
SURF ID: 169
Membrane Mechanical Parameter Extraction from Laser-Induced Vibrations
Scott E. Kenning, PI: Dr. Kevin Webb
- 10:30-10:45**
SURF ID: 180
Stretchable, Functional, and Biocompatible Cellulose-based Fibrous Composite Fabrication and Characterization
Yuwei Katherine Liu, PI: Dr. Tian Li
- 10:45-11:00**
SURF ID: 133
Automated Measurement of Acoustoelectric RF MEMS for Wireless Communication Applications
Jaideep Damle, PI: Dr. Dana Weinstein
- 11:00-11:15**
SURF ID: 143
Optimizing Conjugated Ligand Incorporated Two-Dimensional Lead-Free Perovskites for Field Effect Transistors
Joseph Farrell, PI: Dr. Letian Dou
- 11:15-11:30**
SURF ID: 104
Investigating the Feasibility of On-line Particle Size Distribution for Real-Time Condition Monitoring of a Continuous Dry Granulation Process
Mariana Araujo da Conceicao, PI: Dr. Gintaras Reklaitis

1:00-1:30	Students Check In
1:30-2:00	Welcome and Ground Rule Discussion
2:00-3:15	Material Modeling & Simulation 2 (Session A)
	Click Zoom Link
2:00-2:15 SURF ID: 124	Development of Predictive Radiation Hardening by Design Tools <i>Landon Carre, PI: Dr. Mark Johnson</i>
2:15-2:30 SURF ID: 149	Application of Space Radiation Environments Software and Models on Magnetoresistive RAM Technologies <i>Aaron H. Guo, PI: Dr. Peter Bermel</i>
2:30-2:45 SURF ID: 200	Initial Evaluation of a Perovskite Semiconductor for a Betavoltaic Application <i>Andrew J. Mulrenin, PI: Dr. Shripad Revankar</i>
2:45-3:00 SURF ID: 217	Space Environment Radiation Effects on Commercial Magneto-resistive Random Access Memory (MRAM) <i>Matthew J. Rahfaldt, PI: Dr. Peter Bermel</i>
3:00-3:15 SURF ID: 257	IoT Based Sensing Platform for Real-Time Compressive Concrete Strength Monitoring <i>Bowen Zheng, PI: Dr. Na (Luna) Lu</i>
2:00-3:30	Environmental Characterization 2 (Session B)
	Click Zoom Link
2:00-2:15 SURF ID: 139	Industrial Water Consumption Coefficients and the Effect on Regional Water Availability <i>Annalynne P. Doll, PI: Dr. Inez Hua</i>
2:15-2:30 SURF ID: 151	Workflow Design and Visualization of Water Quality Data <i>Anushka Gupta, PI: Dr. Dharmendra Saraswat</i>
2:30-2:45 SURF ID: 161	3-Dimensional Analysis of Two Fluid Model Developments <i>James Howard, PI: Dr. Martin Lopez-de-Bertodano</i>
2:45-3:00 SURF ID: 189	Developing a Low-Cost and Low-Power Device for Community Water-Based Ecological Research <i>Shayne Stephen Marques, PI: Dr. Jacob Hosen</i>
3:00-3:15 SURF ID: 208	Indoor Aerosol Dynamics in Residential Buildings <i>Sarah May Palmer, PI: Dr. Brandon Boor</i>
2:15-3:30 SURF ID: 211	SLIC Segmentation and Deep Learning for Plant Disease Area Identification from Handheld Images <i>Hieu Phan, PI: Dr. Dharmendra Saraswat</i>
2:00-3:30	Machine Learning: Applications in Science & Engineering (Session C)
	Click Zoom Link
2:00-2:15 SURF ID: 116	Data-Driven Model for Electrode Property Prediction <i>Brennan S. Birn, PI: Dr. Partha Mukherjee</i>
2:15-2:30 SURF ID: 138	Analysis of Multiple Large-Scale Reaction Classification Methodologies employing Support Vector Machine <i>Caleb J. Diaz Acevedo, PI: Dr. Allison Godwin</i>
2:30-2:45 SURF ID: 172	Classification of Chemical Reactions Using Molecular Fingerprints and Logistic Regression <i>Amel J. Ksaibati, PI: Dr. Allison Godwin</i>

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2:45-3:00 SURF ID: 206	Evaluation of Different Fingerprinting Techniques for Classification of Large-Set Organic Reaction Data Using the Random Forest Algorithm <i>Lainey J. Orr, Pl: Dr. Allison Godwin</i>
3:00-3:15 SURF ID: 240	Geometric Sensitive Loss Function for X-ray Micro-Tomography Segmentation <i>Christopher Trombley, Pl: Dr. Nikhilesh Chawla</i>
2:15-3:30 SURF ID: 241	Leveraging Recurrent Neural Networks with Bidirectional Long Short-Term Memory for Top Quark Reconstruction <i>Nischay Uppal, Pl: Dr. Andreas Jung</i>

2:00-3:15 Biological Signaling (Session D)**Click Zoom Link**

2:00-2:15 SURF ID: 140	Development of a Co-culturing Method for Understanding Astrocyte's Role in Autism Spectrum Disorder <i>Aksana Doss, Pl: Dr. Tamara Kinzer-Ursem</i>
2:15-2:30 SURF ID: 154	cArgo: an Argonaute Mediated COVID-19 Detection Device <i>Manuela Haddad Correa, Pl: Dr. Kari Clase</i>
2:30-2:45 SURF ID: 194	Differential Tractography as a Patient-Specific Tool to Monitor Alzheimer's Disease Biomarkers <i>Noah J. Mehringer, Pl: Dr. Vitaliy L. Rayz</i>
2:45-3:00 SURF ID: 253	Temperature Dependence of Ion Channels in Neurons with Demyelination <i>Kayla M. Yates, Pl: Dr. Tamara Kinzer-Ursem</i>
3:00-3:15 SURF ID: 250	PLA-PCL Polymer Microsphere Formulation for the Deterrence of Prescription Opioid Abuse by Smoking <i>Elyssia N. Wellington, Pl: Dr. Luis Solorio</i>

2:00-3:15 Fabrication & Robotics (Session E)**Click Zoom Link**

2:00-2:15 SURF ID: 203	Wing Kinematics of Insect Robot <i>Saw Yan Naung, Pl: Dr. Xinyan Deng</i>
2:15-2:30 SURF ID: 179	Form + Function 4D Printing: Surface Preparation <i>John William LePage, Pl: Dr. Richard Voyles</i>
2:30-2:45 SURF ID: 233	233: Detailed Design of a Laser-Driven Flyer System <i>Kristen Stava, Pl: Dr. Weinong Chen</i>
2:45-3:00 SURF ID: 234	234: Investigation of the Implementation of 4D Printed Strain Gauges <i>Sara Swanlund, Pl: Dr. Richard Voyles</i>
3:00-3:15 SURF ID: 148	148: 4D Printer Project <i>Raymond Gregory Godjali, Pl: Dr. Richard Voyles</i>

30th Afternoon Session**2:00-3:15 Deep Learning & Cyber Security (Session F)****Click Zoom Link**

2:00-2:15 SURF ID: 110	Purposefully Public, Yet Vulnerably Exposed: Probing Web Services for Regex Denial of Service Vulnerabilities <i>Efe Barlas, Pl: Dr. James Davis</i>
2:15-2:30 SURF ID: 142	Hidden in Plain Sight: Suborning Client-side Sanitization of HTML Forms to Launch Regex Denial of Service (ReDoS) <i>Xin Du, Pl: Dr. James Davis</i>
2:30-2:45 SURF ID: 215	Counterfactual Multi-Agent Reinforcement Learning <i>Rohan Potdar, Pl: Dr. Shreyas Sundaram</i>
2:45-3:00 SURF ID: 236	Are two identically trained models equally fair? Variance in the fairness of models. <i>Prithviraj Praveen Tarale, Pl: Dr. Lin Tan</i>
3:00-3:15 SURF ID: 251	A New Approach for Program-by-Example Program Synthesis <i>Siyu Wu, Pl: Dr. Xiaokang Qiu</i>

2:00-3:15 Chemical Catalysis & Synthesis (Session G)**Click Zoom Link**

2:00-2:15 SURF ID: 102	Understanding the Speciation of Chloropalladate Ions for the Viral Synthesis of Palladium Nanomaterials through an Original Python Algorithm <i>David F. Amelema, Pl: Dr. Michael Harris</i>
2:15-2:30 SURF ID: 128	Defining and Mitigating Deactivation of Pt-based Dehydrogenation Catalysts <i>Isha Chavan, Pl: Dr. Jeffrey Miller</i>
2:30-2:45 SURF ID: 114	Automatic Process Synthesis using a Global Optimization Approach <i>Arsh Bhatia, Pl: Rakesh Agrawal</i>
2:45-3:00 SURF ID: 232	Synthetic Approaches to Independently Vary Al Distribution and Density in MEL Zeolites <i>Hannah Elizabeth Snider, Pl: Dr. Rajamani Gounder</i>
3:00-3:15 SURF ID: 181	Computational assessment of Brønsted acid site proximity in chabazite and its effect on protolytic propane cracking and dehydrogenation kinetics <i>Huston Loch, Pl: Dr. Rajamani Gounder</i>