

2020 SURF SUMMER SYMPOSIUM

30 - 31 July 2020

Hosted By:

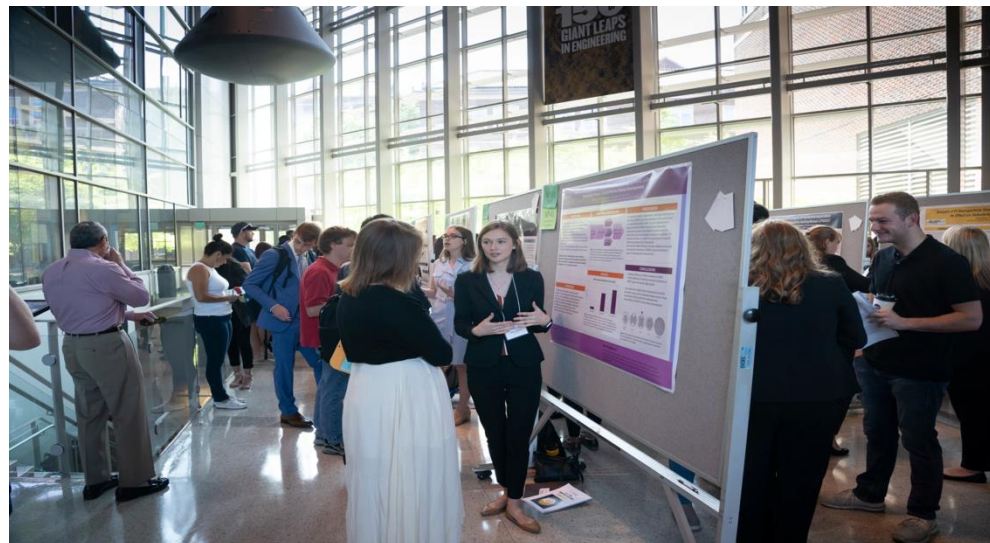


College of Engineering

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:

- Medical Science and Technology
- Chemical Unit Operations
- Biological Characterization and Imaging
- Biotechnology Data Insights
- Cellular Biology
- Composite Materials and Alloys
- Genetics
- Material Processing and Characterization
- Biological Simulation & Technology
- Nanotechnology
- Environmental Characterization
- Material Modeling and Simulation
- Ecology and Sustainability
- Big Data/Machine Learning
- Energy and Environment
- Deep Learning
- Learning and Evaluation
- Engineering the Built Environment
- Thermal Technology



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

*Sign into Zoom with an existing zoom account or create one to view the sessions.

Date & Time (EDT)	Session A https://zoom.us/j/95328444220	Session B https://zoom.us/j/91284348762	Session C https://us02web.zoom.us/j/89163545974	Session D https://us02web.zoom.us/j/85656633832	Session E https://zoom.us/j/99598814958
July 30 10:00 AM	Medical Science & Technology	Environmental Characterization	Thermal Technology	Machine Learning I: Big Data	Material Modeling & Simulation
July 30 2:00 PM	Biological Characterization & Imaging	Ecology & Sustainability	Material Processing & Characterization	Machine Learning II: Deep Learning	No Session
July 31 10:00 AM	Cellular Biology	Learning & Evaluation	Biotechnology Data Insights	Nanotechnology	Biological Simulation & Technology
July 31 2:00 PM	Genetics	Energy & Environment	Engineering The Built Environment	Chemical Unit Operations	Composite Materials & Alloys

Add all your sessions to: [Google Calendar](#)

[Calendar File Download](#)

Questions related to attending sessions: Call 765 203 1059 or 765 233 6224
email [<eur@purdue.edu>](mailto:eur@purdue.edu)



PROGRAMME DAY 1 | THURSDAY MORNING | JULY 30 2020

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

10:00-10:50 Medical Science and Technology (Session A) Click [Zoom Link](#)

10:05-10:20 30-M1: Assessing Preference of Temperature or Light in Laboratory Mice
Haley Davis, PI: Dr. Brianna Gaskill, Department of Animal Sciences

10:20-10:35 30-M2: Investigation of A Common Canine Factor VII Deficiency Variant in Dogs With Unexplained, Excessive Bleeding On Necropsy
Jessica Ashley Clark, PI: Dr. Kari Ekenstedt, Department of Basic Medical Sciences

10:35-10:50 30-M3: Behavioral Comparison of Comodulation Masking Release Between Chinchillas and Human Subjects
Fernando Aguilera De Alba, PI: Dr. Michael G. Heinz, Weldon School of Biomedical Engineering

10:00-11:20 Environmental Characterization (Session B) Click [Zoom Link](#)

10:05-10:20 30-M4: Development of Open-Source Beehive Monitoring Systems
Nathan Sprague, PI: Dr. John Evans, Department of Agricultural & Biological Engineering

10:20-10:35 30- M5: Improving Biomass Prediction of Soybean Using Multispectral Imagery
Siddhant Singh, PI: Dr. Keith Cherkauer, Department of Agricultural & Biological Engineering

10:35-10:50 30- M6: Modeling Spatial and Temporal Emissions for Animal Farming Using Mechanistic Models
Martina Macaggi, PI: Dr. Shweta Singh, Department of Agricultural & Biological Engineering

10:50-11:05 30- M7: NAPRA+ Model: Development Of An Updated Version Of The National Agricultural Pesticide Risk Analysis (NAPRA) WWW System Using Open Source Tools
Julia Schneider, PI: Dr. Dharmendra Saraswat, Department of Agricultural & Biological Engineering

11:05-11:20 30- M8: The Impact of Extended Stagnation on Building Water Quality
Danielle Angert, PI: Dr. Andrew Whelton, Lyles School of Civil Engineering

10:00-10:50 Thermal Technology (Session C) Click [Zoom Link](#)

10:05-10:20 30-M9: Design Optimization Of 3d Printed Micro-channel Heatsinks
Rafael Leonardo Estrella, PI: Dr. Justin A Weibel, School of Mechanical Engineering

10:20-10:35 30-M10: Design and Manufacturing of Bio-inspired Nanocomposites for Radiative Cooling
Fernando Jose Barrios, PI: Dr. Xiulin Ruan, School of Mechanical Engineering

10:35-10:50 30-M11: Design and Analysis of a Novel Membrane Heat Exchanger
Bryan Christopher Pamintuan, PI: Dr. James Braun, School of Mechanical Engineering

10:00-11:05 Machine Learning I: Big Data (Session D) Click [Zoom Link](#)

10:05-10:20 30-M12: Income inequality effect on travel pattern during COVID 19
Chengyuan Yang, PI: Dr. Satish Ukkusuri, Lyles School of Civil Engineering

10:20-10:35 30-M13: Analyzing Social Distancing using Large Scale Computer Vision
Isha Ghodgaonkar, PI: Dr. Yung-Hsiang Lu, School of Electrical and Computer Engineering

10:35-10:50 30-M14: Impact of State HCBS Waiver Policies on Patient Outcomes
Makayla Courtney Roma, PI: Dr. Paul Griffin, School of Industrial Engineering

10:50-11:05 30- M15: Effects of Lifting Task on Heart Rate
Nan Chen, PI: Dr. Denny Yu, School of Industrial Engineering

10:00-11:20 Material Modeling and Simulation (Session E) Click [Zoom Link](#)

10:05-10:20 30-M16: Three-Dimensional Structural Real-Time Hybrid Simulations Applied to Extra-Terrestrial Habitats
Sterling Reynolds, PI: Dr. Shirley Dyke, School of Mechanical Engineering

10:20-10:35 30-M17: Finite Element Modeling of Transmembrane Potential under Applied Electric Fields
Lorin Irene Breen, PI: Dr. Allen Garner, School of Nuclear Engineering

10:35-10:50 30-M18: Automatic Machining Feature Generation
Siyang Chen, PI: Dr. Martin Jun, School of Mechanical Engineering

10:50-11:05 30-M19: Optimization of Centrifugally Tensioned Metastable Fluid Detectors (CTMFD) for Alpha and Neutron Detection
Jacob Andrew Minnette, PI: Dr. Rusi Taleyarkhan, School of Nuclear Engineering

11:05-11:20 30-M20: Automated Fitting of Freeform Surfaces to Point Cloud Datasets for Comparison of Manufactured Components
Ryoma Kawakami, PI: Dr. Michael Sangid, School of Aeronautics and Astronautics

PROGRAMME DAY 1 | THURSDAY AFTERNOON | JULY 30 2020

1:00-1:30 Students Check In
1:30-2:00 Welcome and Ground Rule Discussion

2:00-3:05 Biological Characterization and Imaging (Session A) Click [Zoom Link](#)

2:05-2:20 30-A1: Abdominal Aortic Aneurysm Progression and Thrombus Formation Displayed Using Various Murine Models
Blake Tanski, PI: Dr. Craig Goergen, Weldon School of Biomedical Engineering

2:20-2:35 30-A2: Characterization Of In Vivo Aortic Valve Dynamics Using Four-Dimensional Ultrasound
Daniel Gramling, PI: Dr. Craig Goergen, Weldon School of Biomedical Engineering

2:35-2:50 30-A3: Localization Imaging of Neuronal Signaling With Spatiotemporal Fluorescent Reporter Data
David Czerwonsky, PI: Dr. Kevin Webb, School of Electrical and Computer Engineering

2:50-3:05 30-A4: Using Automated Image Processing to Characterize the Osteocyte Lacunar-Canalicular System
Rachel Zhang, PI: Dr. Russell P. Main, Weldon School of Biomedical Engineering

2:00-3:20 Ecology and Sustainability (Session B) Click [Zoom Link](#)

2:05-2:20 30-A5: Salinity in Arid Landscapes: A Case Study from Arequipa, Peru
Xochilth Saldana, PI: Dr. Sara K McMillan, Department of Agricultural & Biological Engineering

2:20-2:35 30-A6: Fragmentation and Carbon Storage in Forest Ecosystems
Breanna Motsenbocker, PI: Dr. Brady Hardiman, Environmental and Ecological Engineering

2:35-2:50 30-A7: Recent Lake Michigan Shoreline Changes Along Indiana's Coast
Ben Nelson-Mercer, PI: Dr. Cary Troy, Lyles School of Civil Engineering

2:50-3:05 30-A8: Results of A Nearshore Lake Michigan Mixing Experiment
Kira Mccorrey, PI: Dr. Cary Troy, Lyles School of Civil Engineering

3:05-3:20 30-A9: Computer Simulations of Polar Ice Calving
Jacques Barsimantov, PI: Dr. Marisol Koslowski, School of Mechanical Engineering

2:00-3:20 Material Processing and Characterization (Session C) Click [Zoom Link](#)

2:05-2:20 30-A10: Sputter Deposition with Transparent Conducting Oxide
Xingyu Wang, PI: Dr. Sunghwan Lee, School of Engineering Technology

2:20-2:35 30-A11: 3D simulation of shrinkage during femtosecond two-photon polymerization
Yijie Chen, PI: Dr. Xianfan Xu, School of Mechanical Engineering

2:35-2:50 30-A12: Stress and Failure Analysis of Thin Film Electrodes Induced By The Volumetric Strain
Gary Li, PI: Dr. Kejie Zhao, School of Mechanical Engineering

2:50-3:05 30-A13: Single Crystal HMX Under Quasi-Static Loading
Kristyna Hyblova, PI: Dr. Steven Son, School of Mechanical Engineering

3:05-3:20 30-A14: High Pressure Burning Characteristics of Additively Manufactured Gun Propellants
Chase Wernex, PI: Dr. Steven Son, School of Mechanical Engineering

2:00-3:05 Machine Learning II: Deep Learning (Session D) Click [Zoom Link](#)

2:05-2:20 30-A15: Applications of Deep Reinforcement Learning
Anurag Lalit Shah, PI: Dr. Vaneet Aggarwal, School of Industrial Engineering

2:20-2:35 30-A16: Sparsity Aware Core Extension Benchmarking in Resource-Limited Microcontroller
Ruoyi Chen, PI: Dr. Mark Johnson, School of Electrical and Computer Engineering

2:35-2:50 30-A17: A Query Processing Engine for Vehicle Re-Identification: A Clustering Approach
Kaiwen Shen, PI: Dr. Felix Lin, School of Electrical and Computer Engineering

2:50-3:05 30-A18: Modeling Light Transport in Fog for Computational Imaging
Emi Mondragon, PI: Dr. Kevin Webb, School of Electrical and Computer Engineering

PROGRAMME DAY 2 | FRIDAY MORNING | JULY 31 2020

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

10:00-11:20 Cellular Biology (Session A) Click [Zoom Link](#)

10:05-10:20 31-M1: Multi-fidelity Analysis to Study the Emergence of Drug Resistance in Multiple Tuberculosis Granulomas
Shaurya Gaur, PI: Dr. Elsje Pienaar, Weldon School of Biomedical Engineering

10:20-10:35 31-M2: Computational Investigation of Mechanical Interactions between Cells and Extracellular Matrix
Brandon Slater, PI: Dr. Taeyoon Kim, Weldon School of Biomedical Engineering

10:35-10:50 31-M3: The Application Of Single Cell Genomics In Viral Infectious Disease
Zonghao Zhang, PI: Dr. Majid Kazemian, Department of Biochemistry

10:50-11:05 31-M4: Effects of Cell-Cell Contact During Multicellular Migration
Anuhya Edupuganti, PI: Dr. Bumsoo Han, School of Mechanical Engineering

11:05-11:20 31-M5: Noninvasive Measurement and Visualization of Vagus Nerve Activity to Improve the Efficacy Of Gastric Electrical Stimulation Therapy in Human Subjects with Gastroparesis
Rama Coimbatore, PI: Dr. Matthew P Ward, Weldon School of Biomedical Engineering

10:00-11:05 Learning and Evaluation (Session B) Click [Zoom Link](#)

10:05-10:20 31-M6: Novel Ethnographic Investigations of Engineering Workplaces to Advance Theory and Research Methods for Preparing the Future Workforce
Paige Kadavy, PI: Dr. Brent Jesiek, School of Engineering Education

10:20-10:35 31-M7: Automatic Grading System for Programming Assignments
Swapnil Kelkar, PI: Dr. Milind Kulkarni, School of Electrical and Computer Engineering

10:35-10:50 31-M8: Automated Grading for Programming Assignments
Brandon Xu, PI: Dr. Milind Kulkarni, School of Electrical and Computer Engineering

10:50-11:05 31-M9: Predicting Subsequent Memory from Cognitive States During Learning
Gloria Dietz, PI: Dr. Yu-Chin Chiu, Department of Psychological Sciences

10:00-11:05 Biotechnology Data Insights (Session C) Click [Zoom Link](#)

10:05-10:20 31-M10: Automation in Drug Approval Process Information
Bobby Putra Santoso, PI: Dr. Alina Alexeenko, Davidson School of Chemical Engineering

10:20-10:35 31-M11: Bioinformatic Analyses and Synthesis of Natural Product Inspired Cyclic Peptides
Chloe Smith, PI: Dr. Elizabeth Parkinson, Department of Chemistry

10:35-10:50 31-M12: Expanding A Lipid Fragmentation Database and LIQUID Functionality
Chisa Zensho, PI: Dr. Julia Laskin, Department of Chemistry

10:50-11:05 31-M13: Applications of Biotechnology in Phage Discovery, Lipidomics, and Proteomics
Emma Lietzke, PI: Dr. Kari Clase, Department of Agricultural & Biological Engineering

10:00-11:20 Nanotechnology (Session D) Click [Zoom Link](#)

10:05-10:20 31-M14: Modeling Ferroelectric Domain Switching Kinetics
Minh Tran, PI: Dr. Dana Weinstein, School of Electrical and Computer Engineering

10:20-10:35 31-M15: Optimization of Focused Ultrasound from Piezoelectric Micromachined Ultrasound Transducers For Neural Stimulation
Daria Shkel, PI: Dr. Dana Weinstein, School of Electrical and Computer Engineering

10:35-10:50 31-M16: Finite Element Implementation of Strain Gradient Plasticity for Microscale Amorphous Polymer Structures
Fredrik Arentz, PI: Dr. Xianfan Xu, School of Mechanical Engineering

10:50-11:05 31-M17: Design and Simulation of an On-Chip LC Filter for Superconducting Quantum Circuits
Gozde Iloglu, PI: Dr. Ruichao Ma, Department of Physics and Astronomy

11:05-11:20 31-M18: Simulation, Identification, and Application of CMOS inverters using OFETs
Walter Kruger, PI: Dr. Robert Nawrocki, School of Engineering Technology

10:00-11:05 Biological Simulation and Technology (Session E) Click [Zoom Link](#)

10:05-10:20 31-M19: Modeling of Mass and Fluid Transfer in Hemodialysis to Maximize Treatment Efficiency
Dunya Ai Marzooqi, PI: Dr. Vivek Narsimhan, Davidson School of Chemical Engineering

10:20-10:35 31-M20: Computational Modeling of Fluid Flow Through Porous Media in A Cholera Enrichment Device
Julio Rivera, PI: Dr. Jacqueline Linnes, Weldon School of Biomedical Engineering

10:35-10:50 31-M21: Mechanobiology Computational Modeling of Healing Following Breast Conserving Surgery
Maira Fontaine, PI: Dr. Sherry Voytik-Harbin, Weldon School of Biomedical Engineering

10:50-11:05 31-M22: Coarse-grained Modeling of Proteins
Kata Alilovic, PI: Dr. Arezoo Ardekani, School of Mechanical Engineering

PROGRAMME DAY 2 | FRIDAY AFTERNOON | JULY 31 2020

1:00-1:30 Students Check In
1:30-2:00 Welcome and Ground Rule Discussion

2:00-3:20 Genetics (Session A)

[Click Zoom Link](#)

2:05-2:20 31-A1: Analysis of the Indenoisoquinoline Compound Library for Myc G-Quadruplex Targeting
Joshua Kosnoff, PI: Dr. Danzhou Yang, Department of Medicinal Chemistry and Molecular Pharmacology

2:20-2:35 31-A2: The Role of BMAL1 and CLOCK in the Formation of Alveolar Structures in 3D Cultures
Jacob Larsen, PI: Dr. Theresa Casey, Department of Animal Sciences

2:35-2:50 31-A3: Structural Studies of Phospholipase C Epsilon
Amanda Everly, PI: Dr. Angeline Lyon, Department of Chemistry

2:50-3:05 31-A4: The Characterization of the Formation of SAGA and CHAT in *Drosophila*
Hannah Blum, PI: Dr. Vikki Weake, Department of Biochemistry

3:05-3:20 31-A5: R-loops and DNA damage in aging Photoreceptor Neurons
Alyssa Easton, PI: Dr. Vikki Weake, Department of Biochemistry

2:00-3:20 Energy and Environment (Session B)

[Click Zoom Link](#)

2:05-2:20 31-A6: Marine Renewable Energy: Aligning the Technology, Geography, and Markets
Sean Murphy, PI: Dr. Joseph Sinfield, Lyles School of Civil Engineering

2:20-2:35 31-A7: Development of a Riverine Energy Harvesting Device: Characterization of Wabash River in Lafayette As A Test Site
Jingzhe (Zack) Zhang, PI: Dr. Jun Chen, School of Mechanical Engineering

2:35-2:50 31-A8: Wind Energy Production and Resource Optimization
Abigayle Elaine Moser, PI: Dr. Luciano Castillo, School of Mechanical Engineering

2:50-3:05 31-A9: Development of a More Environmentally Sustainable Machine Tool Through Innovative Design
Adriana M. Munoz-Soto, PI: Dr. John Sutherland, Environmental and Ecological Engineering

3:05-3:20 31-A10: An Online Behavioral Experiment on Users- Agency Interactions in the Provision of a Public Service
Mauneel Amin, PI: Dr. David J. Yu, Lyles School of Civil Engineering

2:00-3:05 Engineering the Built Environment (Session C)

[Click Zoom Link](#)

2:05-2:20 31-A11: Exploration of Trust in Automation in Complex, Safety-Critical Systems
Jacob Evans, PI: Dr. Shirley Dyke, School of Mechanical Engineering

2:20-2:35 31-A12: Investigating Membrane Material Alternatives For Carbon Dioxide Removal In Space
Gabriela Cesar, PI: Dr. David Warsinger, School of Mechanical Engineering

2:35-2:50 31-A13: Thermal Transfer System Development of Cyber-Physical Testbed for Resilient Extra-Terrestrial Habitats
Jordan Soberg, PI: Dr. Shirley Dyke, School of Aeronautics and Astronautics

2:50-3:05 31-A14: Real Time Occupancy Sensing with a Low-Cost Seat Based Temperature Array
Aayush Mathur, PI: Dr. Brandon Boor, Lyles School of Civil Engineering

2:00-3:05

Chemical Unit Operations (Session D)

[Click Zoom Link](#)

2:05-2:20 31-A15: More Olefins: Oxidative Dehydrogenation of Ethane in Shale Gas to Ethylene
Cristian Oviedo, PI: Dr. Rakesh Agrawal, Davidson School of Chemical Engineering

2:20-2:35 31-A16: Consequences of Brønsted Acid Site Proximity and Location in H-MFI Zeolites for Propene Dimerization
Lauren Kilburn, PI: Dr. Raj Gounder, Davidson School of Chemical Engineering

2:35-2:50 31-A17: Shale Gas to Oil: Kinetic Model for Oligomerization Reactor
Dorinda Ntim, PI: Dr. Rakesh Agrawal, Davidson School of Chemical Engineering

2:50-3:05 31-A18: Sensing and Measurement For Controlled Nucleation In Lyophilization
Siyue Shen, PI: Dr. Alina Alexeenko, Davidson School of Chemical Engineering

2:00-3:05

Composite Materials and Alloys (Session E)

[Click Zoom Link](#)

2:05-2:20 31-A19: Progress Towards 20% Efficient Flexible Perovskite Solar Cells
Yiyuan (Melody) Zhang, PI: Dr. Letian Dou, Davidson School of Chemical Engineering

2:20-2:35 31-A20: Examining Fatigue Damage Mechanisms in Carbon Fiber Reinforced Composite Laminates Through High Resolution X-ray Micro Computed Tomography
Jose Solano, PI: Dr. Michael Sangid, School of Aeronautics and Astronautics

2:35-2:50 31-A21: Mathematical Modeling of the Anionic Diffusion in Halide Perovskites
Alan Pistone, PI: Dr. Letian Dou, Davidson School of Chemical Engineering

2:50-3:05 31-A22: Thermodynamic Modeling of Oxidation In Refractory Complex Concentrated Alloys
Haydn Schroader, PI: Dr. Michael S Titus, School of Materials Engineering