MATERIALS SCIENCE & ENGINEERING
UNIVERSITY of WASHINGTON

2025 RESEARCH & INDUSTRY SHOWCASE

Walker-Ames Room, Kane Hall
Monday, March 3, 2025
2:30 p.m. - 6:30 p.m.

PROGRAM

2:30 – 3:00 pm **Check-In**

3:00 – 3:05 pm Opening remarks and announcements

3:05 – 3:35 pm **Keynote Address**
John Felts
CEO and Co-founder
Cruz Foam

3:35 – 3:45 pm **MSE Mentor Appreciation**

3:45 – 4:00 pm *Break*

4:00 – 5:00 pm **Graduate student presentations**

Jacob Beitzel
Adviser: Miqin Zhang
Injectable Hydrogels for Cartilage Regeneration

Paulina Portales Picazo
Adviser: Navid Zobeiry
Machine Learning for Kinetics Characterization in Polymer Composites Processing

Lingnan Shen
Advisers: Di Xiao, Ting Cao
Harnessing Quantum Computing for Strongly Correlated Topological Material

Mingyuan Zhang
Adviser: Bruce Hinds
Continuous whole blood dialysis based on regenerated dialysate utilizing TiO2 nanowire photo-electrochemical oxidation and protective forward osmotic membrane

5:00 – 6:30 pm **Poster Session, dinner and mingling**

KEYNOTE SPEAKER

John Felts

'15 M.S. MSE

CEO and Co-founder

Cruz Foam

John Felts is Co-founder and CEO of Cruz Foam. Cruz Foam is a circular materials company that produces eco-friendly plastic foam alternative solutions that power key industry leaders to be the catalyst for a cleaner environment. John holds a BS in chemical engineering from UC Santa Barbara and an MS in materials engineering from the University of Washington. John co-founded Cruz Foam in 2017 with the mission of saving our oceans and helping end the global epidemic of plastic pollution. He is an avid surfer and lives with his family in Santa Cruz, California.

POSTERS

1. **William Berman**
   (Adviser: Quansan Yang)
   Implosion carving: hydrogel-mediated nanoscale manufacturing: An introduction to a subtractive manufacturing process and the plans to study it further

2. **Zoe Blumenkranz, Mark Fernandez**
   (Advisers: Lucien Brush, Ayo Olanrewaju)
   Optimizing Surface Properties and Geometries for Capillary Microfluidic Devices Produced on LCD 3D Printers

3. **Vanessa Bradshaw**
   (Adviser: Dwayne Arola)
   The Impact of 3D Printing Parameters on the Qualification of Additively Manufactured High Strength Polymers

4. **Martin Brischetto**
   (Adviser: Jihui Yang)
   Rate Limiting Mechanisms in Li-ion Battery Cathodes

5. **Ian Campbell**
   (Adviser: Eleftheria Roumeli)
   Using biomatter analogues to understand cohesion in algal bioplastics

6. **Meaghan Capper**
   (Adviser: Dwayne Arola)
   Colgate-Palmolive Project: Evaluating the Organic Content Distribution in Enamel

7. **Amirali Eskandariyun**
   (Adviser: Navid Zobeiry)
   Integrated Process and Failure Analysis in Composites Using Multi-fidelity Simulations and Machine Learning

8. **Jianxi Huang**
   (Adviser: Miqin Zhang)
   Nanotechnology for cancer diagnosis and treatment

9. **Daniel Lund**
   (Adviser: Dwayne Arola)
   Understanding Spatter and its Spatial Variations in LPBF

10. **Colin Marquis**
    (Adviser: Dwayne Arola)
    Improving Interfacial Strength of Ultra-high Molecular Weight Polyethylene Yarn in Composite Feedstocks via Functionalization with Activated Peroxides

11. **Alicia Piscitelli**
    Propelling the Industry: Strategic Demonstration of a Bioequivalent Phenolic Resin for Aerospace

12. **Akila Rajan, Natasha Young, Rodrigo Pulgar, Martin Ma, Marquiz Silvestre, Aidan Mattson, Nathan Eng**
    (Adviser: Luna Huang)
    Boeing Expandable Positive Pressure Composite Repair

13. **Pan Shi**
    (Adviser: Mo Chen)
    Repetitive readout based on long-lived TLS in superconducting qubits

14. **Alexey Soldatenko**
    (Adviser: Peter Pauzauskie)
    Reduced photothermal heating in H3-doped micro-sized diamonds

15. **Max Stafford**
    (Adviser: Charles Marcus)
    Characterization Workflow for Unconventional Superconductivity

16. **Henry Stirrat**
    (Adviser: Luna Huang)
    AI Powered Dataset Construction

17. **Julia White**
    (Adviser: Jihui Yang)
    Leveraging Machine Learning and Meta-Analysis to Design High-Performance 3D Current Collectors for Lithium Metal Batteries

18. **Jiaheng Xue**
    (Adviser: Quansan Yang)
    Multichannel single cell sensor

19. **Harvey Yang, Kaden Burke, Maggie Ma, Surbhi Kakar, Farrell Atzuri, Ian Foy, Cal Davis**
    (Advisers: Jun Liu, Luna Huang)
    Hydrogen-Powered Model Submarine

20. **Wendy Zhao**
    (Adviser: Miqin Zhang)
    Injectable and Tissue Adhesive Chitosan and Hyaluronic Acid-based Hydrogels for Stem Cell Delivery and Cartilage Regeneration