WASHINGTON NASA SPACE GRAN CONSORTIUM

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POSTER SESSION & CHALLENGE DAY

August 19, 2022

Husky Union Building

SUPELAVA TUBE EXPLORATION

VIUDENT CHALLENGE



WA SPACE GRANT CONSORTIUM

Lead Institution

University of Washington

Director — Kristi Morgansen Professor and Chair, William E. Boeing Department of Aeronautics and Astronautics

Deputy Director for Program Operations — Mary Denmon Co-Investigator, Lunar Lava Tube Exploration Challenge

Deputy Director for High-Altitude Ballooning — Sarah Tuttle Assistant Professor, Astronomy

Deputy Director for Rocketry — Owen Williams Research Assistant Professor, William E. Boeing Department of Aeronautics and Astronautics

Affiliates

- Bellevue College
- Central Washington University
- Everett Community College
- Heritage University
- Northwest Indian College
- Pacific Science Center
- Peninsula College
- Pierce College Fort Steilacoom
- Seattle Central College
- University of Puget Sound
- Washington State University
- Western Washington University
- Whitworth University

Collaborative Partners

- Eagle Harbor Technologies
- Museum of Flight
- North Seattle College
- White Swan High School

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POSTER SESSION & CHALLENGE DAY

Schedule

8:30 a.m. Welcome from Director Kristi Morgansen

- HUB South Ballroom
- 9 a.m. 12 p.m.

Artemis LLTEC teams begin challenge *(see next page for full schedule)* • HUB 250

9–10 a.m.

- Open poster session • HUB South Ballroom
- 10–11:30 a.m.

Presentations

- HUB 238 & 307
- 12:30–2 p.m.
 - Presentations
 - HUB 238 & 307

1–5 p.m.

Artemis LLTEC teams continue challenge (see next page for full schedule) • HUB 250

Virtual

Artemis LLTEC livestream @ <u>YouTube</u>



Virtual comment boards @ Jamboard









ARTEMIS LUNAR LAVA TUBE EXPLORATION CHALLENGE

Schedule

9 a.m.

Stay Hydrated (Everett Community College)

9:45 a.m.

Atom (Everett Community College)

10:30 a.m. **Woman Bosses** (Everett Community College)

12 p.m.

Order of Chaos (Everett Community College)

1:15 p.m.

MoonWalkers (Pierce College)

2 p.m.

Team Rock (University of Washington, Seattle and Bothell)

2:45 p.m.

Lunarticos (University of Texas at El Paso)

3:30 p.m.

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Lunar Miners (The University of Texas at El Paso)

Each team will have 15 minutes to run their robot through the lava tube challenge course.

Want to see what's happening inside the lava tube? Watch the livestream on our <u>YouTube</u>!!

Last-minute schedule adjustments may occur as needed by the teams.



ARTEMIS LUNAR LAVA TUBE EXPLORATION CHALLENGE

Teams

Atom

Everett Community College; Everett, WA Leonel Guerra (team lead), Eric Steven Martin, Eduardo caballero, Anthony Cousins, Mike Merkley *Mentor: Kristine Washburn*

Lunar Miners

The University of Texas at El Paso; El Paso, TX

Eunize Tobias (team lead), Enrique Ceballos, Jenny Chavez, Naily Estrella Delgado *Mentor: Robert Roberts*

Lunarticos

University of Texas at El Paso; El Paso, TX Alan Melendez (team lead), Marco Colmenero, Sebastian Oropeza, Brayan Garcia Pong, David Guereca *Mentor: Robert Roberts*

MoonWalkers

Pierce College; Puyallup, WA Christopher Copans (team lead), Vinny Leuzzi, Khush Thakor, Brandon Russo *Mentor: Alan Man*

Order of Chaos

Everett Community College; Everett, WA Yuliya Fedorchenko (team lead), Nickolas Sturgeon, Mariana Tejada, Michael Smith *Mentor: Kristine Washburn*

Stay Hydrated

Everett Community College; Everett, WA Kiara Frazier (team lead), Nika Gagucas, Elishah Webb, Axel Rochel, Chris Lopez *Mentor: Kristine Washburn*

Team Rock

University of Washington-Seattle and Bothell; Seattle, WA Emily Kang (team lead), Henrie Filart, Jordy Ruiz, Rodrigo Moreno *Mentor: Mary Denmon*

Woman Bosses

Everett Community College; Everett, WA Alexis Harmon (team lead), Alondra Torres, Celeste Hartman, Madison Woolridge, Rachel Zook *Mentor: Kristine Washburn*



PRESENTATIONS

<u>10–11:30 a.m.</u>

10:00 a.m. — **"Measuring the Electron Density of Z-Pinch Plasmas on the ZaP-HD Experiment"**

Harry Furey-Soper University of Washington

10:00 a.m. — **"The effect of rugose small colony variants on Pseudomonas aeruginosa biofilm dispersion"**

Angel Reddy University of Washington

- 10:20 a.m. "Clustering Spectral Noise in the search for gravitational waves" Athena Baches University of Washington
- 10:20 a.m. "Optimizing Spaceflight Trajectories Using Genetic Algorithms" Margaret Fairborn, Caleb Flegel, and Connor Florey Whitworth University
- 10:40 a.m. "Negative 4D Photo-Patterning to Control Cell Activity in Hydrogels" Annabella Li University of Washington
- 10:40 a.m. "Single Platelet Spreading on Key Proteins" Francisco Morales University of Washington
- 11:00 a.m. "Mechanical and Thermal Modeling of a High Pulse Rate Inductive Thruster"

Jacob Sawyer University of Washington

11:00 a.m. — "Recycling Expired Carbon Fiber Prepreg Material"

Areesa Trevno University of Washington

WASHINGTON NASA SPACE GRANT CONSORTIUM Last-minute schedule adjustments may occur as needed by the presenters.

PRESENTATIONS

<u>12:30–2 p.m.</u>

12:30 p.m. — "Insect-Scale, Low-Power Olfactory-Based Sensing with Artificial Intelligence"

Maitri Dedhia University of Washington

- 12:30 p.m. **"4D Protein Photoactivation in Biomaterials and Living Cells"** Kathy Do *University of Washington*
- 12:50 p.m. **"Optimizing 3D Printed Tourniquets for Immediate Aid in Ukraine"** Tosh Kaneala Brown-Moore *University of Washington*
- 12:50 p.m. **"A novel zebrafish mutant to elucidate the consequences of Wnt16 cysteine deletion"**

Emily Ramirez University of Washington

- 1:10 p.m. **"A New Spin On Modern Rocketry"** Stephen Cushing, Daniel Johnson, Brennen Johnston, Parker Schulmerich *University of Washington*
- 1:10 p.m. **"University of Washington Industrial Assessment Center"** Caitlin DeShazo-Couchot, Harris Nakajima, Jack Philbrick *University of Washington*
- 1:30 p.m. "Fighting Vibrations With Vibrations: Towards Self Optimized Aerospace Structures"

Roger Colglazier University of Washington

1:30 p.m. — **"Understanding Ice Temperature in Ice Streams in Antarctica and Greenland"**

Jonathan Ortiz-Candelaria University of Washington



Seattle Central College

"A New Spin On Modern Rocketry"

Stephen Cushing, Daniel Johnson, Brennen Johnston, Parker Schulmerich *Mentor(s): John Correy; UW Aeronautics & Astronautics*

Western Washington University

"Analyzing the Position and Distribution of Centriolar Satellites"

Elizabeth Cameron, Jonah Goodfried Mentor(s): Nick Galati; WWU Biology

"The effect of Targeted Acoustic Startle Technology on the foraging success of individual harbor seals"

Kate Clayton, Kathleen McKeegan Mentor(s): Alejandro Acevedo-Gutiérrez; WWU Biology

University of Washington

"4D Protein Photoactivation in Biomaterials and Living Cells"

Kathy Do Mentor(s): Cole DeForest; Chemical Engineering & Bioengineering

"A Data Assimilation-Based Twentieth Century Climate Reconstruction Framework for Identifying Antarctic Ice Core Sites"

Advik Eswaran Mentor(s): TJ Fudge; Earth and Space Sciences

"A novel zebrafish mutant to elucidate the consequences of Wnt16 cysteine deletion"

Emily Ramirez Mentor(s): Ronald Kwon; Orthopaedics and Sports Medicine "Analyzing a Winter Cyclone with Snowbands During the Investigation of Microphysics and Percipitation for Atlantic Coast-Threatening Snowstorms (IMPACTS) Campaign" Sarah Phillips Mentor(s): Lynn McMurdie; Atmospheric Sciences

"Cellular Requirements for KSHV Latent Infection"

Jessica Lee Mentor(s): Michael Lagunoff; Microbiology

"Characterizing Vascular Organoids with Cerebral autosomal dominant arteriopathy with subcortical infarcts and leukoencephalopathy (CADASIL)" Solhee Jin Mentor(s): Ying Zheng; Bioengineering

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"Clustering Spectral Noise in the search for gravitational waves"

Athena Baches Mentor(s): Joey Key, Ansel Neunzert; UW Bothell — Division of Physical Sciences

"Construction & Integration of Fiber Optics Test Stands and Solutions"

Daniel Schweizer, Benjamin Herrera Mentor(s): Sarah Tuttle, Travis Mandeville; Astronomy

"Demonstrating and Evaluating Quantum Key Distribution"

Suhani Jain Mentor(s): Kai-Mei Fu; Electrical and Computer Engineering

"Developing a Graphical User Interface for Nanosecond Pulsers"

Sophia Anderson, Elijah Carino, Ian Rain-Water, Jakob Zuraw *Mentor(s): Eagle Harbor Technologies;*

"Fabrication of Liquid-Filled Voronoi Foams For Impact Absorption Using Material Jetting Technology"

Tosh Kaneala Brown-Moore Mentor(s): Jeff Lipton; Mechanical Engineering

"Fighting Vibrations With Vibrations: Towards Self Optimized Aerospace Structures"

Roger Colglazier *Mentor(s): Ed Habtour; Aeronautics & Astronautics*

"Genomic analysis of cyanobacteria from the world's largest Oxygen Deficient Zone"

Cristian Swift Mentor(s): Gabrielle Rocap; School of Oceanography

"Guns... that save lives!? Fluid dynamics of vaccine Gene Guns"

Treyson Gleich Mentor(s): Owen Williams; Aeronautics & Astronautics

"ICESat-2 Observations of Ice Shelf Fracture"

Aidan Dealy Mentor(s): Brad Lipovsky; Earth and Space Sciences

"Insect-Scale, Low-Power Olfactory-Based Sensing with Artificial Intelligence"

Maitri Dedhia Mentor(s): Vikram Iyer; Computer Science and Engineering

"Investigating Fundamental Toughening Mechanisms in Nanocellular Foams"

Ryleigh Weston Mentor(s): Marco Salviato, Aeronautics & Astronautics; Lucas Meza, Mechanical Engineering; Vipin Kumar, Mechanical Engineering;

"LOST: Open-Source Star Tracker"

Karen Haining, Kenneth Yang, Edward Zhang *Mentor(s): Kristi Morgansen; Aeronautics & Astronautics*



"Measuring the Electron Density of Z-Pinch Plasmas on the ZaP-HD Experiment"

Harry Furey-Soper Mentor(s): Uri Shumlak; Aeronautics & Astronautics

"Mechanical and Thermal Modeling of a High Pulse Rate Inductive Thruster"

Jacob Sawyer Mentor(s): Justin Little; Aeronautics & Astronautics

"Negative 4D Photo-Patterning to Control Cell Activity in Hydrogels"

Annabella Li Mentor(s): Cole DeForest; Chemical Engineering & Bioengineering

"Non-Native Oyster Performance in the Anthropocene"

Emma Beck Mentor(s): Jennifer Ruesink; Biology

"Optimizing 3D Printed Tourniquets for Immediate Aid in Ukraine"

Tosh Kaneala Brown-Moore Mentor(s): Jeff Lipton; Mechanical Engineering

"Quantifying Single Photon Purity in a Commercial Quantum Teaching Apparatus"

Helen Lai Mentor(s): Kai-Mei Fu; Electrical and Computer Engineering

"Recycling Expired Carbon Fiber Prepreg Material"

Areesa Trevino Mentor(s): Navid Zobeiry; Materials Science and Engineering

"Relative Proximity Operations Testbed"

Kaylee Hudson and Harry Furey-Soper *Mentor(s): Kristi Morgansen; Aeronautics & Astronautics*

"Single Platelet Spreading on Key Proteins"

Francisco Morales Mentor(s): Wendy Thomas; Bioengineering

"SOPhy: Southern Ocean Phytoplankton Database"

Ayush Nag Mentor(s): Hannah Joy-Warren; School of Oceanography

"Studying Extremely High-Velocity Outflows in Sloan Digital Sky Survey" Veronica Powell, Tzitzi Romo Perez, Easton Pierce

Mentor(s): Paola Rodriguez Hidalgo; UW Bothell — Division of Physical Sciences

"Temperature Amplitude and Isotope Diffusion in Firn"

Cody Cruz Mentor(s): TJ Fudge; Earth and Space Sciences

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"The effect of rugose small colony variants on Pseudomonas aeruginosa biofilm dispersion"

Angel Reddy Mentor(s): Matthew Parsek, Courtney Kleeschulte; Microbiology

"Understanding Ice Temperature in Ice Streams in Antarctica and Greenland"

Jonathan Ortiz-Candelaria Mentor(s): TJ Fudge, Ben Hills; Earth and Space Sciences

"University of Washington - Industrial Assessment Center"

Caitlin DeShazo-Couchot, Harris Nakajima, Jack Philbrick *Mentor(s): Alexander Mamishev; Electrical and Computer Engineering*





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