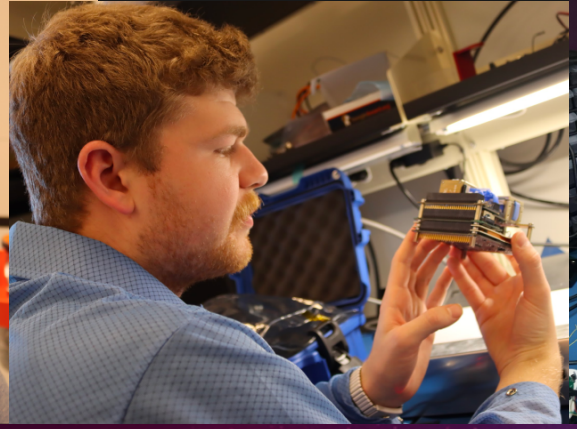
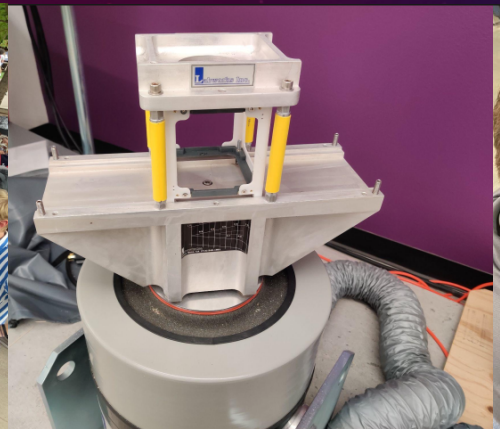
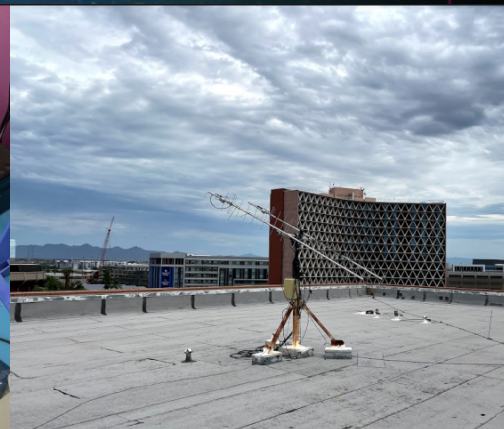



ASU’s Interplanetary Initiative Lab



Purpose

Supporting small space missions at ASU and with partners

What: All mission phases: design, build, fly

Who: Powered primarily by students with staff and professional supervison

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II Lab Staff Team:

Danny Jacobs
II Associate Director: Laboratory
SESE Assistant Professor
Co-Director Low frequency Cosmology Lab

Joe Dubois
II Sr. Engineer and Special Projects
LunaH-Map Mechanical Engineer

Chandler Hutchens
Major:
BS and MS Aerospace Engineering
Specialties:
Systems, Thermal

Christopher McCormick
Major:
BS and MS Electrical Engineering
Specialties:
PCB Design, RF

Ashley Lepham
Major:
BS Mechanical Engineering
Specialties:
Structures, Design

Ben Weber
Major:
BS Aerospace Engineering
Specialties:
Controls, Ground station

Sam Cherian
Major:
BS Aerospace Engineering
Specialties:
Manufacturing

Genevieve Cooper
Major:
BS Computer Science
Specialties:
Programming, Sustainability

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External Student Engineers:

Lightcube:

- David Ordaz Perez, BS Aerospace Engineering
- Logan Skulund, BS Mechanical Engineering
- Malhar Sonaniskar, MS Mechanical Engineering (Thermal)

DORA:

- Siddharth Vaidyanathan, BS Mechanical Engineering
- Anyell Mata, BS Electrical Engineering
- Dylan Larson, BS Computer Systems Engineering

Capabilities and Equipment

Space hardware and software development spaces

- 6000 sq. ft. space
- Opened Feb 2020
- Available to Registered Users (students, faculty or partners)
- Staffed by students
- Support for projects available with application to II

Collaboration and Light Hacking

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Capabilities and Equipment

Collaboration space

Ground Station and Movable Tables

- Ground station terminal area
- Study areas
- Flex collab setup (movable tables, screens, videocon)
- Kitchen
- Front desk

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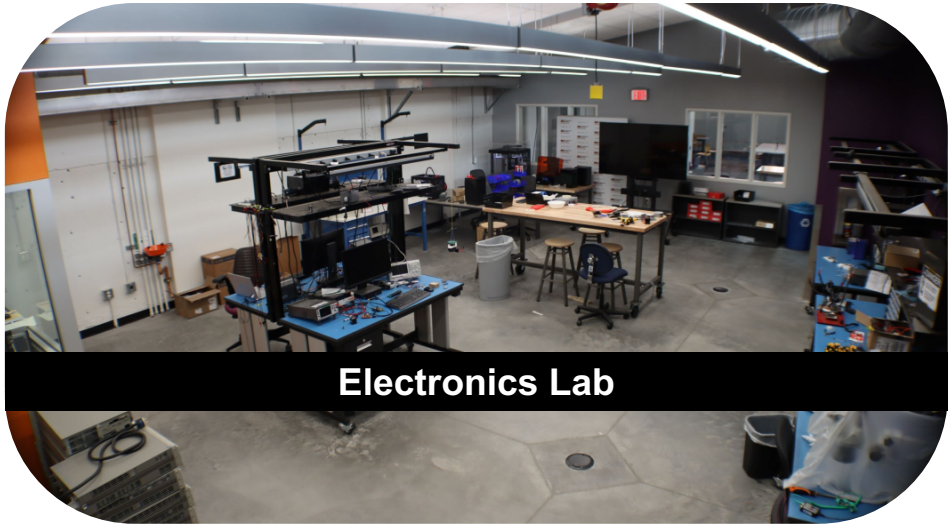
Capabilities and Equipment

Electronics Assembly and Test



Electronics Lab

- Oscilloscopes, signal generators, power supplies, logic analyzer
- 1 Raise 3D, 2 Prusa, and 1 Form 3+
- Assembly Microscope
- Reflow oven
- RF spectrum analyzer
- Fieldfox VNA

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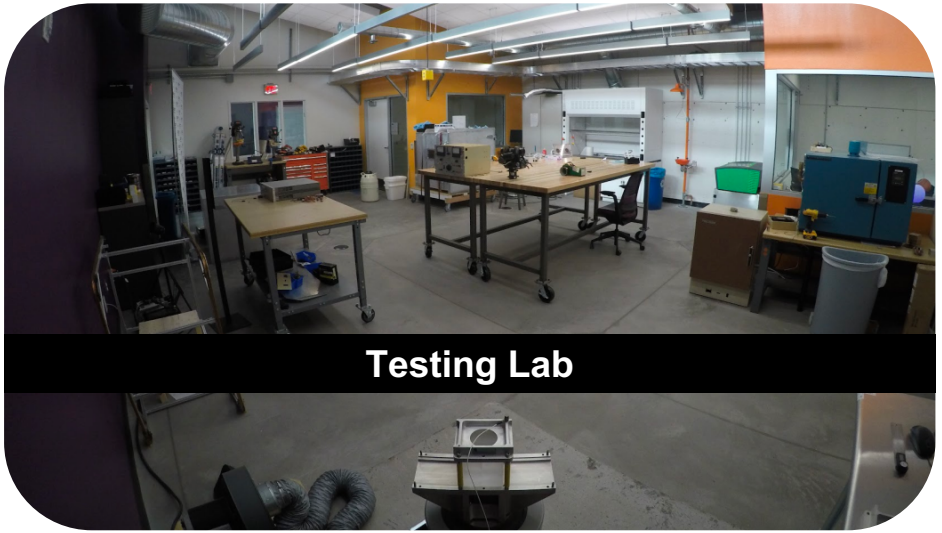
Capabilities and Equipment

Testing Lab

- 2 Thermal Chambers
- Thermal Vacuum Chamber
- CubeSat Vibe Table
- Fume Hood
- 100 sq. ft. Clean Room
- Mechanical tools and stock materials
    - Drill presses, circular saw, ect.
- Attitude Testbed (Fall 2021)



Testing Lab

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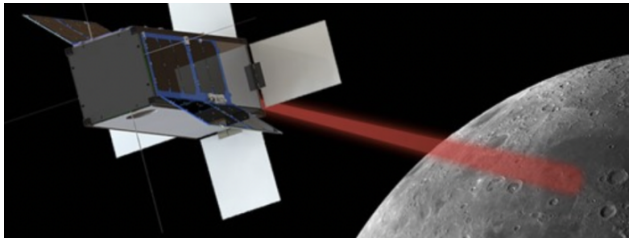
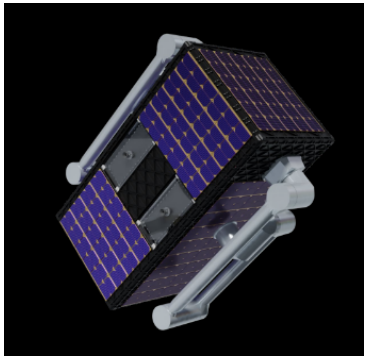
Projects

Overview

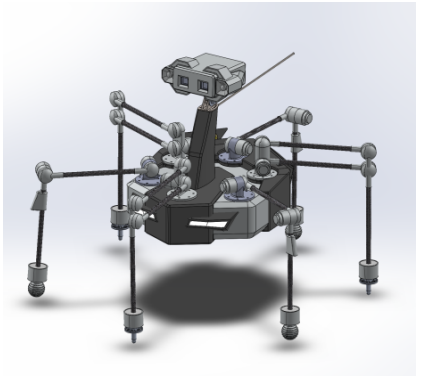
LightCube



DORA



ROAMER



Charlotte

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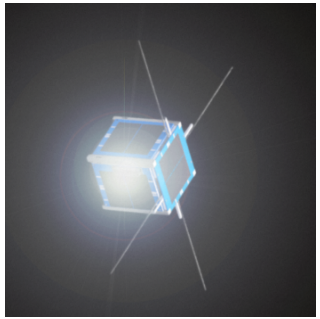
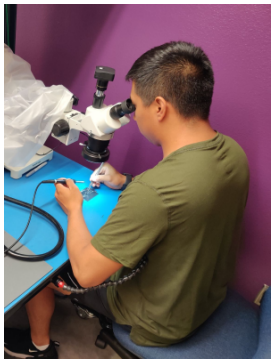
Projects:
Lightcube





- **Size:** 1U CubeSat
- **Goal:** Outreach lowering barriers to space, connecting to night sky
- **Payload:** Easy-to-trigger flash bulb that is visible to the naked eye

- **Partners:**
  - NASA
  - CSLI – accepted in May 2021
  - Nanoracks
  - ASU ECEE
  - CETYS Universidad
  - Vega Space Systems
- **Delivery for Launch:** December 2022

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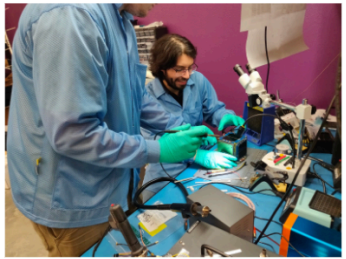
Lightcube

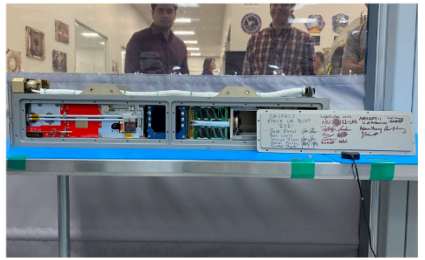
Launch scheduled for 27 March on NG-27

Capstone Development

Awarded CSLI Launch

Delivery!





August, 2019

2020

2021

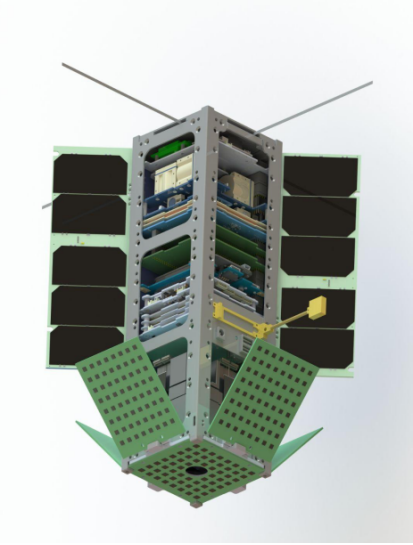
2022

2023

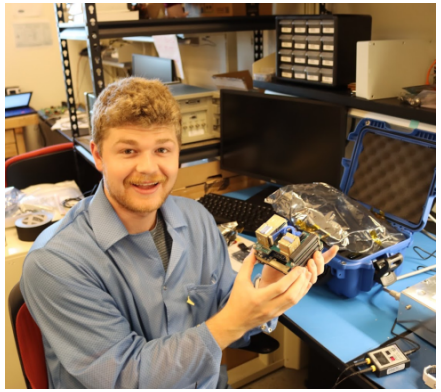
Projects:

DORA

(Deployable Optical Receiver Aperture)



- **Size:** 3U CubeSat
- **Goal:** Technology Demonstration
- **Payload:** Laser Communication



- **Partners:**
  - NASA
  - CSLI – accepted in April 2022
  - SSTP
  - JPL
  - Vega Space Systems
- **Delivery Expected:** November 2023

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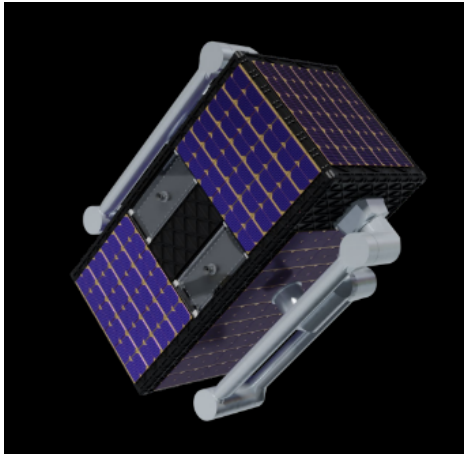
Projects:

ROAMER

(Reusable Orbital Asset Maintenance and Examination Robot)



- **Size:** 3U x 3U x 7U
- **Goal:** Proposal Paper
- **Payload:** Water Thrusters & Robotic Arms

- **Partners:**
  - Space Force
  - Howe Industries
  - Redwire Space
- **Proposal Due:** October 2022

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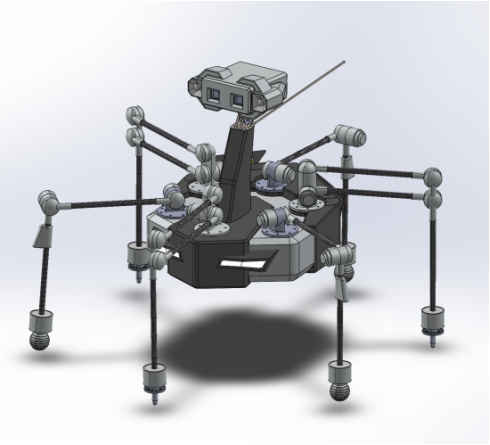
Projects:

Charlotte

(Crater Hydrogen And Regolith Laboratory for Observation on Technical Terrain Environments)



- **Size:** 3.2’ diameter, 4.3’ tall
- **Weight:** 220 lbs
- **Goal:** Thermal and Simulated Lunar Environment Testing

- **Partners:**
  - Luminosity Lab
- **Proposal Due:** October 2022

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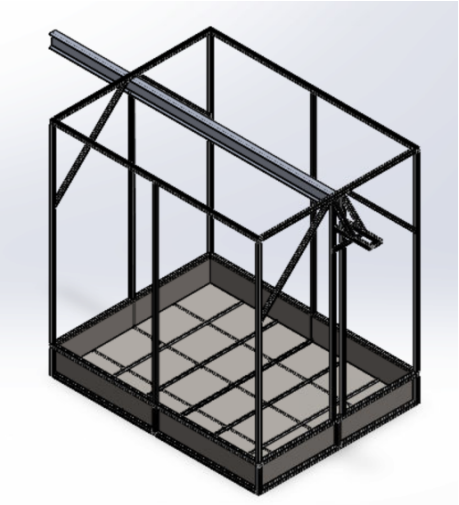
Lab Projects: Facility Upgrades

Overview

TVAC



Lunar Testbed

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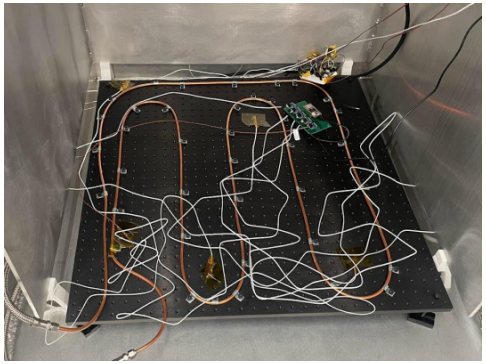
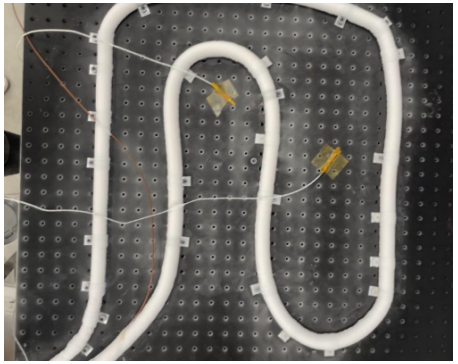
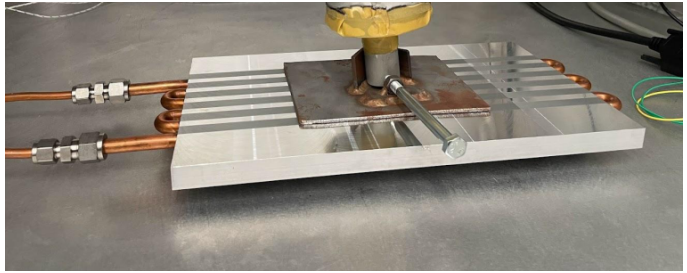
Lab Projects: Facility Upgrades

TVAC







- **New:** Added platen (LN2 Cold Plate) with custom plumbing
- **Testing:** Been able to achieve -130 at the center of the platen

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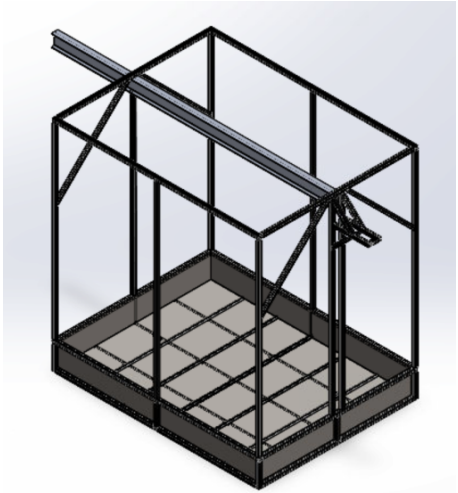
Lab Projects: Facility Upgrades

Lunar Testbed



- **Purpose:**
  - Designed for Charlotte
  - Simulate Lunar gravity and isolate regolith
- **Build Expected:** October 2022

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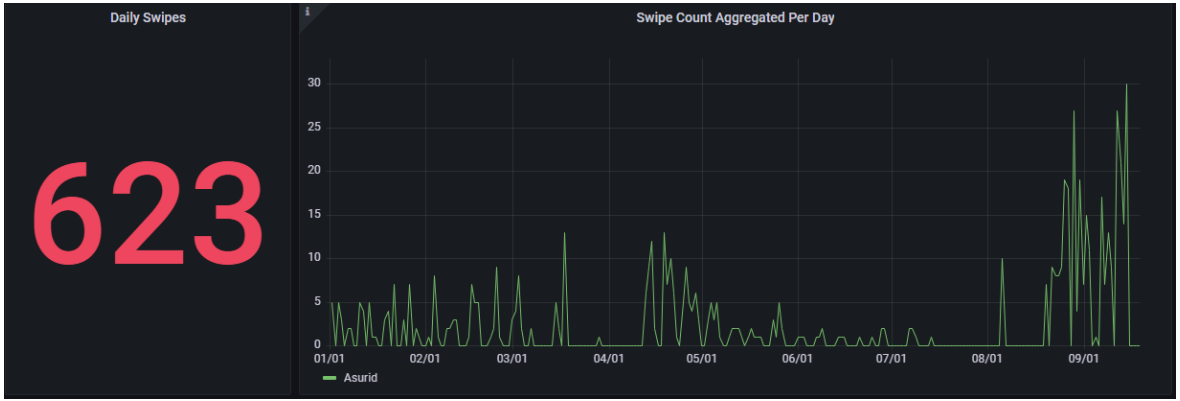
Lab Visitors:
Statistics

User visits in 2022:



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Lab Visitors:

ASCEND and Space Grant

- Originally a Team of 6 Members
- This Fall now have 28 Members!
- **Mentors:** Dr. Tom Sharp and Dr. Das

ARIZONA SPACE GRANT CONSORTIUM

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Lab Outreach Events:

Rocket-Palooza, Passport to ASU, Interplanetary Mixer

- **Rocketpalooza:**
  - ~100 people
  - April 7th
- **Passport to ASU:**
  - 243 lab inquiry forms filled out!
  - LC Demo was used
- **Interplanetary Mixer:**
  - First fall event in the lab
  - ~30 people
  - Presentations from TL, SDSL and Next Level Devils, and ASCEND
  - Lab tours

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Conferences:

Breakthrough Discuss 2022, SmallSat Conference

- **Breakthrough Discuss 2022:**
  - Santa Cruz, CA
  - Chandler and Ashley
  - Great opportunity!
- **SmallSat Conference:**
  - Logan, UT
  - Christopher, Chandler, Joe
  - Made connections

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