



Cornell University



ASTRA

Asteroid Surface Sampler

CORNELL MICRO-G



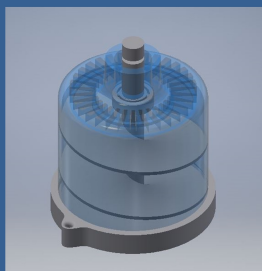
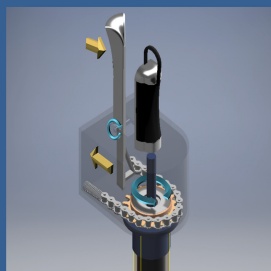
Project Management

Team Lead	Eric Berg
Design and Manufacturing Leads	Hannah Klapper Bhavi Jagatia
Proposal and Presentation Lead	Emma Renner
Outreach Lead	Priscilla Cancar
Design and Manufacturing Members	Kadambari Suri Jacob Wyrick Colin Hegarty
Faculty Advisor	Ana Diaz Artiles

Project Overview

As a part of NASA's Micro-g Neutral Buoyancy Experiment Design Teams (Micro-g NExT) program, the Cornell Micro-G team chose to tackle the challenge of designing and building an Asteroid Surface Sampler. The surface sampler is used to collect the top layer of regolith resting on a larger body in a microgravity environment. This tool is one of many mission critical EVA tools to be used in investigating celestial bodies beyond Low Earth Orbit.

Design Features



- An all-in-one simple design that is intuitive
- Innovative Archimedes screw design allows for a large volume of sand to be collected over the sample area
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- Ergonomic Handle and Trigger Design
- A ratcheting sprocket that turns linear actuation to rotation of the Archimedes Screw

Objectives

1. Design, fabricate and test a user-friendly asteroid surface sampler hardware prototype
2. Conduct outreach activities for K-12 students as well as the general public in Ithaca and the surrounding region.
3. Collaborate with NASA on human testing in the NBL and on the overall engineering design and development process.
4. Analyze diver experience, tool practicality and functionality to evaluate success and identify potential improvements.

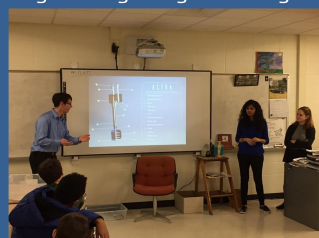
Archimedes Screw for Targeted Regolith Aggregation



Educational Outreach



The Cornell Microgravity Team aimed to inspire the next generation of space engineers and enthusiasts. We reached out to students of all ages and stages within education, however, we primarily focused on younger students between grades 5 - 12. At our outreach events we demonstrated real-world applications of science and technology within space as well as created hands-on engineering design challenges for the students.



- Featured on Cornell Mechanical Engineering Website
- Presentation and Rocket Activity at Cayuga Heights Elementary School: (entire 4th grade)
- Seminar and Workshop at Ithaca Sciencenter
- Presentation and Discussion at Cornell University
- Presentation and GoPro Lunar Lander Activity at Boynton Middle School
- Presentation and Mars Rover Activity for Science Olympiads at Ithaca High School