Cornell University

ICICLE

Under Ice Sampling Device

CORNELL MICRO-G

Project Management

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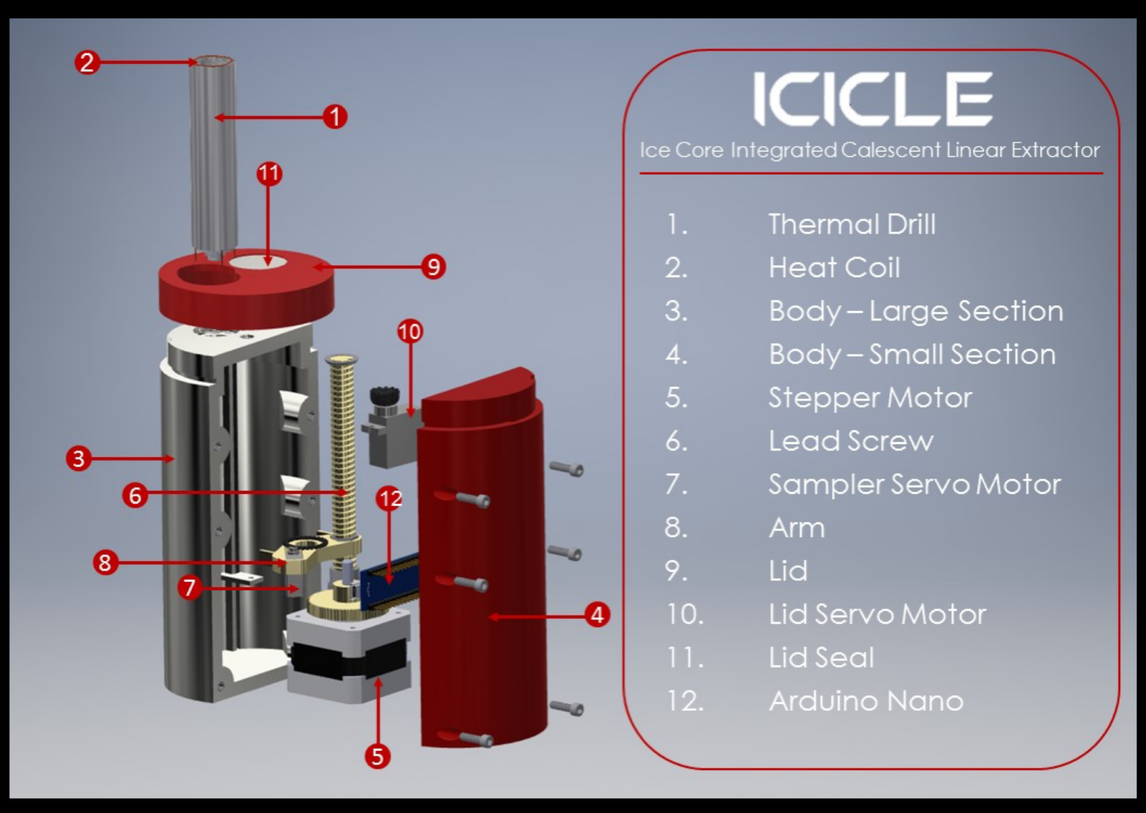
Project Overview

As a part of NASA's Micro-g Neutral Buoyancy Experiment Design Teams (Micro-g NExT) program, the CUMicroG team chose to tackle the challenge of designing and building an Under Ice Sampling Device. The sampler is used to collect ice core samples in a microgravity environment. This tool will be used on “Ocean World” planets to determine whether their surfaces could serve as a home for microbial life forms .

Design Features

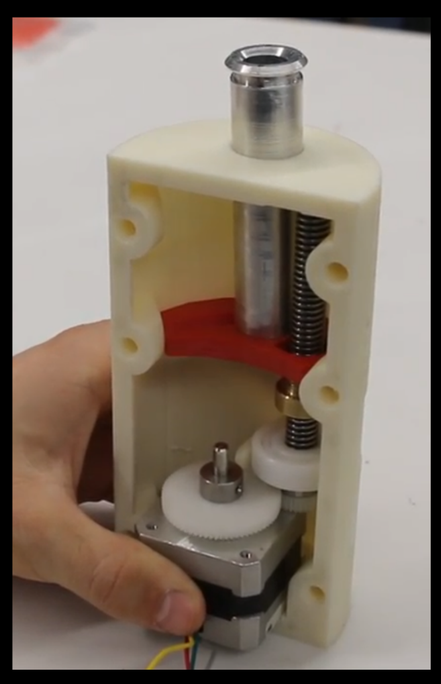


The team sought to find a design that met the volumetric requirement for sample retrieval, while ensuring the ICICLE would interface seamlessly with the JPL Buoyant Rover. ICICLE takes an input of 12V to actuate and heat a thermal drill which retrieves cylindrical ice samples of NASA’s specified dimensions. The thermal drill allows for optimal under ice sample retrieval with a minimal administered buoyant force due to the efficiency of the thermal collection method.

Objectives

1. Design, fabricate and test Under Ice Sampling Device prototype.
1. Conduct outreach activities for K-12 students as well as the general public in Ithaca and the surrounding region.
1. Collaborate with NASA on human testing in the NBL and on the overall engineering design and development process.
1. Analyze diver experience, tool practicality and functionality to evaluate success and identify potential improvements.

Integrated Calescent Ice Coring Linear Extractor



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, primarily focusing on younger students between grades 5 - 12. At our outreach events, we demonstrated real-world applications of space science and technology as well as created hands-on engineering design challenges for the students.

Outreach Events

- Presentations and Soil Sampler and Ice Moon Model Activities at Cayuga Heights Elementary School
- Presentations and Soil Sampler and Lunar Lander Activities at Boynton MIddle School
- Space Exploration Night Event at Cornell University with other space-related Cornell organizations
- Presentation and Remote Building Activity at Ithaca High School
- Social and Brainstorming Events with other Project Teams at Cornell University