NASA L'SPACE MISSION CONCEPT ACADEMY

Water on the Moon!?

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What is L'Space?

- Virtual academy
- Open to undergraduate STEM major students interested in pursuing a career with NASA or other Space organizations
- 12-week Academy
- Learn NASA mission procedures and protocols from industry professionals
- Collaborate with fellow team members to complete mission project
- This mission is a concept, so it is not actually going to be launched

Science and Engineering Mission Objectives:

- Design a small mission concept that will characterize the polar water ice on Earth's Moon.

Water ice characteristics to research:

- Verify that ice deposits actually exist in places where water ice signatures have been detected by orbital missions
- Are the ice deposits present at the surface of the Moon or subsurface?
- How is the water ice preserved within the regolith? State of water ice?
- What (if any) other elements are concentrated within the water ice?

Given payload:

- Mass constraint: Up to 10Kg.
- Volume constraint: Our spacecraft must fit into a space no larger than a 60 x 60 x 60 cm cube

Planetary Science Team:

The geological composition of the moon:

- The Maria are mostly composed of dark basalts (volcanic rock)
- The Highlands rocks are largely Anorthosite (igneous rock)
- Lunar regolith (soil) is made up of rock chips, mineral fragments, impact and volcanic glasses

Regions where water has been found:

- within darkest/coldest parts of the moon's polar regions
- the shadows of craters
- where sunlight never reaches

Water production on the moon:

- it is produced when the solar winds hit the moon's surface
- it is in the form of almost pure ice grains mixed in with the rest of the soil

Descent & Landing (Engineering team):

We designed a lander that will:

- facilitate our ice characterization experiment
- be transported onboard a craft in polar orbit of the Moon
- be released 20 km above the surface of the Moon
- land at the site we chose for suitability of terrain and proximity to water ice
- sustain violent vibrations upon launch, extreme temperature fluxuations, and the impact from landing on the Moon

The image on the left is our lander.

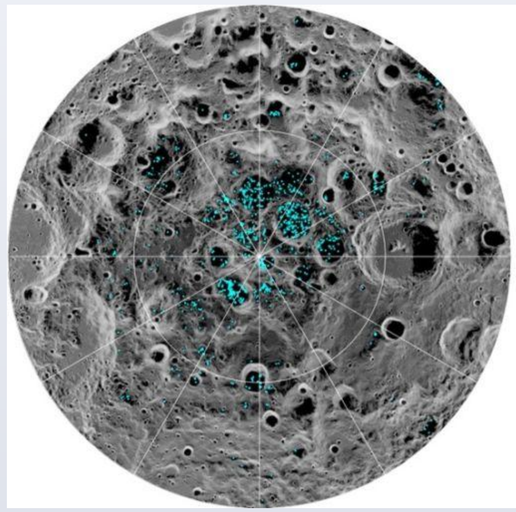
The instruments on our lander consists of:

- camera - model: MASCOTCAM
- radiation sensor - model: RADMON
- Thermal and Evolved Gas Analyzer
- Burst Alert Telescope - model: BPS2S4P
- (x3) Central Processing Unit - model: RAD 750
- Inertial Measurement Units - model: OEM-STIM300

Landing Site Selection:

- south pole of the moon
- used the Planetary Science Community Tool called JMOON to choose our site

Below is an image of water on the lunar south pole.



Budget:

- I was the Chief Financial Officer
- Budget Cap: $35M or less

I had to account for:

- science personnel time for the design of your experiment and analysis of the data
- engineering personnel time for building and testing the mission concept and for mission operations
- salary for all personnel
- hardware and payload
- travel for key personnel on our team to Cape Canaveral, FL

Opportunities!!!

Once you have successfully completed the L'Space Academy, you are eligible to apply for NASA internships! The L'Space Academy is a great resume builder when applying for NASA internships!