

A black and white photograph of an astronaut on the moon. The astronaut is kneeling on the lunar surface, holding a cylindrical container from which a stream of lunar soil is falling. The astronaut's helmet has a bright light reflecting off it. The background shows the dark, cratered surface of the moon under a starry sky.

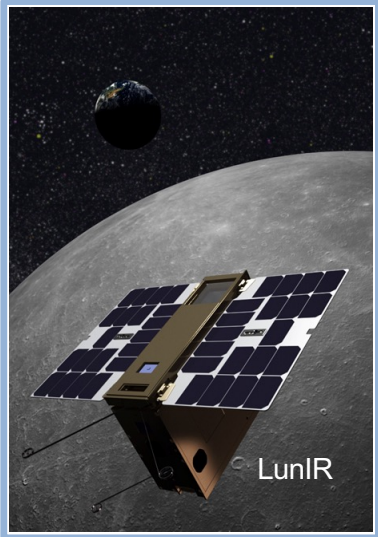
**Exploration Systems Development Mission Directorate (ESDMD)**  
**Artemis Small Spacecraft Missions**

**NASA Town Hall**  
**Andres Martinez**

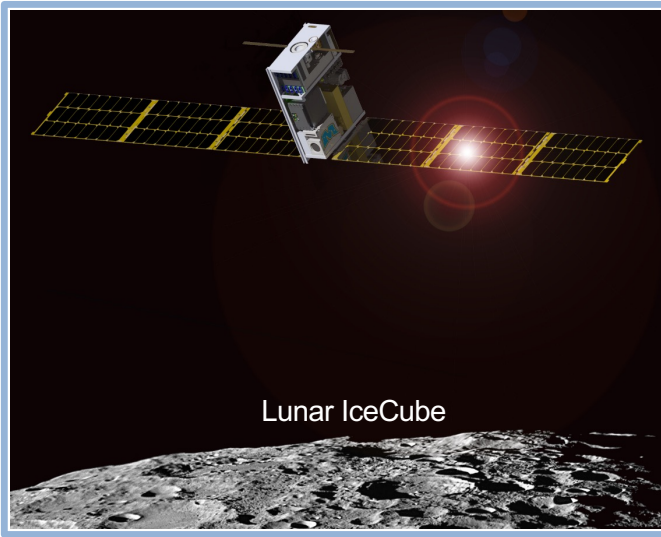
**Small Spacecrafts Program Executive**  
Exploration Systems Development Mission Directorate (ESDMD)

NASA Headquarters  
August 8, 2022

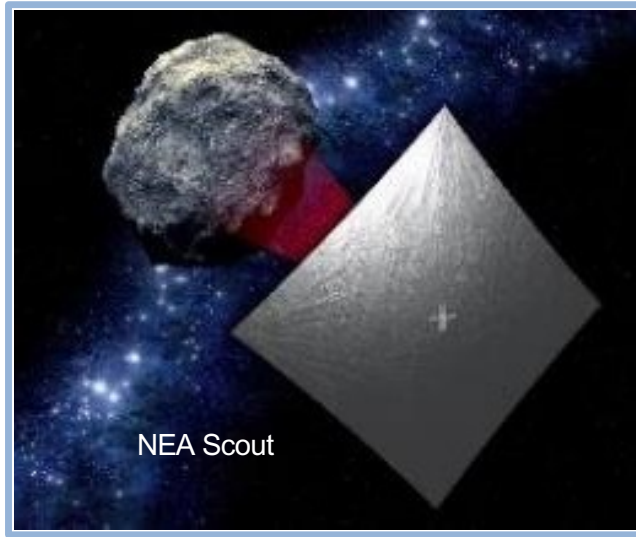
# ESDMD Artemis Small Spacecraft Missions



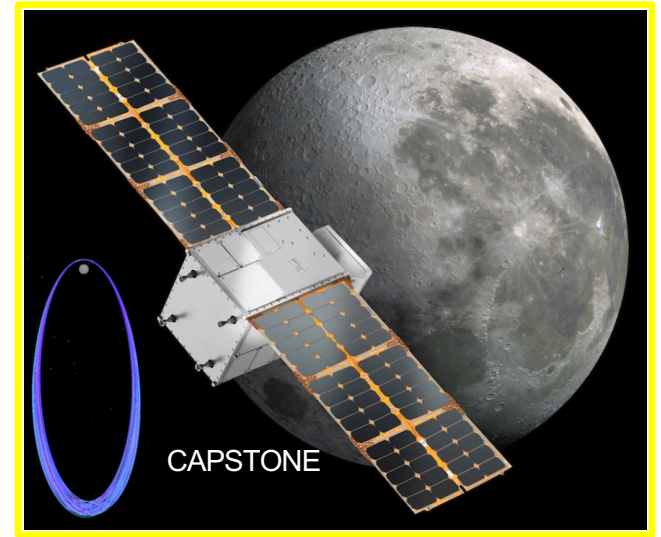
LunIR



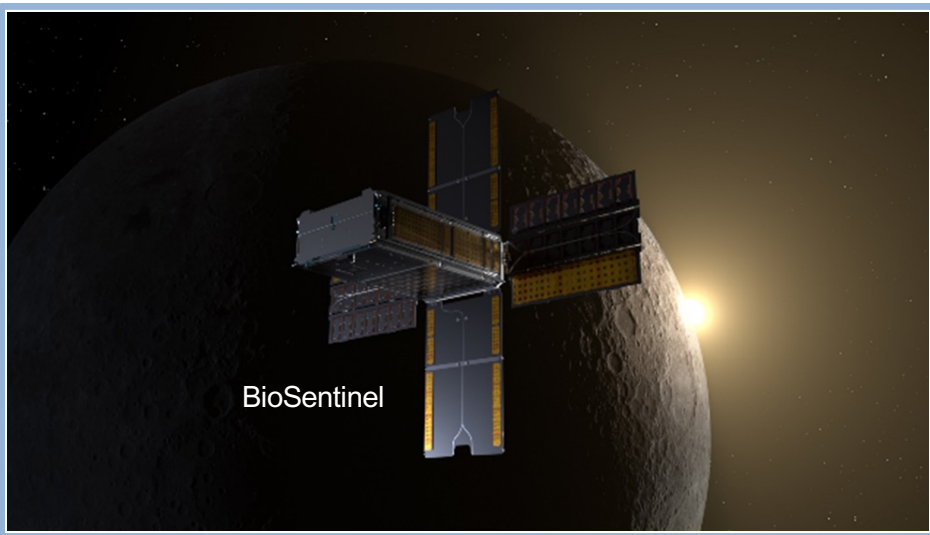
Lunar IceCube



NEA Scout



CAPSTONE



BioSentinel

Enabling interplanetary research with small spacecraft platforms

**MarCO Demonstrations:**

- Downlink Using X-Band Feed and DSN Equipment
- Downlink Using X-Band Feed and MarCO Receiver System
- OMSPA Using X-Band Feed and Custom SDR-based Multiple Receiver System

**First Opportunistic Multiple Spacecraft Per Antenna (OMSPA) Demonstration with a CubeSat**

First 5 Demodulated Frames from MarCO OMSPA Demonstration on May 6, 2018 from DSS-17

D. Abrahamian, Z. Towfic, S. Finley (JPL)  
C. Cooper, M. Stratton, R. Arak (Morehead State)

Develops an operational capability to support Artemis-1 SmallSat missions

Expands DSN capabilities by utilizing non-NASA assets to provide communication and navigation services to small spacecraft missions to the Moon and inner solar system.

**Deep Space Station 17**

**LRO Demonstrations:**

- Routinely Tracking LRO at S-Band
- Interim: Frequency (F) Systems and DSN Downlink Equipment (DCD, DTT) Verified
- LRO Telemetry Blocks Sent Directly from DSS-17 to JPL DSDG over the MarCO Mission Backbone- verifying DSS-17 Signal Path

Mission Ops Center at MSU

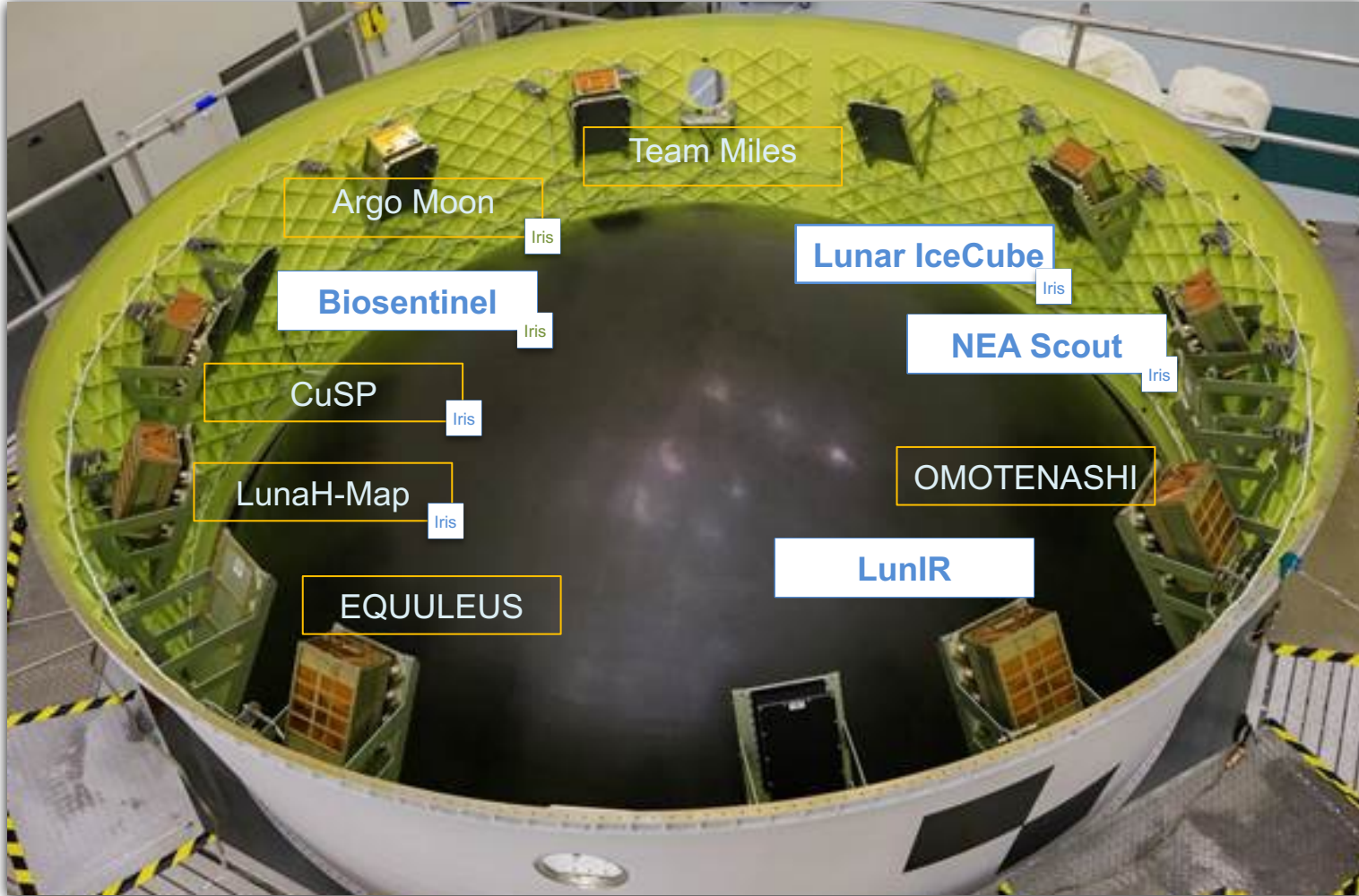
ESDMD Small Spacecraft sponsored Missions contribute to **18** key Human Exploration Strategic Knowledge Gaps (SKGs) and advance **17** key Technologies



# ESDMD Artemis SmallSats on Orion Stage Adapter (OSA)



NET August 29, 2022



- 4 of the 10 SmallSats on Artemis 1 are ESDMD sponsored
- ESDMD also sponsored the IRIS radio design used by the Mars One CubeSats (MarCO), CAPSTONE, 6 Artemis 1 Missions, upcoming Lunar Flashlight, and others.

# You are the Artemis Generation - Connect with us

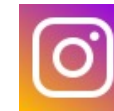


## Andres Martinez

Small Spacecrafts Program  
Executive, Exploration Systems  
Development Mission Directorate  
(ESDMD) at NASA Headquarters  
in Washington, D.C.



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# Thank you!