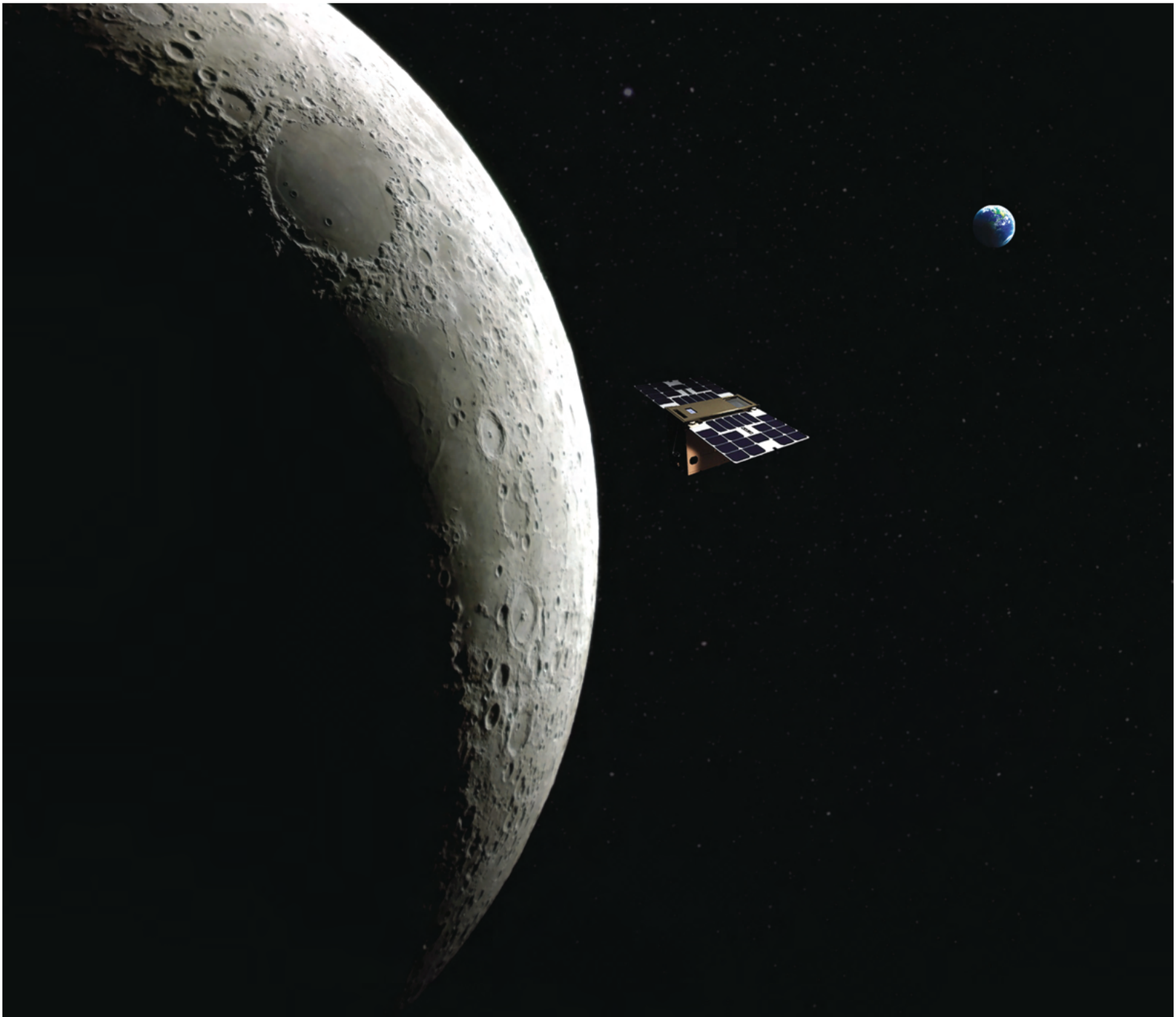

LunIR

LUNAR FLYBY

PRESS KIT | NET 29 AUGUST 2022

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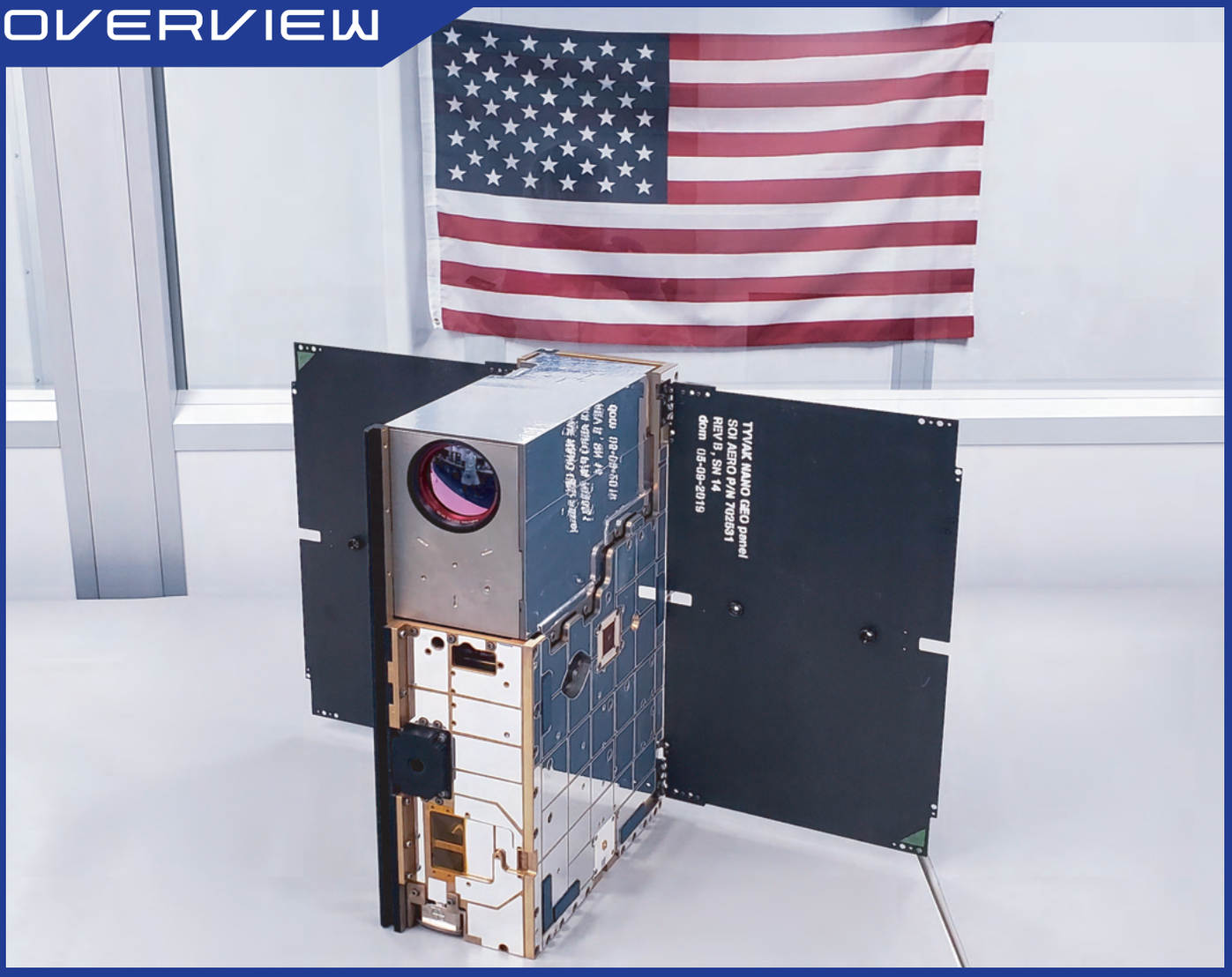
MISSION OVERVIEW



LunIR's mission is to prove out a new infrared imager by observing the lunar surface and demonstrating technologies that could be applied to future deep space missions.

LunIR

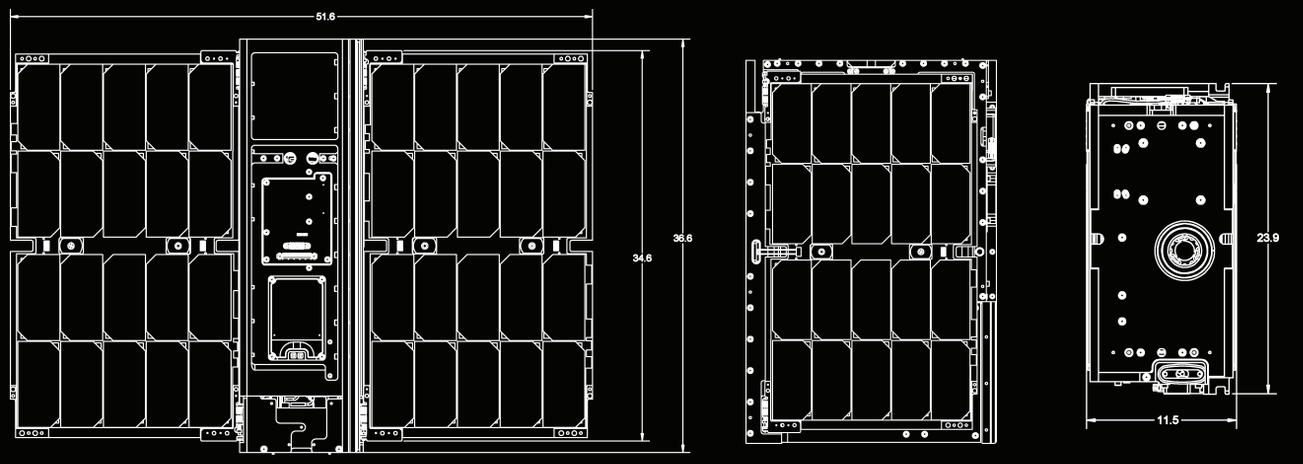
LUNAR FLYBY MISSION

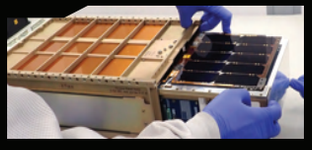
LunIR is jointly funded and developed by Lockheed Martin also Terran Orbital to collect lunar images and gather data.

LunIR is a technology demonstration mission proving key technologies for a miniature infrared (IR) sensor in space. This sensor has numerous potential applications, including planetary science and Earth observation. LunIR will fly by the Moon as a secondary payload on the Artemis 1 mission to collect surface thermography. There is a water spectral feature in midwave infrared, so the LunIR sensor may be particularly useful to NASA to map the distribution of water on the surface of the Moon.

Lockheed Martin developed LunIR's infrared sensor and cryocooler to operate day and night, mapping the lunar surface, detecting materials, and identifying potential landing sites. Terran Orbital designed, built, and integrated the spacecraft and is responsible for mission operations.

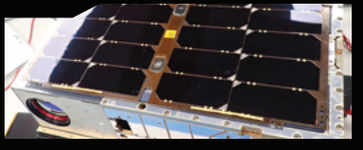
KEY FACTS





SPACECRAFT DESIGN, BUILD, AND ASSEMBLY

TERRAN ORBITAL PRODUCTION FACILITY IN IRVINE, CA



VEHICLE PARAMETERS

Solar Panels Stowed: 36.6 cm 11.5 cm x 23.9 cm

Solar Panels Deployed: 36.6 cm x 51.6 cm x 23.9 cm

MASS: 11 kg

LAUNCH VEHICLE

SLS ARTEMIS 1

LAUNCH SITE

NASA Kennedy Space Center Launch Complex 39B

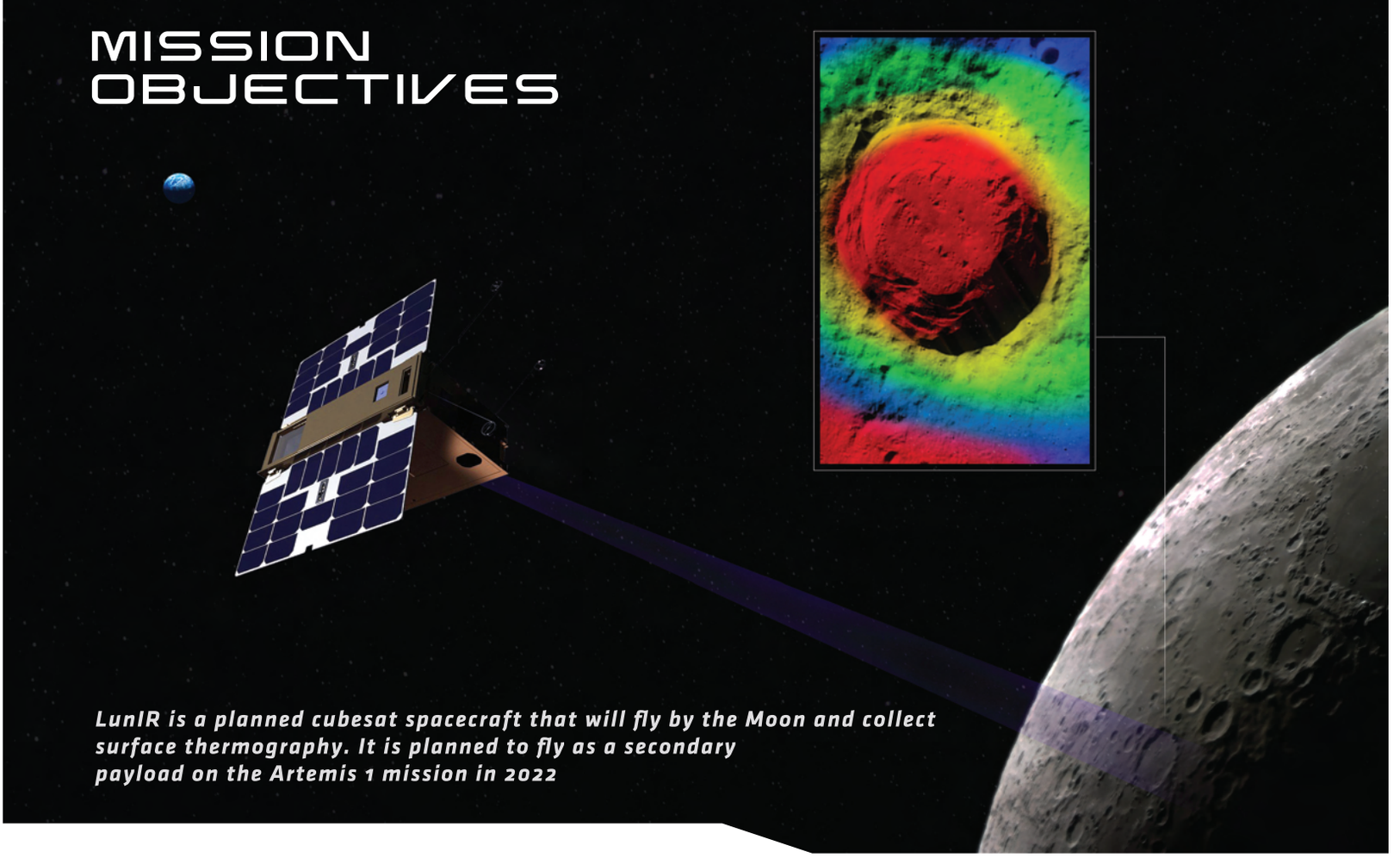
SUBSYSTEM	VALUE
AVIONICS	MKII LINUX FLIGHT COMPUTER
POWER GENERATION	MKII DEPLOYABLE SOLAR ARRAYS
ENERGY STORAGE	THREE MKII 12V BATTERY MODULES
COMMAND AND CONTROL	TYVAK LDRR S/X-BAND RADIO FOR UPLINK AND DOWNLINK
GUIDANCE NAV AND CONTROL	MKII SENSORS AND ACTUATORS INTEGRATED WITH A LOCKEED MARTIN "MOON CAM"
SEPARATION SYSTEM	PLANETARY SYSTEMS CORPORATION (PSC) 6U CONTAINERIZED SATELLITE DISPENDER (CSD)
GROUND NETWORK	KSAT MAX + TERRAN ORBITAL
MISSION OPERATIONS CENTER	TERRAN ORBITAL IN IRVINE, CA

LAUNCH WINDOW OPENS

AUGUST 29, 2022

(SUBJECT TO CHANGE)

MISSION OBJECTIVES



LunIR is a planned cubesat spacecraft that will fly by the Moon and collect surface thermography. It is planned to fly as a secondary payload on the Artemis 1 mission in 2022

Perform a lunar flyby followed by taking imagery.

The primary objectives of the mission are to gather images that observe thermal signatures of the moon, proving out a novel infrared imager that could be used for future deep space missions.

Collect data on thermal environments adding to the body of knowledge on the composition, structure, interaction with the space environment, and interaction with solar particles and the lunar regolith – all contributing to risk reduction for potential future human missions.

Demonstrate very low size, weight and power (SWAP) technologies in avionics, mid-wave infrared sensing and micro-cryocooling.

IR sensor images of the moon and stars will allow the sensor team to demonstrate and characterize the two key technologies of the LunIR sensor, the nBn focal plan detector, and the micro-cryocooler.

The Moon provides a good test target because of its high contrast and lack of atmosphere. In addition, images of other targets (including stars) will allow precise characterization of the detector response and any opportunity for Sun imaging will allow observation of the detector's thermal response properties.

The midwave IR band of the LunIR sensor is a band well-suited to mapping of the Moon's surface composition, because the Moon's surface is visible in that band both when sunlit and when dark. Furthermore, there is a water spectral feature in midwave infrared, so the LunIR sensor may be particularly useful to NASA to map the distribution of water on the surface of the Moon.

MISSION PARTNERS

NASA

Artemis 1 is the first mission in NASA's Artemis program of lunar exploration, which aims to establish a permanent human presence on and around the Moon by the late 2000s. LunIR supports Artemis 1 and will ride atop the Space Launch System (SLS), a super heavy-lift expendable launch vehicle created by NASA. The SLS is intended to become the successor to the retired Space Shuttle, and the primary launch vehicle of NASA's deep space exploration plans through the 2020s.

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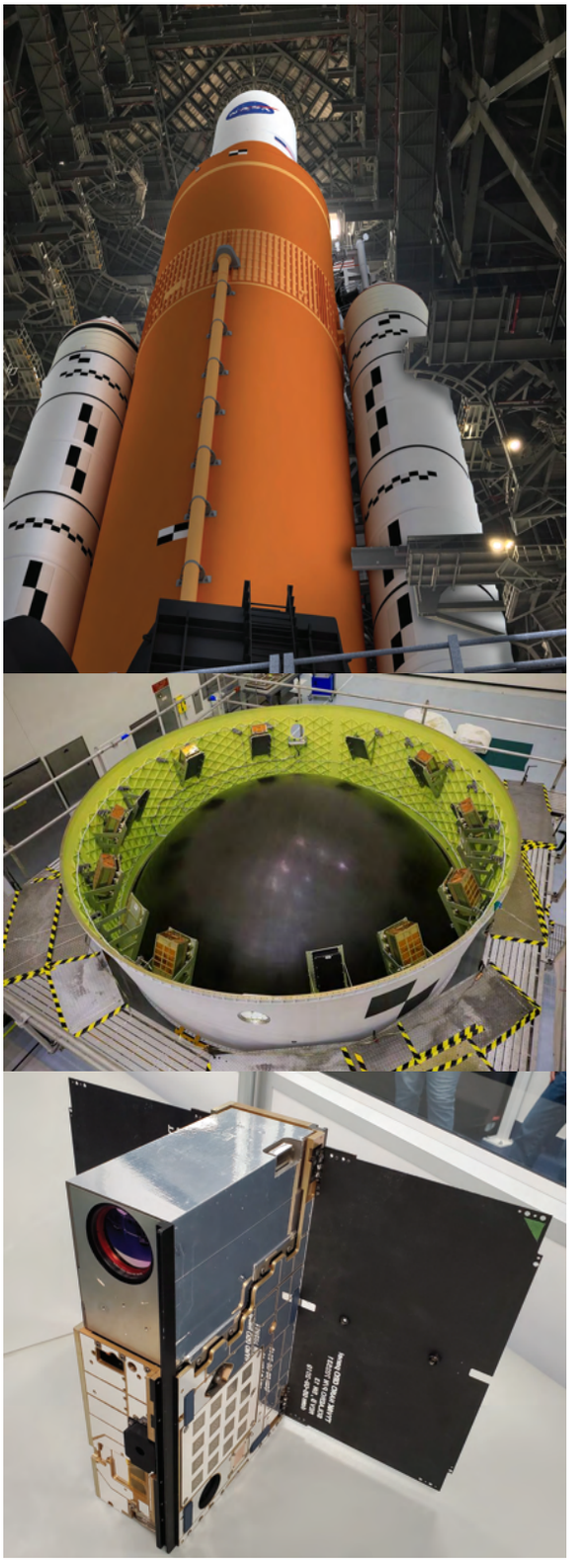
Terran Orbital will also run mission operations throughout LunIR's journey, which will use a Moon Camera in place of GPS to allow the spacecraft to point at the Earth and Moon.

LOCKHEED MARTIN

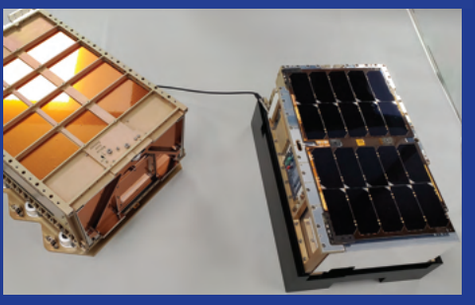
Lockheed Martin created the miniature high temperature Mid-Wave Infra-Red (MWIR) sensor for LunIR. Key technology elements of the MWIR sensor include an integrated micro-cryocooler and a high temperature nBn based 1-Megapixel focal plane. Lockheed Martin also provides Terran Orbital with a novel algorithm that converts into navigation and pointing commands. The company also provides the overall systems engineering and mission planning.

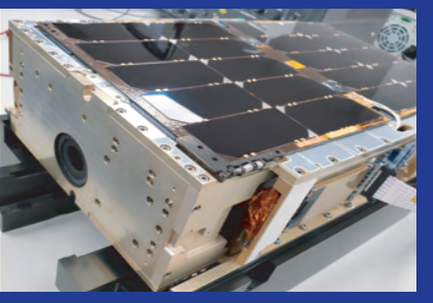
KSAT
KONGSBERG SATELLITE SERVICES

Providing ground network support to the LunIR mission from ground stations in Punta Arenas, Chile; Svalbard, Norway; and Troll station, Antarctica.



TERRAN ORBITAL LunIR MISSION PATCH





Visit www.terranorbital.com/lunir
to learn more about the LunIR Spacecraft and launch.

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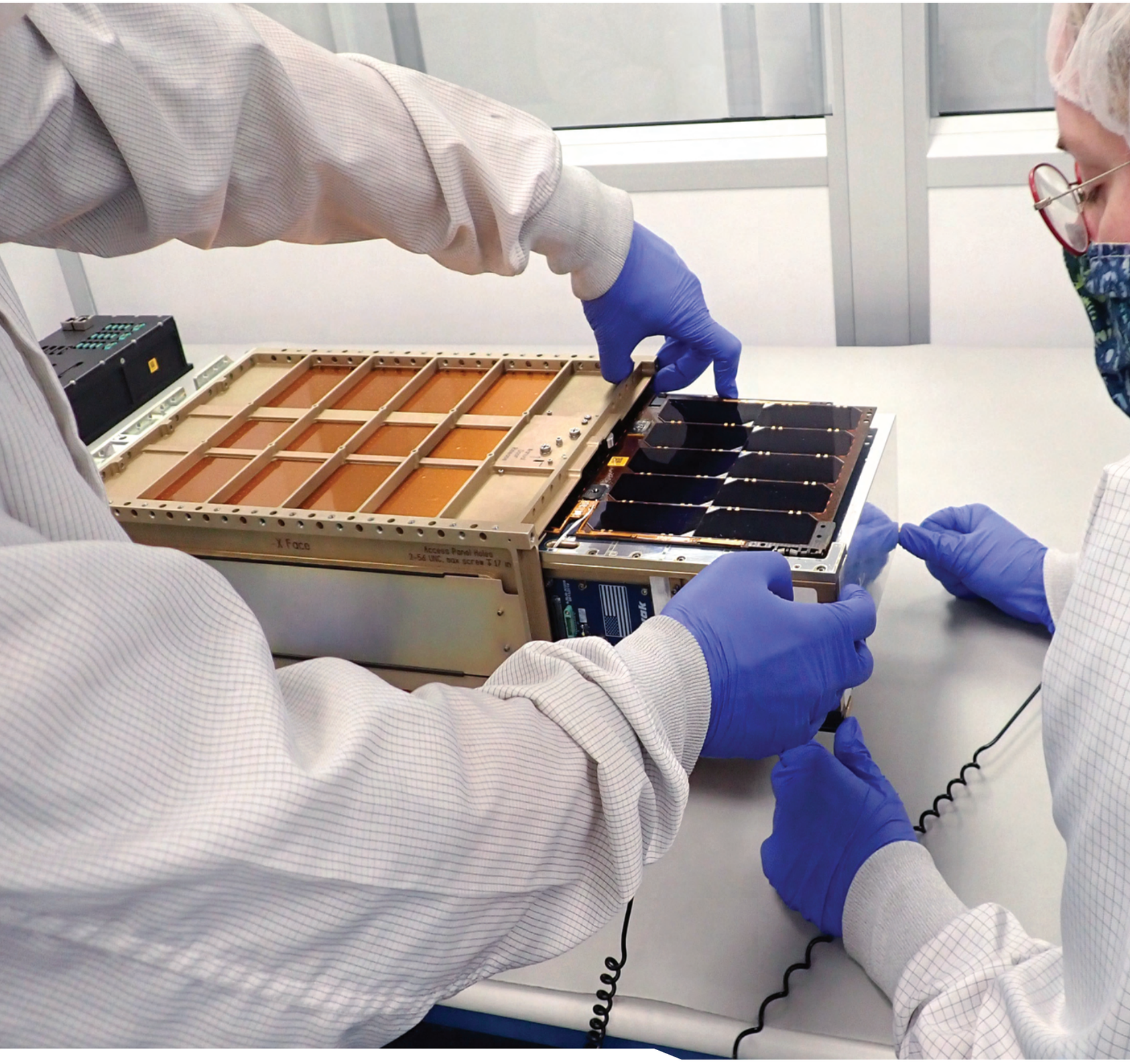
X Face
Access Panel Holes
2-56 UNC, max screw