LFT3

Unique Opportunity in Human History

LUNAR FARSIDE TECHNOSIGNATURE AND TRANSIENTS TELESCOPE

A Legacy Survey Mission

UNIVERSITY OF OXFORD
BREAKTHROUGH INITIATIVES
HELIOSPACE
SSL
RADIO ASTRONOMY SYSTEMS | BYU

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Radio Science Impact

Radio wavelengths provide the ability to observe and understand the roughly 90% of ordinary matter that comprises our Universe and is inaccessible to other wavelength bands. Radio wavelengths also uniquely allow us to observe and survey the entirety of the very early times of the Universe when the first structures began to coalesce.

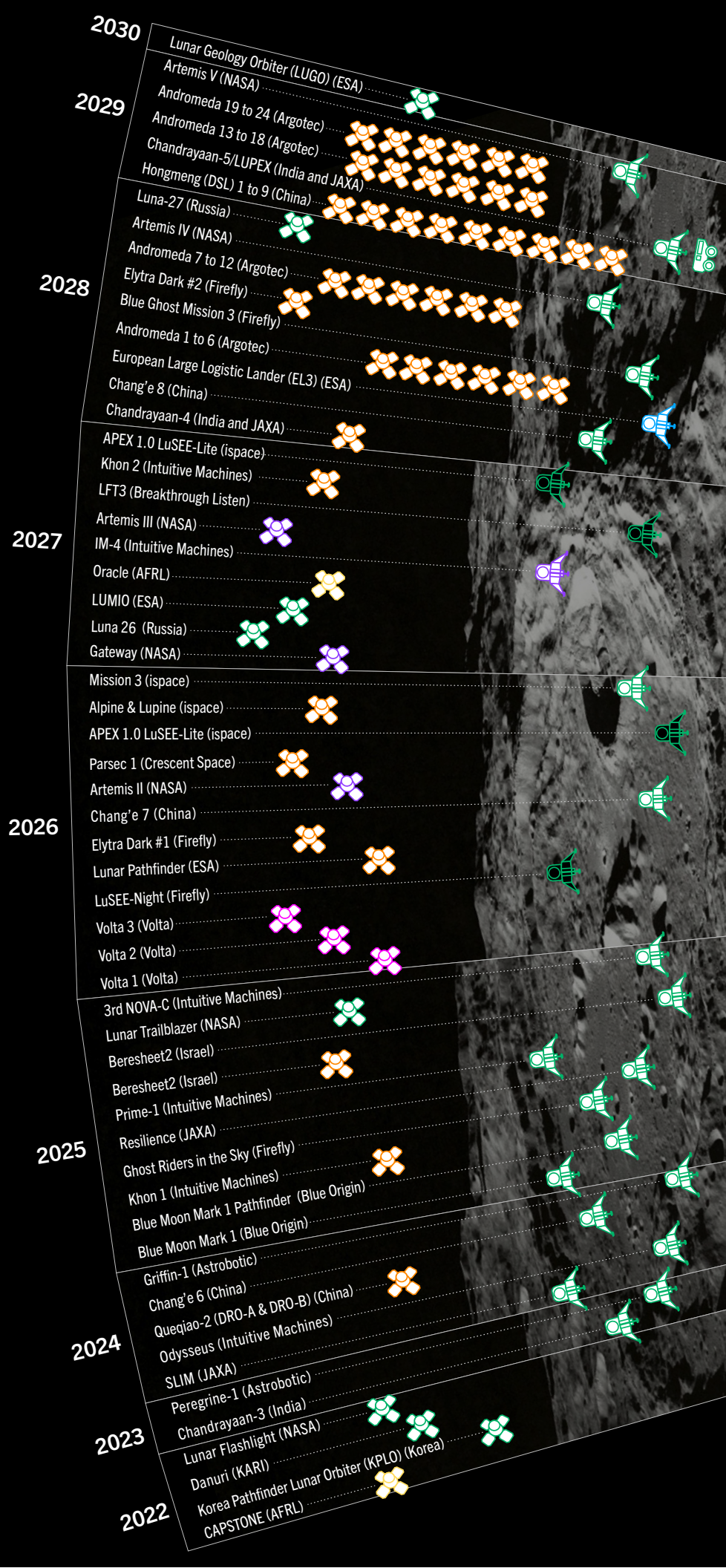
Radio wavelengths potentially provide our best chance to glimpse technological signals from other civilizations in our Universe.

The lunar farside is a uniquely radio-quiet location in the inner solar system since it is always blocked from Earth's line-of-sight.

Humanity is poised to explore the cislunar environment, but has not yet arrived in numbers.

Now is the time to conduct this once-in-human-history survey of the quiet cosmic radio frequency environment.

By the end of this decade, many orbiters and landers will be present, impacting the pristine environment and humanity will lose this unique opportunity.



- NAVIGATION
- SCIENCE
- COMMUNICATION
- EXPLORATION
- LOGISTICS
- POWER BEAMING
- FARSIDE

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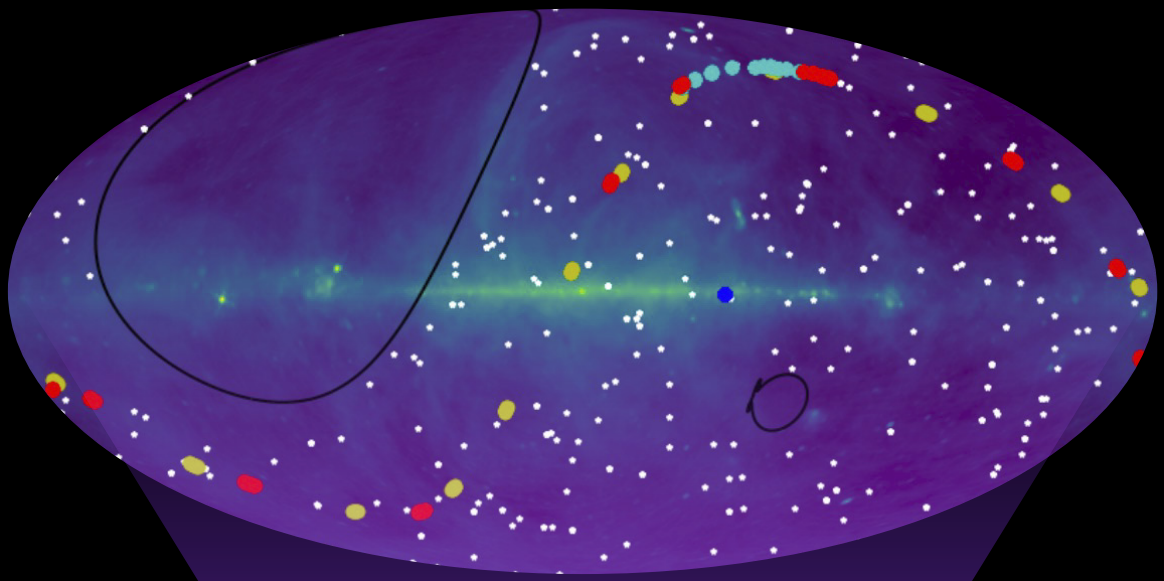
The 1973 measurements taken by NASA's RAE-2 mission highlighting the extreme radio-quiet lunar farside environment remain the exemplar, however recent missions (like China's 2018 Longjiang orbiters) are beginning to show this same promise.

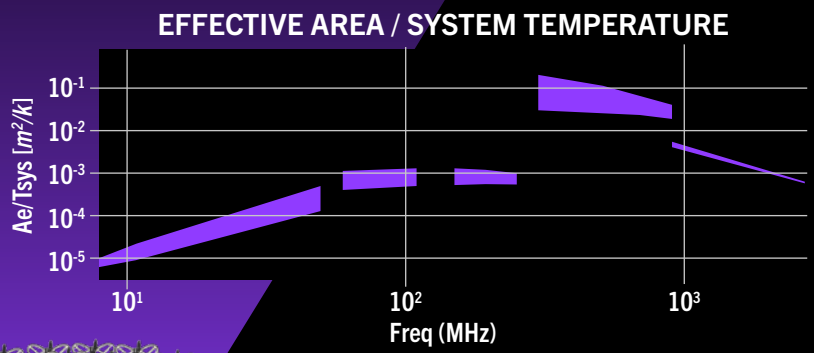
China is the only country to land and operate from the lunar farside with their Chang'E 4 mission, which suffered from self-interference.

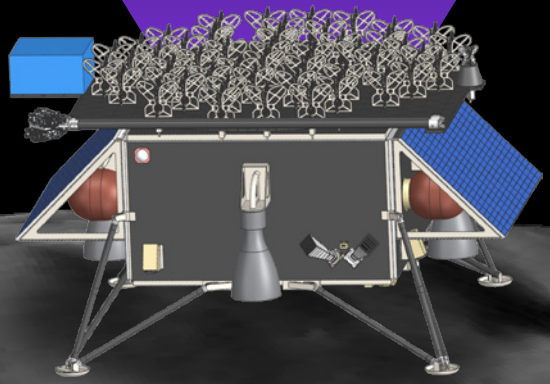
The full system provides sensitive frequency coverage from 1-2700 MHz.

LFT3 builds on the LuSEE-Night stand alone pathfinder in 2026 to land on the farside and use lander resources to provide continuous far side observations for 6 Earth years.

The LFT3 midband compact dual polarization multi-beam phased array provides wide sky coverage with full aperture sensitivity.







MARS
JUPITER
SUN
ALPHA CENTAURI
NEAREST STARS

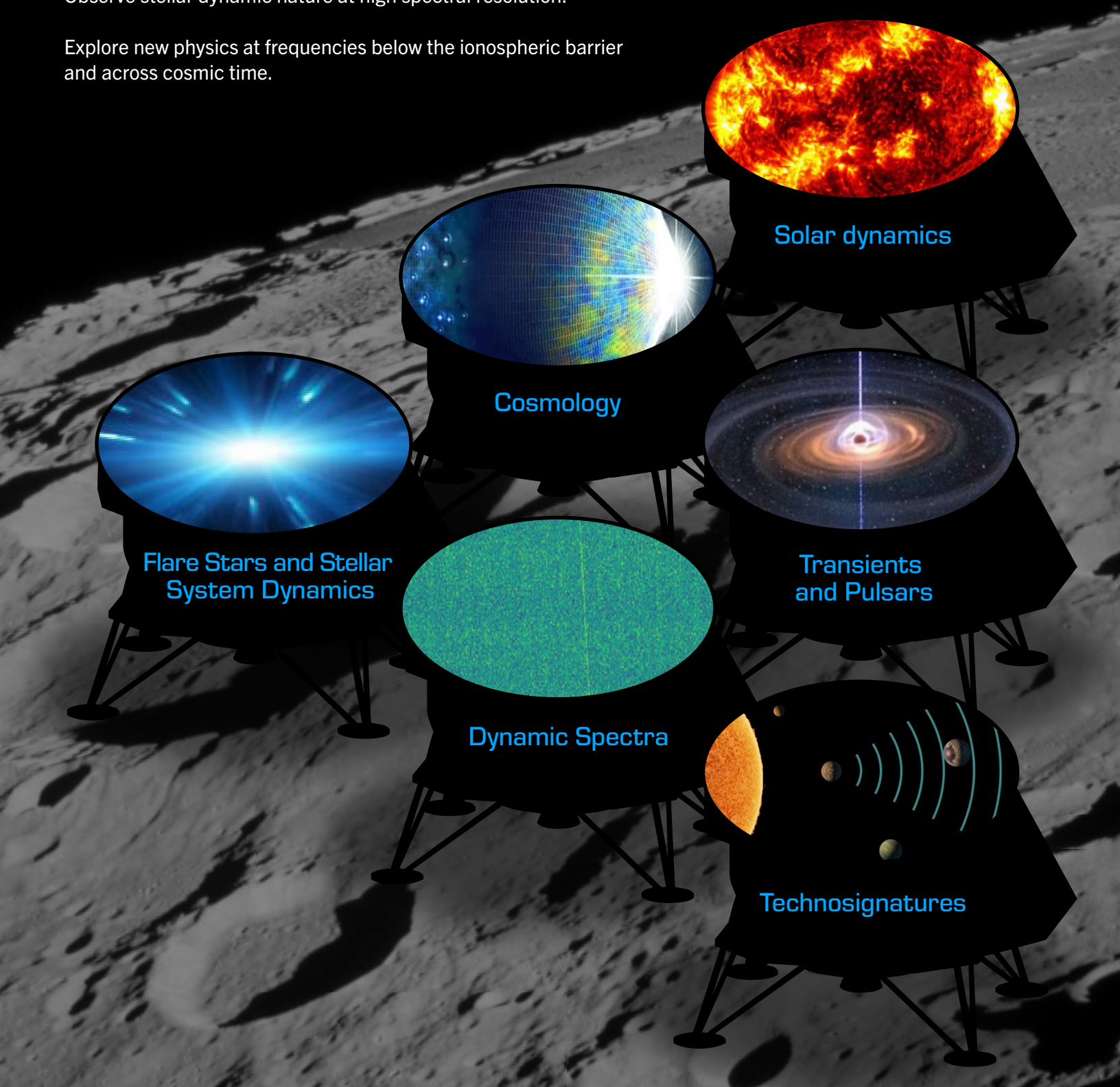
LFT3

Search for extraterrestrial life beyond the sphere of human influence and across the radio band.

Study unique periodic or transient events across a wide range of wavelengths and timescales.

Observe stellar dynamic nature at high spectral resolution.

Explore new physics at frequencies below the ionospheric barrier and across cosmic time.



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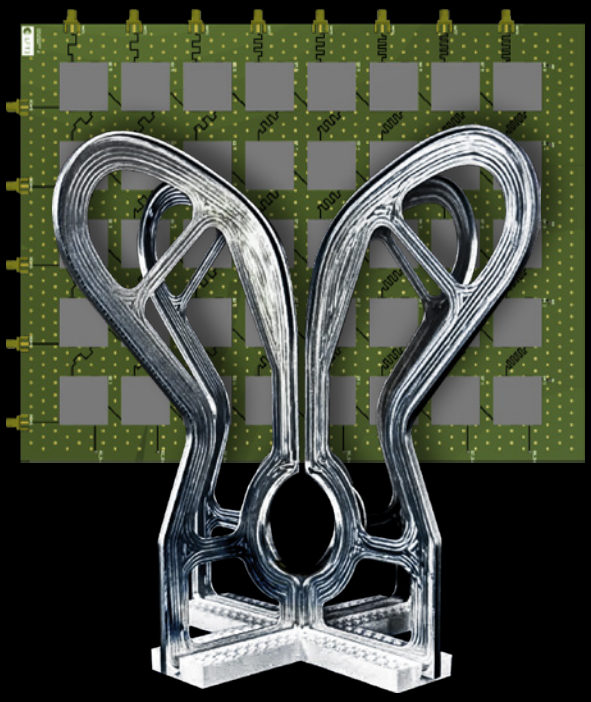
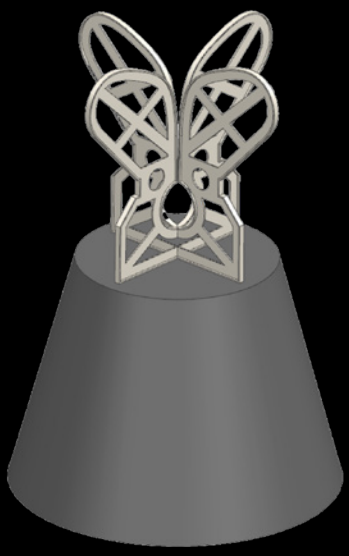
UHF-Lo Phased Array and Beamformer

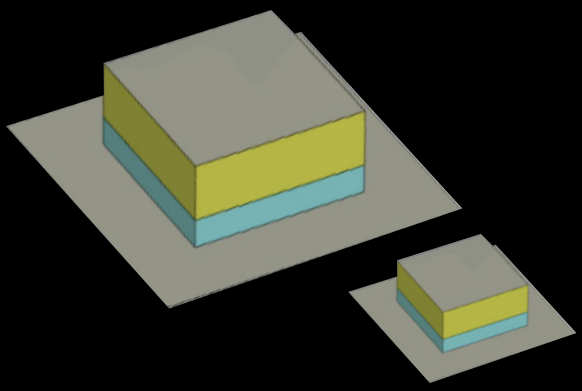
The LFT3 UHF-Lo compact dual polarization multibeam Vivaldi phased array provides wide sky coverage with full aperture sensitivity. Operating bandwidth is 300-900 MHz.





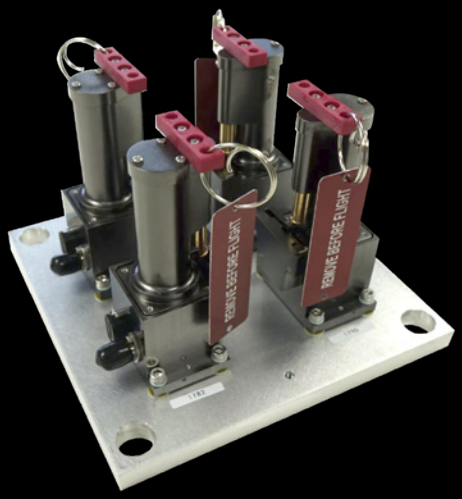
UHF-Hi Antenna

The UHF-Hi Antenna operating in the 900-2700 MHz range is 1/3 the size of the Mid-Band Antenna.



VHF-Lo and VHF-Hi Antenna

The VHF Antennas operating in the 60-110 MHz and 150-250 MHz range is a scaled concept based on the The Dark Ages Polarimeter Pathfinder (DAPPER) instrument.



Low Band Antennas

The LFT3 low band antennas operating in the 1-50 MHz range and are the same as those flown on LuSEE Night and have heritage to the antennas for ROLSES.

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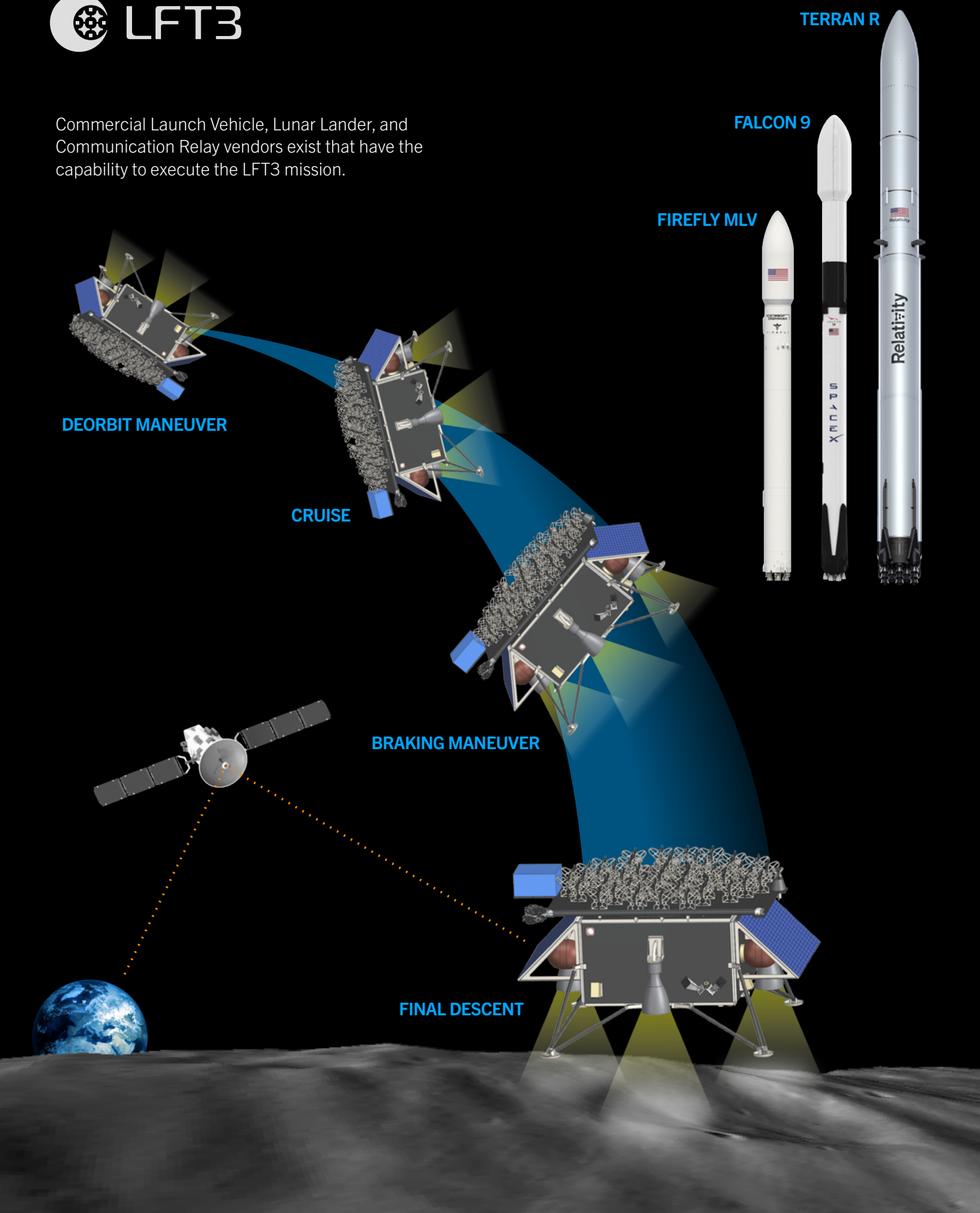
Commercial Launch Vehicle, Lunar Lander, and Communication Relay vendors exist that have the capability to execute the LFT3 mission.



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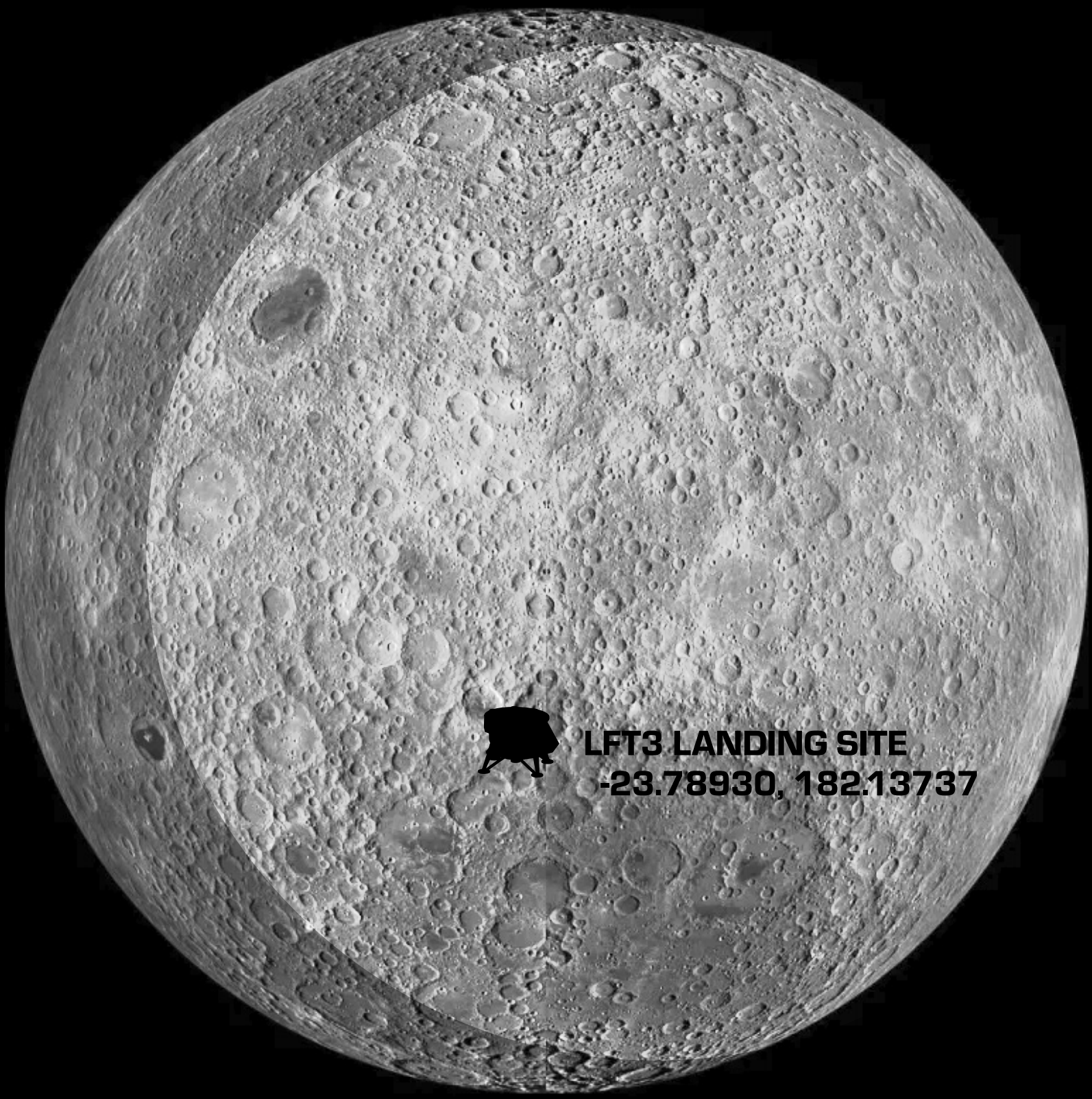

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