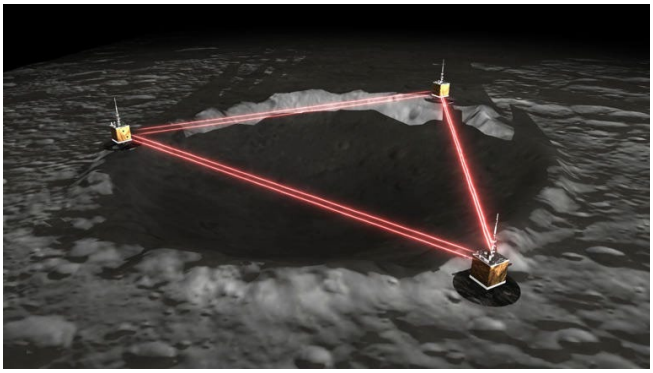
Mars Gravitational Research
Energy Antenna Test (GREAT) Mission 2024-2025

Background

NASA scientists are working with Vanderbilt University to create a Laser Interferometer Lunar Antenna (LILA)—three boxes shooting lasers at each other, in a giant triangle, across a lunar crater.

Like its L-shaped LIGO (Laser Interferometer Gravitational-wave Observatory) counterparts on Earth, LILA's lasers can detect faint gravitational waves—ripples in the fabric of space-time that travel toward us from distant collisions of *black holes* or *neutron stars* (the collapsed, dense cores of old, gigantic stars). Intense space events like these are how elements like gold, platinum, and silver get created. By stretching its lasers across a large crater in space, LILA could detect gravitational waves too faint for LIGO to detect on Earth.



This Year's Mission Objective

Expanding on the LILA concept, Mission to Mars scientists are embarking on the Mars **Gravitational Research Energy Antenna Test (GREAT) Mission**, to bring this technology to the Red Planet, as well! Our great scientists and engineers travel to Mars to establish and test a three-way laser gravitational wave detector antenna, using technology developed by the AFRL's Directed Energy directorate, placed in a triangular formation across a large Martian crater.

Personnel supporting the **2024-2025 Mars GREAT Mission** will require a colony of long-term living quarters and food on Mars. Fifth grade students participating in this year's Mission to Mars will plan and build the necessary facilities and life support resources, and present them at the culminating Link-Up Day event in the spring.

STEM and Mission to Mars astronauts…they're GREAT!

Mars Gravitational Research Energy Antenna Test (GREAT) Mission 2024-2025