AFRL

THE AIR FORCE RESEARCH LABORATORY

ORACLE

SPACE SITUATIONAL AWARENESS MISSION BEYOND GEOSYNCHRONOUS EARTH ORBIT (GEO)

WHAT IS ORACLE?

Oracle is a spacecraft developed by the Air Force Research Laboratory, or AFRL, to demonstrate the technologies the United States Space Force will need to detect and track space objects, both artificial and natural, at lunar distances and beyond (a range of 385,000 km). Currently, most satellite tracking sensors are designed to detect and track objects at GEO (~36,000 km) distances or closer.

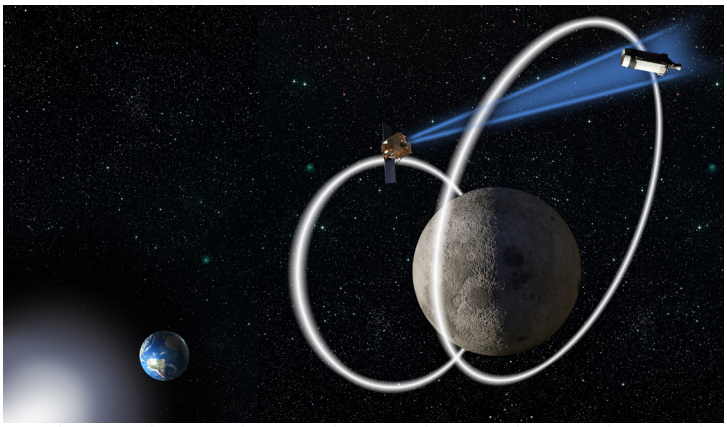
Oracle will search for unknown objects such as debris, rocket bodies, and other previously untracked cislunar objects, as well as provide position updates on spacecraft currently operating near the Moon or other cislunar regions that are challenging to observe from Earth.

In addition to proving the technology for sensing capabilities, Oracle will provide the Department of Defense with experience operating in the complicated gravitational environment that exists in specific areas between the Earth and the Moon, and help mature technology required to communicate and navigate near the Moon.

HOW DOES IT WORK?

The Oracle spacecraft aims to launch in 2026 to an area of gravitational stability between the Earth and the Moon to test techniques to monitor space traffic that travels through that region. It will use a wide-field sensor and a more sensitive narrow field sensor to discover and maintain custody of objects operating in this region.

AFRL will develop and deploy novel on-board image processing and new navigation techniques needed to accommodate the large distances between the Earth and Oracle's planned operational area. The data collected will then be fed into orbit determination software on the ground that AFRL is developing.



The image depicts one possible cislunar orbit, where the Air Force Research Laboratory's Oracle spacecraft will collect observations of resident space objects in the region near the Moon. These observations will be cataloged and used to maintain space situational awareness in support of the space community and help enable a free and open environment for commerce and space exploration for all. (Image credit / AFRL)

WHY IS IT IMPORTANT?

In the next decade, the amount of traffic to the Moon and the lunar surface is expected to increase significantly. It is critical that these endeavors are supported by robust awareness to ensure a safe operating environment. Oracle will provide space situational awareness data to the space community and assist NASA with its mission to land astronauts safely on the Moon, as well as identify and track potentially hazardous near-Earth objects such as asteroids.

Video link: **https://www.dvidshub.net/video/871230/oracle-satellite-cislunar-space**