
National Aeronautics and
Space Administration
NASA
Lunar Quest
Program Overview

Agenda

- Why Do We Explore?
- Where are We Going?
- NASA's Lunar Quest Program
  - Mission In Flight
  - Mission In Development
  - Mission In Pre-Formulation
- Web Resources

Why Do We Explore?

Inspiration

Inspire students to explore, learn, contribute to our nation's economic competitiveness, and build a better future.

Innovation

Provide opportunities to develop new technologies, new jobs, and new markets.

Discovery

Discover new information about ourselves, our world, and how to manage and protect it.

We Explore the Solar System to Understand…

Where do we come from?

- Our missions search for pieces of history hidden in the expanse of the solar system

Where are we going?

- We are going to explore the space environment for hazards to humans

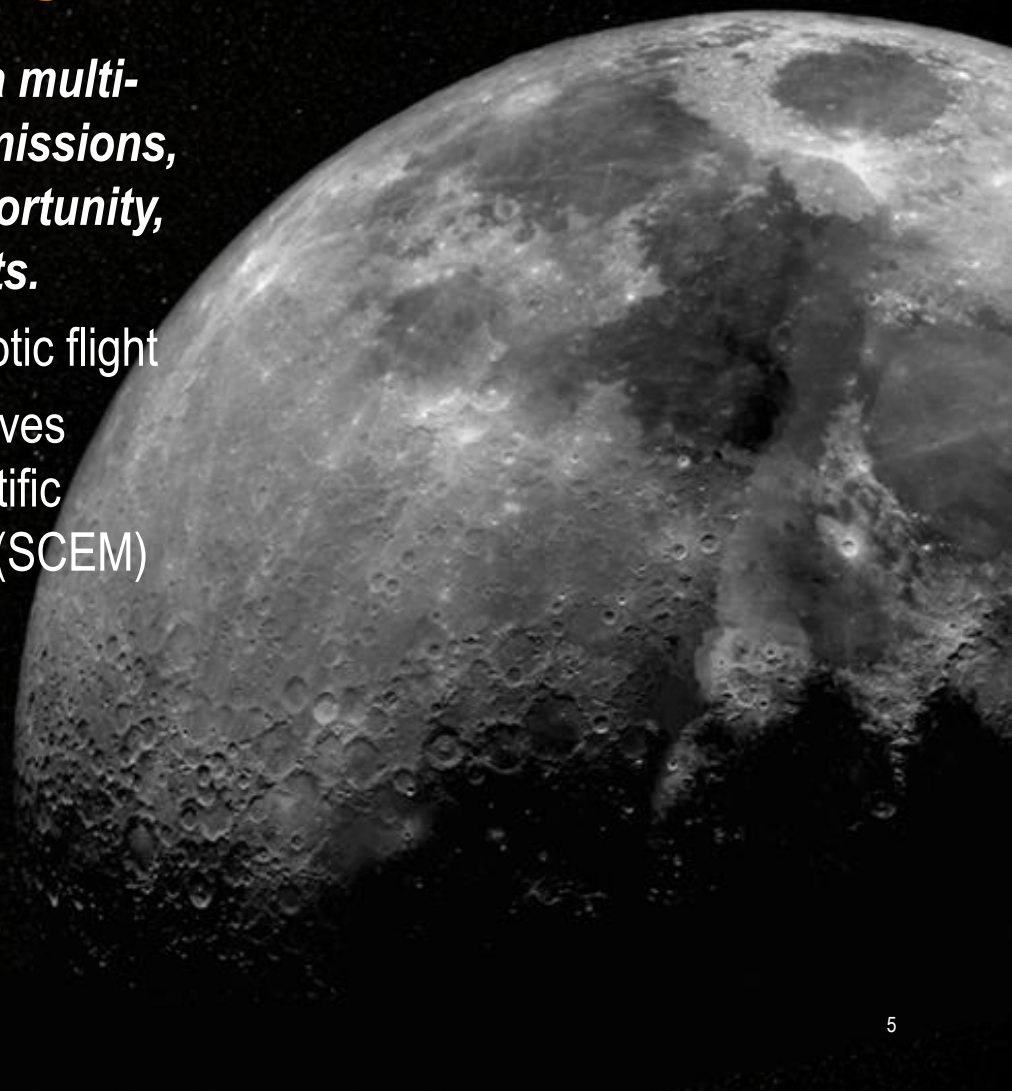
Are we alone?

- Did any planets (or their moons), including our own, have life earlier than we know? Does life exist outside of Earth?

NASA's Lunar Quest Program

NASA's new Lunar Quest Program is a multi-element program consisting of flight missions, instruments for lunar missions of opportunity, as well as research and analysis efforts.

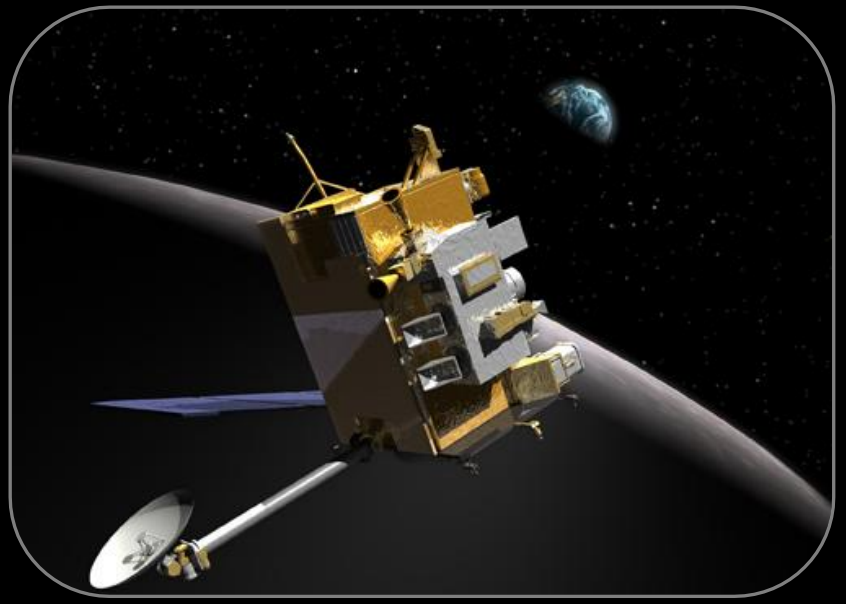
- Strategic roadmap-initiated lunar robotic flight
- Science community prioritized objectives captured in roadmaps and the "Scientific Context for Exploration of the Moon" (SCEM)



Mission in Flight

Lunar Reconnaissance Orbiter (LRO)

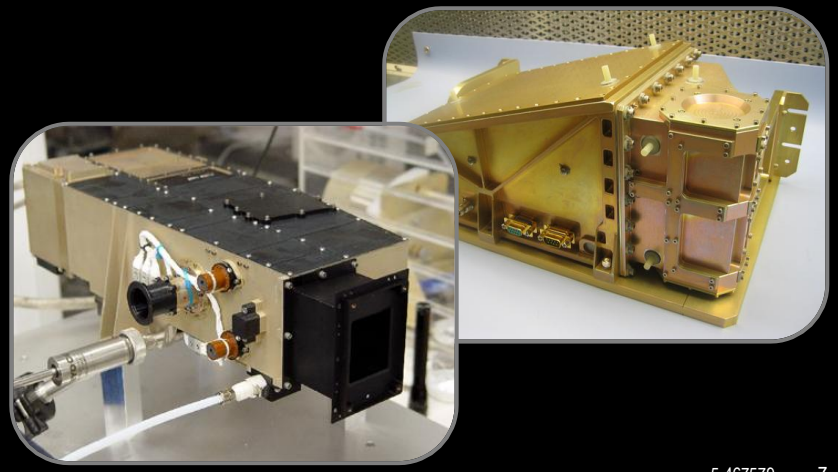
- An Atlas V rocket launched the Lunar Reconnaissance Orbiter on June 18, 2009. LRO is currently spending a year in low polar orbit, while its seven instruments find safe landing sites, locate potential resources, characterize the radiation environment and test new technology.
- After spending a year exploring, the LRO mission will transition to a science mission. It will perform lunar mapping, radiation characterization, topography and volatile identification. The mission begins in September 2010.



Mission in Flight

Lunar Reconnaissance Orbiter (LRO)

- The seven instruments include:
  - Cosmic Ray Telescope for the Effects of Radiation (CRaTER)
  - Diviner Lunar Radiometer Experiment (DLRE)
  - Lyman-Alpha Mapping Project (LAMP)
  - Lunar Exploration Neutron Detector (LEND)
  - Lunar Orbiter Laser Altimeter (LOLA)
  - Lunar Reconnaissance Orbiter Camera (LROC)
  - The Miniature Radio Frequency (Mini-RF)

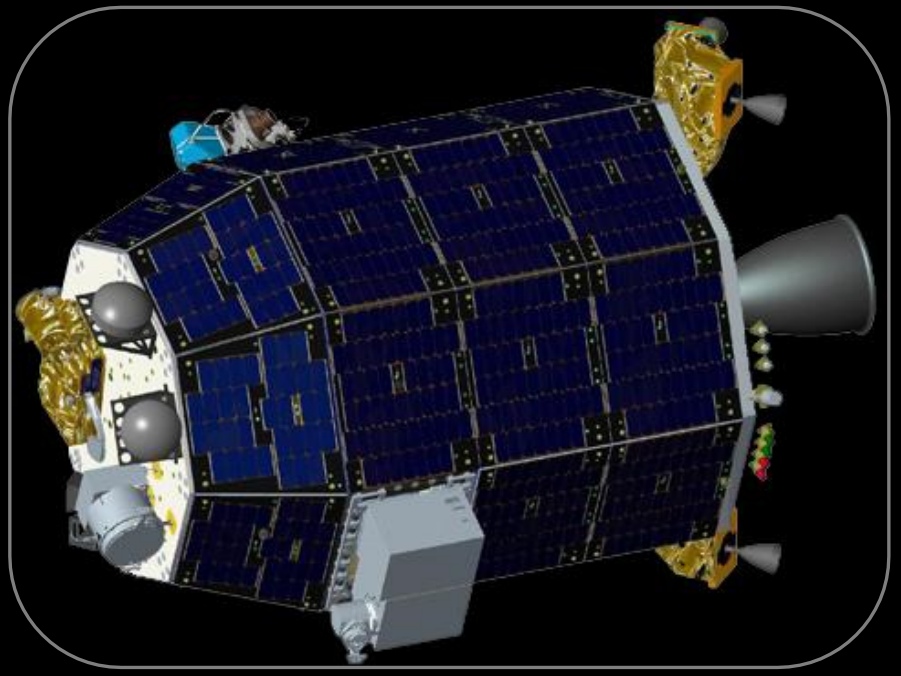


Mission in Development

Lunar Atmosphere and Dust Environment Explorer (LADEE)

Launch Date: 2013, Launch Site: Wallops Flight Facility, Wallops Island, VA

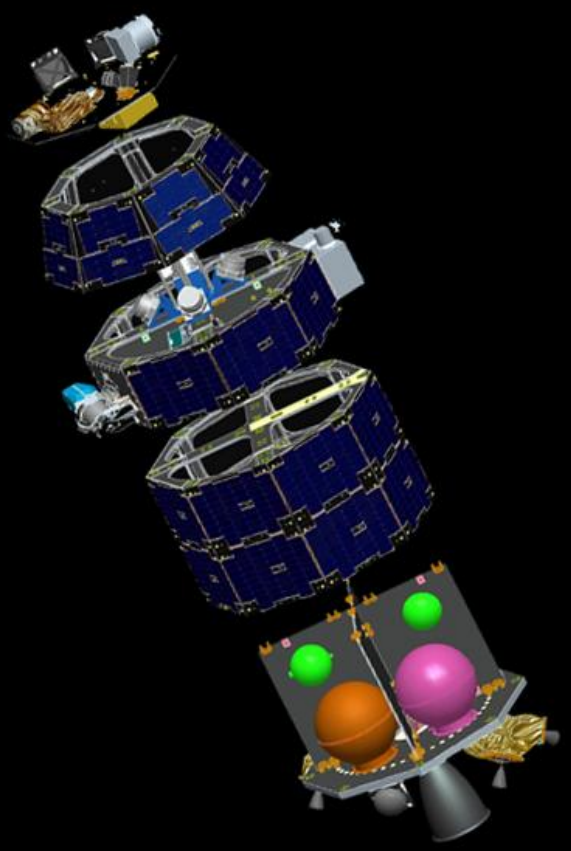
NASA's LADEE mission will orbit the moon to determine the composition of the lunar atmosphere and investigate the processes that control the environment. LADEE will characterize the lunar exospheric dust environment to measure variability and impact to the atmosphere.



Mission in Development

Lunar Atmosphere and Dust Environment Explorer (LADEE)

- Mission Duration: Approximately 160 days (30 days to travel to the moon, 30 days for checkout and 100 days for science operations)
- Science Instruments:
  - Neutral Mass Spectrometer
  - UV/VIS Spectrometer
  - Dust Detection
- Launch Vehicle: Minotaur V
- Mass: Approximately 286.6 pounds

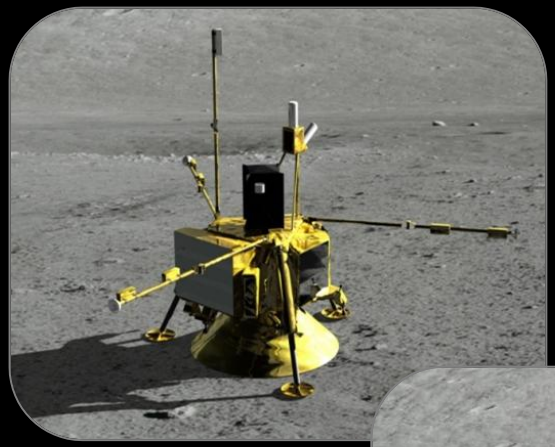


Mission in Pre-Formulation

Robotic Lunar Lander Development Team

- An ILN Anchor Nodes mission is desired by the science community to understand the interior structure and composition of the moon; fundamental information on the evolution of a differentiated planetary body.

- Two mission concepts were developed by MSFC/APL based on SMD direction: 4-lander/ASRG & 2-lander/Solar



4-lander / ASRG Concept
Lander mass: 260 kg
Power (day/night): 115/115 W

2-lander / Solar-Battery Concept)
Lander mass: 422 kg
Power (day/night): 56/26 W

Mission in Pre-Formulation

Robotic Lunar Lander Development Team

- Robotic Lander Test Bed
  - Provides a test environment for robotic lander test articles, components, sensors, algorithms, flight software etc.
  - Autonomous Operation, closed- loop control
  - Rapid turn around time (several flights per day)
  - Emulates reduced gravity lunar environment
- Next Generation Robotic Lander Test Bed
  - Develop a “warm” gas test article for longer duration flights.
  - First test flight scheduled for August 2010
  - Open to academia and private industry for technology testing

Web Resources

More information for Lunar Quest Program

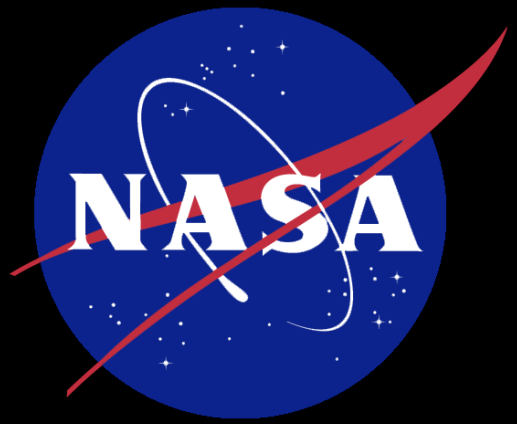
- www.nasa.gov/lunarquest

NASA/Aerospace Career Information

- http://oea.larc.nasa.gov/PAIS/Careers.html
- http://nasajobs.nasa.gov/studentopps/employment/programs.htm
- http://www.nasa.gov/audience/forstudents/postsecondary/index.html

More information for Discovery and New Frontiers Programs

- http://discovery.nasa.gov
- http://newfrontiers.nasa.gov/



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