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**AT A GLANCE:
LUNAR CRATER OBSERVATION AND SENSING SATELLITE**

Mission and Science Objectives

LCROSS' mission objective to confirm the presence or absence of water ice in a permanently shadowed crater of at the Moon's South Pole to help evaluate its suitability for future human activities.

LCROSS was launched on June 18, 2009 as a co-manifested payload with the Lunar Reconnaissance Orbiter. The LCROSS mission will culminate in two impacts in the early morning hours of Oct. 9. The impacts will create a plume up to 6.2 miles above the Moon's surface that will be seen and recorded by ground and space-based observatories. The plume will be analyzed for the presence of water ice, hydrocarbons and hydrated materials.

LCROSS also provides a modular, rapid-development spacecraft architecture for future science and exploration missions.

Procuring Customer

NASA Ames Research Center

LCROSS Project Team

NASA Ames Research Center
Jet Propulsion Laboratory
Goddard Space Flight Center
Kennedy Space Center
United Launch Alliance

Spacecraft Design and Overall Integration

In addition to spacecraft design, development, integration and test, Northrop Grumman Aerospace Systems is responsible for building, integrating and testing avionics; flight software; launch site integration support; and mission operational technical support.

Science Operations

NASA Ames is responsible for Mission Management, Science, Operations, and developing and integrating the science payload.

Science Instruments

The science payload consists of two near-infrared spectrometers, an ultraviolet-visible light spectrometer, two mid-infrared cameras, two near infrared cameras, a visible camera, and a visible high-speed photometer.

Spacecraft Specifications

Dimensions: The overall size is 79 inches (2 m) tall and the basic structure is 103 inches (2.6 m) in diameter. From omni -Z” to “omni +Z” antennae the spacecraft is 131 inches (3.3 m) wide.

Mass: The total mass at launch was 1,664 pounds (891 kg) consisting of 1,290 pounds (585 kg) for the spacecraft and 674.6 pounds (306 kg) of hydrazine fuel.

Additional Information: The max./min. range for the mass of the S-S/C at impact is max. = 866 kg, min. = 621 kg, and avg. = 743 kg. There are a number of factors that predict this mass at time of impact, including launch day.

Power: Power to onboard systems is provided by a fixed 600-watt peak power solar array and a Li-ion battery. A star tracker assembly and 10 coarse sun sensors maintain orientation to the sun.

Targeting Accuracy: A targeting accuracy of 2.17 mile (3.5 km) circle is required, but actual targeting accuracy is expected to be much higher.

Telemetry: Spacecraft communications are provided through two medium gain antennas operating at 1.5 Mbps (nominal), two omni-directional antennas operating at 40 Kbps (nominal), and a 7-watt S-band radio frequency transponder.

Data: Spacecraft data (engineering and housekeeping) and science instrument data are relayed in real time to the LCROSS mission and science operations teams.

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