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[Home](#) > Recent Results from the Lunar Reconnaissance Orbiter Mission and Plans for the Extended Science Phase

# Recent Results from the Lunar Reconnaissance Orbiter Mission and Plans for the Extended Science Phase

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The Lunar Reconnaissance Orbiter spacecraft (LRO), launched on June 18, 2009, began with the goal of seeking safe landing sites for future robotic missions or the return of humans to the Moon as part of NASA's Exploration Systems Mission Directorate (ESMD). In addition, LRO's objectives included the search for surface resources and to investigate the Lunar radiation environment. After spacecraft commissioning, the ESMD phase of the mission began on September 15, 2009 and completed on September 15, 2010 when operational responsibility for LRO was transferred to NASA's Science Mission Directorate (SMD). The SMD mission was scheduled for 2 years and completed in September, 2012.

The LRO mission has been extended for two years under SMD. The extended mission focuses on a new set of goals related to understanding the geologic history of the Moon, its current state, and what it can tell us about the evolution of the Solar System. Here we will review the major results from the LRO mission for both exploration and science and discuss plans and objectives going forward including plans for the extended science phase out to 2014. Results from the LRO mission include but are not limited to the development of comprehensive high resolution maps and digital terrain models of the lunar surface; discoveries on the nature of hydrogen distribution, and by extension water, at the lunar poles; measurement of the day and night time temperature of the lunar surface including temperature down below 30 K in permanently shadowed regions (PSRs); direct measurement of Hg, H<sub>2</sub>, and CO deposits in the PSRs, evidence for recent tectonic activity on the Moon, and high resolution maps of the illumination conditions as the

poles.

The objectives for the second and extended science phases of the mission under SMD include: 1) understanding the bombardment history of the Moon, 2) interpreting Lunar geologic processes, 3) mapping the global Lunar regolith, 4) identifying volatiles on the Moon, and 5) measuring the Lunar atmosphere and radiation environment.

**Presenter Information**

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