

Lunar Reconnaissance Orbiter

T. Morgan , G. Chin

Goddard Space Flight Center, Greenbelt USA, 20771 (Thomas.h.morgan@nasa.gov) /Fax:
301-405-3538 / Phone: 301-405-3733)

NASA's Lunar Reconnaissance Orbiter (LRO) plans to launch in October 2008 with a companion secondary impactor mission, LCROSS, as the inaugural missions for the Exploration System Mission Directorate. LRO is a pathfinder whose objective is to obtain the needed information to prepare for eventual human return to the Moon. LRO will undertake at least one baseline year of operation with additional extended mission phase sponsored by NASA's Science Mission Directorate.

LRO will employ six individual instruments to produce accurate maps and high-resolution images of future landing sites, to assess potential lunar resources, and to characterize the radiation environment. LRO will also test the feasibility of one advanced technology demonstration package. The LRO payload includes: Lunar Orbiter Laser Altimeter (LOLA) which will determine the global topography of the lunar surface at high resolution, measure landing site slopes, surface roughness, and search for possible polar surface ice in shadowed regions; Lunar Reconnaissance Orbiter Camera (LROC) which will acquire targeted narrow angle images of the lunar surface capable of resolving meter-scale features to support landing site selection, as well as wide-angle images to characterize polar illumination conditions and to identify potential resources; Lunar Exploration Neutron Detector (LEND) which will map the flux of neutrons from the lunar surface to search for evidence of water ice, and will provide space radiation environment measurements that may be useful for future human exploration; Diviner Lunar Radiometer Experiment (DLRE) which will chart the temperature of the entire lunar surface at approximately 300 meter horizontal resolution to identify cold-traps and potential ice deposits; Lyman-Alpha Mapping Project (LAMP) which will map the entire lunar surface in the far ultraviolet. LAMP will search for surface ice and frost in the polar regions and provide images of

permanently shadowed regions illuminated only by starlight; Cosmic Ray Telescope for the Effects of Radiation (CRaTER), which will investigate the effect of galactic cosmic rays on tissue-equivalent plastics as a constraint on models of biological response to background space radiation. The technology demonstration is an advanced radar (mini-RF) that will demonstrate X- and S-band radar imaging and interferometry using a light-weight synthetic aperture radar.