New NASA Moon Mission Begins Integration of Science Instruments

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Several instruments that will help NASA characterize the moon's surface have been installed on the Lunar Reconnaissance Orbiter, or LRO. The powerful equipment will bring the moon into sharper focus and reveal new insights about the celestial body nearest Earth.

Engineers and technicians on the LRO Integration and Test Team work almost around the clock in a clean room at NASA's Goddard Space Flight Center in Greenbelt, Md., to ready the spacecraft for testing and eventual launch later this year. "The spacecraft really is coming together now," said Cathy Peddie, LRO deputy project manager at Goddard. "We are in the space assembly homestretch and making solid progress. You can begin to see what LRO will look like in all of its glory."

Four of six instruments have been mated to the spacecraft, with one to be installed soon and one to arrive in the near future. The instruments are:

The Lyman-Alpha Mapping Project was built and developed at the Southwest Research Institute in San Antonio. The instrument will map the entire lunar surface in the far ultraviolet spectrum and search for surface ice and frost in the polar regions. It will provide images of permanently shadowed regions that are illuminated only by starlight.

The Cosmic Ray Telescope for the Effects of Radiation, or CRaTER, was built and developed by Boston University and the Massachusetts Institute of Technology in Boston. CRaTER will characterize the lunar

radiation environment, allowing scientists to determine potential impacts to astronauts and other life. It also will test models on the effects of radiation and measure radiation absorption by a type of plastic that is like human tissue. The results could aid in the development of protective technologies to help keep future lunar crew members safe.

Diviner Lunar Radiometer Experiment was built and developed by the University of California, Los Angeles, and the Jet Propulsion Laboratory in Pasadena, Calif. Diviner will measure surface and subsurface temperatures from orbit. It will identify cold traps and potential ice deposits as well as rough terrain and other landing hazards.

The Lunar Orbiter Laser Altimeter was conceived and built by scientists and engineers at Goddard. The instrument will measure landing site slopes and lunar surface roughness and generate high resolution three-dimensional maps of the moon. The instrument also will measure and analyze the lunar topography to identify both permanently illuminated and shadowed areas.

The Russian-built Lunar Exploration Neutron Detector has arrived from the Institute for Space Research in Moscow. The detector will create high-resolution maps of hydrogen distribution and gather information about the neutron component of lunar radiation. Its data will be analyzed for evidence of water ice near the moon's surface.

The remaining instrument, the Lunar Reconnaissance Orbiter Camera from Arizona State University in Tempe, Ariz., will provide high resolution imagery to help identify landing sites and characterize the moon's topography and composition. It should arrive at Goddard in May.

Also on board will be the Mini-RF Technology Demonstration experiment sponsored by NASA's Exploration Systems and Space Operations Mission Directorates. The miniaturized radar will be used to

image the polar regions and search for water ice. The communications capabilities of the system also will be tested during the mission.

The satellite is scheduled to launch from NASA's Kennedy Space Center, Fla., in late 2008 on an Atlas V rocket. It will spend one year in low polar orbit on its primary exploration mission, with the possibility of three more years to collect additional detailed scientific information about the moon and its environment. That information will help ensure a safe and productive human return to the moon.

The spacecraft is being built and managed by Goddard for the Exploration Systems Mission Directorate at NASA Headquarters in Washington. It will transition to the Science Mission Directorate in 2010.

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