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NASA Points Hubble at Moon To Prep for Lunar Orbiter

By [BRIAN BERGER](#)

Space News Staff Writer

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Making rare use of its prerogative to jump the queue, NASA commandeered the Hubble Space Telescope for three days in August to collect the first high-resolution, ultraviolet images of the Moon's surface.

NASA said the observations will help it get a head start on a new era of lunar science and exploration that is set to begin with the launch of the 2008 Lunar Reconnaissance Orbiter, which will carry an ultraviolet camera among its suite of instruments.

NASA announced its initial results Oct. 19 during a press conference at the U.S. space agency's headquarters here.

"Our initial findings support the potential existence of some unique varieties of oxygen-rich glassy soils in both the Aristarchus and Apollo 17 regions. They could be well-suited for visits by robots and human explorers to learn how to live off the land on the Moon," said Jim Garvin, chief scientist at NASA Goddard Space Flight Center in Greenbelt, Md., and the lead investigator on the project.

Using Hubble's Advanced Camera for Surveys, NASA photographed the Apollo 15 and 17 landing sites and the Aristarchus impact crater, which was a proposed landing site for the canceled Apollo 18 mission.

Garvin said Hubble's observations will help NASA identify regions on the Moon that are rich in ilmenite, an ore consisting of titanium and iron oxide. Laboratory experiments have shown that applying certain chemical processes to ilmenite found on Earth can easily liberate oxygen, making the lunar ilmenite a potential source of oxygen for producing breathable air and rocket fuel.

Jennifer Wiseman, Hubble program scientist at NASA Headquarters, said the agency currently does not have any plans to make further observations of the Moon using Hubble.

Hubble needs to have three working gyroscopes to maintain the necessary stability to photograph an object as close as the Moon. Hubble has been operating on just two gyroscopes since late August when ground controllers shut down one of the space telescope's gyroscopes to keep it in reserve, hopefully extending the telescope's science-gathering lifetime until mid-2008.

Wiseman said the switch to the two-gyroscope mode actually was postponed several days to accommodate the lunar observations.

While Hubble is not likely to train its instruments on the Moon again unless the telescope is refurbished during a long-proposed space shuttle servicing mission, NASA intends to continue ultraviolet surveys of the lunar soil with the Lunar Reconnaissance Orbiter it plans to launch in 2008.

Mark Robinson, a Northwestern University scientist serving

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as the Lunar Reconnaissance Orbiter's principal investigator, also participated in the Hubble lunar observations. Robinson said scientists have very little experience making ultraviolet observations of the Moon, or any planetary body for the matter.

Robinson said analyzing the results of the Hubble lunar observations will be good preparation for analyzing the ultraviolet imagery NASA expects to collect with the Lunar Reconnaissance Orbiter.

"This is going to jump start our ability to scientifically analyze those data when they start to come down," Robinson said.

Although Hubble observation time is precious and often booked by scientists years in advance, NASA has at least once before exercised its right to jump to the head of the line.

David Leckrone, a senior Hubble scientist at the space agency's Goddard Space Flight Center, said the only other time he could remember that NASA made use of its discretionary Hubble observation time was to take pictures of the Lunar Prospector spacecraft crashing into the Moon's south pole in 1999.

Bjorn Carey contributed to this article from New York. Comments: bberger@space.com

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