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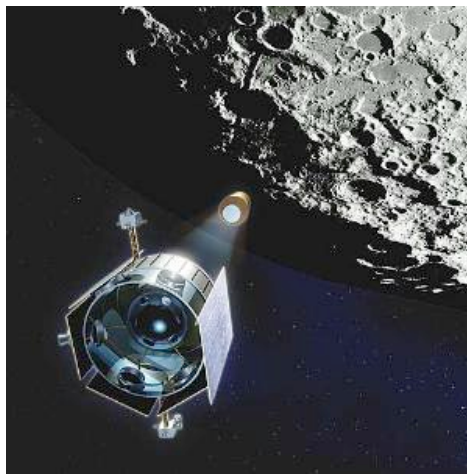
Mauna Kea scopes will be used to observe when NASA crafts hit the moon

By Helen Altonn

POSTED: 01:30 a.m. HST, Oct 07, 2009

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Hawaii will have Earth's best view of an explosive rocket crash on the moon at 1:30 a.m. Friday.



The LCROSS (Lunar Crater Observation and Sensing Satellite) Mission was timed for optimal observing from Mauna Kea's telescopes because of their location and power and nearly full stage of the moon.

Islanders also should be able to see the impact with 10- to 12-inch telescopes, weather permitting, and amateur astronomers are encouraged to record images and share them with NASA for an archive of data.

The \$79 million mission is expected to provide the answer, or at least clues, to the big question of whether

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COURTESY NASA

As the Lunar Crater Observation and Sensing Satellite approaches the moon Friday, the rocket will separate from its "Shepherding Spacecraft." First the rocket and then the spacecraft will hit the moon, creating a debris plume that will rise above the lunar surface. The impact will be timed so that it can be observed with the large telescopes on Mauna Kea, and smaller scopes will be able to spot it, too.

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there is water on the moon.

Jeffrey Gillis-Davis, among University of Hawaii scientists participating in the program, said the presence of water would be significant scientifically and as a resource for

humans to return there.

"As a resource, it will allow us to 'live off the land' more easily," he said. It could be used as drinking water or split into hydrogen and oxygen, which "can be used for breathing or as rocket propellant, which would allow the moon to be a launch pad for exploring the solar system."

LCROSS and the Lunar Reconnaissance Orbiter were launched in June. They separated, and the LRO is orbiting and mapping the moon's surface.

A "Shepherding Spacecraft" is guiding the rocket that will separate and smash into the moon. Nine instruments on the spacecraft will have just four minutes to collect data from the impact and send it back to Earth before it also crashes.

Tony Colaprete of NASA's Ames Research Center in California, the principal investigator for the mission, said in a telephone interview with the Star-Bulletin two years ago that the 4,500-pound rocket will strike Cabeus crater near the moon's south pole at 5,600 mph, making a hole about the size of a tennis court. "It will be like a small SUV moving at twice the speed of a rifle bullet," he described.

The impact of the Centaur rocket is expected to throw a cloud of debris more than three miles above the lunar surface that will be illuminated by sunlight and should be visible from Earth.

Playing a critical role in observations on Mauna Kea will be the W.M. Keck Observatory, NASA Infrared Telescope Facility, Gemini North, Su-baru and Canada-France-Hawaii Telescopes. The Hubble Space Telescope and other satellites and telescopes on Earth also will be studying the plume.

UH scientists Gillis-Davis, Paul Lucey, B. Ray Hawke and John Raynor will be analyzing data to learn more about the moon's environment, minerals and deposits from volcanic eruptions.

Astrophysicist Diane Wooden of NASA Ames Research Center will conduct observations from Keck Observatory, said Alan Tokunaga, NASA Infrared Telescope Division chief.

Tokunaga, with the UH Institute for Astronomy, said by telephone from the American Astronomical Society meeting in Puerto Rico that the NASA facility and Keck will do complementary work. The Infrared Telescope will look for hydrated water and Keck for water vapor, he said.

"I hope it works," he said, adding that it's "very, very challenging. ... Diane spent many months working on how to point the telescope exactly where the impact will be on the moon."

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