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NASA finally sees plume from moon impact

LCROSS camera captures image of 'faint' plume with debris, vapor

By **SPACE.com** staff

updated 3:21 p.m. MT, Fri., Oct . 16, 2009

NASA scientists have finally seen in their data a debris plume created by the impact of a moon probe last week.

The faint plume was seen in the data from the engineered crash one week after the **impact of the LCROSS probe**.

Scientists are hoping that analysis of the plume will show signs of water ice ejected from the **probe's target crater**, named **Cabeus**, at the lunar south pole.

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The **debris plume**, created by the probe's Centaur stage rocket, was captured by the **LCROSS** ultraviolet/visible and near infra-red spectrometer. Its signature was faint, but distinct.

"There is a clear indication of a plume of vapor and fine debris," said Anthony Colaprete, LCROSS principal investigator and project scientist.

The magnitude, form, and visibility of the debris plume add additional information about the concentrations and state of the material at the impact site.

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"Within the range of model predictions we made, the ejecta brightness appears to be at the low end of our predictions and this may be a clue to the properties of the material the Centaur impacted," Colaprete said.

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NASA's LCROSS lunar probe smashed into a crater on the south side of the moon. But there have been other crashes in and from space too.

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The LCROSS spacecraft also captured the Centaur impact flash in both mid-infrared (MIR) thermal [cameras](#) over a couple of seconds. The temperature of the flash provides valuable information about the composition of the material at the impact site.

LCROSS also captured emissions and absorption spectra across the flash using an ultraviolet/visible spectrometer. Different materials release or absorb energy at specific [wavelengths](#) that are measurable by the spectrometers.

With the spacecraft returning data until virtually the last second, the thermal and near-infrared cameras captured excellent images of the Centaur impact crater at a resolution of less than 6.5 feet. The images indicate that the crater was about 92 feet wide.

"The images of the floor of Cabeus are exciting," Colaprete said. "Being able to image the Centaur crater helps us reconstruct the impact process, which in turn helps us understand the observations of the flash and ejecta plume."

The LCROSS team will continue combing through and examining the probe's data in the coming weeks to see if they can find signs of water ice.

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"We are blown away by the data returned," Colaprete said. "The team is working hard on the analysis and the data appear to be of very high quality."

Water has **already been detected** in small quantities all over the lunar surface, bound to the particles of dirt that coat the moon.

And evidence from other spacecraft suggests there is water ice in permanently shadowed craters like Cabeus.

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