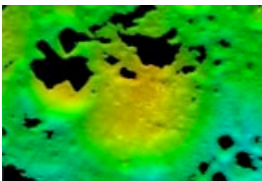


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NASA Picks Moon Crater to Slam Into

By [Andrea Thompson](#)
Senior Writer
posted: 11 September 2009
02:07 pm ET

When NASA's LCROSS lunar probe slams into the moon next month as planned to look for signs of water, it will aim for the south polar crater Cabeus A, the agency announced today.

The \$79 million moon-impacting spacecraft is carrying an empty Centaur rocket stage, which has about the same mass as a sports utility vehicle and will be [hurled into the lunar surface](#) on Oct. 9.

Professional astronomers and backyard skywatchers will be watching the spectacle.

"The purpose of our missions is to see if there may indeed be [some water ice](#) located in some permanently shaded crater positions on the south pole of the moon," said LCROSS project manager Daniel Andrews. Other missions have provided tantalizing but so-far inconclusive evidence for water ice there.

At the announcement of [the crater target](#), the LCROSS team dedicated the mission to the late journalist Walter Cronkite.

"It's a great honor, thank you very much. Dad would be pleased to be part of this ongoing process," his son, Chip Cronkite, said at a NASA press briefing.

What will happen

LCROSS will first release its Centaur stage rocket to impact the crater, then LCROSS itself will impact the lunar surface at about 5,580 mph (8,980 kph), and the resulting ejecta can be examined for signatures of water.

"It will kick up whatever is on the floor of the crater; that may very well include water ice," Andrews said.

More than a decade ago, the Lunar Prospector mission detected hydrogen deposits around the moon's south polar region, suggesting that some form of water ice may exist where the sun never shines.

Finding water on the moon would be a boon for future manned missions because it would eliminate the need to haul it up from Earth. The ice could be melted for drinking water, and hydrogen could be extracted for fuel.

Cabeus A was one of several finalist craters — including Shackleton, Shoemaker and Hayworth craters — examined by the team for many months. The crater sits at 81 degrees south on the moon and is relatively large (about 40 kilometers across).

The crater also meets other criteria to achieve a successful impact that throws up ejecta in a way that telescopes will be able to see it: "We want to hit a nice flat, fluffy place," said LCROSS principal investigator Anthony Colaprete.

Cabeus A seems to fit the bill, with plenty of flat areas for the spacecraft to smash into.

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An artist's depiction of the LCROSS moon-smashing mission as the Shepherding Spacecraft (left) pulls free of the Centaur upper stage impactor. Credit: NASA/Ames

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[Expand to View Replies \(1\)](#)**MartianSam1** wrote: posted 11 September 2009, 3:21 pm ET

All the previous crashes have been at grazing angles, by lightweight probes, and only observed from Earth. This will be a direct hit, observed by two probes plus Earth, with a secondary collision for good measure by one of the probes - also at a direct angle.

The high-speed vertical hit will be important. I'm sure the other probes that basically smacked horizontally into whatever exposed hilltop they happened into weren't in the best position to either go deep in a crater or deep beneath the surface once they did impact.

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Water doesn't sublimate at the temperatures found in the shaded polar regions, so it could remain there quite happily for eons.

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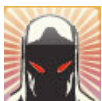
Is it really worth 79 million bucks to crash a lunar probe just to see if there is water on the moon?
How about we try this.....Lets go there and see.

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I thought that the moon was way too bright and moving way too fast to be photographed by Hubble... no? Maybe the spectrometer is ok?

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Wait a minute! I bought a deed to part of that crater...

[Reply](#) | [Recommend \(7\)](#) | [Report Abuse](#)[Expand to View Replies \(1\)](#)**Nuruhuine** wrote: posted 11 September 2009, 7:59 pm ET

Am I the only one who is completely outraged by this mission?? I honestly can't express my deep dismay and seething anger without swearing my face off, so I won't. But seriously folks, this is a *PRIME* example of NASA leaping before it looks! To send up a probe to the moon to look for ice is a GOOD thing, please don't get me wrong, but JESUS! NASA is pissing away resources by doing it *this* way! I've said it before, and I'll say it until the day I freaking die: NASA could easily accomplish the EXACT same survey WITHOUT crashing an entire \$79,000,000 probe! All NASA would have had to do was send up LCROSS with an ATTACHED IMPACTOR!! Insted of throwing the entire satellite at earths satellite and watching from afar, LCROSS could 'fire off' the impactor and stay

around and watch it, WITHOUT pissing away an entire probe! I can't get over how stupidly planned this whole mission is, and I can't help but wonder how such a bungled mission got out've it's planning stage.... Seriously! I want to hear opinions people.

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vaxheadroom wrote: posted 11 September 2009, 10:01 pm ET

Nuruhuine: You have NO idea what you're talking about, and yes you're just about the only person outraged by this. I'll guarantee it can't be done any cheaper - in fact, my email is public record - anybody who DOES this cheaper I'll personally buy them a beer. Heck, I'll buy anybody a beer who shows me a credible PROPOSAL to do this cheaper!

This is essentially an interplanetary mission (yes, I know it's just the moon!) for \$79M and if LCROSS finds what it's looking for, the payback is huge. Do the math: \$50K/lbs to land something on the moon - water is 8lbs/gallon that's \$400K/GALLON!! You'll pay for LCROSS in 200 gallons! There's no way for the LCROSS shepherding spacecraft to put the Centaur on the correct path and then have enough propulsion to MISS the MOON! At that point it's too deep in the gravity well to get into orbit.

Besides, the spacecraft has a mass spectrometer on board, and the only way to use it is to fly thru the ejecta plume. Believe me, some of the smartest people on the planet figured out how to do this mission and this IS the fastest, cheapest, BEST way it can be done.

Emory Stagmer
Lead C&DH Flight Software Engineer, NASA's LCROSS mission
Northrop Grumman Tech Services SSC
(specking, of course, only for myself and not NG or NASA)

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