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SMART-1 Image Of New LCROSS Impact Target

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The European Space Agency's SMART-1 team has released an updated image of the future impact site of NASA's Lunar Crater Observation and Sensing Satellite (LCROSS), after the LCROSS team announced a new target last week. LCROSS will search for water ice on the Moon by making two impacts into a crater named Cabeus at the lunar South Pole. The impacts are scheduled for 11:31:19 UTC and 11:35:45 UTC on October 9 2009.

Bjoern Grieger, the liaison scientist for SMART-1's AMIE camera, and Bernard Foing, ESA SMART-1 Project Scientist, have searched through SMART-1's database for images of Cabeus, taken four years ago. The SMART-1 images are at high resolution as the spacecraft was near its closest distance of 500 km from the South Pole. The SMART-1 images of LCROSS potential targets were

discussed on 18 September at lunar sessions of European Planetary Science Congress (EPSC) in Potsdam, Germany.

The Cabeus crater interior is permanently shadowed, so ice lying inside the crater could be protected from the Sun's harsh rays. LCROSS will send the upper stage Centaur rocket crashing into Cabeus and a shepherd spacecraft will fly into the plume of dust generated and measure its properties before making a second impact with the lunar surface. Astronomers will observe both impacts using ground and space-based telescopes. The SMART-1 spacecraft also concluded its mission with a controlled bouncing impact on September 3 2006. The event was observed with ground-based telescopes (a "dry run" for LCROSS) and the flash from the impact was detected at infrared wavelengths.

"The Cabeus topographic features as observed by SMART-1 vary greatly during the lunar rotation and the yearly seasons due to the polar grazing illumination conditions", said Foing. "The floor of Cabeus near LCROSS targets shows number of small craters, and seems old enough to have accumulated water ice delivered from comets and water-rich asteroids, and might have kept it frozen in its shadowed area."

"These ESA SMART-1 observations of the Cabeus crater can help in the final planning and interpretation of LCROSS impact observations", he added.

Image Caption: New LCROSS impact target Cabeus: Mosaic of 4 images taken by the Advanced Moon Imaging Experiment (AMIE) on board ESA's SMART-1 mission. The SMART-1 images forming the mosaic have been taken at different epochs with different illumination conditions: in January 2005 from a distance of 1037 km and on February 2006 from a distance of 622 km. The SMART-1 AMIE mosaic size is 400 km. The dots at the centre of the image indicate the impact points for the LCROSS Centaur stage and shepherd spacecraft well placed within the shadowed area. Image credit: B.Grieger, B.H. Foing & ESA/SMART-1/ AMIE team

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