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Let's Talk About: Spacecrafts set to crash into the moon

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Just like on Earth, water is a crucial resource on the moon. It is critical to find natural resources, such as water, on the moon if humans are ever going to return for extended periods.

NASA designed the Lunar Crater Observation and Sensing Satellite to confirm the presence or absence of water ice on the lunar surface. It will soon begin the search for water at Cabeus A, a permanently shadowed crater at the moon's South Pole.

LCROSS will excavate the crater with two heavy impactors on Oct. 9 at 7:30 a.m., to test the theory that ancient ice lies buried there. The impact will eject material from the crater's surface to create a plume that instruments will be able to analyze for the presence of water, hydrocarbons and hydrated materials.

The two main components of the LCROSS mission are the Shepherding Spacecraft and the Centaur upper stage rocket. The Shepherding Spacecraft guides the rocket to a site selected on the moon that has a high probability of containing water.

The Centaur rocket will crash into the crater at more than twice the speed of a bullet, causing an impact that results in a big plume or cloud of lunar debris, and possibly water. While this is happening, the Shepherding Spacecraft, which has cameras and scientific instruments onboard, will take pictures of the rocket's descent and impact. Four minutes later, the Shepherding Spacecraft follows almost the same path as the rocket, descending down through the big plume and analyzing it with special instruments.

A variety of ground-based and orbital observatories also will inspect the dust and water plumes caused by the impacts. The impact plume may even be visible through amateur telescopes with apertures as small as 10 to 12 inches.

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