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NASA's LCROSS Mission and the Search for Water Ice on the Moon GWENDOLYN BART, Univ. of Idaho, ANTHONY COLAPRETE, NASA Ames Research Center — The Lunar Prospector neutron spectrometer found evidence for hydrogen on the Moon, possibly as water, in permanently shadowed polar regions. To directly detect this water ice, the LCROSS spacecraft (Lunar CRater Observation and Sensing Satellite), will guide the empty Earth departure upper stage of the rocket into a controlled impact in a permanently shadowed region on the Moon. The LCROSS spacecraft will follow the impactor, using its nine instruments to detect the presence of water ice in the crater's ejecta. This presentation will give an overview of the LCROSS mission, its scientific rationale, and the expected return. Furthermore, this presentation will discuss the ongoing characterization of potential lunar impact sites. The impact site must be permanently shadowed from the sun and show an increased hydrogen signal in the neutron spectrometer data. The impact plume must be ejected up into sunlight and should be visible from Earth. The ideal site would be smooth on meter scales and be relatively flat. Lunar water would be a valuable resource for future human lunar explorers and the establishment of a permanent lunar base.

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