Computer model defines planetary landscapes

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FAIRBANKS, Alaska—A new technique allows scientists to determine the landscape of locales more than 48 million miles from Earth. The method determines the diameter, depth and overall shape of other planets’ surface craters from shadows visible in images captured from probes traveling through the Milky Way.

John Chappelow, a postdoctoral fellow with the Arctic Region Supercomputing Center and the Geophysical Institute at the University of Alaska Fairbanks, is developing a computer program called CRATERZ, based on the method. The program will read an image’s resolution, and the solar elevation and azimuth to calculate the diameter, depth and parameters to describe the shapes of surface craters on celestial bodies millions of miles away.

The shapes of impact craters are used to infer planetary surface properties and compositions, crater ages, and impact conditions. Impact crater shapes are difficult to obtain from single-image photography, such as that provided through flybys of the National Aeronautics and Space Administration’s probe MESSENGER—short for Mercury Surface, Space Environment, Geochemistry, and Ranging. John Chappelow’s method, and the computer program CRATERZ, currently is the only way to decipher impact crater shapes, and UAF is the only place it can be done.

Chappelow will present on this topic at the American Geophysical Union’s Annual Fall Meeting in San Francisco. His poster presentation, “Simple Impact Crater Shapes From Shadows—The Sequel” is a continuation of a talk he provided at the Lunar and Planetary Science Conference in Houston, TX in March 2008. The presentation will begin at 8 a.m. on Wednesday, Dec. 17 in Moscone North Exhibit Hall D.

FOR MORE INFORMATION:
http://www.arsc.edu/homepage.html
http://www.agu.org/meetings/fm08/index.php/Main/HomePage

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