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2015 GSA Annual Meeting in Baltimore, Maryland, USA (1-4 November 2015)

Paper No. 282-12

Presentation Time: 10:50 AM

THE GEOLOGIC MAPPING OF CERES USING DAWN SPACECRAFT DATA

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NASA's Dawn spacecraft arrived at dwarf planet Ceres in March 2015, and began orbiting in April. The Dawn Science Team is conducting a geological mapping campaign during the nominal mission, with the goals of providing real time interpretations of geological features and providing geological context for compositional measurements to be made by the Visible and Infrared Spectrometer and the Gamma-Ray and Neutron Detector. The geological mapping campaign is being done in stages, related to the spatial resolution of images obtained by the Framing Camera during each orbital phase. First, images from the Approach (1.3 km/px) and Survey (415 m/px) orbits, including grayscale and color images and digital terrain models derived from stereo images, are being used to enable an initial characterization of the surface geology at the global scale. Second, images from the High Altitude Mapping Orbit (140 m/px, beginning mid-August 2015) will be used to refine the global map and enable identification of a chronostratigraphy and geologic timescale for Ceres. Third, images from the Low Altitude Mapping Orbit (35 m/px, beginning mid-December 2015) will be used for detailed mapping of the surface using a 15-quadrangle system, where the quadrangle maps will focus on investigation of the formation and evolution of key surface features and regions.

Ceres has a non-uniformly cratered surface, with large regions of low impact crater abundances indicative of resurfacing processes. Impact crater sizes and degradation states vary considerably, from fresh bright rayed craters to degraded old basins. Tectonic fractures and dome-like features have been mapped. Color imaging shows distinctive color variations across the surface, suggestive of compositional variations that need to be identified.

Support by the Dawn Instrument, Operations, and Science Teams is gratefully acknowledged. This work is supported by grants from NASA through the Dawn project, and from the German Space Agency.

This session will be accompanied by a special poster session showing the geologic maps of the surface of Ceres based on the Survey data.

Session No. 282

[T172. Geology of Dwarf Planets: First Results from NASA's Dawn Mission to Ceres](#)

Wednesday, 4 November 2015: 8:00 AM-12:00 PM

Room 344 (Baltimore Convention Center)

Geological Society of America *Abstracts with Programs*. Vol. 47, No. 7, p.710

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