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UPDATE ON THE GLOBAL GEOLOGIC MAP OF CERES FROM NASA'S DAWN MISSION

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The Dawn Science Team is conducting an iterative geologic mapping campaign for Ceres similar to Vesta [1,2], including production of an Approach- and Survey-based global map [3] and a series of 15 Low Altitude Mapping Orbit (LAMO)-based quadrangle maps [1]. Here, we report on the progress to map the global geology of Ceres at a scale of 1:2.5M using image, spectral and topographic data from the Dawn mission. Basemaps include the Dawn Framing Camera (FC) High Altitude Mapping Orbit (HAMO; 140 m/pixel) mosaic, the global DTM (137 m/pixel) derived from FC stereo images, and FC color mosaics (0.44-0.96 µm) to help identify contacts, and provide context for map unit characterization.

Ceres exhibits ~16 km of relief, and is dominated by broad expanses of low-lying terrains, and small areas of elevated terrain. The "lows" within the low-lying terrains appear to have been shaped largely by large-diameter impacts, whereas the "highs" within the elevated areas appear to be composed of large knobs and the rims of moderately-sized craters.

Impact structures are the most pervasive features visible on the surface of Ceres. We are mapping the rims of craters greater than 15 km in diameter. Many craters of all sizes appear morphologically "fresh" to moderately modified; the rims of these craters are nearly circular and raised above the surrounding terrain. Many craters exhibit irregularly shaped, sometimes scalloped, rim structures, and debris lobes on their floors, suggesting instability in surface materials. Ceres also contains a number of large depressions that are only apparent in the topographic data.

Geologic mapping at the Survey and HAMO scales have defined two regional units that dominate the surface, which are superposed by a series of impact crater units. *Smooth material* forms nearly flat-lying to hummocky plains throughout the western hemisphere, is found largely to the east and west of crater Kerwan, and appears to contain some of the lowest crater densities on Ceres. *Cratered terrain* forms most of Ceres' surface and contains rugged surfaces formed largely by the structures and deposits of impact features.

References: [1] Williams D.A. et al. (2014) *Icarus*, 244, 1-12. [2] Yingst R.A. et al. (2014) *PSS*, 103, 2-23. [3] Buczkowski, D.L., et al. (2016) *Science*, in review.

Session No. 110

[T174. The Geology of Dwarf Planet Ceres](#)
Monday, 26 September 2016: 8:00 AM-12:00 PM

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