P53E-2179: Preliminary Geological Map of the Ac-H-12 Toharu Quadrangle of Ceres: An Integrated Mapping Study Using *Dawn* Spacecraft Data

ABSTRACT

Friday, 18 December 2015
13:40 - 18:00
Moscone South - Poster Hall

We are using recent data from the Dawn spacecraft to map the geology of the Ac-H-12 Toharu Quadrangle (21-66°S, 90-180°E) of the dwarf planet Ceres in order to examine its surface geology and understand its geologic history. At the time of this writing, mapping was performed on Framing Camera (FC) mosaics from late Approach (1.3 km/px) and Survey (415 m/px) orbits, including clear filter and color images and digital terrain models derived from stereo images. Images from the High Altitude Mapping Orbit (140 m/px) will be used to refine the map in Fall 2015, followed by the Low Altitude Mapping Orbit (35 m/px) starting in December 2015.

The quad is named after crater Toharu (87 km diameter; 49°S, 155°E). The southern rim of Kerwan basin (284 km diameter) is visible along the northern edge of the quad, which is preserved as a low-relief scarp. The quad exhibits smooth terrain in the north, and more heavily cratered terrain in the south. The smooth terrain forms nearly flat-lying plains in some areas, such as on the floor and to the southeast of Kerwan, and overlies hummocky materials in other areas. These smooth materials extend over a much broader area outside of the quad, and appear to contain some of the lowest crater densities on Ceres. Impact craters exhibit a range of coinciding sizes and preservation styles. Smaller craters (<40 km) generally appear morphologically “fresh”, and their rims are nearly circular and raised above the surrounding terrain. Larger craters, such as Toharu, appear more degraded, exhibiting irregularly shaped, sometimes scalloped, rim structures, and debris lobes on their floors. Numerous craters (> 20 km) contain central mounds; at current FC resolution, it is difficult to discern if these are primary structures (i.e., central peaks) or secondary features.

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