P53E-2167: Preliminary Geological Map of the Ac-H-1 Asari 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 used geologic mapping applied to Dawn spacecraft data as a tool to understand the geologic history of the Ac-H-1 Asari quadrangle of dwarf planet Ceres. The Dawn Framing Camera observed the quadrangle (north polar area: 66°N-90°N) from an altitude of 4424 km and a clear-filter mosaic was produced at a spatial resolution of 400 m/pixel. A stereo-photogrammetric digital elevation model was calculated from images acquired during a higher altitude resulting in a spatial resolution of 1.4 km/pixel. Key characteristics of the study area are (1) a high density of impact craters and (2) moderate topographic variations. We measured a crater density of 9.8E-04 (km-2) for crater diameters >10 km, the highest on Ceres. Few isolated topographic highs (plateaus), reaching ~5 km in altitude relative to the ellipsoid, are present. Their irregular shape is often sculpted by impacts. We also note a positive relief with relatively steep slopes (~13°) and a cone-like shape centered at 85°N/8°E. Topographic lows, reaching -4 km, correspond to the floors of impact craters with diameters up to 64 km. The morphology of impact craters exhibits varying degrees of degradation. Degraded crater floors show central peaks and mass wasting deposits. The largest morphologically fresh deposit (78°N/38°E) is 20 km long, and has a lobate shape with striations on its surface. It extends from a crater rim downslope. No extensive ejecta deposits are present in the study area. In the course of the ongoing mission, we will incorporate mosaics from the High Altitude Mapping Orbit (~140 m/pixel) and Low Altitude Mapping Orbit (~35 m/pixel) phases to complete the preliminary photo-geological map and stratigraphy.

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