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GEOMORPHOLOGICAL SURFACE PROCESSES ON CERES

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Ceres surface is characterized by a smooth and rugged topography ranging from about -7.5km to 7.5km relative to a best-fit ellipsoidal shape with 482x482x446km. Ceres' topography has a much greater range in elevation relative to its ellipsoidal dimensions (3.2%) than the Moon and Mars (1% and 0.9%) or Earth (0.3%) but is lower compared to Vesta (15%). Its topography is comparable to the icy satellite Iapetus (3.6%) but significantly higher than that of other icy satellites (<1.8%). The topography of Ceres indicates a rigid crust manifesting a range of processes in the course of its geological evolution. Ceres' surface is characterized by pristine to highly degraded impact craters with central peaks and rings and a variety of ejecta blankets, as well as lineaments, apparent depression infills and distinctive bright spots. Some craters show upwelling dome-like structures on the floor. Bright spots with higher albedo than the surrounding terrain occur at different locations correlated with impact structures and tectonic crustal stress. These spots indicate material differences and possible time-variable effects related to cryo-processes either volcanic and/or glacial. Trough-like features and polygonal impact crater rims indicate crustal stress that compensates by tectonic processes. In summary, Ceres exhibits geological features indicating significant resurfacing due to impact cratering, tectonic stress, relaxation, mass displacement, upwelling, doming and possible cryo-volcanic and/or cryo-glacial processes. According to the relatively high topography to radius ratio, steep slopes, mass wasting, and flow processes are expected and observed. Support by F. Preusker, T. Roatsch, E. Ammannito, K. Krohn, K. Otto, A. Nass, K. Stephan, K.D. Matz, S. Elgner, E. Kersten, R. Wagner, S. Schröder, F. Schulzeck, I. von der Gathen, N. Schmedemann, T. Kneissl, J.E.C. Scully, S.C. Mest, R.A. Yingst, S. Marchi, P. Schenk, T. McCord and the Dawn Instrument, Operations, and Science Teams.

Session No. 282

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

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