Geophysical Research Abstracts
Vol. 18, EGU2016-7204-3, 2016
EGU General Assembly 2016

Geological Mapping of the Ac-H-2 Coniraya Quadrangle of Ceres from NASA's Dawn Mission.

Jan Hendrik Pasckert (1), Harald Hiesinger (1), David Williams (2), David Crown (3), Scott Mest (3), Debra Buczkowski (4), Jennifer Scully (5), Nico Schmedemann (6), Ralf Jaumann (7), Thomas Roatsch (7), Frank Preusker (7), Andrea Naß (7), Andreas Nathues (8), Martin Hoffmann (8), Michael Schäfer (8), Maria Cristina De Sanctis (9), Carol Raymond (5), and Christopher Russell (10)

(1) Westfälische Wilhelms-Universität Münster, Institut für Planetologie, Münster, Germany (jhpasckert@uni-muenster.de), (2) School of Earth & Space Exploration, Arizona State University, Tempe, Arizona, (3) Planetary Science Institute, Tucson, Arizona, (4) JHU-APL, Laurel, Maryland, USA, (5) NASA JPL, California Institute of Technology, Pasadena, California, USA, (6) Inst. of Geosciences, FU Berlin, Berlin, Germany, (7) DLR, Berlin, Germany, (8) Max Planck Inst. for Solar System Research, Göttingen, Germany, (9) National Institute of Astrophysics, Rome, Italy, (10) UCLA, Los Angeles, California, USA

Dwarf planet Ceres (∼950 km) is located at ∼2.8 AU in the main asteroid belt [1], and is currently orbited by NASA's Dawn spacecraft. Similar to Vesta [2], the 15 quadrangles of Ceres will be mapped on the basis of Framing Camera mosaics from Low Altitude Mapping Orbits (LAMO) with a spatial resolution of ∼35 m/px. Here we report on our preliminary geological map of the Ac-H-2 Coniraya Quadrangle (located between 21-66 ˚N and 0-90 ˚E) based on High Altitude Mapping Orbit (HAMO) data (∼120 m/px), as LAMO images are just becoming available.

The Coniraya Quadrangle is dominated by craters of different sizes and degradation stages. Most of the craters are highly degraded and no ejecta blankets are visible (e.g., Coniraya: 136 km; 65.8˚E/40.5˚N). Only some craters like Gaue and Ikapati seem to be relatively fresh, and still have ejecta blankets. Such fresher impact craters could already be mapped in detail on HAMO data, and subdivided into crater ejecta, crater wall, crater floor, and crater central peak materials. At the crater floor and around Ikapati crater we also identified smooth materials that fill local depressions. The formation of the smooth material seems to be related to the formation of the impact crater, as crater densities of the smooth materials and the ejecta blanket are similar, as are their absolute model ages (AMAs), derived from crater size-frequency distribution (CSFD) measurements. Using the lunar derived chronology, CSFD measurements of Ikapati's ejecta blanket and the smooth materials located in and around the crater show AMAs of 300 to 390 Ma. CSFD measurements of Gaue crater show AMAs of 910-980 Ma. Both craters show background AMAs of 3.1 to 3.5 Ga, which might be related to old large craters (e.g., Coniraya or Kerwan).

Apart from crater related units, we identified one dome-like structure (∼65 km wide; ∼3 km high) at the crater floor of a large degraded crater at the western edge of this quadrangle. This might be an indication for the present of volcanic activity in this quadrangle.

A lobate flow-like deposit identified at an unnamed crater (50.5˚E/27˚N) and pitted terrain on some smooth units might be an indication for ice or volatiles in the subsurface.

References: [1] C. T. Russell, C. A. Raymond, The Dawn Mission to Minor Planets 4 Vesta and 1 Ceres, *Springer* (2012). [2] Williams D.A. et al. (2014), *Icarus*, 244, 1-12.