

Geological Mapping of the Ac-H-10 Rongo and Ac-H-15 Zadeni quadrangles of Ceres from NASA's Dawn Mission.

Thomas Platz (1), Andreas Nathues (1), Hanna Sizemore (2), Ottaviano Ruesch (3), Martin Hoffmann (1), Michael Schaefer (1), David Crown (2), Scott Mest (2), R. Aileen Yingst (2), David Williams (4), Debra Buczkowski (5), Kynan Hughson (6), Thomas Kneissl (7), Nico Schmedemann (7), Norbert Schorghofer (8), Andrea Nass (9), Frank Preusker (9), and Christopher Russell (6)

(1) Max Planck Institute for Solar System Research, Justus-von-Liebig-Weg 3, 37077 Göttingen, Germany, (2) Planetary Science Institute, Tucson, USA, (3) NASA/GSFC, Greenbelt, USA, (4) Arizona State University, Tempe, USA, (5) JHU-APL, Laurel, USA, (6) UCLA, Los Angeles, USA, (7) Freie Universität Berlin, Berlin, Germany, (8) University of Hawaii, Honolulu, USA, (9) DLR, Berlin, Germany.

On March 6, 2015 NASA's Dawn spacecraft arrived at (1) Ceres, the largest object in the main asteroid belt. Dawn is studying the dwarf planet more than one year through successively lower orbits at increasing resolution. Main orbital phases include Survey Orbit, High Altitude Mapping Orbit (HAMO), and Low Altitude Mapping Orbit (LAMO) where Framing Camera (FC) [1] resolution increased from c.400 m/px to c.140 m/px and c.35 m/px, respectively. The Dawn Science Team is conducting geological mapping campaigns for Ceres (as done before for Vesta [2,3]) and includes the production of a Survey/HAMO-based global geological map and a series of 15 LAMO-based geological quadrangle maps. This abstract presents HAMO-based geological maps of Ac-H-10 Rongo (22°N–22°S, 288–360°E) and Ac-H-15 Zadeni (65°–90°S, 0°–360°E) quadrangles.

The Rongo Quadrangle is located at the equatorial region and comprises the unique isolated mountain Ahuna Mons (10.5°S/316.0°E; formerly known as the pyramid), abundant impact craters spanning a range in diameters and states of preservation—from fresh to highly degraded—, and a number of tholi, which may represent surface expressions of sub-surface diapir intrusions. The SW portion of the quadrangle is characterised by Yalode (D=260 km) sourced ejecta. The Zadeni Quadrangle is dominated by the 122-km-diameter crater Zadeni located at 70.2°S/37.4°E) and a suite of mid-sized craters whose morphologies range from fresh to highly degraded. Portions of the quadrangle are covered by Urvara [4] and Yalode [5] ejecta materials. The South Polar Region is poorly illuminated and the South Pole itself is likely located within a larger impact structure.

Future work of this mapping campaign includes revision of HAMO-based line work (e.g., contacts) with higher resolution LAMO data. Final interpretations regarding the geological histories of these two quadrangles will also be based on FC colour and stereo-derived topography data, VIR spectra as well as GRaND data.

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