GEOLOGICAL MAPPING OF THE AC-H-10 RONGO QUADRANGLE OF CERES. T. Platz[1,2], A. Nathues[1], O. Ruesch[3], H.G. Sizemore[2], M. Schaefer[1], M. Hoffmann[1], D.A. Crown[2], S.C. Mest[2], R.A. Yingst[2], D.A. Williams[4], T. Kneissl[5], N. Schmedemann[5], A. Naß[6], and F. Preusker[6], [1]Max Planck Institute for Solar System Research, Justus-von-Liebig-Weg 3, 37077 Göttingen, Germany (platz@mps.mpg.de), [2]Planetary Science Institute, Tucson, USA, [3]NASA/GSFC, Greenbelt, USA, [4]Arizona State University, Tempe, USA, [5]Freie Universität Berlin, Berlin, Germany, [6]DLR, Berlin, Germany.

Introduction: Dwarf planet Ceres, the largest object in the main asteroid belt, is being investigated by the orbiting Dawn spacecraft. The three main orbital phases were Survey, High-Altitude Mapping Orbit (HAMO), and the currnet Low-Altitude Mapping Orbit (LAMO), where Framing Camera (FC) [1] image resolution continuously increased from c.410 m/px to c.140 m/px and c.35 m/px, respectively. As done for Vesta [2,3], Ceres's surface geology is being mapped globally at LAMO scale through a series of 15 quadrangle maps [4].

This abstract presents the first version of the LAMO-based geological map of the Ac-H-10 Rongo quadrangle (22°N–22°S, 288-360°E).

Base maps: Mapping bases are the panchromatic LAMO mosaic and the HAMO-based stereo-photogrammtically derived Digital Terrain Model (DTM) with a horizontal resolution of c.137 m/px and a vertical accuracy of 10 m [5]. Auxiliary databases comprise the HAMO FC RGB and colour ratio mosaics as well as the photometrically corrected panchromatic LAMO mosaic.

Results: The Rongo Quadrangle is located in the western hemisphere equatorial region. Its main feature is the unique isolated mountain Ahuna Mons (10.5°S/316.0°E) rising up to 4 km above surrounding terrain; planar outline is 21 km × 13 km (Fig. 1). Ahuna Mons' flanks are smooth and are composed of bright material. The contact to the surrounding cratered terrain is sharp and only gradational where flank-induced flow deposition occurred. The summit region exhibits linear to arcuate ridges with no preferred orientation. Ahuna Mons is a cryovolcanic edifice and is likely formed by the eruption of brines-bearing material [6].

The landscape in the Rongo Quadrangle is also characterised by an abundance of impact craters spanning a range in diameter from <100 m to 205 km and states of preservation—from fresh to highly degraded. Rongo crater located at (3.5°N/348.1°E) is 65 km in diameter and experienced several crater wall collapse events as evidenced by the pronounced scalloped rim.

A number of gently rising landforms are observed across the quadrangle, which may represent surface expressions of sub-surface diapir intrusions. The SW portion of the quadrangle is characterised by rough-textured material currently interpreted to represent ejecta deposition from Yalode crater (260 km in diameter), which is centred approximately 300 km SW of Ahuna Mons. Note Yalode's northern rim is only 33 km away from the southern boundary of the Rongo quadrangle.

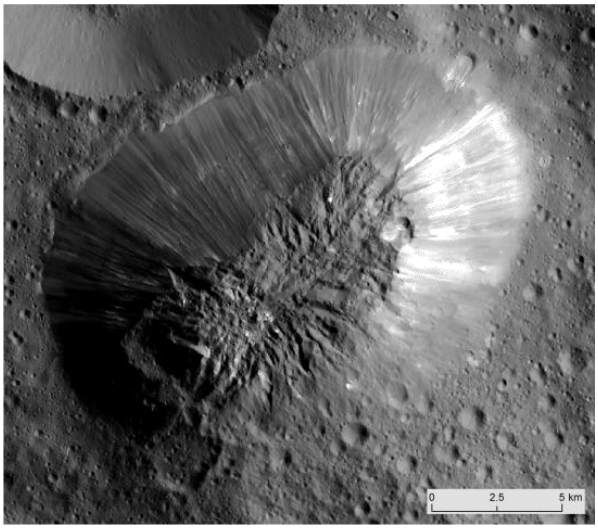

Fig. 1: Ahuna Mons.

The eastern region of the quadrangle is partially covered by Haulani-sourced ejecta. Haulani is a young, 34 km in diameter crater located 5.8°N/10.8°E. Individual ejecta rays can be traced and mapped in panchromatic imagery but are more pronounced visible (and more widespread) in FC colour images. The preliminary geological map of the Ac-H-10 Rongo quadrangle is presented in Fig. 2.

References:

[1] Sierks H. et al. (2011) *Space Sci. Rev.*, 163, 263–327. [2] Williams D. A. et al. (2014) *Icarus*, 244, 1–12. [3] Yingst R. A. et al. (2014) *PSS*, 103, 2–23. [4] Roatsch, T. et al. *PSS*, (submitted). [5] Preusker F. et al. (2016) *LPS XLVII*, abstract #1954. [6] Ruesch O. et al. *Science*, (in revision).

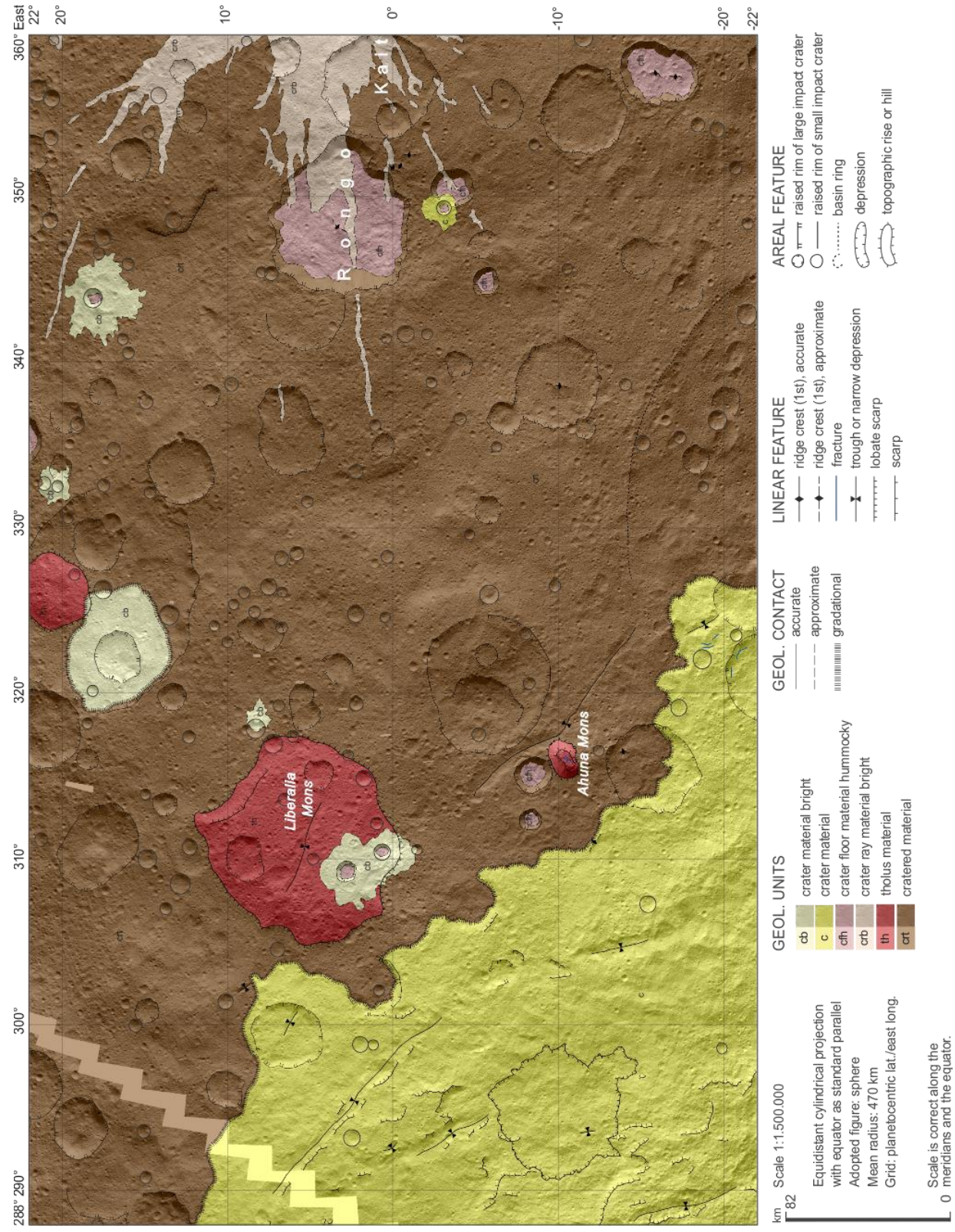

Fig. 2: Preliminary LAMO-based geological map of the Ac-H-10 Rongo Quadrangle.