

[Start](#) | [Author Index](#) | [View Uploaded Presentations](#) | [Meeting Information](#)

2015 GSA Annual Meeting in Baltimore, Maryland, USA (1-4 November 2015)

Paper No. 282-7

Presentation Time: 9:35 AM

PRELIMINARY INVESTIGATION OF POLYGONAL CRATERS ON (1) CERES

OTTO, Katharina A.¹, JAUMANN, Ralf¹, KROHN, Katrin¹, BUCZKOWSKI, Debra L.², VON DER GATHEN, Isabel³, MEST, Scott C.⁴, SCHULZECK, Franziska³, SCULLY, Jennifer E.C.⁵ and WILLIAMS, David A.⁶, (1)Institute of Planetary Research, German Aerospace Center (DLR), Rutherfordstr. 2, Berlin, 12489, Germany, (2)Johns Hopkins University Applied Physics Laboratory, Laurel, MD 20723, (3)German Aerospace Center (DLR), Institute of Planetary Research, Rutherfordstr. 2, Berlin, 12489, Germany, (4)Planetary Science Institute, Tucson, AZ 85719, (5)Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA 91109, (6)School of Earth and Space Exploration, Arizona State University, Tempe, AZ 85287, katharina.otto@dlr.de

The Dawn space craft arrived at dwarf planet Ceres in March 2015 [1]. The on-board Framing Camera (FC) collected image data which revealed a large variety of impact crater morphologies including polygonal craters. Polygonal craters show straight rim sections aligned to form an angular shape. They are commonly associated with fractures in the target material [2]. Polygonal craters are known from a variety of planetary bodies such as icy satellites [3].

We use a mosaic composed of FC images to interpret the distribution and geologic setting of polygonal craters on Ceres.

We find polygonal craters with a size of up to 250 km in diameter. A preferential hexagonal shape is observed. Some polygonal craters exhibit central peaks or relaxed crater floors, while other polygonal craters are simple bowl-shaped. Polygonal craters show both relatively distinct and degraded crater rims indicating a continuous formation period. Areas showing a higher density of polygonal craters are evident in the higher latitudes. In the eastern hemisphere, polygonal craters are associated with a set of regional linear structures. The crater rims tend to align with these structures.

We will analyze polygonal crater density, orientation and morphology with respect to Ceres' geology and thus aim to infer structural information on geologic units. Assuming that polygonal craters are caused by fractures in the impacted material, structural regolith variations as well as tectonics of surface units will be discussed and related to Ceres' evolution.

[1] Russell, C. T. et al., 46th LPSC, #1131, 2015. [2] Öhman, T. et al., GSA Special Paper 465, pp. 51-65, 2010. [3] Beddingfield, C. B. et al., 46th LPSC, #1159, 2015.

Supported by E. Kersten, K.-D. Matz, A. Naß, F. Preusker, T. Roatsch, S. Schröder, K. Stephan, R. Wagner, C. A. Raymond and C. T. Russell.

Session No. 282

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

Wednesday, 4 November 2015: 8:00 AM-12:00 PM

Room 344 (Baltimore Convention Center)

Geological Society of America *Abstracts with Programs*. Vol. 47, No. 7, p.709

© Copyright 2015 The Geological Society of America (GSA), all rights reserved. Permission is hereby granted to the author(s) of this abstract to reproduce and distribute it freely, for noncommercial purposes. Permission is hereby granted to any individual scientist to download a single copy of this electronic file and reproduce up to 20 paper copies for noncommercial purposes advancing science and education, including classroom use, providing all reproductions include the complete content shown here, including the author information. All other forms of reproduction and/or transmittal are prohibited without written permission from GSA Copyright Permissions.

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

[<< Previous Abstract](#) | [Next Abstract >>](#)
