HIGH RESOLUTION CERES HAMO ATLAS DERIVED FROM DAWN FC IMAGES. Th. Roatsch[1], E. Kersten[1], K.-D. Matz[1], F. Preusker[1], F. Scholten[1], R. Jaumann[1], C. A. Raymond[2], and C. T. Russell[3], [1]Institute of Planetary Research, German Aerospace Center (DLR), Berlin, Germany, Thomas.Roatsch@dlr.de, [2]Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA, [3]Institute of Geophysics, UCLA, Los Angeles, CA.

Introduction: NASA's *Dawn* spacecraft entered the orbit of dwarf planet Ceres in March 2015, and will characterize the geology, elemental and mineralogical composition, topography, shape, and internal structure of Ceres. One of the major goals of the mission is a global mapping of Ceres.

Data: The Dawn mission is mapping Ceres from three different orbit heights during Survey orbit (4425 km altitude), HAMO (High Altitude Mapping Orbit, 1475 km altitude), and LAMO (Low Altitude Mapping Orbit, 375 km altitude) [1]. The Dawn mission is equipped with a framing camera (FC) [2] which was the prime instrument during the HAMO phase. Dawn orbited Ceres during HAMO in 6 cycles between August 18 and October 21, 2015. The framing camera took about 2,600 clear filter images with a resolution of about 140 m/pixel during these cycles. The images were taken with different viewing angles and different illumination conditions. We selected images from one cycle (cycle #1) for the mosaicking process to have similar viewing and illumination conditions. Very minor gaps in the coverage were filled with a few images from cycle #2.

Data Processing: The first step of the processing chain towards the cartographic products is to ortho-rectify the images to the proper scale and map projection type. This process requires detailed information of the Dawn orbit and attitude data and of the topography of the targets. Both, improved orientation and a high-resolution shape model, are provided by stereo processing (bundle block adjustment) of the HAMO stereo image dataset [3]. Ceres's HAMO shape model was used for the calculation of the ray intersection points while the map projection itself was done onto the reference sphere of Ceres with a radius of 470 km. The final step is the controlled mosaicking of all images to a global mosaic of Ceres, the so-called basemap.

Ceres map tiles: The Ceres HAMO atlas was produced in a scale of 1:750,000 and consists of 15 tiles that conform to the quadrangle scheme proposed by Greeley and Batson [4] and widely used e.g., for the Icy Saturnian satellites [5]. A map scale of 1:750,000 guarantees a mapping at the highest available Dawn resolution in HAMO. The individual tiles were extracted from the global mosaic and reprojected.

Nomenclature: The Dawn team proposed 81 names for geological features. By international agreement, craters must be named after gods and goddesses of agriculture and vegetation from world mythology, whereas other geological features must be named after agricultural festivals of the world. The nomenclature proposed by the Dawn team was approved by the IAU [http://planetarynames.wr.usgs.gov/] and is shown in Fig. 1. The entire Ceres HAMO atlas will be available to the public through the Dawn GIS web page [http://dawngis.dlr.de/atlas].

Future work: The Dawn mission entered the LAMO orbit in December 2015 and started to map Ceres globally with a resolution of 35 m/pixel. These data will be used to produce a higher resolution atlas of Ceres.

References: [1] Russell, C.T. and Raymond, C.A., Space Sci. Rev., 163, 3-23; [2] Sierks, et al., 2011, Space Sci. Rev., 163, 263-327; [3] Preusker, F. et al., this session; [4] Greeley, R. and Batson, G., 1990, Planetary Mapping, Cambridge University Press; [5] Roatsch, Th. et al., 2009, Cartographic Mapping of the Icy Satellites Using ISS and VIMS Data, in Saturn from Cassini-Huygens, 763-782, Springer, NY.

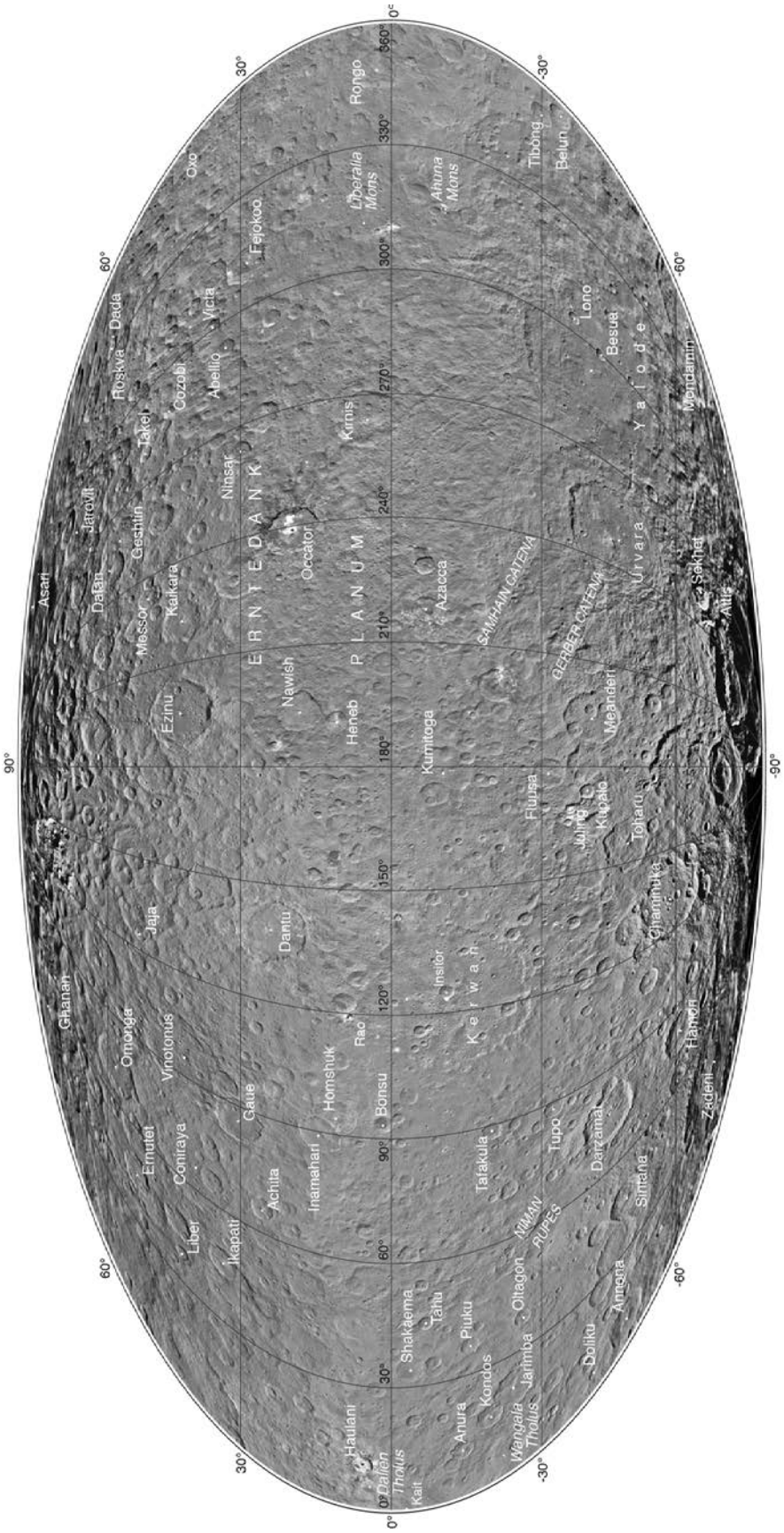

Figure 1: Global Mosaic of Ceres in Mollweide projection with approved nomenclature for geological features.