



## High resolution VESTA LAMO atlas derived from Dawn FC images.

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**Introduction:** NASA's *Dawn* spacecraft entered orbit of the inner main belt asteroid 4 Vesta on July 16, 2011, and spent about one year in orbit to characterize the geology, elemental and mineralogical composition, topography, shape, and internal structure of Vesta before it departed to asteroid 1 Ceres in late 2012. One of the major goals of the mission was a global mapping of Vesta.

**Data:** The DAWN mission was mapping Vesta from three different orbit heights during Survey orbit (3100 km altitude), HAMO (High Altitude Mapping Orbit, 700 km altitude), and LAMO (Low Altitude Mapping Orbit, 210 km altitude) [1]. The Dawn mission is equipped with a framing camera (FC) [2] which was the prime instrument during the LAMO phase. DAWN orbited Vesta during LAMO in 21 cycles between December 2011 and end of April 2012. The framing camera took about 10,000 clear filter images with a resolution of about 20 m/pixel during these cycles. The images were taken with different viewing angles and different illumination conditions. We selected about 8,000 images for the global coverage of Vesta.

**Data Processing:** The first step of the processing chain is to ortho rectify the images to the proper scale and map projection type. This process requires detailed high-resolution information of the local topography of Vesta. The global topography was calculated during the stereo processing of the HAMO images [3] and was used here. The shape model was used for the calculation of the ray intersection points while the map projection itself was done onto a sphere with a mean radius of 255 km. The next step was the mosaicking of all images to one global mosaic of Vesta, the so called basemap.

**Vesta map tiles:** The Vesta atlas was produced in a scale of 1:200,000 and consists of 30 tiles that conform to the quadrangle scheme proposed by Greeley and Batson [4] and is used for example for mapping Mars in a scale of 1:5,000,000. A map scale of 1:200,000 guarantees a mapping at the highest available DAWN resolution in LAMO and results in an acceptable printing scale for the hardcopy map of 10 pixel/mm. The individual tiles were separately mosaicked and reprojected.

**Nomenclature:** The DAWN team proposed to the International Astronomical Union (IAU) to use the names of vestal virgins and famous Roman women as names for the craters and to use names of places and festivals associated with vestal virgins for other feature names. This proposal was accepted by the IAU and the team could propose 50 names for geological features to the IAU which were also approved [5]. These feature names were applied to the map tiles. The entire Vesta atlas consisting of 30 map tiles will become available to the public through the Planetary Photojournal and the PDS.

**References:** [1] Russell, C.T. and Raymond, C.A., Space Sci. Review, 163, DOI 10.1007/s11214-011-9836-2; [2] Sierks, et al., 2011, Space Sci. Rev., 163, DOI 10.1007/s11214-011-9745-4; [3] Preusker, F. et al., this session; [4] Greeley, R. and Batson, G., 1990, Planetary Mapping, Cambridge University Press; [5] <http://planetarynames.wr.usgs.gov/Page/VESTA/target>