THE COLORS OF VESTA. Th. Roatsch[1] S.E. Schröder[1], S. Mottola[1], K.-D. Matz[1], E. Kersten[1], R. Jaumann[1], C.A. Raymond[2], and C.T. Russell[3], [1]Institute of Planetary Research, German Aerospace Center (DLR), Berlin, Germany; [2]Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA; [3]Institute of Geophysics, UCLA, Los Angeles, CA. (Thomas.Roatsch@dlr.de)

Introduction: NASA's Dawn spacecraft entered orbit of the inner main-belt asteroid 4 Vesta on July 16, 2011, and spent 14 months 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 September 2012. One of the major goals of the mission is a global color mapping of Vesta.

Data: The Dawn mission mapped Vesta from three different heights during Survey orbit (2700 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) with one clear and seven narrow band color filters [2]. The FC took about 6,500 color images in all seven filters with a resolution of about 60 m/pixel during the two HAMO phases, which resulted in almost complete coverage of Vesta.

Data processing: The first step of the processing chain is an accurate radiometric calibration of the images. The camera was calibrated on ground but it became necessary to improve this procedure with an extended in-flight calibration [3]. Images taken through the narrow band filters are plagued by in-field stray light, which must be subtracted after the standard radiometric correction [4]. The next step in the processing chain is the photometric correction of the images [4,5]. The following steps are the same as those for clear filter images: ortho rectification and mosaicking [6].

True color: The global true color mosaic in Mollweide projection is shown in Fig.1. True color was achieved by scaling FC images acquired through the red, green, and blue filters to RGB values calculated from the CIE color matching functions and a Vesta spectrum [7].

Clementine ratios: Clementine-type color ratio image mosaics were calculated using the mosaics of three different narrow band filters; Red: 750/430 nanometers (nm); Green: 750/920 nm; Blue: 430/750 nm. The color ratio image product serves to cancel out the dominant brightness variations of the scene (controlled by albedo variations and topographic shading) and enhances color differences related to soil mineralogy and, possibly, maturity.

Download: All color mosaics will become available to the public through JVesta, the Vesta version of the JMARS geographic information system [8].

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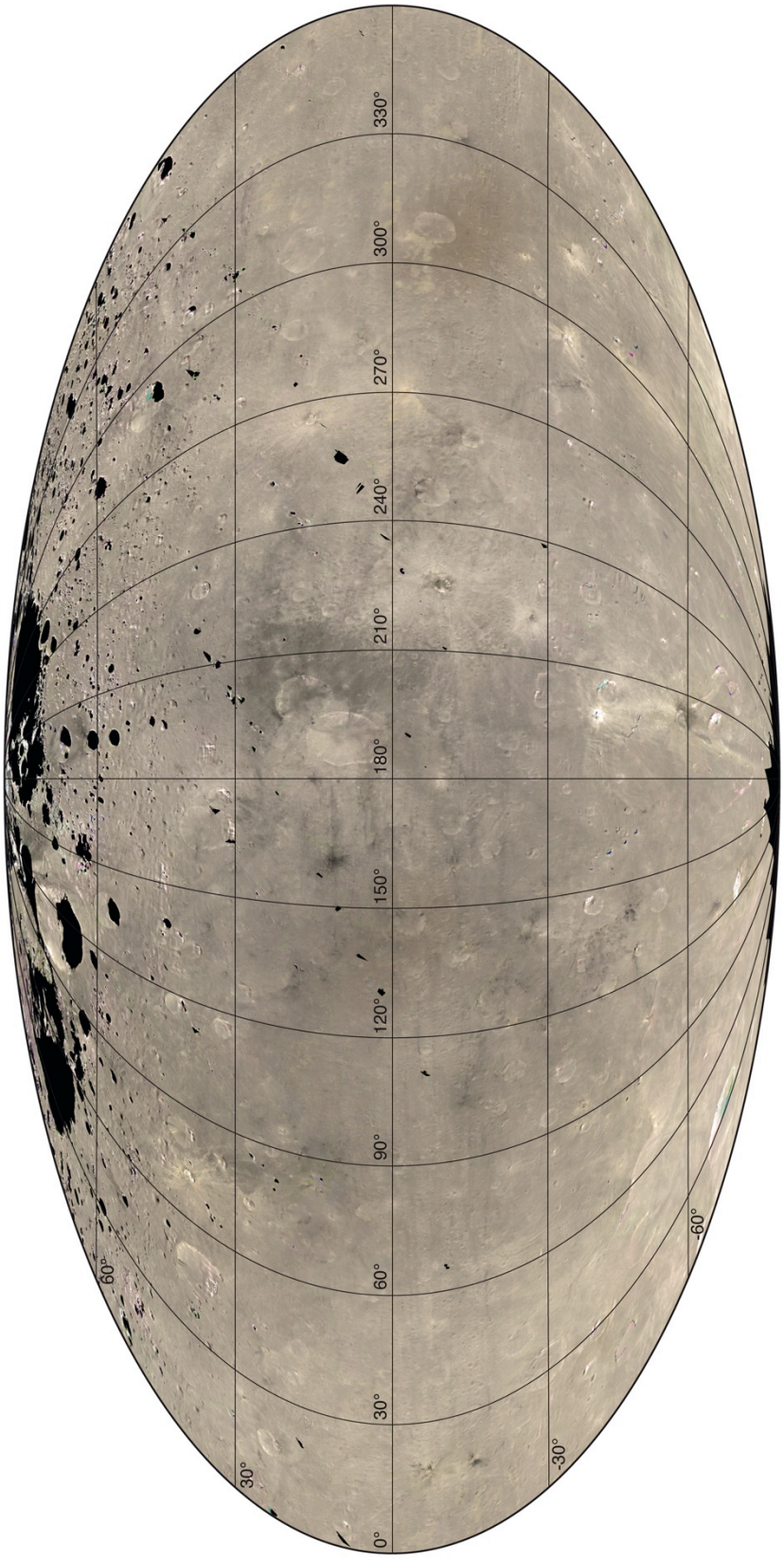

Fig. 1: Global true color mosaic in Mollweide projection