Geophysical Research Abstracts
Vol. 14, EGU2012-**PREVIEW**, 2012
EGU General Assembly 2012

Geologic Mapping of the Av-12 Sextilia Quadrangle of Asteroid 4 Vesta

K. Krohn (1), R. Jaumann (1,2), K. Stephan (1), C.M. Pieters (3), R. Wagner (1), R.A. Yingst (4), D.A. Williams (5), P. Schenk (6), G. Neukum (2), N. Schmedemann (2), T. Kneissl (2), M.C. DeSanctis (7), A. Nathues (8), D.L. Buczkowski (9), T. Roatsch (1), F. Preusker (1), E. Kersten (1), C.T. Russell (10), and C.A. Raymond (11)

(1) German Aerospace Center (DLR), Institute of Planetary Research, Germany (katrin.krohn@dlr.de), (2) Freie Universität Berlin, Inst. of Geosciences, Planetology and Remote Sensing, (3) Brown University, Providence, RI, USA, (4) Planetary Science Institute, Tucson, AZ, USA, (5) Arizona State University, Tempe, USA, (6) Lunar and Planetary Institute, Houston, USA, (7) National Institute of Astrophysics, Rom, Italy, (8) Max Planck Int. Katlenburg-Lindau, Germany, (9) Johns Hopkins University Applied Physics Laboratory Laurel, USA, (10) UCLA, Institute of Geophysics, Los Angeles, USA, (11) Jet Propulsion Laboratory, California Institute of Technology, Pasadena, USA

NASA's Dawn spacecraft is spending one year in orbit of asteroid 4Vesta to characterize its geology, chemical and mineralogical composition, topography, shape, and internal structure. The Dawn Team is conducting geological mapping of the surface in the form of 15 quadrangle maps, and here we report results from the mapping of Sextilia quadrangle Av-12. Mapping is based on a Framing Camera (FC) mosaic produced from High Altitude Mapping Orbit (HAMO) data with a spatial resolution of ∼70 m/pixel, supplemented by a Digital Terrain Model (DTM: lateral spacing of 450 m/pixel and vertical accuracy of ∼30 meters), FC color images, and Visible and InfraRed (VIR) hyperspectral images.
Av-12 Sextilia Quadrangle is located between 21° - 66° South and 90° - 180° East. This quadrangle is dominated by the Sextilia crater. The crater is about 20 km in diameter and shows a very well preserved ejecta blanket around the rim. Quadrangle Av-12 is also dominated by two scarps, Argonium Rupes at 108 km in diameter (centered at 53.3°S and 166.7°E) and Matronalia Rupes which continues in Quadrangle Av-11 Pinaria at 180 km in diameter (centered at ∼ 49°S and 85°E). The two scarps define the rim of the Rheasilvia impact crater.
Primary geologic features of this region includes Rheasilvia material, dark material, slump material in impact craters and an old basin material. The Rheasilvia impact basin extends across the Quadrangles 11-15 and encompasses different units. Av-12 contains scarp wall material, slump deposits and ridge-and-groove terrain. The scarps define part of the rim of Rheasilvia and have steep slopes. Scarp wall material is characterized by a fresh morphology with low crater density and smooth material. The slump deposits have a low crater density and smooth material as well but compared to the scarp wall material the morphology is affected by ramps and a lower slope. The adjacent ridge-and-groove terrain shows ridges and grooves radiating about 90° to 270°. Lower-albedo surface material ("dark material") appears within the boundaries of the quadrangle in the form of ejecta associated with impact craters and as linear features. In this quadrangle it appears within impact craters and associated its ejecta, as well as linear features. In impact craters it normally occurs as streaks along crater walls, indicating that it may be fallback ejecta or remnants of dark material strata. Dark material that slumps down the wall is the result of mass wasting. Linear dark features developed as a straight line through craters, as seen in Sextilia crater. Quadrangle Av-12 exhibits significant differences in elevation, from -20 km to 12.5 km. As a result, some craters were formed on slopes ("slump material in impact craters"). The material from the upslope rims overrun the lower downslope rims and flowed out of the craters, as seen in Helena crater. The northern part of the Quadrangle is dominated by an inhomogeneus higher cratered terrain containing several large craters. The South Pole DTM indicates the terrain is a relic of a large basin underlying the Rheasilvia basin ("old basin material").