

VESTA: TOP OF ITS NORTHERN BULGING HEMISPHERE IS CUT BY INTERSECTING RIFTS PRODUCING SQUARE “CRATERS”; Kochemasov G.G., IGEM of the Russian Academy of Sciences, 35 Staromonetny, 119017 Moscow, kochem.36@mail.ru

Detailed images of Vesta sent by DAWN spacecraft certainly show a prominent tectonic (must be also compositional) dichotomy of this large asteroid. The wave planetology fundamental conception: Theorem 1 – “Celestial bodies are dichotomous” [2, 4], is affirmed once more. Available images show that Vesta has two sides: one concave, another convex (Fig. 1). (4) Vesta, about 525 km across, has a deep dark depression from one side opposed by a bulging shining hemisphere [1] (Fig.1) The image of Fig. 1 hints that the dichotomy is complicated by sectoring (Theorem 2: “Celestial bodies are sectoral”[2]).

The principal dichotomous shape of (4) Vesta is characteristic also for (1) Ceres [4]. The oblong body of Ceres (major/minor axes of 898/788 km [3] and 970/930 km [Parker & Stern]) according to HST (J.Parker & Stern) has a prominent dusky dark spot (Piazz) from one side. It occupies a significant part of the asteroid (about 250 km, more than a quarter the size of Ceres) and probably might be assigned to a depression. One may compare this depression tectonically with the Pacific basin hollow on Earth. It seems that a smaller natural shape model of Vesta could be a nucleus of icy comet Tempel. The smaller asteroid Eros well studied from both concave and convex sides shows protruding “crater” on the concave side and deep ditch (“saddle”) on the convex side (Fig. 4). A geometrical model of a bent body is in Fig. 4. Vestan concave side is adorned with prominent protruding rise and convex side with intersecting ditches (Fig. 5).

Cracking of the convex hemisphere of cosmic bodies is due to extension and protrusion of extra material out of depths at the concave hemisphere is due to compaction. Origin of warping interfering waves is due to non-circular keplerian orbits causing periodically changing alternating accelerations [2, 4 & others]. One may state that the wave planetology is a science that can predict tectonic, geomorphologic and compositional features of cosmic bodies.

The last obliquely sunlit image of Vestan North Pole region (Fig. 5) underlines roughness of top areas of this bulging hemisphere mainly caused by intersecting long and wide ditches (rifts). A row of evenly sized dark square “craters” is formed along the diagonally striking ditch (NW direction) intersected by perpendicular ditches. Tighter spaced wavy lineations of these two directions one reveals at the lower portion of the Fig. 5 image. They form grids with small ring

structures appearing at intersections. On the whole, large ditches breaking the bulging hemisphere can be compared with the asteroid Eros’ deep “saddle” formed on its uplifted broken hemisphere (Fig. 4).

Many vestan craters considered as impact features have the wave interference nature. This is especially true for chains and regular grids of subdued ring structures often observed on vestan surface (Fig. 3). Partially imaged the northern hemisphere shows clear signs of chess-board structure developed due to intersecting waves (Fig. 2). Bordering checks intersecting lines sometimes are marked by crater chains obviously related to degassing (compare with the comet Hartley2 core).

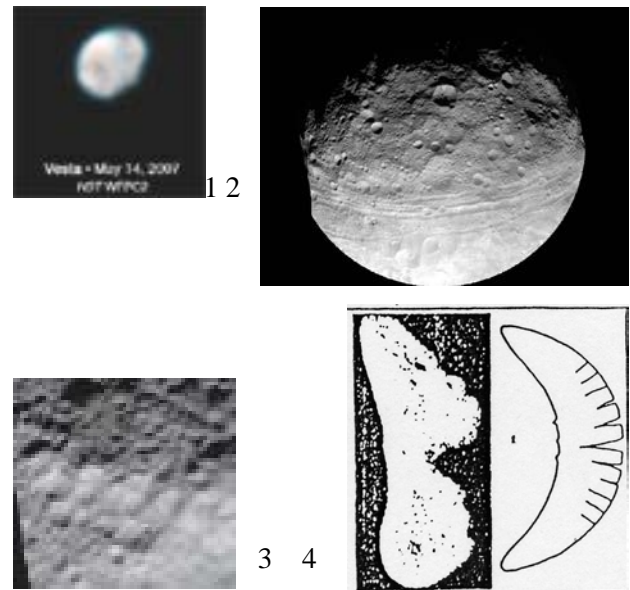


Fig. 1. Vesta. May14, 2007. HST WFPC2 180401main_vesta_1.jpg. [5, Parker J. (Southwest Research Institute), and I. McFadden (University of Maryland). STScI-PRC07-27a].

Fig. 2 Vesta, 595403main_pia14894-43_946-710.jpg

Fig. 3. Vesta, a portion of IOTD-104-page.jpg. A grid of non-impact craters long ~ 20 km.

Fig. 4. Eros and a geometrical model showing a bent body with cracked extended convex hemisphere and contracted concave hemisphere.

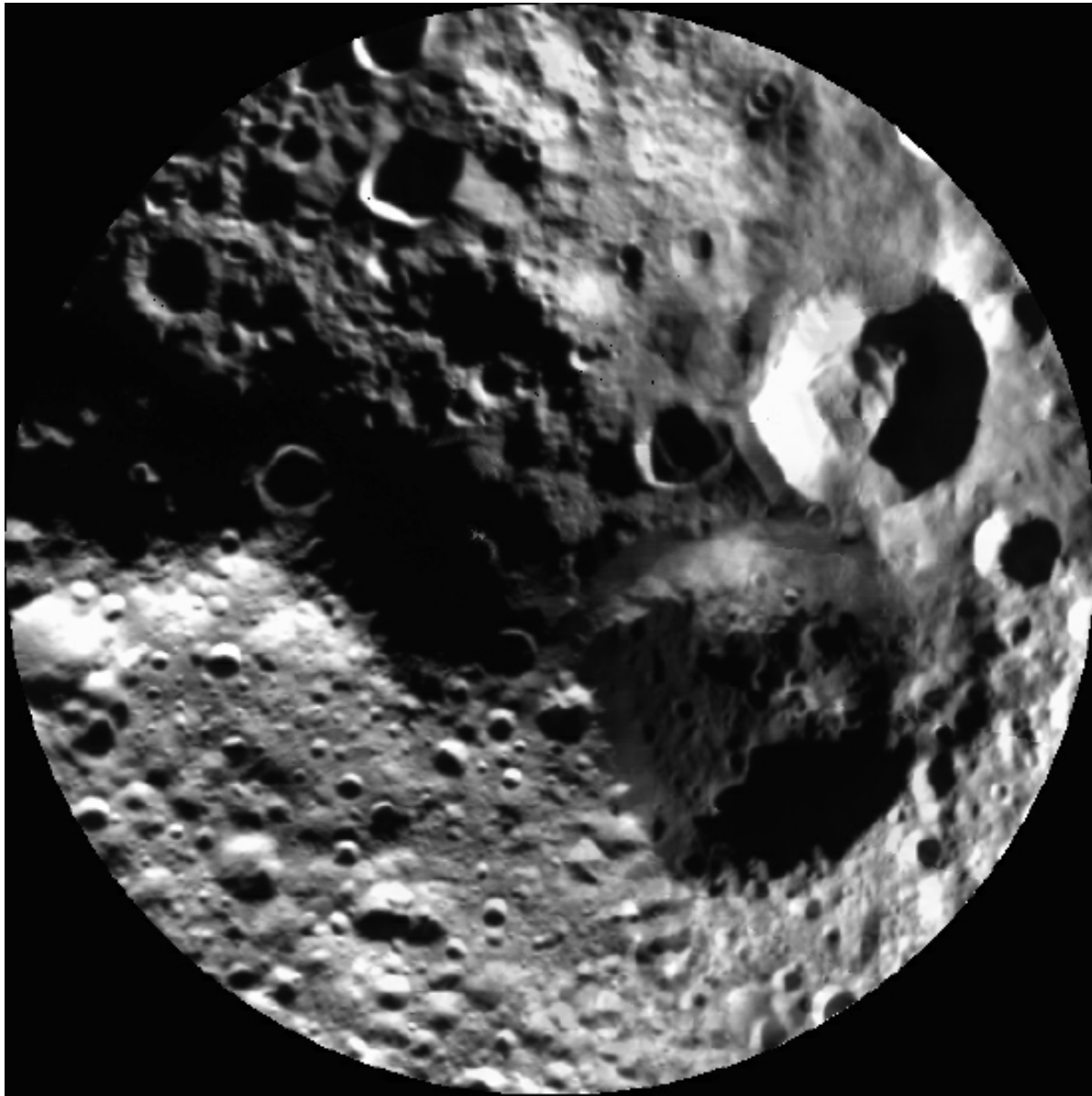


Fig. 5. Vesta North Pole, mos-st31_full.jpg. Crossing ditches.

References

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