EPSC
European Planetary Science Congress

Highest volcanoes on terrestrial planets and dwarf-planets adorn the deepest depressions of their respective bodies

G.G. Kochemasov; IGEM of the Russian Academy of Sciences, kochhem.36@mail.ru

Four highest volcanoes of the inner solar system tower above four largest and deepest hemispheric depressions of the Earth, Moon, Mars, and Vesta. Of course, this is not a mere coincidence; behind of this fundamental fact stays an equally fundamental planetary regulation. The wave planetology based on elliptical keplerian orbits of cosmic bodies evoking their wave warping shows that the fundamental wave 1 inevitably produces hemispheric tectonic dichotomy. One hemisphere rises, the opposite falls. The uprising half increases its planetary radius and space and thus is intensively cut by numerous faults and rifts. The antipodean subsiding half decreases its radius and space and thus is intensively compacted and affected by folds and faults. Forming extra material finds its way out in form of volcanic ridges and volcanoes. The strongest compaction caused by the wave 1 subsidence produces most voluminous eruptions. That is why the relation exists between the largest and deepest hemispheric basins and the highest basic volcanoes having mantle roots [1-4]. On the Earth's Pacific Ocean floor stay the Hawaiian volcanoes; on the lunar Procellarum Ocean occurs Crater Copernicus (erroneously taken as an impact feature); Martian Vastitas Borealis is adorned with Olympus Mons; Vestan Reasilvia Basin (obviously tectonic not impact feature) has the central mountain – the highest volcanic peak in the Solar system (Fig. 1-4). A regular row of increasing heights of these largest volcanoes extends in the outward direction.

A study of the dwarf-planet Ceres only begins (DAWN project). Already the first distant images of this globe about 950 km in diameter have shown that it is, as was predicted [5], tectonically two-faced or dichotomous body (Fig. 5, 6). It seems that on its relatively even subsided hemisphere there are some elevated locations often bright white in color (Fig. 6). They could represent prominent "edifices" covered with frozen ices – degassing traces [6].

References: [1] Kochemasov G.G. 1993. Relief-forming potential of planets // 18th Russian-American microsymposium on planetology, Abstracts, Oct. 9-10, 1993, Moscow, Vernadsky Inst. (GEOKHI), 27-28. **[2]** Kochemasov G.G. 2009a. A regular row of planetary relief ranges connected with tectonic granulations of celestial bodies // New Concepts in Global Tectonics Newsletter, # 51, 58-61. **[3]** Kochemasov G.G. 2009b. A quantitative geometric model of relief-forming potential in terrestrial planets // EPSC Abstracts, Vol. 4, EPSC2009-16-1. **[4]** Kochemasov G.G. Why four highest volcanoes of the rocky planets adorn their deepest planetary wide depressions: Earth, Mars, Vesta and Moon // NCGT Journal, v. 2, # 4, Dec. 2014, 85-88. **[5]** Kochemasov G.G. From Vesta to Ceres: predicting spectacular dichotomous convexo-concave shape for the largest mini-planet in the main asteroid belt // Vesta in the light of Dawn: first exploration of a protoplanet in the Asteroid Belt, Febr. 3-4, 2014, Houston, Texas, LPI Contribution # 1773, Abstract # 2003. pdf. **[6]** Kochemasov G.G. Ceres' two-face nature: expressive success of the wave planetology // NCGT Journal, v. 3, #1, March 2015, 63-64.

Fig. 1. Mauna Kea

Fig. 2. Crater Copernicus, Moon
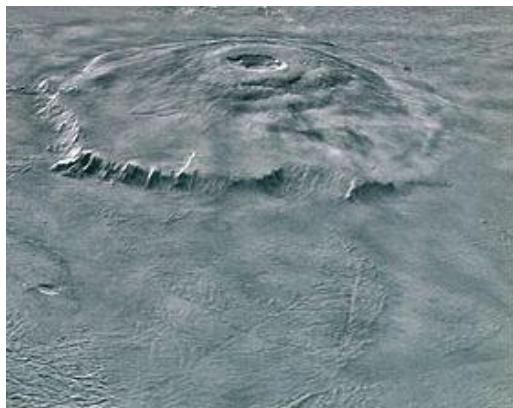
Fig. 3. Olympus Mons, Mars.


Fig. 4. Central peak of Rheasilvia, Vesta
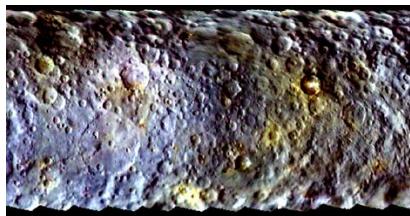
Fig. 5. Ceres' topography. Pia19063.
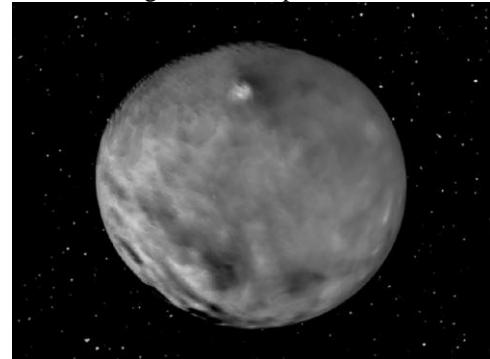
Fig. 6. Ceres, OUBF3CLM.JPG. Distant view