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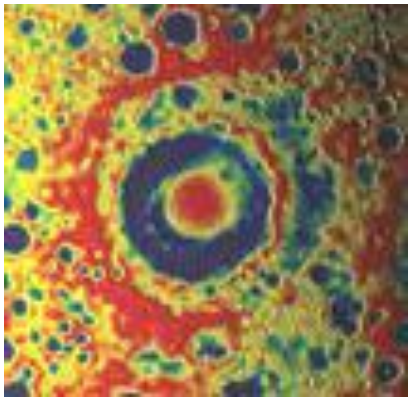
Regular structures of the lunar Orientale Basin: ring spacing and beads-like collars

Kochemasov G.G.
IGEM of the Russian Academy of Sciences, 119017 Moscow, kochem.36@mail.ru

The NASA's GRAIL mission produced unprecedented detailed gravity maps of the lunar subsurface as its measurements (from very low orbits – 55 -23 kilometers) included some depths of the satellite (down to the core?). However, one might say that these maps have repeated in some aspects the principal gravity pattern acquired earlier by Clementine [1] and Kaguya missions (Fig. 3), which shows the surface densely "peppered" by even-sized "craters" about 100 km in diameter. The wave planetology admits that many of them are of an impact origin but a bulk is due to an intersection of standing waves produced by the two elliptical orbit of the body (Fig. 2). The lunar community should realize that one of bases of the Moon's geology – crater size –frequency curve is of a complex nature. Impacts surely contribute to this curve but a significant part of it is due to ring structures of non-impact origin. Ring structures can be produced by an interference of standing inertia-gravity waves of four directions (ortho- and diagonal) warping any rotating celestial body moving in an elliptical orbit (Fig. 2) [2]. Many ring structures observed on solid and gaseous planetary spheres are of such profound nature. They form regular grids of shoulder-to-shoulder even ring structures (Fig. 1-3). Their sizes depend on orbiting frequencies: the higher frequency- the smaller "rings", and vice versa. Satellites having two orbiting frequencies in the Solar system are particularly "peppered" with rings as a low frequency modulates a high one producing along with the main ring populations the side populations [3]. Recent MOONKAM lunar images (GRAIL mission) at the first time show so clearly intersecting planetary scale lineations (imprint of standing waves) producing chains and grids of ring features (Fig. 5-6; a theoretical model-Fig. 2). This wave woven pattern with spacing and beads has to be compared with a real gravity pattern of Fig. 1. Multi-ring spacing with the factor of $\sqrt{2}$ and collars with regularly spacing craters-beads are common for the two structures. "Beads" are remarkable around other large basins in Fig. 3 & 4. Their non-impact nature is rather obvious. An impact origin of two parallel lines of basins (mascons & masdefs) in Fig. 4 also is dubious. **Ref.**: **[1]** Konopliv, A.S. et al. (1998) Clementine: gravity survey of the Moon // Science, v. 281, # 5382, 1476-1480; **[2]** Kochemasov G.G. (1992) Concerted wave supergranulation of the solar system bodies // 16th Russian-American microsymposium on planetology, Abstracts, Moscow, Vernadsky Inst. (GEOKHI), 36-37; **[3]** Kochemasov G.G. (2001) On one condition of further progress in lunar studies // First Convention of Lunar Explorers, 8th to 10th March, 2001, Palais de la Découverte, Paris, France; Programme and Contributed Abstracts; ESTEC, eds: D. Heather and B. Foing, 58 pp (p.26);

Fig. 1. Lunar concentric gravity in Mare Orientale area. Red-high, blue-low (Science, 2013, v. 339, # 6120, book-jacket). **Fig. 2.** Graphic representation of crossing waves (+ up, - down) producing chains and grids of round forms (craters) and multi-ring structure (better seen from some distance). **Fig. 3.** Gravitation anomaly of the Moon measured by by Kaguya mission. Credit: forum.worldwindcentral.com. **Fig. 4.** Mascons & masdefs on Moon. LPOD-Sept. 6-09.jpg. **Fig. 5-6.** Images of spacious portions of lunar surface acquired

by MOONKAM cameras at the twin satellites of GRAIL mission. Intersecting wave formations are clearly seen. They produce chains and grids of round features ("craters").grail-moonkam-first-student-selected-lunar- image-lg.jpg. **Fig. 6**-Enlarged portion of -20120418_20120419-Ben-Franklin-CO.jpg;



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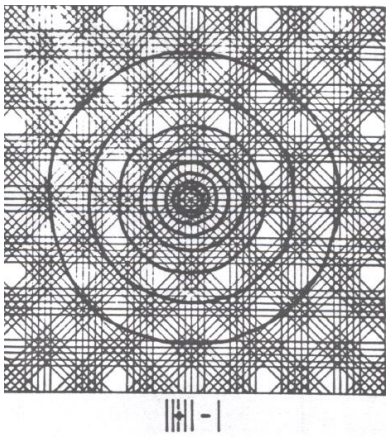

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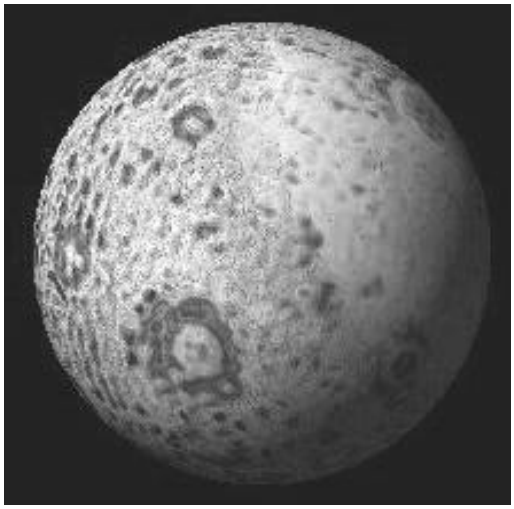

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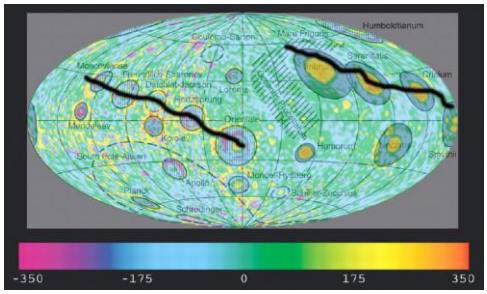

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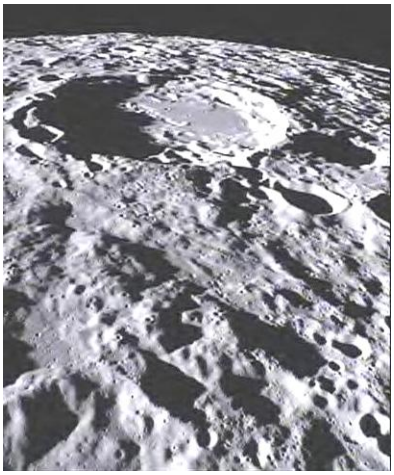

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