EPSC Abstracts
Vol. 9, EPSC2014-37, 2014
European Planetary Science Congress 2014

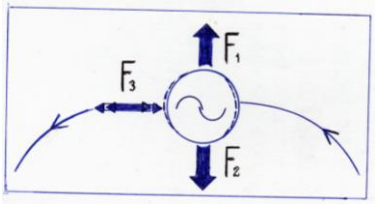
Titan: the largest and the fastest for its size icy satellite, finely wave tectonically granulated and hence producing and supporting the unique atmosphere.

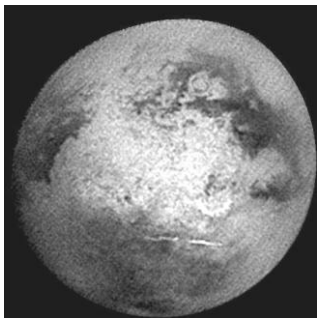
Kochemasov G.G. IGEM of the Russian Academy of Sciences, 119017 Moscow, kochem.36@mail.ru

The manifested sequence of full-disk cosmic bodies with diminishing orbital frequencies (Fig. 2-7) clearly shows that sizes of their wave tectonic granulations regularly increase from Titan (orbital frequency 1/15.9 days, granule diameter πR/91) through Callisto (1/16.7, πR/88), Moon (1/27.3, πR/48), Mercury (1/88, πR/16), Earth (1/365, πR/4) to Mars (1/687, πR/2). This fundamental observation proves that the main structuring force of celestial bodies belongs to their orbital energies (Fig. 1). All bodies moves in the elliptical keplerian orbits with periodically changing accelerations. It means that the bodies experience an action of inertia-gravity forces producing standing wave warpings having in rotating bodies four interfering ortho- and diagonal directions. This interference makes grids of evenly sized shoulder-to-shoulder rings (actually polygons) "peppering" surfaces and striking into deeper spheres of celestial bodies. These wave warpings having standing character periodically change their phases (+ & -) that mean oscillations of entire bodies. Such perturbations provoke sweeping out volatiles stocked in bodies. The smaller and hence more frequent waves are more effective for this action, that is why bodies with higher orbiting frequencies have more massive atmospheres: Mars-Earth-Venus-Titan [1]. In this row Titan (of course, icy and rich in volatiles) with the fastest orbit has the richest gas envelope regarding its size (Fig. 8). Its gas envelope is constantly replenished with gases through intensive sweeping of the solid body and disperses into space.

[1] Kochemasov, G.G.: Atmospheres of Venus, Earth, and Mars: their masses and granulations in relation to orbits and rotations of the planets, " Comparative Climatology of Terrestrial Planets" Conference, Abstract #8008, 2012. **[2]** Slade, M.A. et al.: Mercury: the radar experiment from Earth, Science, v.258, 635-640, 1992.

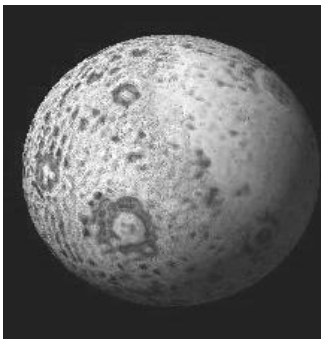
Fig. 1. Forces acting on a moving body: F1-centrifugal, F2-central body attraction, F3-inertia-gravity. **Fig. 2-7**. Full disk images of celestial bodies in order of diminishing orbital frequencies. **Fig. 2.** Titan, PIA06154; **Fig. 3**. Callisto (Voyager image); **Fig. 4.** Moon, Kaguya mission, forum.worldwindcentral.com; **Fig. 5.** Mercury [2]; **Fig. 6**. Earth, PIA04159, (the MRO image from the distance of 1.2 mln.kms); **Fig. 7.** Mars (image 314_2, Jaime Fernández, telescope Clestron 9.25, Valdemorillo, Spain). **Fig. 8.** Titan, atmospheric granulation, IMG001101-br500, grain πR/91.



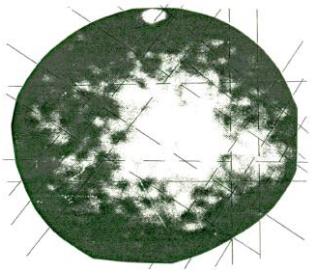


2

3

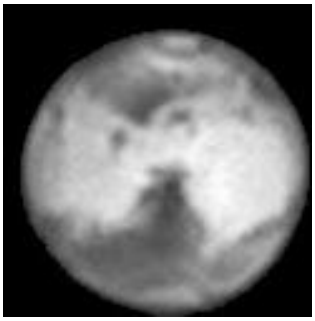


4

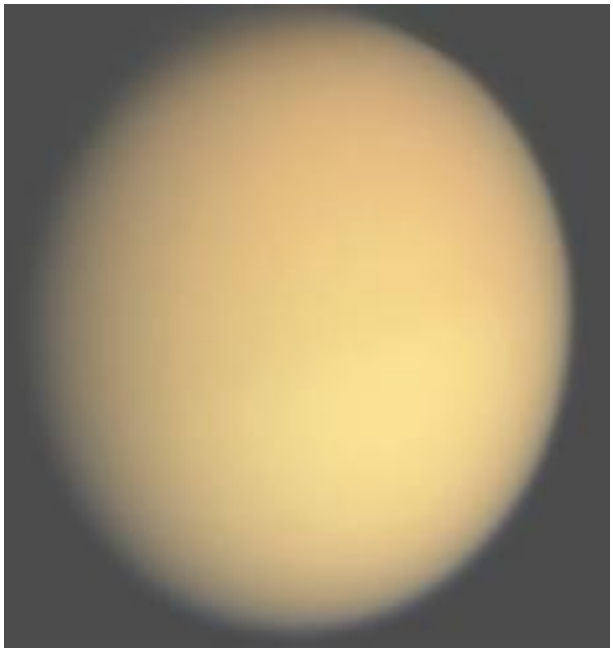


5

6



7



8