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Saturnian ring particles as building material for tiny "flying saucers"

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Dr. Porco and co-authors have shown in two papers in Science (December 7, 2007) that small saturnian satellites orbiting in rings and making gaps can use diffusive ring material to build up a superstructure. Naturally, this material can be found only in the rings, that is why this process of changing a body shape was observed only at tiny satellites within saturnian rings. Pan and Atlas, 33 and 39 km long, respectively, though tiny have enough gravity force to attract ring particles and add them preferably to their equatorial belts. This additional material causes increase of the bodies diameters in the equatorial planes thus making a shape resembling "flying saucer". The equatorial bulges encircling bodies are mountains 1.5 to 4 (Pan) and 3 to 5 (Atlas) km high. But two remarks concerning the general shapes of these two bodies however should be made. The distant view of Pan resembles not only a "flying saucer' but also a polyhedron, namely a flattened square or lozenge in a given projection (PIA08405). Secondly, an obtained view of Atlas from nearly above the body (PIA08405) shows that expected circular outlines of a saucer are not exactly circular but consist of rather rectilinear segments crossing at the right angle. Both shape peculiarities of the bodies make to think about their overall shapes as polyhedra (and not as shapeless fragments left after impacts) smoothed by accumulated ring particles. This opinion about shaping celestial bodies is supported by an exclusive image of Yanus (PIA08192) presenting a shapely octahedron not spoiled by impacts and accumulated material. The authors of the above mentioned papers fairly remark that shape transformations by accumulation of material was possible only in the rings but not outside them. The wave planetology [1, 2 & others] has repeatedly shown that "orbits make structures". This means that non-round (elliptical) keplerian orbits with changing accelerations produce in ce-

lestial bodies inertia-gravity waves that deform globular and other shapes. Having in rotating bodies standing character and 4 directions these waves interfere to produce wave polyhedra. The fundamental waves $2\pi R$ long give a tetrahedron, the first overtone waves long πR make an octahedron, the waves 4 are responsible for a cubic form of small bodies or a cubic structural symmetry in larger bodies, and so on. The Plato's polyhedra were recognized as shapes of several small saturnian and jovian satellites [3]. A tetrahedron shape appears in Hyperion (PIA08904, PIA06645), Telesto (PIA07546), Amalthea (PIA01074). An octahedron is manifested in classic diamond shape of Amalthea (PIA01074), in Yanus (PIA08192), Prometheus (PIA07549). A cube is clearly seen in Epimetheus (PIA07531) and Helene (PIA07547) [3]. It is essential to note that the dichotomous convexo-concave shape so typical for small bodies (satellites, asteroids, comets) [4] is characteristic for small bodies of various sizes and is an expression of a structural tetrahedron: the concave side represents a face, the convex sharpened side represents an opposing vertex. **References: [1]** Kochemasov G.G. Tectonic dichotomy, sectoring and granulation of Earth and other celestial bodies // Proceedings of the International Symposium on New Concepts in Global Tectonics, "NCGT-98 TSUKUBA", Geological Survey of Japan, Tsukuba, Nov 20-23, 1998, p. 144-147. **[2]** Kochemasov G.G. Theorems of wave planetary tectonics // Geophys. Res. Abstr.1999. V.1, ź3, p.700. **[3]** Kochemasov G.G. Plato' polyhedrons as shapes of small satellites in the outer Solar system // Vernadsky-Brown microsymposium 46, 2-3 Oct. 2007, Moscow, Russia, Abstract m46_38. **[4]** Kochemasov G.G. On convexo-concave shape of small celestial bodies // "Asteroids, Comets, Meteors", Cornell Univ., July 26-30, 1999, Abstract # 24.22.