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Hartley 2 and Tempel 1 comet nuclei demonstrate shapes and structurizations revealing an action of inertia-gravity forces excited by non-circular orbits.

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Recently obtained images of Hartley 2 and Tempel 1 comets (NASA's EPOXI and NEXT missions) reveal unprecedented details of the comets shaping and structurization helping understand making them forces. The wave planetology [1-6 & others] long ago stated that "orbits make structures'. This assertion was based on recognition of inertia-gravity forces aroused in any cosmic body because of its movement in non-circular keplerian orbit. Such an orbit implies periodically changing accelerations causing inertia-gravity forces absorbed by a cosmic body by its warping, undulations. These standing wave warpings in rotating bodies have four interfering ortho- and diagonal directions producing uplifted (+), subsided (-) and neutral compensated (0) tectonic blocks. The blocks sizes depend on warping wavelengths the longest and most amplitudinal of which is the fundamental wave 1 long 2πR. These waves produce inevitable tectonic dichotomy - a body division in two opposite segments-hemispheres: one uplifted, another subsided (an example is Earth with its uplifted continental and subsided oceanic hemispheres). In small bodies with a weak gravity one often observes oblong convexo-concave shapes so typical for the Main Belt asteroids.

Traces of warping waves of four directions are often seen on surfaces of many celestial bodies as cross-c5, 6utting lineations. A recent example of the small core of the Hartley 2 comet is very impressive. At received points of view are clearly seen at least three ortho- and diagonal lineations often marked by small outgassing craters (Fig. 1). Crossing lineations produce square forms (craters) earlier seen on the Eros' surface. Wave compression lineations make the Hartley 2 to appear as a wafer cake. A "waist" (neck) is formed as a result of nearing a concave depression, from one side, and deep cracks at the convex bulge, from the antipodean side (Fig. 2, 3)[5, 6].

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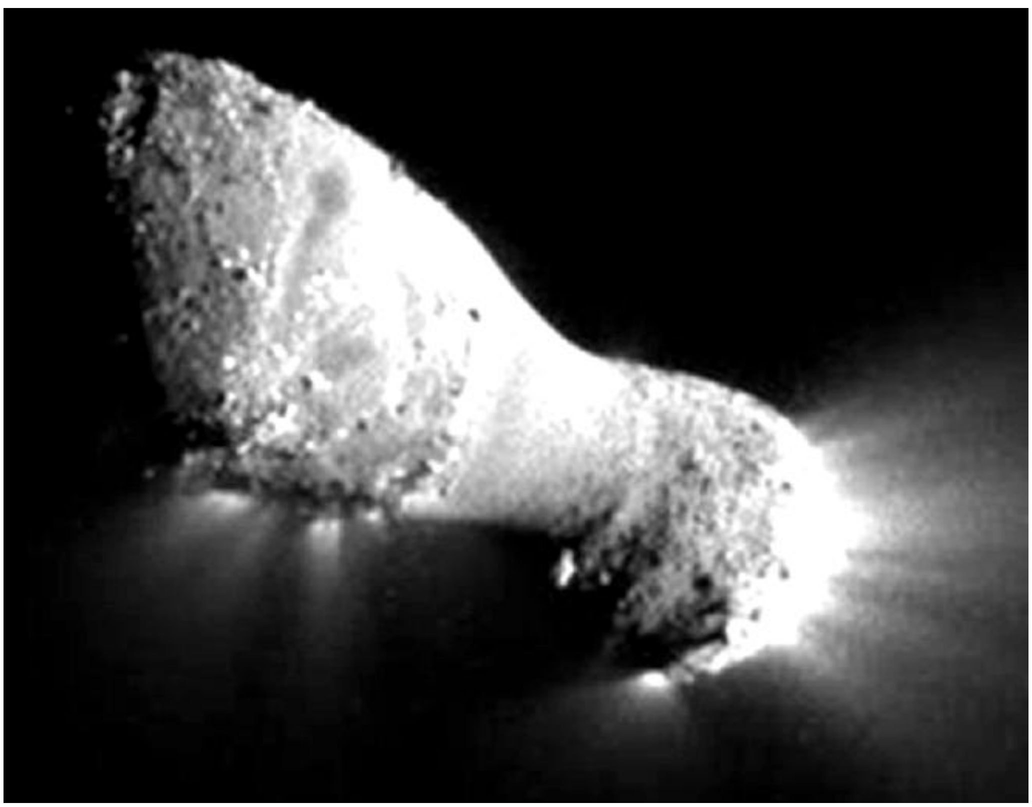
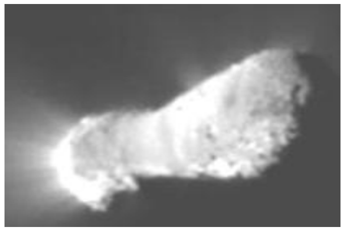


Fig. 1. Hartley 2, 2 km long, Credit: NASA/JPL-Caltech/UMD



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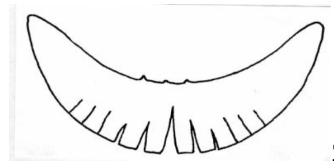

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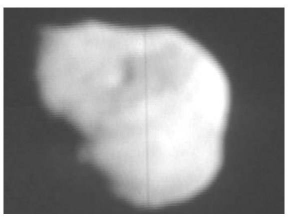
Fig. 2. 103P/Hartley exhibiting the concave side (up), destroyed convex side (down) and "waist".

Fig. 3. Geometrical model of convexo-concave oblong shape of a small celestial body caused by the wave1 warping. Deep cracks of the convex hemisphere and the concave hemisphere cause development of a "waist" or 'neck" and finally lead to a body breakage

Three figures below (Fig. 4-6) demonstrate various views of the Tempel 1 comet nucleus. Fig. 4 ("Deep Impact" mission) and Fig. 5 (NEXT mission) show tectonic dichotomy – an opposition of uprising bulging and subsiding compressing sides. Fig. 6 (NEXT mission) gives some details of morphology and structure of the convex bulge – a portion of an octahedron that appears as a result of the first overtone (πR) of the fundamental wave ($2\pi R$)[2-4]. A vertex marking four joining facets can be discerned. The fundamental convexo-concave shape demonstrates also Hartley 2 (EPOXI, Fig. 1-2).



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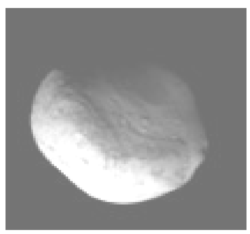

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Fig. 4. Tempel 1, 7.6 x 4.9 km. PIA02119. Convexo-concave shape is clearly visible.("Deep impact" mission).

Fig. 5. Tempel 1, n30036te01_226-170,jpg. Spacious depression on the concave side (NEXT mission).

Fig. 6. Tempel 1. credit: 517261main_T1_mosaic_11096_still1-43_full.jpg, Four facets join at a vertex on the convex side . Smoothed straight lines and polygonal outline are visible (NEXT mission).

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