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Discretization of cosmological periodic orbits

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Abstract content
 (Max 300 words)
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Special chars

A rigorous analytical derivation of discrete energies and distances of orbiting objects from a central star or massive body is presented.

Given the positions of two orbiting objects as boundary values, the derived formula gives the positions of all the other objects orbiting a particular central massive body. The formula is applied successfully to the solar system, the satellites and moons of the solar planets, to the rings of planets, periodic comets and to all applicable exoplanet systems, pulsars, circumbinary and circumternary systems, and to star clusters orbiting the centre of the Milky Way galaxy. The calculated distances agree with observation within a total average relative deviation of 0.021, or 2.1\%. At present the total number of successful applications is 174.

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Primary author: Prof. WAGENER, Pieter (University of Fort Hare)Presenter: Prof. WAGENER, Pieter (University of Fort Hare)Session Classification: Space

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