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Orbits in a two Dimensional Non-axis-symmetric Galactic Potential NELSON ZAMORANO, ALFREDO GOMEZ, Universidad de Chile, ANDRES MEZA, Universidad Nacional Andres Bello — The dynamics of stellar objects, considered as point test particles in a non-axis-symmetric logarithmic galactic potential U(x,y)$\propto$ $Ln\left[R_c^2 + x^2 + \frac{y^2}{b^2}\right]$ are studied numerically and analytically, using a Leapfrog Integrator. This potential is considered as a model of a galaxy in astrophysics since it includes the gravitational effects of both the visible and the dark matter composing it. The ellipticity parameter 0<b<1 generates a fluctuating torque acting on the moving test particles of the galaxy (actually the stars) and triggers the emergence of a set of non conventional families of orbits. This fluctuating torque provides, in our opinion, a rich field to test concepts like conserved quantities and compare them with the known conventional orbits in mechanics. We provide a simple numerical approach that reproduces most of the orbits associated with this potential. We also analyze the behavior of the torque and angular momentum at the different orbits.

Nelson Zamorano
Universidad de Chile

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