Contribution ID: **283** Type: **Invited talk in a parallel session**

Dynamical Coupling of Keplerian Orbits in Post Newtonian Gravity: From Galactic Center to Compact Planetary Systems.

Friday, 12 July 2024 16:10 (20 minutes)

This work investigates the long-term evolution of two bodies in nearby initially coplanar orbits around a central dominant body, perturbed by a fourth body on a distant Keplerian orbit. Previous works on this setup enforced circular orbits by adding a spherical potential of extended mass. This results in a long-term coherent evolution with nearly coplanar orbits experiencing only small inclination oscillations. This work extends the previous research by (i) considering post-Newtonian corrections to the gravity of the central body, either instead of or in addition to the potential of extended mass and (ii) relaxing the requirement of strictly circular orbits. In this work, we tested the applicability with a system scaled to the orbits of S-stars; we consider the clockwise disc to represent the perturbing body, with post-Newtonian corrections to the gravity of Sagittarius A* playing the role of damping potential. Considering post-Newtonian corrections, even stellar-mass central bodies in compact planetary systems can allow for the coupled evolution.

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