

# Seminario del Grupo GISDA

Grupo de Investigación en  
Sistemas Dinámicos y Aplicaciones

## Dynamics of Planetary Systems



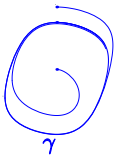
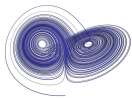
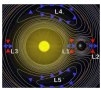
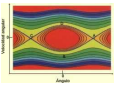
**Expositora:** Dra. Carolina Charalambous

**Institución:** Pontificia Universidad Católica de Chile

**Fecha:** Miércoles 30 de Julio, 2025.

**Horario:** 16:00 a 17:00 hrs.

**Lugar:** Sala 101 ex-mecánica.



**Abstract:** This talk will explore the dynamics governing planetary systems, leveraging the powerful framework of Hamiltonian mechanics. We will begin by introducing the fundamental concepts of Hamiltonian systems, emphasizing their utility in describing conservative systems and the conservation laws inherent within them. A significant portion of the discussion will then focus on the crucial role of resonances, explaining their mathematical description and physical implications in orbital dynamics. We will delve into how these resonant configurations can lead to both stability and instability, shaping the long-term evolution of planets. Finally, we will apply these theoretical insights to real-world planetary systems, examining examples of observed resonances in our Solar System (e.g., Jupiter's Galilean moons, Kirkwood gaps in the asteroid belt) and in exoplanetary systems, illustrating how Hamiltonian theory provides a robust tool for understanding their complex dynamics. This presentation aims to provide a clear overview, highlighting the elegance and predictive power of theoretical mechanics in astrophysics.