

**Disciplina:** TÓPICOS AVANÇADOS DE DINÂMICA PLANETÁRIA

**Código:** AST-E17

**Tipo:** Eventual

**Créditos:** 02

**Programa:**

Planetary migration in gas disks: causes, type I, II and III, local effects, migration of multiple planets, Grand Tack model

Planetary migration in planetesimals disks: causes, soft migration, instabilities, Nice model, constraints

Tidal evolution of close-in systems: theory, Darwin, Mignard, Ferrz-Mello, circularization, sincronization, consequences for exoplanets - Long term evolution and chaos: long term simulations of the solar system, application of chaos estimators to exoplanets

Resonances: theory, characterization, alignment of apsides, resonance capture, consequences, systems with multiple resonances, binary systems

Coorbital motion: theory, expansion of the hamiltonian, application to exoplanets

Spin evolution: spin torques in the solar system, Saturn tilt, Uranus tilt, Venus rotation, spin torques in exoplanets, star rotation

Proper elements and asteroid families: analytical and numerical approaches, discovery and modern identification of families, dating young families

Asteroid dynamics due to gravitational interactions: the role of resonances, final evolutions, implications for past solar system histories

The Yarkovsky effect: postulation and verification, implications for transport in the solar system, use for estimating the ages of families - Asteroid collisional size distributions: early analysis, modern analytical and numerical results, implications for the survival of Vesta's crust

Binary asteroids: origins, stability, modern analytic theories.

Asteroid spin statistics: their interpretation and their evolution, summaries of measured spin states, spin rate evolution due to impacts and gravitational interactions

The YORP effect: theory, validation, and implications

### **Bibliografia:**

Artigos especializados