

An introduction to the three-body problem

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Timetable: 10 hrs, First lecture on June 3, 2013, 14:00 (dates already fixed, see the calendar), Torre Archimede, Room 2BC/30.

Course requirements: Basic Lagrangian and Hamiltonian Mechanics.

Examination and grading: Oral exam.

SSD: MAT/07

Aim: The lectures provide an introduction to the dynamics of the planar circular restricted three body problem, using classical techniques of analysis as well as recent results of hyperbolic dynamics (stable and unstable manifolds of the Lagrangian equilibrium points L1,L2 and hyperbolic close encounters).

Course contents: The circular restricted three body problem: Jacobi constant, Lagrangian equilibrium points, Hill regions). Hyperbolic theory: stable, unstable and center manifolds of equilibrium points. Application to L1,L2. Levi-Civita regularization and close encounters. Some implications for space mission design.