



Seminari Informal  
de Matemàtiques de Barcelona



UNIVERSITAT DE  
BARCELONA

B:KC  
Barcelona  
Knowledge  
Campus

# Seminari Informal de Matemàtiques de Barcelona

---

**Speaker:** Gladston Duarte Ferreira.  
**University:** Universitat de Barcelona.

**Date:** Wednesday, 17th of October.  
**Schedule:** 12:00, *coffee break*; 12:20, talk.  
**Place:** T1 classroom, *Facultat de Matemàtiques* of UB.  
**Language:** Spanish.

**Title:** Invariant Manifolds near L1 and L2 in the Planar Restricted Three-Body Problem.

**Abstract:** In this work we investigate the connections between the stable and unstable manifolds of periodic orbits around the points L1 and L2 of the Restricted Three-Body Problem (RTBP). In the Planar Circular RTBP (PCRTBP) we can see, that there is a connection of these manifolds on the phase space of this problem, which means that there is a mechanism of an orbit that goes outside the orbit of one primary (for instance, that describes an orbit close to an ellipse with greater semi-major axis), to go through it and start to describe an orbit inside of it (close to an ellipse with smaller semi-major axis) and/or vice-versa; in other words, this mechanism is a bridge connecting orbits outside with orbits inside. Using some computer algebra tools we start by computing the normal forms around L1 and L2 to describe periodic orbits around each of these points. After that, with the same tools, we focus on the computation of the stable and unstable manifolds of these orbits and on the searching for connections between them. Time permitting, it will be presented some differences between the PCRTBP and the PERTBP (the E letter standing for 'Elliptic'). Which are the features and the objects in this new problem and what could be used from the PCRTBP what could not.

---

**Qui som?** El SIMBa és un seminari jove organitzat pels estudiants de doctorat de les Facultats de Matemàtiques i Informàtica de Barcelona. Està dirigit a estudiants de doctorat, de màster i, fins i tot, dels darrers cursos de grau. El nostre objectiu és donar a conèixer la recerca que estem fent, així com adquirir coneixements d'altres àrees de les matemàtiques diferents de les pròpies.

Més informació a [www.ub.edu/simba](http://www.ub.edu/simba).