Author: T. M.-SEARA
`Universitat Politecnica de Catalunya (Spain)`
Title: *"Oscillatory orbits in the restricted planar three-body problem"*

Abstract. The restricted planar three-body problem models the motion of a massless body under the Newtonian gravitational force of two bodies evolving in Keplerian ellipses.

Since Chazy (1922), it is known that the possible states the body $q(t)$ can approach as time tends to infinity are four:

- Hyperbolic: $\|q(t)\| \to \infty$ and $\|\dot{q}(t)\| \to c > 0$ as $t \to \pm\infty$.
- Parabolic: $\|q(t)\| \to \infty$ and $\|\dot{q}(t)\| \to 0$ as $t \to \pm\infty$.
- Bounded: $\limsup_{t\to\pm\infty} \|q\| < +\infty$.
- Oscillatory: $\limsup_{t\to\pm\infty} \|q\| = +\infty$ and $\liminf_{t\to\pm\infty} \|q\| < +\infty$.

Examples of all these types of motion, except the oscillatory ones, were already known by Chazy.

In this talk, we prove the existence of oscillatory motions for any value of the masses of the primaries assuming they move in ellipses whose eccentricity is small enough, as a consequence of the transversal intersection of the stable and unstable manifolds of periodic orbits at "infinity", and using techniques of Arnold diffusion. We plan to extend these results to the non restricted case.

This is a joint work with M. Guardia, P. Martin, L. Sabbagh.