

From the Lagrange Triangle to the Figure Eight Choreography: Proof of a Conjecture of C. Marchal

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Abstract

In the context of the three-body problem with equal masses, Marchal conjectured in 1999 that the most symmetric continuation class of Lagrange's equilateral triangle solution, known as the P12 family of Marchal, includes the remarkable figure-eight choreography discovered by Moore in 1993 and proven to exist by Chenciner and Montgomery in 2000. In this talk, I will present a framework for verifying the existence of the P12 family as a zero-finding problem. Additionally, we will explore the relation between this verification and Marchal's conjecture. This work is a collaboration with Carlos García-Azpeitia, Olivier Hénot, Jean-Philippe Lessard, and Jason Mireles James.