

1135-70-1111      **Hector Sanchez\*** ([hector@matem.unam.mx](mailto:hector@matem.unam.mx)), **Richard Moeckel** and **Richard Montgomery**.  
*Free time minimizers for the planar three body problem.*

We prove that any solution to planar Newton's three-body problem which is asymptotic to a Lagrange's parabolic homothetic solution is eventually a free time minimizer. Conversely, we prove that every free time minimizer tends to Lagrange's solution, provided the mass ratios lie in a certain large open set of mass ratios. We exclude being asymptotic to Euler's central configurations by a second variation argument. Central configurations correspond to rest points for the McGehee blown-up dynamics. The large open set of mass ratios are those for which the linearized dynamics at each Euler rest point has a complex eigenvalue. (Received September 19, 2017)