

Abstract Submitted
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Generalized Three-Body Gravitational Systems NICHOLAS LUCAS, Georgia Institute of Technology, WOLFRAM SCIENCE SUMMER SCHOOL COLLABORATION¹ — The three-body problem deals with the orbits of three bodies caused by the gravitational effects on one another. This problem is examined for various special initial conditions to minimize parameters allowing a classification scheme of the orbits complexity to be created. A phase space is used to visualize the complexity of orbits with varying initial conditions. Investigation of the phase space shows distinct patterns for different types of orbits and complexity levels in the systems. Further generalization of the gravitational force law to an arbitrary power dependency of the distance between respective bodies produces results of great interest. It is possible in other power law's to obtain stable orbits of considerable simplicity and complexity depending on initial conditions much like that for the standard gravitational force law.

¹Collaboration with Stephen Wolfram, Ph.D. and Vitaliy Kaurov, Ph.D.

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