

CCSU
DEPARTMENT OF MATHEMATICAL SCIENCES

COLLOQUIUM

Friday, September 4

3:00 – 4:00 PM

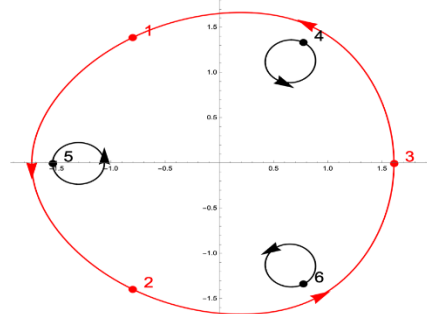
Maria Sanford, Room 101

FINDING PERIODIC SOLUTIONS OF THE 4- AND 6-BODY PROBLEMS WITH AN ADAPTIVE GRADIENT-FREE STOCHASTIC METHOD

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Abstract: In this talk, we study the n-body problem, the classical problem of describing the motion of several bodies that attract each other through gravity. We focus on finding periodic motions: configurations in which the bodies eventually repeat their motion. Using symmetry, we reduce particular 4- and 6-body problems to much smaller systems of differential equations. Finding periodic solutions then requires solving a system of nonlinear equations. Standard Newton-type methods were not successful in our experiments, which led us to develop a simple gradient-free stochastic method that uses only evaluations of the equations and does not require derivatives. We will illustrate the method with several numerical periodic solutions and animations of the resulting motions.



To join us online use the following link: <https://ccsu.webex.com/meet/gotchev>

For further information: gotchevi@ccsu.edu; 860-832-2839; <http://mathcolloquium.sites.ccsu.edu/>