CCSU
DEPARTMENT OF MATHEMATICAL SCIENCES

COLLOQUIUM

Friday, September 10
3:00 – 4:00 PM
Maria Sanford, Room 101

PERIODIC SOLUTIONS
OF THE N-BODY PROBLEM

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Joint work with Andrés M. Rivera and Johann Suarez

Abstract: The n-body problem is the problem of describing all possible motions of an n-body system when the only forces acting on the bodies are the forces of gravitational attraction among them. The only case with a complete solution is when n=2. For some special initial configurations (initial positions and velocities of all the bodies in consideration), the n-body problem reduces to an easier system that allows us to draw some conclusions. In this talk we will study one of these configurations: *the non-alternating* solutions. For these solutions, the initial conditions are such that at every instance, n-1 bodies are at the vertices of a regular polygon and the other body is in the line that goes through the center of the polygon and is perpendicular to the plane determined by the polygon. Both, the side of the polygon and the plane containing them, change with time. We will show the existence of families of *non-alternating* periodic solutions by analytically finding a bifurcation point.

The link https://www.youtube.com/watch?v=2Wpv6vpOxXk shows a 1:21 minute long video that explains one of the solutions in one of the families.