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THE FIELDS INSTITUTE FOR RESEARCH IN MATHEMATICAL SCIENCES

GEOMETRIC MECHANICS SEMINAR

SPEAKER:

BRETT ZOMBRO
Department of Mathematics
University of Maryland

On the Topic:

"Relative Equilibria for the Dynamics of a Classical Ozone Molecule"

The classical ozone molecule consists of three identical point masses moving in three-space subject to a single-minimum pairwise interaction potential. We present a stability and local bifurcation analysis for the relative equilibria in this system, assuming a qualitatively reasonable form for the potential function. Our local analysis makes use of a block-diagonalization technique, by Marsden, et. al., (Contemp. Math. 97, 1989) in connection with the energy-momentum method. In our study, block-diagonalization is achieved through the choice of appropriate local trivializations of the (configuration space) $\rightarrow$ (shape space) bundle, which may be interpreted in traditional kinematic terms as reference frames. The bifurcation structure of the problem is quite rich, and some of the stability results are surprising. In particular, there exist linearly stable free rotations about the instantaneous middle axis - a phenomenon which has received little, if any, notice in the mechanics literature.

Thursday, June 24, 1993

3:30 pm, room 3018

at

The Fields Institute

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