

1023-E5-1242

**Brian A. Coomes** ([coomes@math.miami.edu](mailto:coomes@math.miami.edu)), Department of Mathematics, University of Miami, 1365 Memorial Dr., Ste. 515, Coral Gables, FL 33124, **Hüseyin Koçak\*** ([hk@cs.miami.edu](mailto:hk@cs.miami.edu)), Department of Computer Science, University of Miami, P.O. Box 248154, Coral Gables, FL 33124, and **Kenneth J. Palmer** ([palmer@math.ntu.edu.tw](mailto:palmer@math.ntu.edu.tw)), Department of Mathematics, National Taiwan University, Taipei, Taiwan. *Periodic and connecting orbits as source of chaos in ODEs.*

We will present a new computational method (shadowing) for establishing rigorously the existence of periodic orbits and special orbits connecting periodic orbits in Ordinary Differential Equations. The presence of such connecting orbits, called transversal homoclinic or heteroclinic orbits, implies chaotic dynamics. We will show computer animations of periodic and chaotic orbits in the chaotic Lorenz equations. (Received September 25, 2006)