

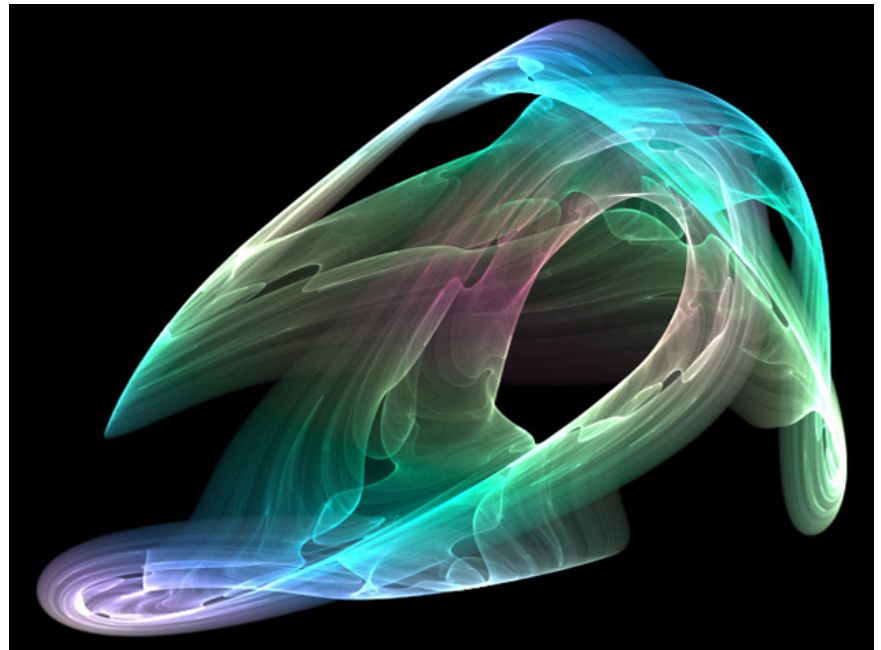
The Oliver Club

www.math.cornell.edu/~oliver/

Sarah Day, College of William and Mary

Computational Dynamics and Tools from Topology

Numerical studies of nonlinear dynamical systems yield glimpses of beautiful and highly complicated structures, including strange attractors, pattern formation, and sensitive dependence on initial conditions in chaotic regions. However, errors inherent to numerical studies and high dimensionality of some model systems may make careful and accurate numerical simulations difficult if not impossible. I will focus on topological tools, ranging from Banach's fixed point theorem to Betti numbers from computational homology, and their incorporation into rigorous numerical techniques for overcoming these problems in studying nonlinear systems. For illustration, I will discuss the application of these tools to studies of the two-dimensional (real) Hénon map, as well as the infinite-dimensional Kot-Schaffer and high dimensional coupled Ricker patch models from ecology.



Thursday, April 1, 2010
at 4:25 PM in 406 Malott Hall

Refreshments will be served at 3:55 PM in the Mathematics Department lounge (532 Malott Hall).