

1065-37-2

Michael Field* (mikefield@gmail.com), Department of Mathematics, University of Houston, Houston, TX 77204-3008. *Symmetry, structure, and stochastic fluctuations associated to some models of neural dynamics.*

In this talk we describe a simple, yet dynamically rich, discrete model motivated by neural dynamics. This model incorporates both random and deterministic components. On the mathematical side, there are a number of interesting questions about the statistical (ergodic) behavior of this system. From the point of view of numerics and modeling, a feature of the system is its capability of simulating very large numbers of interacting “neurons” with relatively few dynamically interacting nodes. We show some striking visualizations and representations of the complex dynamics that may occur with this model. These images have a number of interpretations which we explore. In particular, they suggest the utility of thinking of observable (neural) outputs as statistical averages; just as we regard physical and chemical laws as statistical averages. (Received September 11, 2010)