



THE WEIZMANN INSTITUTE OF SCIENCE
FACULTY OF MATHEMATICS AND COMPUTER SCIENCE

Distinguished Lecturer

Room 1 ,Ziskind Building
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at 11:15

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The Dynamical Systems Approach to Coupled Map Lattices

Abstract:

Coupled Map Lattices (CML) of an unbounded media appear as a result of time and space discretization of evolutionary partial differential equations but can also be viewed as original phenomenological models of the medium. I will present the dynamical systems approach to study the global behavior of solutions of CML. In particular, I will describe the dynamics of the evolution operator on the set of traveling wave solutions of CML and discuss the phenomenon known as spatio-temporal chaos. I will illustrate this phenomenon in the particular example of CML associated with the famous FitzHue-Nagumo equation that describes propagation of voltage impulse through a nerve axon. When the leading parameter of this equation varies the dynamics undergoes several stages presenting Morse-Smale type dynamics, strange attractors and Smale horseshoes.