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Entropy properties of smooth maps
(with introduction to the theory of symbolic extensions)
(based on several works, joint with Mike Boyle and Sheldon Newhouse)

Abstract:

Consider a topological dynamical system (X, T), for instance a diffeomorphism on a Riemann manifold. The class of interval maps is sufficiently rich to be interesting from our point of view, as well.
Suppose one needs to "digitalize" the system, i.e., encode it using a finite set of symbols. What one usually does? One partitions the space into finitely many pieces and encodes its elements by their "names" with respect to the partition. Such procedure has two major disadvantages: 1) it usually destroys the topology and 2) it looses information about the dynamics finer than than the size of the partition cells (although such dynamics may generate the highest entropy).
We propose another approach, by embedding the system in a subshift as its factor, i.e, by finding a "symbolic extension". Not all systems admit such an extension. Of what does this ability depend? What are the criteria for a system to be embeddable in a subshift? How do these criteria apply to smooth dynamical systems?
During the talk I will present answers to some of the above questions, and also some conjectures.