

EXTREME VALUE THEORY AND LAWS OF RARE EVENTS: SHORT TALKS

The short talks will be on Tuesday 3:30pm-4:30pm.

Romain Aimino: Dynamical Borel-Cantelli lemmas for the Rauzy-Veech-Zorich map

Abstract : The Rauzy-Veech-Zorich map is an accelerated version of the classical Rauzy induction on the space of interval exchange maps. We will consider dynamical Borel-Cantelli lemmas for this map. They can be described as follows : for a dynamical system (X, T, μ) , if (A_n) is a decreasing sequences of sets such that the series $\sum_n \mu(A_n)$ is divergent, does μ -almost every $x \in X$ satisfies $T^n x \in A_n$ infinitely often? We will show that the answer to this question is largely positive for the Rauzy-Veech-Zorich map.

Tamas Bodai: Predictability of extreme events in dynamical systems

Abstract: In a very low-order model of the general circulation of the atmosphere we examine the predictability of peak-over-threshold ‘extreme’ events. We do this in a probabilistic data-driven framework based on monitoring precursory structures consisting of some chosen observables that relate to the state of the system. The prediction skill is measured in terms of true positives and false negatives statistically. Our results for the examined system confirm a statement – provided that a parameter of the scheme is optimized, but not otherwise – previously formulated for more simple autoregressive stochastic processes, namely, that stronger extremes are better predictable. Another measure of predictability, the finite-time maximal Lyapunov exponent, when viewed as a function of the prediction lead time and the threshold level does not correspond directly to the other skill score. This points to the fact that the Lyapunov exponent as an intrinsic property of the system, measuring the instability of trajectories, determines predictability – as it should, but – in a nontrivial manner.

Paulo Guillietti: On some Anisotropic Banach spaces for Anosov flows

Date: July 9, 2014.

Abstract: In this talk we will show that there is a family of anisotropic Banach spaces well suited to study dynamical zeta functions and decay of correlations for Anosov flows. This method rely on studying the spectrum of suitable transfer operators on such spaces, and the relationship with extreme events follows naturally.

This is joint work with C. Liverani and M. Pollicott.
