

FRANÇOIS LEDRAPPIER
TOPICS ON ENTROPY

Week 1: 27 June - 2 July, 5 double lectures (each lecture is 45-50 minutes)

1. Information and entropy.
 - 1a. Conditional information; continuity; examples.
 - 1b. Mean (relative) entropy, (relative) Shannon-McMillan-Breiman Theorem.
 - 1c. Brin-Katok local entropy. Mané's partition.
2. Entropy, exponents and dimension for automorphisms of the torus.
 - 2a. Dimension 2: Young formula.
 - 2b. Higher dimension, hyperbolic: Ledrappier-Young and Barreira-Pesin-Schmeling.
 - 2c. Higher dimension, nonhyperbolic: no entropy comes from the central direction.
3. Entropy, exponents and dimension for a general $C^{1+\alpha}$ diffeomorphism.
 - 3a. Results from Pesin Theory: Lyapunov norms, invariant foliations.
 - 3b. Dimension 2: Young formula.
 - 3b. General case. Issues when extending 2b and 2c.

Comments: The idea is to be rather complete and precise in Chapter 1; I need the material later, and it is not systematically presented in usual courses. For 1a and 1b, I'll use the Rokhlin article and the book by Bill Parry, Entropy and generators in Ergodic Theory. 1c is made of two useful properties. The idea in 2 is to make most of the theory when the geometric framework is linear and straightforward. Time permitting, I'd like to present as much as I can in 3 (using Omri's Oseledets Theorem).