

# NYC Dynamics Seminar at Yeshiva University

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**Bassam Fayad** (CNRS and University of Paris-6)

*will speak on*

## **Spectral properties of mixing flows on surfaces**

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**Wednesday, April 20, 5pm**

Lectures will last 1 hour and be followed by 30 minutes for further lecture and/or discussion.

**Yeshiva University, 215 Lexington Ave, Room 506**

On the SW corner of Lexington Ave and 33rd Street. You will need to sign in.

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*Abstract:*

How ‘chaotic’ can smooth area preserving surface flows be? It is known for a long time (from the works of Kolmogorov, Katok and then Kochergin) that starting from very low regularity these flows, if they do not have fixed points, cannot be mixing. Via Poincaré sections, the latter phenomenon is due to a Denjoy type rigidity of discrete time one dimensional dynamics. However, Kochergin and then Khanin and Sinai showed that these flows can be mixing when they have singularities. Nothing however was known about their spectral type. We will explain why Kochergin flows with one (sufficiently strong) power like singularity typically have a maximal spectral type equivalent to Lebesgue measure on the circle. So, these quasi-minimal flows on the two torus, that have almost the same phase portrait as that of a minimal translation flow, share the same maximal spectral type as Anosov flows! In fact, the Lebesgue spectrum is rather reminiscent of the parabolic paradigm (of horocyclic flows for example) to which the Kochergin flows are related due to the shear along their orbits. We will discuss this relation and its consequences as well as several questions around mixing area preserving flows.