ABSTRACT:

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Dynamics in the moduli spaces of translation surfaces

I will introduce translation surfaces, the links with holomorphic 1-forms and some motivations (billiards in polygons).
I will describe the moduli spaces of translation surfaces (analytic structure, Lebesgue measure) and the action of GL(2,R) on these spaces.
I will explain how the dynamics of the SL(2,R) action in the parameter space is related to the properties of the linear flows on translation surfaces. As an important example, I will discuss square tiled surfaces.
I will define the Kontsevich-Zorich cocycle and come back to the motivations.
I will end the course by stating recent important theorems by Eskin-Mirzakhani.