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Title: Recent progress on the horocycle flow on strata of translation surfaces

For about 2 decades the horocycle flow on strata of translation surfaces was studied, very successfully, in analogy with unipotent flows on homogeneous spaces, which by work of Ratner, Margulis, Dani and many others, have striking rigidity properties. In the past decade Eskin-Mirzakhani and Eskin-Mirzakhani-Mohammadi proved some analogous rigidity results for SL(2,R) and the full upper triangular subgroup on strata of translation surfaces.

This talk will begin by introducing translation surfaces and describing some of the previously mentioned rigidity before moving onto its goal, that many such rigidity results fail for the horocycle flow on strata of translation surfaces. Time permitting we will also describe some rigidity result for special sub-objects in strata of translations surfaces. This will include joint work with Osama Khalil, John Smillie, Barak Weiss and Florent Ygouf.