Mathematics, Statistics, and Computer Science **@ UIC**

Geometry, Topology and Dynamics Seminar

Entropy, metrics and quasi-morphisms

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Abstract: One of the mainstream and modern tools in the study of non abelian groups are quasi-morphisms. These are functions from a group to the reals which satisfy homomorphism condition up to a bounded error. Nowadays they are used in many fields of mathematics. For instance, they are related to bounded cohomology, stable commutator length, metrics on diffeomorphism groups, displacement of sets in symplectic topology, dynamics, knot theory, orderability, and the study of mapping class groups and of concordance group of knots.

Let S be a compact oriented surface. In this talk I will discuss several invariant metrics and quasi-morphisms on the identity component $\mathrm{Diff}_0(S, \mathrm{area})$ of the group of area preserving diffeomorphisms of S. In particular, I will show that some quasi-morphisms on $\mathrm{Diff}_0(S, \mathrm{area})$ are related to the topological entropy. More precisely, I will discuss a construction of infinitely many linearly independent quasi-morphisms on $\mathrm{Diff}_0(S, \mathrm{area})$ whose absolute values bound from below the topological entropy. If time permits, I will define a bi-invariant metric on this group, called the entropy metric, and show that it is unbounded. Based on a joint work with M. Marcinkowski.

Monday, September 16 at 3:00 PM in 636 SEO