

Bloomington Geometry Workshop 2014

Titles and Abstracts.

1. Igor Belegradek, Spaces of Nonnegatively Curved Metrics.

The talk will be about topological properties of the space of complete Riemannian metrics of nonnegative curvature on a given open manifold.

2. Keith Burns, Ergodicity of the Weil-Petersson geodesic flow

The talk will give an outline of the proof that the geodesic flow for the Weil Petersson metric is ergodic. This is joint work with Howard Masur and Amie Wilkinson.

3. Laura DeMarco, A dynamical Andre-Oort conjecture.

Inspired by connections between arithmetic geometry and complex dynamics, Matt Baker and I formulated a conjecture about "special" points within the moduli space of rational maps. I will describe what is known and many of the questions surrounding this conjecture.

4. Alex Eskin, Continuity of Lyapunov exponents.

We show that the Lyapunov exponents of a random product are continuous as functions of the matrix entries. This is joint work with Artur Avila and Marcelo Viana..

5. Chris Leininger, Geometry and dynamics of free-by-cyclic groups.

I will describe various results on free-by-cyclic groups which parallel the work of Thurston, Fried, McMullen and others on fibered hyperbolic 3-manifolds. This is joint work with Spencer Dowdall and Ilya Kapovich.

6. Federico Rodriguez Hertz, Invariant measures for higher rank actions.

In joint work with Aaron Brown and Zhiren Wang we prove that an $SL(n, \mathbb{Z})$ action on an m -dimensional manifold with m less than or equal to $n-2$ always has an invariant measure. In case $m=n-1$ we show the action is measurably isomorphic to a boundary action.

As an application, after work by J. Franks and M. Handel, we get that for n larger than or equal to 4, any action of $SL(n, \mathbb{Z})$ on a surface factors through a finite group action. In this lecture we plan to give an idea of the proof of this result and its generalizations.

7. Victoria Sadovskaya, Linear cocycles over hyperbolic systems.

We consider Hölder continuous linear cocycles over a hyperbolic dynamical system. An important motivation comes from the differential of a hyperbolic diffeomorphism or its restriction to an invariant sub-bundle. We consider the questions when two cocycles are cohomologous and when a cocycle is cohomologous to one with values in a smaller group. In particular, we discuss what conclusions can be made based on the values of the cocycle at the periodic points of the system. We also give a structure theorem for fiber bunched cocycles with one Lyapunov exponent.

8. Alex Wright, $GL(2, \mathbb{R})$ orbit closures of translation surfaces.

We will survey recent results towards the classification of $GL(2, \mathbb{R})$ orbit closures of translation surfaces, including the technique of cylinder deformations and the author's joint results with Auricino and Nguyen in genus 3.