CHRISTIAN BONATTI
Insitut de Mathematiques de Bourgogne

Existence of homoclinic intersections

In 1889 Poincare point out the fact that transverse homoclinic intersection lead to a very complicated dynamical behavior. This observation opened the door of the "chaotic dynamics". Conversely, a conjecture of Palis states that any diffeomorphism can be approched eiser by Morse-Smale diffeomorphisms, or by diffeomorphisms with transverse homoclinic intersections. This conjecture has been recently proved for the C1-topology. I will present this proof wich use in an essential way the partial hyperbolicity.

KEITH BURNS
Northwestern University

Stable ergodicity and partial hyperbolocity

The lecture will give a survey of some of the recent work on partial hyperbolicity. It is the first of a series of three lectures to be given by Federico Rodriguez Hertz and Keith Burns. Coauthor: Amie Wilkinson

KEITH BURNS
Northwestern University

Ergodicity of center bunched partially hyperbolic diffeomorphisms

This lecture will give an outline of the proof of ergodicity of these diffeomorphisms. The juliennes introduced by Pugh and Shub still play a crucial role, but they are used in a somewhat different way. The lack of dynamical coherence is dealt with by introducing "fake" foliations, which are dynamically coherent and are well enough related to the dynamics to still be useful. Coauthor: Amie Wilkinson

DANNY CALEGARI
California Institute of Technology

Quasigeodesic flows on hyperbolic 3-manifolds

A quasigeodesic flow on a (closed) hyperbolic 3-manifold gives rise to a dynamical package analogous to that obtained from a pseudo-Anosov automorphism of a (higher genus) surface. One can construct naturally a universal circle, and a pair of invariant laminations on which the fundamental group of the underlying manifold acts.

There are two immediate corollaries of this structure theory:

1. Nonexistence results. There are infinitely many closed hyperbolic 3-manifolds without quasigeodesic flows.

2. Thurston norm. The unit ball in the (dual) Thurston norm is the convex hull of the Euler classes of quasigeodesic flows on the manifold.

LORENZO J. DIAZ
PUC-Rio

Non-dominated homoclinic classes

We discuss some wild dynamics associated to homoclinic classes which do not admit any dominated splitting. We also give a natural mechanism (heterodimensional tangencies) leading to the generation of non-dominated homoclinic classes.

ALEXEY GLUTSYUK
Ecole Normale Superieure de Lyon, France

Upper bounds of topology of complex polynomials in two variables

It is well-known that if a monic complex polynomial has a critical point at 0 and all its critical values lie in the unit disc, then all its roots and critical points lie in the disc of radius four centered at 0. We prove analogues of this statement for complex polynomials in two variables (normalized in a similar way). In particular, we give upper bound of the minimal radii of bidiscs that contain all the nontrivial topology of level curves. These results were used in our joint work with Yu.S.Ilyashenko concerning a restricted version of Hilbert 16-th problem (upper bounds of number of zeros of Abelian integrals).

ANATOLE KATOK
The Pennsylvania State University

Local differtiable rigidity of some partially hyperbolic actions of higher rank abelian groups

We consider examples of partially hyperbolic actions: restrictions of Weyl chamber flows on $SL(n, \mathbb{R})/\Gamma$ ($n \geq 4$). We show that generic restrictions of rank at least two are locally rigid. Our approach combines the geometry of the invariant foliations for the action and the algebraic properties of the group $SL(n, \mathbb{R})$. Our approach is applicable to restrictions of other Weyl chamber flows. This is a joint work with Danijela Damjanović.

HOWARD MASUR
University of Illinois at Chicago

Multiple Saddle Connections for Translation surfaces and Quadratic Differentials

We describe typical degenerations of quadratic differentials thus describing generic cusps of the moduli space. Even for a typical degeneration one may have several short loops on the Riemann surface that shrink simultaneously. I will explain this phenomenon. Coauthor: Anton Zorich

YAKOV PESIN
The Pennsylvania State University

Existence of Hyperbolic Bernoulli Flows on Compact Manifolds

I will present an affirmative solution of the long-stading problem that every compact smooth Riemannian manifold M of dimension ¿2 admits a volume-preserving Bernoulli flow with non-zero Lyapunov exponents (except for the Lyapunov exponent along the flow direction). Coauthors: H. Hu, A. Talitskaya.

ENRIQUE PUJALS
IMPA

Some results on dominated splitting

We will show some dynamical context where dominated splitting appear, and some results about the dynamic of systems exhibiting dominated splitting.

BARAK WEISS
Ben Gurion University

Finiteness results for quadratic differentials

Joint with J. Smillie. We prove the finiteness of three sets of affine equivalence classes of quadratic differentials: for fixed alpha, those containing no triangle of area less than alpha; for fixed S and k, those containing no cusp corresponding to a cylinder decomposition with k cylinders, and with covolume less than S; for fixed l and T, those admitting a hyperbolic automorphism with dilatation less than T and with Markov partition into l rectangles. As consequences we obtain characterizations of the lattice property and restrictions on Veech groups.