Titles / abstracts

Conference on dynamical systems: may 29–31

Artur Avila   (CNRS - Institut de Mathématiques de Jussieu / IMPA)
TBA

Arnaud Chéritat   (Institut de Mathématiques de Toulouse)

Generic perturbation of parabolic points having more than one attracting petal

With Christiane Rousseau we study generic one-parameter perturbation of holomorphic vector fields in complex dimension one, with the aim of applying this to the study of bifurcation loci of one-parameter families.

Hakan Eliasson   (Institut de Mathématiques de Jussieu)

Almost reducibility for the quasi-periodic linear wave equation

The linear wave equation on a torus with a mass term and perturbed by a potential depending quasi-periodically on time becomes, when written in Fourier coefficients, an infinite dimensional symplectic quasi-periodic co-cycle depending on a parameter (= the mass). We shall discuss the almost reducibility of this model when potential is analytic and the quasi- periodic frequencies are supposed to satisfy certain arithmetical conditions.

Giovanni Forni   (University of Maryland)

Effective equidistribution of twisted horocycles and Fourier coefficients of cusp forms

Results on the effective equidistribution of closed, cuspidal horocycles were first proved by Zagier (1981) and Sarnak (1981). The results were later extended to all finite area-surfaces and arbitrary orbits (Burger, Flaminio-Forni, Hejhal, Strombergsson, ...). In this talk we will consider the question of effective equidistribution of twisted horocycles in connection with sparse equidistribution problems (horocycle maps at polynomial times, at prime times) and Fourier coefficients of cusp forms. Joint work with Livio Flaminio and James Tanis.

Etienne Ghys   (CNRS - École Normale Supérieure de Lyon)
Singularities of real analytic curves

Vadim Kaloshin   (University of Maryland)

Birkhoff Conjecture for convex planar billiards and deformational spectral rigidity of planar domains

The classical Birkhoff conjecture states that the only integrable convex planar domains are circles and ellipses. We show that this conjecture is true for perturbations of ellipses. It turns out that the method of proof gives an insight into deformational spectral rigidity of planar axis symmetric domains and gives a partial answer to a question of P. Sarnak. This is based on several papers with Avila, De Simoi, G. Huang, Sorrentino, and Q. Wei.

Mikhail Lyubich   (Stony Brook)

Pacman Renormalization and scaling of satellite Mandelbrot copies near Siegel points

In the 1980s Branner and Douady discovered a surgery relating various limbs of the Mandelbrot set. We put this surgery in the framework of "Pacman Renormalization Theory" that combines features of quadratic-like and Siegel renormalizations. Siegel renormalization periodic points (constructed by McMullen in the 1990s) can be promoted to pacman renormalization periodic points. We prove that each of these periodic points is hyperbolic with one-dimensional unstable manifold. We follow up with a description of the global structure of this unstable manifold, viewed as a one-parameter transcendental family, which yields various scaling laws for satellite Mandelbrot sets near Siegel parameters.

Based upon joint work with Dima Dudko and Nikita Selinger.

Curtis Mc Mullen   (Harvard University)

Plane cubics, quadrilaterals and totally geodesic surfaces in moduli space

We will describe new examples of totally geodesic curves and surfaces in the moduli spaces $M_{g,n}$. These examples connect Teichmueller theory to classical projective geometry, and emerge from the study of billiards in quadrilaterals. (Joint work with Eskin, Mukamel and Wright.)

Enrique Pujals   (Instituto de Matemática Pura e Aplicada)

Strong dissipative diffeomorphisms of the disk with zero entropy: structure of periodic points and infinite renormalization

We will discuss a class of volume-contracting surface diffeomorphisms (named strong dissipative diffeomorphisms) whose dynamics is intermediate between one-dimensional dynamics and general surface dynamics.

For the particular case of the disk, we will consider the ones that have zero entropy, explaining their structure of periodic orbits and showing that they are infinitely renormalizable if they are in the boundary of zero entropy.

The talk is a consequence of a series of joint works with Sylvain Crovisier and Charles Tresser

Corinna Ulcigrai   (University of Bristol)

On Birkhoff sums and Roth type conditions for interval exchange transformations

Understanding growth and behaviour of Birkhoff sums is one of the central themes in the study of interval exchange transformations (IET), starting from the work of Zorich and Forni on deviations of ergodic averages, up to recent results on limit theorems by Bufetov and others. J. C. Yoccoz, in joint work with Marmi and Moussa, introduced an object called "limit shape" which can be used as a tool to study Birkhoff sums which display polynomial deviations. In joint work with Yoccoz and Marmi, we describe a limit object for Birkhoff sumsof functions whichcorrespond to relative homology classes and, as in the case of the circle, display slower growth.We will also discuss two related variations of the Roth type Diophantine condition introduced by Marmi, Moussa and Yoccoz to solve the cohomological equation for IETs. This talk is based on joint work with Jean-Christophe Yoccoz and Stefano Marmi.

Marcelo Viana   (Instituto de Matemática Pura e Aplicada)

Lyapunov exponents of continuous cocycles

The Mañé-Bochi theorems that the Lyapunov exponents of continuous SL(2)-cocycles over any invertible aperiodic system may always anihilated by arbitrarily small perturbations, unless the cocycle is uniformly hyperbolic. Surprisingly, this is generally false when the base system is not invertible. We present a few examples and discuss how this discovery fits together with other recent progress in this area. This is a joint work with Jiagang Yang (U. F. Fluminense)

Anton Zorich   (Institut de mathématiques de Jussieu)

Equidistribution of square-tiled surfaces, meanders, and Masur-Veech volumes

We show how recent equidistribution results allow to compute approximate values of Masur-Veech volumes of the strata in the moduli spaces of Abelian and quadratic differentials by Monte Carlo method.

We also show how similar approach allows to count asymptotical number of meanders of fixed combinatorial type in various settings in all genera. Our formulae are particularly

efficient for classical meanders in genus zero. (joint work with V. Delecroix, E. Goujard, P. Zograf)

Tribute day: june 1st

Alain Connes (Collège de France)
Pierre-Louis Lions (Collège de France)
>*Jean-Christophe : du lycée au Collège*

Bassam Fayad (Institut de Mathématiques de Jussieu)
Ricardo Perez-Marco (Institut de Mathématiques de Jussieu)
>*Symétries et conditions optimales de linéarisation en dynamique quasi-périodique*

Xavier Buff (Institut de Mathématiques de Toulouse)
Marguerite Flexor (Université Paris-Sud)
>*Dynamique des polynmes quadratiques*

Carlos Gustavo Moreira (Instituto de Matemática Pura e Aplicada)
Jacob Palis (Instituto de Matemática Pura e Aplicada)
>*Homoclinic Bifurcations: our collaboration with Jean-Christophe Yoccoz*

Stefano Marmi (Scuola Normale Superiore, Pisa)
Carlos Matheus (Université Paris 13)
>*Jean-Christophe Yoccoz et les surfaces plates*

Pierre Berger (Université Paris 13)
Juan Rivera-Letelier (University of Rochester)
>*L'école mathématique d'un maître*