Journées de Géométrie et Combinatoire dans les Espaces des Modules

24 et 25 Septembre 2018, Université Paris 13

Abstracts of talks

Corentin Boissy *Pseudo-Ansosov homeomorphisms in hyperelliptic strata.*

A pseudo-Anosov homeomorphism on a surface naturally defines a pair (X, q), where X is a Riemann surface and q a quadratic differential. The moduli space of such pairs is naturally stratified by the degree of the zeros of q. A question due to Farb is to determine effectively the minimum of expansion factors of pseudo-Anosov on each stratum (in other terms, the systole of the Teichmller flow). We give a complete answer for an infinite family of (connected component) os strata. It is joined work with E. Lanneau.

Vincent Delecroix *Cardinality of Rauzy classes and universal asymptotics.*

We will show in the case of Abelian differentials how adjacency between strata can be translated into a recursive formula for the cardinality of Rauzy diagrams. If time permit we will explain the asymptotics in $(n-1)!$ for all (labeled) Rauzy diagrams on n letters but the hyperelliptic one.

Quentin De Mourgues *A combinatorial proof of the classification of the connected components of the strata of quadratic differentials.*

In this talk, i will present a combinatorial proof of the classification of quadratics differentials using the labelling method. A significant step of the proof will be to establish Boissy's conjecture on the completeness of a set of combinatorial moves on Jenkins-Strebel differentials (i.e standard generalised permutation) and explain how those moves are related to the monodromy of the labels introduced in the labelling method.

Giovanni Forni *On twisted translation flows.*

We study cohomological equations and ergodic integrals for twisted translation flows, define as products of a translation flow on a translation surface and a linear flow on a circle. By standard Fourier analysis the questions we consider reduce respectively to non-homogeneous cohomology equations with purely imaginary zero order term (twisted cohomological equation) and to ergodic integrals of functions times an exponential of time with purely imaginary phase (twisted ergodic integrals). The motivation is two-fold: on the one hand we want to understand a simple example of 3-dimensional translation flow, on the other hand there is a well-known close connection between twisted ergodic integrals and spectral measures of translation flows, already exploited in the work of Bufetov-Solomyak. In this respect our aim is to cast their work in more geometric terms and to generalize it.

Vaibhav Gadre *Veering triangulations and Teichmuller flow.*

We will outline the theory of veering triangulations of surfaces and describe applications of this theory to Teichmuller flow. This is work in progress with Bell, Guttierez and Schleimer.

Elise Goujard *Volumes of moduli spaces of quadratic differentials and intersection numbers.*

Counting square-tiled half-translation surfaces naturally leads to evaluating volumes of related moduli spaces. We will see how intersection numbers arise naturally in this counting in the case of principal strata of quadratic differentials, and we will see how this computation is parallel to the counting of closed geodesics in the hyperbolic setting. This is joint work with Vincent Delecroix, Anton Zorich and Peter Zograf.

Rodolfo Gutierrez *Combinatorics of Rauzy-Veech groups*

A Rauzy-Veech group is the subgroup of the symplectic group obtained by the homological action of the Rauzy-Veech induction. Its index is known to be finite for every Abelian stratum and a large class of quadratic strata. Although its definition is purely combinatorial, it can be interpreted as the subgroup of the monodromy group arising from almost-geodesic segments of the Teichmüller flow.

In this talk, we will explain the combinatorial properties of Rauzy-Veech groups of Abelian strata and how they are used to prove their arithmeticity. Then, we will explain which of these properties can be generalized to quadratic strata and outline the difficulties of proving arithmeticity for every quadratic stratum, which remains an open question.