KMPB Workshop: Holomorphic Differentials & RTG 2965 "From geometry to numbers" : Scientific opening

Report of Contributions

Fabian Haiden

Contribution ID: 2

Type: not specified

Fabian Haiden

Wednesday 20 November 2024 09:30 (1 hour)

Spaces of quadratic differentials versus spaces of stability conditions

Spaces of quadratic differentials are special cases of spaces of Bridgeland stability conditions. I will recall this surprising correspondence and discuss the following questions: 1) Does this tell us something new about quadratic differentials? 2) In what way do more general spaces of stability conditions behave like spaces of quadratic differentials? Based on arxiv:1409.8611, 1808.06364, 2104.06018, 2410.08028.

Martin Möller

Contribution ID: 3

Type: not specified

Martin Möller

Wednesday 20 November 2024 11:00 (1 hour)

Siegel-Veech constants and intersection theory

We give an overview over the methods to compute characteristic quantities of strata, Siegel-Veech constants, Masur-Veech volumes and sum of Lyapunov exponents, by flat geometry and by intersection theory, with a view towards answering the same questions for linear submanifolds

Carlos Matheus

Contribution ID: 4

Type: not specified

Carlos Matheus

Wednesday 20 November 2024 13:30 (1 hour)

Siegel-Veech constants of certain cover constructions

Siegel-Veech constants are quantities describing counting problems (of saddle-connections, cylinders, etc.) on flat surfaces and, after the works of many mathematicians (including Aggarwal, Chen, Eskin, Kontsevich, Moller, Sauvaget, Zagier, Zorich just to mention a few), we know that these constants are related to several interesting mathematical objects such as quasi-modular forms, Lyapunov exponents, slopes of holomorphic bundles, intersection numbers, ...

In this talk, we shall explain how a precise control of the monodromy actions of the orbifold fundamental group of connected components of strata of Abelian differentials on relative cohomology groups allow to compute (and get some surprising phenomena about) the Siegel-Veech constants of loci of cyclic covers of translation surfaces. This is based on a joint work with D. Aulicino, A. Calderon, N. Salter and M. Schmoll.

Ivan Yakovlev

Contribution ID: 5

Type: not specified

Ivan Yakovlev

Wednesday 20 November 2024 15:00 (1 hour)

Counting differentials combinatorially

I will present a couple of results about asymptotic enumeration of holomorphic differentials with periods in Z+iZ (square-tiled surfaces) and meromorphic differentials with periods in Z (integral metric ribbon graphs). These results were obtained by pure combinatorics, and it might be interesting to understand their algebraic meaning.

Gregorio Baldi

Contribution ID: 6

Type: not specified

Gregorio Baldi

Wednesday 20 November 2024 16:00 (1 hour)

Hodge Locus and differential geometry (Ho-Lo-Diff)

I will survey various applications of algebraic differential geometry and Galois theory of foliations to finiteness results in differential geometry. Specifically, I will discuss the study of totally geodesic submanifolds of ball quotients (joint work with Ullmo) and affine invariant submanifolds of strata of abelian differentials (with Urbanik). I will aim to highlight a unifying theme throughout: atypical intersections.

Anja Randecker

Contribution ID: 7

Type: not specified

Anja Randecker

Thursday 21 November 2024 09:30 (1 hour)

Lengths of saddle connections for large genus

For a holomorphic differential on a given surface, we can consider saddle connections, that is, geodesic segments between the zeros of the differential, and we can measure their lengths. We consider the number of saddle connections in a given length range as a random variable on a stratum and show that for genus going to infinity, this converges in distribution to a Poisson distributed random variable. In the talk, I will introduce the geometric aspects of the topic and connect it to Siegel-Veech constants. This is based on joint work with Howard Masur and Kasra Rafi.

David Urbanik

Contribution ID: 8

Type: not specified

David Urbanik

Thursday 21 November 2024 11:00 (1 hour)

Orbit Closures as Atypical Intersections

We review the Hodge-theoretic characterization of orbit closures due to Filip. Using this characterization, we then explain how the theory of atypical intersections from Hodge theory naturally lets us classify such orbit closures as "typical" and "atypical". This classification recovers a finiteness theorem of Eskin, Filip and Wright for atypical orbit closures. If we have time, we explain how this finiteness can be made effective. Joint work with Greg Baldi.

Matteo Costantini

Contribution ID: 9

Type: not specified

Matteo Costantini

Thursday 21 November 2024 13:30 (1 hour)

Geometry of strata of differentials

The geometry of spaces of algebraic curves together with meromorphic k-forms of a fixed type is still quite mysterious. The multi-scale compactification of these strata of differentials allowed to compute some of their topological and algebraic invariants. In this talk we describe the ideas behind such computations and possible applications.

Samuel Grushevsky

Contribution ID: 10

Type: not specified

Samuel Grushevsky

Thursday 21 November 2024 15:00 (1 hour)

Ends of strata of differentials

Using the multi-scale compactification, we determine the number of ends of strata of meromorphic differentials. It turns that in almost all cases all connected components of the strata of differentials have only one end. This is joint work with Ben Dozier.

Jarod Alper

Contribution ID: 12

Type: not specified

Jarod Alper

Friday 22 November 2024 10:00 (1 hour)

Tim Browning

Contribution ID: 13

Type: not specified

Tim Browning

Friday 22 November 2024 11:30 (1 hour)

Soheyla Feyzbakhsh

Contribution ID: 14

Type: not specified

Soheyla Feyzbakhsh

Friday 22 November 2024 14:30 (1 hour)

Rahul Pandharipande

Contribution ID: 15

Type: not specified

Rahul Pandharipande

Friday 22 November 2024 16:00 (1 hour)