



CENTRE FOR QUANTUM GEOMETRY OF MODULI SPACES
SCIENCE & TECHNOLOGY
AARHUS UNIVERSITY

Conference: Progress in Low-dimensional Topology: Teichmüller theory and 3-manifold groups

All talks in Auditorium D1

Saturday 11 August

09.45-10.00: Coffee/tea by Aud. D1

10.00-11.00: On some non-Euclidean trigonometric formulae and applications

by Athanase Papadopoulos

11.30-12.30: The degree of a CP1-structure by Bertrand Deroin

12.30-14.00: Lunch break

14.00-15.00: Extremal length geometry of Teichmüller space by Hideki Miyachi

15.00-15.30: Coffee break

15.30-16.30: Variation of extremal length on Teichmüller space by Weixu Su

18.00: Wine and cheese / Social networking in “Vandrehallen”

(Bldg.1530, 1st floor, next to the Information Office)

Sunday 12 August – Free Day

Informal discussions (if needed - auditoriums and lecture rooms can be unlocked by Jane, please let her know)

Possibility to see Aarhus, see suggestions in “Places worth visiting in Aarhus” (a printout).

If you have questions regarding other places or destinations e.g. Legoland or Skagen please see www.rejseplanen.dk or contact Jane.



Centre for Quantum Geometry
of Moduli Spaces
Aarhus University
Ny Munkegade 118
DK-8000 Aarhus C

Tlf.: +45 87155141
E-mail: mail@qgm.au.dk
<http://qgm.au.dk>



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Monday 13 August

09.45-10.00: Coffee/tea by Aud. D1

10.00-11.00: An effective proof of the generalized Waldhausen conjecture by David Gabai

11.30-12.30: An extension of the Weil-Petersson metric to the Hitchin Component

by Martin Bridgeman

12.30-14.00: Lunch break

14.00-15.00: Earthquakes in the length spectrum Teichmüller spaces of infinite genus surfaces by

Dragomir Saric

15.00-15.30: Coffee break

15.30-16.30: Thurston's gluing equations for $\mathrm{PGL}(n, \mathbb{C})$ by Christian Zickert

18.00: Special dinner at restaurant in town (you must be signed up for this)

Café Hack (number 17 on the map)

Teatergade 1; 8000 Aarhus C

Phone number: +45 8612 4464

Tuesday 14 August

09.45-10.00: Coffee/tea by Aud. D1

10.00-11.00: The virtual Haken conjecture I by Ian Agol

11.30-12.30: The virtual Haken conjecture II by Ian Agol

12.30-14.00: Lunch break

14.00-15.00: Linear slices of the quasifuchsian space of punctured tori by Yohei Komori

15.00-15.30: Coffee break

15.30-16.30: Products of twists, geodesic-lengths and Thurston shears by Scott Wolpert



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All talks in Auditorium D1

On some non-Euclidean trigonometric formulae and applications

by Athanase Papadopoulos. Saturday 11 August, 10.00-11.00.

None

The degree of a CP^1 -structure

by Bertrand Deroin. Saturday 11 August, 11.30-12.30.

We will introduce the degree of a CP^1 structure on a closed surface of genus $g \geq 2$, that counts the average degree of a developing map in restriction to a large ball (in the hyperbolic metric given by uniformization). We will give a formula relating the degree to the Lyapunov exponent of the holonomy representation associated to the Brownian motion on the surface. Several consequences of this formula will be discussed: construction of harmonic measures associated to CP^1 structure and estimates of their dimension (generalizing Makarov and Przytycki-Urbanski-Zdunik estimates for limit sets of Kleinian groups), polynomial convexity of Teichmüller spaces (an alternative proof of a theorem of Shiga), and equidistribution of parabolic subvarieties in Bers slices associated to closed geodesics. This is a joint work with Romain Dujardin.

Extremal length geometry of Teichmüller space

by Hideki Miyachi. Saturday 11 August, 14.00-15.00.

None

Variation of extremal length on Teichmüller space

by Weixu Su. Saturday 11 August, 15.30-16.30.

In this talk, we will discuss the variation of extremal length.

An effective proof of the generalized Waldhausen conjecture

by David Gabai. Monday 13 August, 10.00-11.00.

Tao Li proved that a closed non Haken 3-manifold M has only finitely many irreducible Heegaard splittings. We will describe an algorithm to compute this upper bound when M is hyperbolic. Joint work with Toby Colding.



An extension of the Weil-Petersson metric to the Hitchin Component

by Martin Bridgeman. Monday 13 August, 11.30-12.30.

None

Earthquakes in the length spectrum Teichmüller spaces of infinite genus

surfaces by Dragomir Saric. Monday 13 August, 14.00-15.00.

None

Thurston's gluing equations for $\mathrm{PGL}(n, \mathbb{C})$

by Christian Zickert. Monday 13 August, 15.30-16.30.

Thurston's gluing equations are polynomial equations invented by Thurston to explicitly compute hyperbolic structures or, more generally, representations in $\mathrm{PGL}(2, \mathbb{C})$. This is done via so called shape coordinates. We generalize the shape coordinates to obtain a parametrization of representations in $\mathrm{PGL}(n, \mathbb{C})$. We give applications to quantum topology, and discuss an intriguing duality between the shape coordinates and the Ptolemy coordinates of Garoufalidis-Thurston-Zickert. The shape coordinates and Ptolemy coordinates can be viewed as 3-dimensional analogs of the X and A coordinates on higher Teichmüller spaces due to Fock and Goncharov.

The virtual Haken conjecture I & II

by Ian Agol. Tuesday 14 August, 10.00-11.00 & 11.30-12.30.

We prove that cubulated hyperbolic groups are virtually special.

Linear slices of the quasifuchsian space of punctured tori

by Yohei Komori. Tuesday 14 August, 14.00-15.00.

The complex length λ_V and the complex twist $\tau_{V,W}$ of a marked quasifuchsian punctured torus group $G=(V, W)$ give holomorphic coordinates of the quasifuchsian space \mathcal{QF} of punctured tori, named the complex Fenchel-Nielsen coordinates. In the first half of my talk, the geometry of linear slices of \mathcal{QF} defined by the linear equation $\lambda=c$ will be surveyed. In the second half of my talk, new slices of \mathcal{QF} defined by the equation $\tau=c$ will be concerned, which is an ongoing research project with Yasushi Yamashita.

Products of twists, geodesic-lengths and Thurston shears

by Scott Wolpert. Tuesday 14 August, 15.30-16.30.



Our goal is to generalize formulas for Fenchel-Nielsen twists, geodesic-lengths and the Weil-Petersson metric to the setting of punctured surfaces triangulated by ideal geodesics. We review Bonahon's embedding of Teichmüller space for compact surfaces into the space of transverse cocycles on a maximal geodesic lamination. We further review Penner's lambda-length embedding of decorated Teichmüller space for punctured surfaces to the positive Euclidean orthant. For punctured surfaces triangulated by ideal geodesics, we consider weighted sums of geodesics with weights summing to zero at each cusp. We analyze such configurations by "doubling across cusps" and "opening nodes" to obtain compact surfaces with FN twists. We show that the dual of a Thurston shear is the total length, that the WP symplectic pairing is given by weight summation by parts at punctures, and describe the formula for the WP metric pairing.
