Minicourses

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Anton Mellit (Vienna)

Time: Monday 27/6, Tuesday 28/6 and Wednesday 29/6 at 9h15

Title: *Topological invariants and mirror symmetry*

Abstract: -

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Margarida Melo (Roma Tre)

Time: Monday 27/6, Tuesday 28/6 and Wednesday 29/6 at 10h30

Title: *Compactified Jacobians and Fourier Mukai transforms*

Abstract: In this series of lectures, I will start by giving an overview of the theory of compactified Jacobians for curves with mild singularities, illustrating how the different approaches relate one to the other and the main properties of such objects.
I will then explain that, for curves with locally planar singularities, compactified Jacobians satisfy autoduality statements generalizing the situation for smooth curves.
Such statments can be used to study the geometry of the Hitchin fibration for the general linear group via the spectral correspondence.
Finally, I will give an account on the different constructions of universal compactified Jacobians and illustrate that the geometry of their boundary complex is closely related to tropical counterparts of such objects.

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Michael Groechenig (Toronto)

Time: Monday 27/6, Tuesday 28/6 and Wednesday 29/6 at 12h

Title: *Introduction to p-adic integration*

Abstract: In this mini-course I will introduce the basics of p-adic integration and give an overview of joint work with Wyss and Ziegler pertaining to the Hausel-Thaddeus conjecture.

Lecture 1: Weil's formula and Batyrev's theorem

Lecture 2: Orbifolds and gerbes

Lecture 3: Proof of the Hausel—Thaddeus conjecture

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Du Pei (Harvard)

Time: Monday 27/6, Tuesday 28/6 and Wednesday 29/6 at 14h30

Title: *Mirror symmetry and Higgs moduli spaces*

Abstract: In this mini-course, we will explore the interplay between math and physics in the study of mirror symmetry for moduli spaces of Higgs bundles. We will introduce the notion of "branes," explain what they are good for, discuss how they behave under mirror symmetry, and demonstrate how a better understanding of these objects can shed light on the geometry of moduli spaces of Higgs bundles.

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Mirko Mauri (Michigan)

Time: Monday 27/6 and Tuesday 28/6 at 16h

Title: *The P=W conjecture*

Abstract: Moduli spaces of Higgs bundles and character varieties are invariants of compact Riemann surfaces. They are central objects in nonabelian Hodge theory and an excellent testing ground for conjectures in Hodge theory and mirror symmetry. In 2010, de Cataldo, Hausel and Migliorini proposed a conjectural relation between the cohomology of these spaces, the so-called P=W conjecture, explaining some of their curious properties. In this mini-course, I will provide an example-driven introduction to the conjecture.

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