

WORKSHOP PROGRAM

Time	Monday-08/03/2015	Tuesday-08/04/2015	Wednesday-08/05/2015	Thursday-08/06/2015	Friday-08/07/2015
09.00-10.00	Saul Schleimer Title: Curves and measured laminations	Saul Schleimer Title: Curves and measured laminations	Saul Schleimer Title: Curves and measured laminations	Roland van der Veen Title: The many faces of the colored Jones polynomial	Roland van der Veen Title: The many faces of the colored Jones polynomial
10.00-10.15	Coffee Break	Coffee Break	Coffee Break	Coffee Break	Coffee Break
10.15-11.15	Kate Petersen Title: An introduction to character varieties	Bogwang Jeon Title: An introduction to the arithmetic of hyperbolic 3-manifolds	Mustafa Korkmaz Title: Mapping class groups: presentations, representations and relations with symplectic manifolds	Roland van der Veen Title: The many faces of the colored Jones polynomial	Roland van der Veen Title: The many faces of the colored Jones polynomial
11.15-11.30	Coffee Break	Coffee Break	Coffee Break	Coffee Break	Coffee Break
11.30-12.30	Kate Petersen Title: An introduction to character varieties	Bogwang Jeon Title: An introduction to the arithmetic of hyperbolic 3-manifolds	Mustafa Korkmaz Title: Mapping class groups: presentations, representations and relations with symplectic manifolds	Mehmet Haluk Sengun Title: Arithmetic Hyperbolic 3-Manifolds and Number Theory	Mehmet Haluk Sengun Title: Arithmetic Hyperbolic 3-Manifolds and Number Theory
12.30-13.30	Lunch	Lunch	Lunch	Lunch	Lunch
13.30-14.30	Mustafa Korkmaz Title: Mapping class groups: presentations, representations and relations with symplectic manifolds	Saul Schleimer Title: Curves and measured laminations	Kate Petersen Title: An introduction to character varieties	Mehmet Haluk Sengun Title: Arithmetic Hyperbolic 3-Manifolds and Number Theory	Mehmet Haluk Sengun Title: Arithmetic Hyperbolic 3-Manifolds and Number Theory
14.30-15.00	Coffee Break	Coffee Break	Coffee Break	Coffee Break	Coffee Break
15.00-16.00	Bogwang Jeon Title: An introduction to the arithmetic of hyperbolic 3-manifolds	Mustafa Korkmaz Title: Mapping class groups: presentations, representations and relations with symplectic manifolds	Bogwang Jeon Title: An introduction to the arithmetic of hyperbolic 3-manifolds	Kate Petersen Title: An introduction to character varieties	Free

ABSTRACTS AND TITLES OF WORKSHOP SPEAKERS

Speaker	Title	Abstract
BoGwang Jeon	An Introduction to The Arithmetic of Hyperbolic 3-Manifolds	The goal of this lecture is to define an arithmetic hyperbolic 3-manifold. Starting from the definition of an algebraic number, we will explain how to produce arithmetic lattices via quaternion algebras. We will also go over some important theorems and properties of arithmetic hyperbolic 3-manifolds.
Mustafa Korkmaz	Mapping Class Groups: Presentations, Representations and Relations with Symplectic Manifolds	The mapping class group $MCG(S)$ of an orientable surface S is the group of isotopy classes of orientation-preserving self-diffeomorphisms of S . The groups $MCG(S)$ play a central role in low-dimensional topology; topology of 3-manifolds, symplectic 4-manifolds, Teichmüller theory etc. After the general settings, I will give Dehn twists and relations among them, which are fundamental in this theory. I am planning to give the presentation, some algebraic properties, known linear representations of $MCG(S)$. This will occupy most of the lectures. Certain relations in MCG describes symplectic 4-manifolds. I will discuss them at the end.
Kate Petersen	An Introduction to Character Varieties	The $(P)SL(2, \mathbb{C})$ character variety of a hyperbolic 3-manifold is an algebraic set that encodes deformations of the hyperbolic structure of the 3-manifold. These varieties were fundamental tools in the proof of the cyclic surgery theorem, and 'detect' interesting surfaces in the 3-manifold. I will begin by introducing Thurston's shape variety and gluing equations, using the figure-8 knot complement as a motivating example. Then I will introduce the character variety, and show how it is connected to representations of the fundamental group. I will discuss Thurston's hyperbolic Dehn surgery theorem, and touch on Culler and Shalen's work in using these varieties to detect surfaces in 3-manifolds. As time allows, I will discuss how the geometry of the character variety reflects the topology of the 3-manifold, and connections between character varieties and other 3-manifold invariants.
Saul Schleimer	Curves and Measured Laminations	This series of four lectures will give an introduction to measured laminations on surfaces. Laminations were introduced by William Thurston as a way to study curves on surfaces, hyperbolic metrics on surfaces, ends of hyperbolic three-manifolds, the bending locus of pleated surfaces (appearing on the convex core boundary), and many more topics in low-dimensional topology and holomorphic dynamics. We will start with a basic discussion of the topology of surfaces and curves. After a brief review of hyperbolic geometry we will introduce geodesic laminations. We will then discuss transversely measured laminations and the Dehn-Thurston coordinates on $ML(S)$. We will end the lectures by sketching a proof that $PML(S)$, the space of projectively measured laminations, is a sphere of dimension $6g + 2n - 7$ here g counts the genus of S and n counts the number of boundary components.
Mehmet Haluk Sengun	Arithmetic Hyperbolic 3-Manifolds and Number Theory	In these four lectures, I aim to give a gentle overview of (some proven, some conjectural) connections between arithmetic hyperbolic 3-manifolds, automorphic forms, elliptic curves and mod p Galois representations.
Roland van der Veen	The Many Faces of The Colored Jones Polynomial	The colored Jones polynomial is an important invariant in knot theory because it is relatively simple yet well connected with many other fields of geometry/topology. The purpose of these lectures is to approach the colored Jones polynomial from several different angles: including triangulations, quantum groups and differential equations. Besides giving the elementary definitions we will sample some of the many challenging open problems surrounding the colored Jones polynomial.