TWO-DAY GEOMETRY MEETING - TITLES AND ABSTRACTS

MONDAY 22ND MAY

13:00 – 13:50 Talk 1: Hugo Parlier.

Title: Universal families of arcs and curves on surfaces

Abstract: The talk will be about a family of topological questions on curves and arcs, and on how they relate to geometric problems. One of these involve trying to use a minimal number of curves to create all topological types of pants decompositions. Another is to try and construct all topological types of triangulations on a polygon using a minimal number of arcs.
  This is based on joint work with Niloufar Fuladi and Arnaud de Mesmay.

14:00 – 14:50 Talk 2: Ara Basmajian.

Title: Counting problems on the modular surface

Abstract: The *modular surface X* is the punctured sphere with cone points of orders 2 and 3; equivalently X is the quotient of the upper half-plane by the modular group, $PSL(2, \mathbb{Z})$. In this talk, after setting up the basics, we'll focus on various classes of geodesics and their growth rates (with respect to word length and geometric length) leading to several counting problems. These counting problems are part of more general phenomena that intertwine the geometry and topology of curves on surfaces with number theoretic considerations.

15:20 – 16:10 Talk 3: Dawid Kielak.

Title: Fibring, one-relator groups, and L^2-homology

Abstract: (joint with Marco Linton) I will talk about the role L^2-homology plays in algebraic fibring, and how one can use it to understand one-relator groups with torsion.

TUESDAY 23RD MAY

09:30 – 10:20 Talk 4: Tara Brendle.

Title: Semi-direct product structures in mapping class groups of 3-manifolds

Abstract: We will show that a certain short exact sequence associated with mapping class groups of 3-manifolds admits a splitting. One by-product of this result is that $\mathrm{Out}(F_n)$ arises as a certain stabilizer subgroup of the mapping class group of a connected sum of n copies of $S^2 \times S^1$. The general case is slightly more complicated: using recent work of Chen-Tshishiku, we will describe the second factor in the semi-direct product structure in terms of the prime decomposition of the 3-manifold. This is joint work with Nathan Broaddus and Andrew Putman.

10:50 – 11:40 Talk 5: Christopher Leininger.

Title: Geometry of subgroups of the mapping class group

Abstract: I'll discuss the notion of convex cocompactness in the mapping class group due to Farb and Mosher, and an emerging generalization to (a couple notions of) geometric finiteness. I will explain why we care about these concepts, describe the main conjectures/questions surrounding them, and talk about some results motivating and lending evidence to them. This represents joint work with several people in various combinations over the past 20 years – Mladen Bestvina, Ken Bromberg, Marissa Chesser, Spencer Dowdall, Matthew Durham, Autumn Kent, Alan Reid, Jacob Russell, Saul Schleimer, and Alessandro Sisto – but I will also discuss results of many others.

12:40 – 13:30 Talk 6: Cornelia Drutu.

Title: Property (T) and a-T-menability revisited

Abstract: One way of studying infinite groups is by analysing their actions on classes of interesting spaces. This is the case for Kazhdan's property (T) and for a-T-menability, important properties formulated in terms of actions on Hilbert spaces. In recent years, these properties have been reformulated for actions on Banach spaces, with very interesting results. This talk will overview some of these reformulations and their applications. In particular, I will describe a notion of spectrum providing an optimal way to measure "the strength" of the property (T) that an infinite group may have, and what can be said about this spectrum, in particular for hyperbolic groups. I will also describe weak versions of a-T-menability for (acylindrically) hyperbolic groups and for mapping class groups. This is on joint work with Ashot Minasyan and Mikael de la Salle, and with John Mackay.