Monday, November 21, 2022

10:00am-11:00am  **Integrable Systems and Random Matrix Theory** -- Gaultier Lambert (KTH) *Applications of the theory of Gaussian multiplicative chaos to random matrices* -- ZOOM ID: 926 6491 9790 Virtual

3:00pm-4:15pm  **RTG Seminar on Number Theory** -- Lukas Scheiwiller (UM) *Overview of the theta correspondence* -- 4088 East Hall

4:00pm-5:00pm  **Complex Analysis, Dynamics and Geometry** -- Nattalie Tamam (UM) *Classification of divergence of trajectories* -- 3096 East Hall

4:00pm-5:00pm  **Student Combinatorics** -- Will Dana (University of Michigan) *Coxeter Groups 2: Geometry, Symmetry, and Classification* -- 3866 East Hall

4:30pm-5:30pm  **Group, Lie and Number Theory** -- Alex Youcis (University of Tokyo) *A prismatic realization functor for Shimura varieties of abelian type* -- 4088 East Hall

Tuesday, November 22, 2022

4:00pm-5:00pm  **Colloquium Series** -- Reserved (Reserved) TBA --
Integrable Systems and Random Matrix Theory  
Monday, November 21, 2022, 10:00am-11:00am  
ZOOM ID: 926 6491 9790  Virtual  
Gaultier Lambert (KTH)  
Applications of the theory of Gaussian multiplicative chaos to random matrices

Log-correlated fields are a class of stochastic processes which describe the fluctuations of some key observables in different probabilistic models in dimension 1 and 2 such as characteristic polynomials of random matrices. Gaussian multiplicative chaos is a renormalization procedure which aims at defining the exponential of a Log-correlated field in the form of a family of random measures. These random measures can be thought of as describing the extreme values of the underlying field. In this talk, I will review the theory of multiplicative chaos and report on some applications to the characteristic polynomial of the Ginibre ensemble. If time permits, I will also a connection to Laughlin theory for the fractional Hall effect and a few open problems.

A recording of the talk can be found [here](https://youtu.be/LhY4KbmbQfE).

RTG Seminar on Number Theory  
Monday, November 21, 2022, 3:00pm-4:15pm  
4088 East Hall  
Lukas Scheiwiller (UM)  
Overview of the theta correspondence

Complex Analysis, Dynamics and Geometry  
Monday, November 21, 2022, 4:00pm-5:00pm  
3096 East Hall  
Nattalie Tamam (U(M))  
Classification of divergence of trajectories

The study of group actions attracted significant interest in the past several decades, as it can be a powerful tool when approaching problems from number theory and geometry. We will focus on the dynamical equivalent to vectors with 'infinitely good' diophantine approximation. From this dynamical point of view, Weiss conjectured a complete classification of the relevant trajectories. We will discuss the steps and different tools used to tackle this conjecture. This is a joint work with Omri Solan.
Last week, Katie introduced us to Coxeter groups as given by generators and relations, with an emphasis on permutations and words. In this talk, I'll approach Coxeter groups from a geometric perspective. I'll go into detail on how Coxeter groups abstract the idea of reflection symmetry. I'll also discuss the classification of finite Coxeter groups, and how it relates to other classifications of nicely symmetric objects, like regular polytopes and tilings. And something from another previous student combinatorics talk will make a surprise reappearance.

Although I'll reference last week's talk, you don't need to have attended that one to understand this one.

Shimura varieties are certain varieties attached to a reductive group $G$ whose geometry has been important in a wide range of applications. Notably, it is expected that their étale cohomology realizes the Langlands correspondence. Shimura varieties should be moduli spaces of certain motives with $G$-structure, and their cohomology should be closely related to the realizations of these motives in that cohomology theory.

Work of Bhatt and Scholze has shown that most cohomology theories are avatars of a single unifying theory: prismatic cohomology. I will discuss ongoing work with Naoki Imai and Hiroki Kato on the existence of a 'prismatic realization functor' for Shimura varieties of abelian type. This can be thought of as producing the prismatic cohomology realization of the motives with $G$ structure that these Shimura varieties parameterize.