Women in Math Symposium Schedule
Saturday, February 25, 2017

7:00 Breakfast *in the Barn*

	Eckhart 206	*Eckhart 202*
8:30	**Grace Chisholm Young** Ben Seeger	**Dynamics, Algebraic Groups, Teichmuller Theory, and Billiards – A conversation between the work of Marina Ratner and Maryam Mirzakhani** Paul Apisa
9:05	**An appreciation of the work of Joan Birman** Nick Salter	**Aubert involution and Speh representations** Jonathan Wang
9:40	**Recursive Derivation of 2n-gon Topologies** Catherine Wolfram	**Keisler's Order** Adele Padgett
10:05	**Shapes of polynomial Julia sets** Kathryn Lindsey	

Eckhart 206 (unless otherwise specified)

11:00 **A Dynamical Way of Thinking:** Amie Wilkinson (UChicago Math)

12:00 Lunch *in the Barn*

1:30 **Implicit Bias**: Stephan Meyer (UChicago Astrophysics)

2:00 **Teaching to a Diverse Classroom:** Kiki Zissimopoulos (UChicago Center for Teaching)

3:00 **From Research to Diplomacy: Mathematicians diversifying their careers:** Jitka Stehnova (UChicago Math)

4:00 **Quantitative Mostow Rigidity: Relating volume to topology for hyperbolic 3-manifolds:** Rosemary Guzman (UIUC Math)

5:00 **Impostor Syndrome Workshop:** Claudio Gonzales *in the Barn*

6:00 Dinner and **Trivia** with Mathilde Gerbelli-Gauthier *in the Barn*

Abstracts

(Alphabetical by Last Name)

P. Apisa: **Dynamics, Algebraic Groups, Teichmuller Theory, and Billiards – A conversation between the work of Marina Ratner and Maryam Mirzakhani** *Marina Ratner spearheaded a revolution in homogeneous dynamics in the early 90s. A little over two decades later, Maryam Mirzakhani would develop a far-reaching extension of Ratner's ideas to study dynamical systems on Teichmuller space. For her work, Mirzakhani became the first female Fields medalist.*

This talk will put the work of Ratner and Mirzakhani into conversation (thereby passing the Bechdel test) and in the process, describe their contributions to dynamics, algebraic groups, Teichmuller theory, and billiards. This talk is meant for anyone curious about the work of Ratner and Mirzakhani, but presumes no prior knowledge of their work or of any of the jargon-y words in this abstract (e.g. homogeneous dynamics or Teichmuller space)

C. Gonzales: **Impostor Syndrome Workshop**

R. Guzman: **Quantitative Mostow Rigidity: Relating volume to topology for hyperbolic 3-manifolds** *A celebrated result of Mostow states that if M, N are two closed, connected, orientable, hyperbolic n-manifolds which are homotopy equivalent in dimensions $n \ge 3$, then M, N are equivalent up to isometry.*

This unique geometric-topological relationship has been the framework for many important results in the field, including notable results providing lower bounds on the volume of M, and results relating volume to homology (Culler-Shalen).

In this talk, we will focus on the case where the fundamental group of M has a property, "k-free," for $k \ge 5$, and discuss current work toward an improvement on the volume bound from the current known bound of 3.44 which holds for $k \ge 4$. This is joint work with Peter Shalen.

K. Lindsey: **Shapes of Polynomial Julia Sets**

S. Meyer: **Implicit Bias**

A. Padgett: **Keisler's Order** *In model theory, the complex numbers as an algebraically closed field are often given as an example of a simple, well-behaved mathematical structure, while the reals as a dense linear order without endpoints are more complicated and behave more strangely in many ways. Can we compare the complexity of other mathematical structures in a meaningful and informative way? Keisler's order seeks to address this question by moving from the realm of structures to the theories that describe them. The complexities of two theories can be compared by measuring the relative saturation of certain ultrapowers of each theory's models.*

N. Salter: **An appreciation of the work of Joan Birman** *This talk will do what the title promises. I will survey the many fundamental contributions to low-dimensional topology made by Joan Birman.*

B. Seeger: **Grace Chisholm Young** *Much of the calculus and real analysis you know came from the first woman to receive a Ph.D. in Germany.*

J. Stehnova: **From Research to Diplomacy: Mathematicians diversifying their careers** *There are over 35,800 individual members of the four leading professional mathematical sciences societies in the U.S.---the AMS, the Association for Women in Mathematics, the Mathematical Association of America, and the Society for Industrial and Applied Mathematics. Most would call themselves mathematicians. Many of those employed in academia might call themselves professors instead of mathematicians, and similarly, those in industry and government may not have "mathematician" in their job title. The job title doesn't tell the whole story, however. These people are doing mathematics and are indeed mathematicians. Many combine all three - academia, industry and work for government in their careers. So what else do mathematicians do?*

J. Wang: **Aubert involution and Speh representations** *I will give an overview of the Aubert involution appearing in the representation theory of p-adic groups and how it interchanges Speh representations. This talk summarizes certain works of Anne-Marie Aubert and Birgit Speh.*

A. Wilkinson: **A Dynamical Way of Thinking**

C. Wolfram: **Recursive Derivation of 2n-gon Topologie** *A compact surface can be presented as a polygon whose edges are identified in pairs with orientation. Some presentations like this are commonly used, such as drawing a torus as a square with opposite edges identified. But there are many other ways to identify the $2n$ edges of a polygon with orientation. For a given n, the set of possible identifications define a set P_n of polygons with identified edges. Each element of P_n is a presentation of a compact surface, whose topology is determined by two invariants: orientability and Euler Characteristic. We will prove various results about these invariants in the sets P_n, mostly using an indexed collection of maps from $P_n\to P_{n+1}$. Ultimately, we will find a computational formula for the number of elements of P_n that present a given compact surface S.*

K. Zissimopoulos: **Fostering an Inclusive Classroom** *In this interactive session we will identify different forms of diversity, reflect on what it mean to be inclusive in the classroom, and discuss strategies for creating an inclusive environment.*