Monday, November 30, 2020

11:00am-11:50am **Student Analysis** -- Han Le (University of Michigan) *Determinantal point processes and zeros of Gaussian analytic functions* -- Virtual East Hall

4:00pm-5:00pm **Algebraic Topology** -- Po Hu (Wayne State University) *The coefficient of equivariant complex cobordism for primary cyclic groups* -- online Virtual

4:00pm-5:00pm **Integrable Systems and Random Matrix Theory** -- Guido Mazzuca (SISSA) *Gaussian alpha ensemble and an application to Toda lattice* -- Zoom Meeting: 91617339235 Passcode: 651935 Virtual

7:00pm-8:00pm **Student Math Finance** -- Xin Zhang (University of Michigan) *Displacement convexity and its application* -- https://umich.zoom.us/j/99487325343 Virtual

Tuesday, December 01, 2020

5:00pm-6:00pm **Complex Analysis, Dynamics and Geometry** -- Alex Kapiamba (U(M)) *The (dis)continuity of quadratic filled Julia sets I* -- Virtual

5:00pm-6:00pm **Student Combinatorics** -- Scott Neville () *The RSK algorithm for longest paths* -- Virtual

Wednesday, December 02, 2020

3:00pm-4:00pm **Student Dynamics/Geometry Topology** -- Yueqiao Wu (University of Michigan) *TBA* -- Zoom link: https://umich.zoom.us/s/94090012548 Virtual

3:00pm-4:00pm **MCAIM Colloquium** -- Josselin Garnier (Ecole Polytechnique, France.) *Passive imaging and communication* -- Zoom Meeting ID: 947 2346 1309 . Zoom Link: https://umich.zoom.us/j/94723461309 . Virtual

4:00pm-5:00pm **Algebraic Geometry** -- Stefan Schreieder (Leibniz University Hannover) *Refined unramified cohomology and algebraic cycles* -- Zoom

Thursday, December 03, 2020

3:00pm-4:00pm **Topology** -- Lei Chen (Caltech) *Actions of Homeo and Diffeo groups on manifolds* -- Virtual

4:00pm-5:00pm **Differential Equations** -- Annalaura Stingo (UC Davis) *Almost-global well-posedness for 2d strongly-coupled wave-Klein-Gordon systems* -- Meeting ID: 983 6567 6067 Passcode: 2020 Virtual

5:00pm-6:00pm **Student Commutative Algebra** -- Katie Waddle (University of Michigan) *TBA* -- Virtual

Friday, December 04, 2020

11:00am-11:50am **Representation Stability** -- Andrew Snowden (UM) *K-L theory VI: Calculations in special cases* -- Online

3:00pm-4:00pm **Student Algebraic Geometry** -- Jose Esparza Lozano () *Neron models* -- 3096 East Hall

4:00pm-5:00pm **Preprint Algebraic Geometry** -- Devlin Mallory () *Subadditivity of Kodaira dimension does not hold in positive characteristic* -- Zoom East Hall
Abstracts for the week of November 29th, 2020 - December 5th, 2020

Student Analysis
Monday, November 30, 2020, 11:00am-11:50am
Virtual East Hall
Han Le (University of Michigan)
Determinantal point processes and zeros of Gaussian analytic functions

This talk aims to provide an introduction to determinantal point processes, which arise surprisingly often in random matrix theory, combinatorics and physics. We will first review notions such as point processes and their joint intensities, and then define determinantal processes. After discussing some basic properties, we will shift the focus on one particular example: the zeros of power series with independent complex Gaussian coefficients, and compare the results of this process to those of other classical processes.

Algebraic Topology
Monday, November 30, 2020, 4:00pm-5:00pm
online Virtual
Po Hu (Wayne State University)
The coefficient of equivariant complex cobordism for primary cyclic groups

The equivariant complex cobordism spectrum MU_G, where G is a compact Lie (or just finite) group, are highly interesting and central objects in equivariant stable homotopy theory. In this talk, I will give an explicit computation, in terms of generators and relations, of the coefficient ring of MU_G, in the case where G is a cyclic group whose order is a power of a prime. In particular, I will discuss certain divisibility conditions that arise in the structure of such coefficient rings.
Integrable Systems and Random Matrix Theory  
Monday, November 30, 2020, 4:00pm-5:00pm  
Zoom Meeting: 91617339235       Passcode: 651935 Virtual  
Guido Mazzuca (SISSA)  
*Gaussian alpha ensemble and an application to Toda lattice*

In my talk I will introduce a tridiagonal random matrix models related to the classical Gaussian $\beta$-ensemble in the high temperature regime, i.e. when the size $N$ of the matrix tends to infinity with the constraint that $\alpha N = \beta \lambda$ constant, $\lambda > 0$. I will show how to explicitly compute the mean density of states and the mean spectral measure for this ensemble. Finally, I will apply this result to compute the mean density of states for the periodic Toda lattice in thermal equilibrium.


Student Math Finance  
Monday, November 30, 2020, 7:00pm-8:00pm  
https://umich.zoom.us/j/99487325343  Virtual  
Xin Zhang (University of Michigan)  
*Displacement convexity and its application*

We will talk about McCann's displacement interpolation and its application to isoperimetric inequalities.

Complex Analysis, Dynamics and Geometry  
Tuesday, December 01, 2020, 5:00pm-6:00pm  
Virtual  
Alex Kapiamba (U(M))  
*The (dis)continuity of quadratic filled Julia sets I*

Associated to every polynomial is a compact subset of the complex plane, called the filled Julia set, which is a fundamental object in understanding the dynamics of that polynomial. Douady showed that when a polynomial without parabolic cycles is perturbed, the corresponding filled Julia sets vary continuously. Over the course to two talks we will examine this phenomenon. In the first talk we will give an introductory overview of the continuity of filled Julia sets and parabolic implosion, the obstruction to continuity caused by parabolic cycles. In the second talk we will discuss the space of compact sets which arise as limits of quadratic polynomials and ongoing efforts to describe its topology.
Student Combinatorics  
**Tuesday, December 01, 2020, 5:00pm-6:00pm**  
Virtual  
Scott Neville ()  
*The RSK algorithm for longest paths*

The Robinson-Schensted-Knuth correspondence gives a very concrete algorithm for converting a permutation into a pair of Young Tableaux, from which we can extract the longest increasing subsequence of the original permutation. Fulton and Viennot's Geometric construction gives a different algorithm for producing these Young Tableaux, without so many intermediate steps. Along the way, it converts longest increasing subsequence(s) into disjoint longest paths in $\mathbb{N}^2$ (the positive integer lattice). We will go over this alternative algorithm, enjoy some of its symmetries, and (time permitting) discuss how we might recover these longest disjoint paths.

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Student Dynamics/Geometry Topology  
**Wednesday, December 02, 2020, 3:00pm-4:00pm**  
Zoom link: https://umich.zoom.us/j/94090012548 Virtual  
Yueqiao Wu (University of Michigan)  
*TBA*

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MCAIM Colloquium  
**Wednesday, December 02, 2020, 3:00pm-4:00pm**  
Zoom Meeting ID: 947 2346 1309. Zoom Link: https://umich.zoom.us/j/94723461309. Virtual  
Josselin Garnier (Ecole Polytechnique, France.)  
*Passive imaging and communication*

In this talk we consider the propagation of waves transmitted by ambient noise sources. We discuss a generalized Helmholtz-Kirchhoff identity that derives from Green's identity and Sommerfeld radiation condition. The inspection of this identity makes it possible to design passive imaging methods, i.e., imaging methods using only passive receiver arrays and ambient noise illumination. More surprisingly, it is also possible to design an original passive communication scheme between two passive arrays that uses only ambient noise illumination. The passive transmitter array does not transmit anything but it is a tunable metamaterial surface that can modulate its scattering properties and encode a message in the modulation.

Zoom Link: Join Zoom Meeting:  
https://umich.zoom.us/j/94723461309

Meeting ID: 947 2346 1309  
Passcode: 618309
We introduce refined unramified cohomology. This notion allows us to give in arbitrary degree a cohomological interpretation of the failure of integral Hodge- or Tate-type conjectures, of l-adic Griffiths groups, and of the subgroup of the Griffiths group that consists of torsion classes with trivial transcendentental Abel-Jacobi invariant. Our approach simplifies and generalizes to cycles of arbitrary codimension previous results of Bloch-Ogus, Colliot-Thélène-Voisin, Voisin, and Ma that concerned cycles of codimension two or three. We give several applications that indicate how this approach can be used to study algebraic cycles in concrete examples.

Topology
Thursday, December 03, 2020, 3:00pm-4:00pm
Virtual
Lei Chen (Caltech)
Actions of Homeo and Diffeo groups on manifolds

In this talk, I discuss the general question of how to obstruct and construct group actions on manifolds. I will focus on large groups like Homeo(M) and Diff(M) about how they can act on another manifold N. The main result is an orbit classification theorem, which fully classifies possible orbits. I will also talk about some low dimensional applications and open questions. This is a joint work with Kathryn Mann.
Differential Equations
Thursday, December 03, 2020, 4:00pm-5:00pm
Meeting ID: 983 6567 6067 Passcode: 2020 Virtual
Annalaura Stingo (UC Davis)
Almost-global well-posedness for 2d strongly-coupled wave-Klein-Gordon systems

In this talk we discuss the almost-global well-posedness of a wide class of coupled Wave-Klein-Gordon equations in 2+1 space-time dimensions, when initial data are assumed to be small and localized. The Wave-Klein-Gordon systems arise from several physical models especially related to General Relativity, but few results are known at present in lower space-time dimensions. Compared with prior related results, our novel contributions include a strong quadratic quasilinear coupling between the wave and the Klein-Gordon equation, and no restriction is made on the support of the initial data which are supposed to only have a mild decay at infinity and very limited regularity. Our proof relies on a combination of energy estimates localized to dyadic space-time regions, and pointwise interpolation type estimates within the same regions. This is akin to ideas previously used by Metcalfe-Tataru-Tohaneanu in a linear setting, and is also related to Alinhac's ghost weight method. A refinement of these estimates through different techniques will allow us to pass, in a future work, from almost global existence to global existence of solutions under the same hypothesis on the initial data. This is a joint work with M. Ifrim.

Student Commutative Algebra
Thursday, December 03, 2020, 5:00pm-6:00pm
Virtual
Katie Waddle (University of Michigan)
TBA

Representation Stability
Friday, December 04, 2020, 11:00am-11:50am
Online
Andrew Snowden (UM)
K-L theory VI: Calculations in special cases

Student Algebraic Geometry
Friday, December 04, 2020, 3:00pm-4:00pm
3096 East Hall
Jose Esparza Lozano (
Neron models
Preprint Algebraic Geometry
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Subadditivity of Kodaira dimension does not hold in positive characteristic