### Monday, September 05, 2022

12:00am-12:00am  **Complex Analysis, Dynamics and Geometry** -- Labor Day ()

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### Tuesday, September 06, 2022

3:00pm-4:00pm  **Student Commutative Algebra** -- Organizers ()

4:00pm-5:00pm  **Colloquium Series** -- Roger Casals (UC Davis) *Symplectic geometry and cluster algebras: a microlocal journey* -- 1360 East Hall

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### Wednesday, September 07, 2022

3:00pm-4:00pm  **Special Events** -- (UM) *Student Arithmetic Seminar: Planning Meeting* -- 1866 East Hall

4:00pm-5:00pm  **Algebraic Geometry** -- Daniel Bragg (University of Utah) *A Stacky Murphy’s Law for the Stack of Curves* -- 4096 East Hall

4:00pm-5:00pm  **Financial/Actuarial Mathematics** -- Bingyan Han (UM) *Distributionally robust risk evaluation with causality constraint and structural information* -- 1360 East Hall

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### Thursday, September 08, 2022

3:00pm-4:00pm  **Commutative Algebra** -- Shiji Lyu (Princeton) *Permanence properties of splinters via ultrapower* -- https://umich.zoom.us/j/96274532499 (password: algebra) Virtual East Hall

4:00pm-5:00pm  **Student Dynamics/Geometry Topology** -- DGT Organizers () *Planning meeting* -- 3096 East Hall

4:00pm-12:00am  **Arithmetic Geometry Learning** -- () *Introduction and organizational meeting* -- 4096 East Hall

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### Friday, September 09, 2022

12:00am-12:00am  **Geometry** -- Teddy Weisman (U Michigan) *Extended geometrically finite representations* -- 3866 East Hall

3:00pm-4:00pm  **Applied Interdisciplinary Mathematics (AIM)** -- () *TBA* -- 1084 East Hall

3:00pm-3:50pm  **Student Algebraic Geometry** -- () *Planning Meeting* -- 2866 East Hall
Abstracts for the week of September 4th, 2022 - September 10th, 2022

Complex Analysis, Dynamics and Geometry  
Monday, September 05, 2022, 12:00am-12:00am  
3096 East Hall  
Labor Day ()  
Have a nice day!

Student Commutative Algebra  
Tuesday, September 06, 2022, 3:00pm-4:00pm  
3866 East Hall  
Organizers ()  
Planning Meeting

Please attend to suggest a talk topic you want to hear about, or if you would like to volunteer to give a talk.

New (and old) grad students interested in Commutative Algebra, and possibly related topics like Algebraic Geometry, Number Theory, Combinatorics, Representation Theory, etc, are especially encouraged to attend! Student CA is a friendly place to learn about interesting topics in commutative algebra, and the talks are intended to be accessible to a broader algebra audience.

Colloquium Series  
Tuesday, September 06, 2022, 4:00pm-5:00pm  
1360 East Hall  
Roger Casals (UC Davis)  
Symplectic geometry and cluster algebras: a microlocal journey

We present recent developments in symplectic geometry and explain how they motivated new results in the study of cluster algebras. First, we introduce a geometric problem: the study of Lagrangian surfaces in the standard symplectic 4-ball bounding Legendrian knots in the standard contact 3-sphere. Thanks to results from the microlocal theory of sheaves, which we will survey, we then show that this geometric problem gives rise to an interesting moduli space. In fact, we establish a bridge translating geometric operations, such as Lagrangian disk surgeries, into algebraic properties of this moduli space, such as the existence of cluster algebra structures. The talk is intended for a broad mathematical audience and all key ideas will be introduced and motivated.
Special Events
Wednesday, September 07, 2022, 3:00pm-4:00pm
1866 East Hall
(UM)
Student Arithmetic Seminar: Planning Meeting

We're having our organising meeting (with cookies!!) and you all are welcome to join! Looking forward to seeing you there!

Algebraic Geometry
Wednesday, September 07, 2022, 4:00pm-5:30pm
4096 East Hall
Daniel Bragg (University of Utah)
A Stacky Murphy's Law for the Stack of Curves

We show that every Deligne-Mumford gerbe over a field occurs as the residual gerbe of a point of the moduli stack of curves. Informally, this means that the moduli space of curves fails to be a fine moduli space in every possible way. We also show the same result for a list of other natural moduli problems. This is joint work with Max Lieblich.

Financial/Actuarial Mathematics
Wednesday, September 07, 2022, 4:00pm-5:00pm
1360 East Hall
Bingyan Han (UM)
Distributionally robust risk evaluation with causality constraint and structural information

This work studies distributionally robust evaluation of expected function values over temporal data. A set of alternative measures is characterized by the causal optimal transport. We prove the strong duality and recast the causality constraint as minimization over an infinite-dimensional test function space. We approximate test functions by neural networks and prove the sample complexity with Rademacher complexity. Moreover, when structural information is available to further restrict the ambiguity set, we prove the dual formulation and provide efficient optimization methods. Empirical analysis on realized volatility and stock indices demonstrate that our framework offers an attractive alternative to the classic optimal transport formulation. The preprint is available at https://arxiv.org/abs/2203.10571
Commumative Algebra
Thursday, September 08, 2022, 3:00pm-4:00pm
https://umich.zoom.us/j/96274532499 (password: algebra) Virtual East Hall
Shiji Lyu (Princeton)
Permanence properties of splinters via ultrapower

Splinters are a class of rings that has a simple definition and plays a role in positive and mixed characteristic algebraic geometry. In this talk, we discuss how to show certain permanence properties of splinters via ultrapower, a construction deeply rooted in model theory.

Student Dynamics/Geometry Topology
Thursday, September 08, 2022, 4:00pm-5:00pm
3096 East Hall
DGT Organizers ()
Planning meeting

The planning meeting for the Fall 2022 Student DGT seminar. First years are especially encouraged to attend.

Arithmetic Geometry Learning
Thursday, September 08, 2022, 4:00pm-12:00am
4096 East Hall
() 
Introduction and organizational meeting
Convex cocompact groups are perhaps the best-behaved discrete subgroups of rank-one Lie groups, and have a variety of interesting geometric, algebraic, and dynamical properties. Anosov representations are representations of word-hyperbolic groups into arbitrary semisimple Lie groups which have proven to give a compelling generalization of convex cocompactness in higher rank.

Several (equivalent) definitions exist for an Anosov representation of a relatively hyperbolic group. However, these definitions do not include a number of examples of discrete groups with nice "geometrically finite" behavior, coming from the theory of convex projective structures. The goal of this talk is to introduce a new definition of geometrical finiteness in higher-rank which also contains these examples. I will also motivate and state a relative stability result for this class of representations.

Applied Interdisciplinary Mathematics (AIM)
Friday, September 09, 2022, 3:00pm-4:00pm
1084 East Hall
()
TBA

Student Algebraic Geometry
Friday, September 09, 2022, 3:00pm-3:50pm
2866 East Hall
()
Planning Meeting

Come to help us plan the talks for this semester! Please come with a topic you want to hear about or one you want to talk about!