### Weekly Seminar & Events Bulletin
**February 20th, 2022 - February 26th, 2022**

**Monday, February 21, 2022**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Speaker</th>
<th>Location</th>
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<tbody>
<tr>
<td>3:00pm-4:00pm</td>
<td><strong>RTG Seminar on Number Theory</strong> -- Peter Koymans (University of Michigan) TBA -- 4088 East Hall</td>
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<tr>
<td>4:00pm-5:00pm</td>
<td><strong>Integrable Systems and Random Matrix Theory</strong> -- Chiara Franceschini (Instituto Superior TÂf@cnico de Lisboa) TBA -- ZOOM ID: 926 6491 9790 Virtual</td>
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<tr>
<td>4:00pm-5:00pm</td>
<td><strong>Complex Analysis, Dynamics and Geometry</strong> -- Jacob Russell (Rice) Geometric finiteness and surface group extensions -- <a href="https://umich.zoom.us/j/97288641488">https://umich.zoom.us/j/97288641488</a> Virtual</td>
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<tr>
<td>4:00pm-5:30pm</td>
<td><strong>Donaldson-Thomas Theory</strong> -- Mircea MustaÅ…ÂľÂ„Æ’ (TBA) The Behrend function -- 4096 East Hall</td>
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<td>4:00pm-5:15pm</td>
<td><strong>RTG Representation Theory</strong> -- Karol Koziol (UM) Modular supercuspidal representations of SL2Qp -- 4088 East Hall</td>
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**Tuesday, February 22, 2022**

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<tr>
<td>4:00pm-5:00pm</td>
<td><strong>Colloquium Series</strong> -- Tasho Kaletha (University of Michigan) Representations of reductive groups over local fields -- 1360 East Hall</td>
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**Wednesday, February 23, 2022**

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<tr>
<td>4:00pm-5:20pm</td>
<td><strong>Algebraic Geometry</strong> -- Shizhang Li (UM) TBA -- 4096 East Hall</td>
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<tr>
<td>5:15pm-6:15pm</td>
<td><strong>Student Analysis</strong> -- Han Le (University of Michigan) TBA -- 3096 East Hall</td>
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**Thursday, February 24, 2022**

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<tr>
<td>12:00am-12:00am</td>
<td><strong>IBL Workshops/Lectures</strong> -- (TBA) IBL Lunch --</td>
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<tr>
<td>3:00pm-12:00am</td>
<td><strong>Topology</strong> -- Alex Suciu (Northeastern University) Cohomology jump loci of 3-dimensional manifolds -- Virtual</td>
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<tr>
<td>4:00pm-5:30pm</td>
<td><strong>Arithmetic Geometry Learning</strong> -- Siqiong Zhang (TBA) Definition and basic properties of unramified cohomology -- 4096 East Hall</td>
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<td>4:00pm-5:00pm</td>
<td><strong>Commutative Algebra</strong> -- Yevegeniya (Jenna) Tarasova (Purdue University) TBA -- Virtual</td>
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**Friday, February 25, 2022**

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<tr>
<td>1:00pm-2:00pm</td>
<td><strong>Representation Stability</strong> -- Alexandra Utiralova (MIT) TBA -- Online</td>
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<tr>
<td>3:00pm-4:00pm</td>
<td><strong>Applied Interdisciplinary Mathematics (AIM)</strong> -- Blaise Bourdin (McMaster University) Variational and phase-field models of brittle fracture: past successes and current issues -- 1084 East Hall</td>
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<tr>
<td>3:00pm-3:50pm</td>
<td><strong>Student Algebraic Geometry</strong> -- Reebhu Bhattacharyya (UM) Toric Varieties Via Examples -- 2866 East Hall</td>
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<tr>
<td>4:00pm-4:50pm</td>
<td><strong>Learning Seminar in Representation Stability</strong> -- (TBA) No Meeting. Happy March Break! -- 1866 East Hall</td>
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<tr>
<td>4:00pm-5:00pm</td>
<td><strong>Geometry</strong> -- Nattalie Tamam (U Michigan ) TBA -- 3866 East Hall</td>
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<tr>
<td>4:00pm-5:30pm</td>
<td><strong>Preprint Algebraic Geometry</strong> -- Swaraj Pande (UM) Fujita's conjecture, part II -- 4096 East Hall</td>
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[http://www.math.lsa.umich.edu/seminars_events/](http://www.math.lsa.umich.edu/seminars_events/) - Page 1/6
Abstracts for the week of February 20th, 2022 - February 26th, 2022

RTG Seminar on Number Theory
Monday, February 21, 2022, 3:00pm-4:00pm
4088 East Hall
Peter Koymans (University of Michigan)
TBA

Integrable Systems and Random Matrix Theory
Monday, February 21, 2022, 4:00pm-5:00pm
ZOOM ID: 926 6491 9790 Virtual
Chiara Franceschini (Instituto Superior Técnico de Lisboa)
TBA

Complex Analysis, Dynamics and Geometry
Monday, February 21, 2022, 4:00pm-5:00pm
https://umich.zoom.us/j/97288641488 Virtual
Jacob Russell (Rice)
Geometric finiteness and surface group extensions

Farb and Mosher defined convex cocompact subgroups of the mapping class group in analogy with convex cocompact Kleinian groups. These subgroups have since seen immense study, producing surprising applications to the geometry of surface group extension and surface bundles. In particular, Hamenstadt plus Farb and Mosher proved that a subgroup of the mapping class groups is convex cocompact if and only if the corresponding surface group extension is Gromov hyperbolic.

Among Kleinian groups, convex cocompact groups are a special case of the geometrically finite groups. Despite the progress on convex cocompactness, no robust notion of geometric finiteness in the mapping class group has emerged. Durham, Dowdall, Leininger, and Sisto recently proposed that geometric finiteness in MCG(S) might be characterized by the corresponding surface group extension being hierarchically hyperbolic instead of Gromov hyperbolic. We provide evidence in favor of this hypothesis by proving that the surface group extension of the stabilizer of a multicurve is hierarchically hyperbolic.

https://umich.zoom.us/j/97288641488

Donaldson-Thomas Theory
Monday, February 21, 2022, 4:00pm-5:30pm
4096 East Hall
Mircea Mustaţă
The Behrend function
RTG Representation Theory  
Monday, February 21, 2022, 4:00pm-5:15pm  
4088 East Hall  
Karol Koziol (UM)  
*Modular supercuspidal representations of SL2Qp*

Colloquium Series  
Tuesday, February 22, 2022, 4:00pm-5:00pm  
1360 East Hall  
Tasho Kaletha (University of Michigan)  
*Representations of reductive groups over local fields*

The classical work of Galois introduced the notion of symmetry into number theory, in the form of Galois groups acting on sets of solutions of polynomial equations. Later, Felix Klein in his Erlangen program introduced the notion of symmetry into geometry, in the form of Lie-groups acting on manifolds. The two notions of symmetry are of very different flavor -- while the Galois groups can be understood via their representations in finite-dimensional vector spaces, the representations of Lie-groups are often infinite-dimensional and require analytic techniques. Robert Langlands’ fundamental insight from the 1960s was that, despite their different nature, these two concepts of symmetry have a deep relationship rooted in arithmetic.

In this talk I will discuss progress towards understanding the representations of real and p-adic reductive Lie groups and their relation to those of the Galois groups of local fields. I will also highlight the role played by the University of Michigan over the decades in this study.

Algebraic Geometry  
Wednesday, February 23, 2022, 4:00pm-5:20pm  
4096 East Hall  
Shizhang Li (UM)  
*TBA*

Student Analysis  
Wednesday, February 23, 2022, 5:15pm-6:15pm  
3096 East Hall  
Han Le (University of Michigan)  
*TBA*
IBL Workshops/Lectures
Thursday, February 24, 2022, 12:00am-12:00am

()  
IBL Lunch

Topology
Thursday, February 24, 2022, 3:00pm-12:00am
Virtual
Alex Suciu (Northeastern University)
Cohomology jump loci of 3-dimensional manifolds

The cohomology jump loci of a space are of several types: the characteristic varieties, defined in terms of homology with coefficients in rank one local systems; the resonance varieties, constructed from information encoded in the cohomology ring; and the complements to the Bieri-Neumann-Strebel-Renz invariants, which are defined in terms of Novikov-Sikorav homology. In this talk, I will explore the geometry of these sets and the delicate interplay among them, especially in the context of compact, orientable 3-manifolds.

Arithmetic Geometry Learning
Thursday, February 24, 2022, 4:00pm-5:30pm
4096 East Hall
Siqing Zhang ()
Definition and basic properties of unramified cohomology

Commutative Algebra
Thursday, February 24, 2022, 4:00pm-5:00pm
https://umich.zoom.us/j/96274532499 (password: algebra) Virtual East Hall
Yevegeniya (Jenna) Tarasova (Purdue University)
TBA

Representation Stability
Friday, February 25, 2022, 1:00pm-2:00pm
Online
Alexandra Utiralova (MIT)
TBA
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Applied Interdisciplinary Mathematics (AIM)
Friday, February 25, 2022, 3:00pm-4:00pm
1084 East Hall
Blaise Bourdin (McMaster University)

Variational and phase-field models of brittle fracture: past successes and current issues

In this talk Dr. Bourdin will start with a modern interpretation of Griffith's classical criterion as a variational principle for a free discontinuity energy and will recall some of the milestones in its analysis. Then he will introduce the phase-field approximation per se and describe its numerical implementation. He will illustrate how phase-field models have led to major breakthroughs in the predictive simulation of fracture in complex situations. He will show how this applies to current issues, including crack nucleation in nominally brittle materials, fracture of heterogeneous materials, and inverse problems.

Hybrid: EH 1084 and via <a href="https://umich.zoom.us/j/96087798667">Zoom link</a>

Student Algebraic Geometry
Friday, February 25, 2022, 3:00pm-3:50pm
2866 East Hall
Reebhu Bhattacharyya (UM)

Toric Varieties Via Examples

Toric varieties give us an interesting class of examples of algebraic varieties where it's often easier to do explicit calculations and thus test results and theorems on. They are geometric objects defined by combinatorial information and have a rich theory of their own. In this talk, we will introduce toric varieties via examples and see some of their properties. If time permits, we may discuss some connections with symplectic geometry, namely the moment map. The talk should be accessible to anyone familiar with the notion of algebraic varieties.

Learning Seminar in Representation Stability
Friday, February 25, 2022, 4:00pm-4:50pm
1866 East Hall

No Meeting. Happy March Break!

Geometry
Friday, February 25, 2022, 4:00pm-5:00pm
3866 East Hall
Nattalie Tamam (U Michigan)

TBA
Preprint Algebraic Geometry  
Friday, February 25, 2022, 4:00pm-5:30pm  
4096 East Hall  
Swaraj Pande (UM)  
Fujita's conjecture, part II