## Weekly Seminar & Events Bulletin
### March 22nd, 2020 - March 28th, 2020

### Monday, March 23, 2020
**5:00pm-6:00pm**  
**Student Analysis** -- Malavika Mukundan (University of Michigan)  
*The Harnack Inequality* -- Online Event

### Tuesday, March 24, 2020
**4:00am-5:00am**  
**Colloquium Series** -- Sophie Morel (CNRS/ENS de Lyon)  
*Cancelled* -- 1360 East Hall

**3:00pm-4:00pm**  
**Student Geometry/Topology** -- Shubhankhar Sahai  
*TBA* -- 1866 East Hall

### Wednesday, March 25, 2020
**12:00am-5:30am**  
**RTG Seminar on Geometry, Dynamics and Topology** -- David Fisher (Indiana University)  
*Cancelled* -- 3866 East Hall

**4:00pm-5:20pm**  
**Algebraic Geometry** -- Gebhard Martin (University of Bonn)  
*CANCELED* -- 4096 East Hall

### Thursday, March 26, 2020
**3:00pm-4:00pm**  
**Commutative Algebra** -- Linquan Ma (Purdue University)  
*Singularities in mixed characteristic* -- 1866EH East Hall

**4:00pm-5:00pm**  
**Differential Equations** -- Klaus Kristen (Mathematical Reviews AMS and Baylor University)  
*Spectral zeta functions, conformal transformations and gluing formulas* -- 4088 East Hall

### Friday, March 27, 2020
**12:00am-12:00am**  
**Geometry** -- David Fisher (Indiana University)  
*Cancelled* -- 3866 East Hall

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

**4:00pm-5:00pm**  
**Junior Colloquium Series** -- Kevin Nowland and Benjamin Campbell (Cover My Meds)  
*Invitations to Industry series* -- 1068 East Hall
Abstracts for the week of March 22nd, 2020 - March 28th, 2020

Student Analysis
Monday, March 23, 2020, 5:00pm-6:00pm
Online Event
Malavika Mukundan (University of Michigan)
The Harnack Inequality

This talk will be held via Canvas conferences. Please contact the speaker for instructions on how to access the talk. An abstract is included here as a pdf.

Student Geometry/Topology
Tuesday, March 24, 2020, 3:00pm-4:00pm
1866 East Hall
Shubhankhar Sahai
TBA

Colloquium Series
Tuesday, March 24, 2020, 4:00pm-5:00pm
1360 East Hall
Sophie Morel (CNRS/ENS de Lyon.)
Cancelled

RTG Seminar on Geometry, Dynamics and Topology
Wednesday, March 25, 2020, 12:00pm-5:30pm
3866 East Hall
David Fisher (Indiana University)
cancelled

Algebraic Geometry
Wednesday, March 25, 2020, 4:00pm-5:20pm
4096 East Hall
Gebhard Martin (University of Bonn)
CANCELED
Commutative Algebra
Thursday, March 26, 2020, 3:00pm-4:00pm
1866EH East Hall
Linquan Ma (Purdue University)
*Singularities in mixed characteristic*

We discuss recent work on singularities and birational geometry in mixed characteristic. We introduce mixed characteristic versions of klt/plt singularities and multiplier/adjoint ideals, prove their analogous properties, and compare them with the existing equal characteristic singularities. The theory relies on Andre and Gabber's recent work on the existence of weakly functorial perfectoid big Cohen–Macaulay algebras that factor through the absolute integral closure. We then discuss applications, which include a uniform version of the Briancon-Skoda theorem and a klt/plt adjunction for threefolds in mixed characteristic. This talk is based on joint work in progress with Karl Schwede, Kevin Tucker, Joe Waldron and Jakub Witaszek.

Differential Equations
Thursday, March 26, 2020, 4:00pm-5:00pm
4088 East Hall
Klaus Kristen (Mathematical Reviews AMS and Baylor University)
*Spectral zeta functions, conformal transformations and gluing formulas*

Let $M_1$ and $M_2$ be two Riemannian manifolds each of which have the boundary $N$. Consider the Laplacian on $M_1$ and $M_2$ augmented with Dirichlet boundary conditions on $N$. A natural question to ask is if there is any relation between spectral properties of the Laplacian on $M_1$, $M_2$, and the Laplacian on the manifold $M$ (without boundary) obtained gluing together $M_1$ and $M_2$, namely $M = M_1 \cup N M_2$. Using spectral zeta functions, a partial answer is given by the Burghelea-Friedlander-Kappeler-gluing formula for zeta-determinants. This formula contains an (in general) unknown polynomial which is completely determined by some data on a collar neighborhood of the hypersurface $N$. I will use conformal transformations to understand the geometric content of this polynomial. The understanding obtained will pave the way for a fairly straightforward computation of the polynomial (at least for low dimensions of $M$). Furthermore it leads to a partial understanding of the heat invariant for the Dirichlet-to-Neumann map, that is for the Steklov problem.

Geometry
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