### Weekly Seminar & Events Bulletin
#### September 13th, 2020 - September 19th, 2020

**Monday, September 14, 2020**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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| 4:00pm-5:00pm | **Algebraic Topology**  
Dan Isaksen (Wayne State University) *Deformations of stable homotopy theory*  
-- online Virtual |
| 6:30pm-7:30pm | **Quant Program Practitioner**  
Xiaoxiao Tang (PwC) *Quant Virtual Happy Hour* - Xiaoxiao Tang, PwC  
-- Virtual |
| 7:00pm-8:00pm | **Student Math Finance**  
Dominykas Norgilas (University of Michigan) *On the compensator in the  
Doob-Meyer decomposition of the Snell envelope*  
-- https://umich.zoom.us/j/99487325343 Virtual |

**Tuesday, September 15, 2020**

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| 1:00pm-2:30pm | **IBL Workshops/Lectures**  
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| 4:00pm-5:00pm | **Colloquium Series**  
Martin Hairer (Imperial College London) *Taming infinities*  
-- Zoom: 944 9810 4413, Password: 724688 East Hall |

**Wednesday, September 16, 2020**

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| 5:00pm-6:00pm | **Algebraic Geometry**  
Jakub Witaszek (University of Michigan) *Keel's theorem and quotients in mixed  
characteristic*  
-- Zoom |

**Friday, September 18, 2020**

<table>
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<th>Time</th>
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| 11:00am-11:50am | **Representation Stability**  
Jenny Wilson (UM) *Buildings II: The definition of a building*  
-- Online |
| 3:00pm-4:00pm | **Combinatorics**  
Terrence George (University of Michigan) *Dimers and Beauville systems*  
-- Virtual |
| 4:00pm-5:00pm | **Preprint Algebraic Geometry**  
Bhargav Bhatt () *Drinfeld's refinement of the Deligne-Illusie theorem*  
-- Zoom |

**Saturday, September 19, 2020**

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| 10:00am-11:00am | **Quant Program Practitioner**  
Xinye Xu (CITIC Securities) *Quant Virtual Coffee Chat* - Xinye Xu,  
CITIC Securities  
-- Virtual |
Algebraic Topology  
**Monday, September 14, 2020, 4:00pm-5:00pm**
*online Virtual*
Dan Isaksen (Wayne State University)

*Deformations of stable homotopy theory*

This talk will attempt to give a philosophical explanation of the observation that C-motivic stable homotopy theory is a surprisingly effective tool in the study of the classical stable homotopy groups. The main point is that 2-complete cellular C-motivic stable homotopy theory is a "deformation" whose generic fiber is classical stable homotopy theory and whose special fiber is an algebraic category. Naturality allows us to transport information effectively between the C-motivic, classical, and algebraic contexts.

I will discuss another deformation of classical stable homotopy theory that also has implications for the computation of classical stable homotopy groups. Unlike C-motivic homotopy theory, this deformation is constructed without reference to any underlying geometry.

Quant Program Practitioner  
**Monday, September 14, 2020, 6:30pm-7:30pm**
*Virtual*
Xiaoxiao Tang (PwC)

*Quant Virtual Happy Hour - Xiaoxiao Tang, PwC*

https://umich.zoom.us/j/92590167250

Student Math Finance  
**Monday, September 14, 2020, 7:00pm-8:00pm**
*https://umich.zoom.us/j/99487325343 Virtual*
Dominykas Norgilas (University of Michigan)

*On the compensator in the Doob-Meyer decomposition of the Snell envelope*

We revisit the classical optimal stopping problem in the Markovian setting, and give sufficient conditions for the value function to belong to the domain of the extended generator of the underlying Markov process. It turns out that this follows from the more general result regarding the Doob-Meyer decomposition of the Snell envelope process. Finally we consider some applications.
IBL Workshops/Lectures
Tuesday, September 15, 2020, 1:00pm-2:30pm
Virtual

IBL Lunch

The first IBL lunch will take place (virtually) Tuesday, September 15th from 1-2:30PM.

Come join us to socialize and chat about how the first weeks of the semester have been.

We will be meeting on Gather Town.

Link: https://gather.town/PRhLEEe4hQy1V3rk/IBL_Lunch

Password: wolverine20

If you are unable to enter the meeting, email Anna Weigandt (weigandt@umich.edu) and join this Zoom link instead:

https://umich.zoom.us/j/95947883373?pwd=TVM3RUFUeWE2TzJ0Q1VDQzNxb0pEUT09

Hope to see you there!

Anna Weigandt and Sunita Chepuri

Colloquium Series
Tuesday, September 15, 2020, 4:00pm-5:00pm
Zoom: 944 9810 4413, Password: 724688 East Hall
Martin Hairer (Imperial College London)
Taming infinities

Some physical and mathematical theories have the unfortunate feature that if one takes them at face value, many quantities of interest appear to be infinite! What's worse, this doesn't just happen for some exotic theories, but in the standard theories describing some of the most fundamental aspects of nature. Various techniques, usually going under the common name of "renormalisation" have been developed over the years to address this, allowing mathematicians and physicists to tame these infinities. We will tip our toes into some of the conceptual and mathematical aspects of these techniques and we will see how they have recently been used in probability theory to study equations whose meaning was not even clear until now.
Algebraic Geometry  
**Wednesday, September 16, 2020, 5:00pm-6:00pm**  
**Zoom**  
Jakub Witaszek (University of Michigan)  
*Keel's theorem and quotients in mixed characteristic*

In trying to understand characteristic zero varieties one can apply a wide range of techniques coming from analytic methods such as vanishing theorems. More complicated though they are, positive characteristic varieties come naturally with the Frobenius action which sometimes allows for imitating analytic proofs or even showing results which are false over complex numbers. Of all the three classes, the mixed characteristic varieties are the most difficult to understand as they represent the worst of both worlds: one lacks the analytic methods as well the Frobenius action. What is key for many applications of Frobenius in positive characteristic (to birational geometry, moduli theory, constructing quotients, etc.) is the fact that every universal homeomorphism of algebraic varieties factors through a power of Frobenius. In this talk I will discuss an analogue of this fact (and applications thereof) in mixed characteristic.

Representation Stability  
**Friday, September 18, 2020, 11:00am-11:50am**  
**Online**  
Jenny Wilson (UM)  
*Buildings II: The definition of a building*

Combinatorics  
**Friday, September 18, 2020, 3:00pm-4:00pm**  
**Virtual**  
Terrence George (University of Michigan)  
*Dimers and Beauville systems*

I will describe the dimer integrable systems and how they are birational to certain integrable systems of Beauville associated to toric surfaces. Based on joint work with Alexander Goncharov and Richard Kenyon.

Preprint Algebraic Geometry  
**Friday, September 18, 2020, 4:00pm-5:00pm**  
**Zoom**  
Bhargav Bhatt ()  
*Drinfeld's refinement of the Deligne-Illusie theorem*
Quant Program Practitioner
Saturday, September 19, 2020, 10:00pm-11:00pm
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Xinye Xu (CITIC Securities)
Quant Virtual Coffee Chat - Xinye Xu, CITIC Securities

https://umich.zoom.us/j/98413272924

Sunday, September 20 at 10:00 AM China Standard Time