## CALENDAR

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<tr>
<th>Date</th>
<th>Event</th>
<th>Time</th>
<th>Place</th>
<th>Speaker</th>
<th>Title</th>
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<td>Wednesday, January 21</td>
<td>Seminar in Free Probability and Random Matrices</td>
<td>4:30 p.m.</td>
<td>Jeffery 422</td>
<td>Jamie Mingo, Queen’s University</td>
<td>Second Order Cumulants for Partially Transposed Wishart Matrices, II</td>
<td>Attached</td>
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<td>Thursday, January 22</td>
<td>CYMS Seminar</td>
<td>12:30 p.m.</td>
<td>Jeffery 422</td>
<td>Andrija Perunicic, Queen’s University</td>
<td>Point counting à la Dwork</td>
<td>Attached</td>
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<td>Thursday, January 22</td>
<td>Math Club</td>
<td>5:30 p.m.</td>
<td>Jeffery 118</td>
<td>Mike Roth, Queen’s University</td>
<td>The number 142857</td>
<td>Attached</td>
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<td>Friday, January 23</td>
<td>Number Theory Seminar</td>
<td>9:30 a.m.</td>
<td>Jeffery 422</td>
<td>Hector Pasten, Harvard University</td>
<td>Should Zbe Diophantine in Q?</td>
<td>Attached</td>
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<td>Friday, January 23</td>
<td>Special Colloquium</td>
<td>2:30 p.m.</td>
<td>Jeffery 234</td>
<td>Helen Alexander, ETH Zurich</td>
<td>Applying Stochastic processes to study Pathogen Evolutionary Dynamics</td>
<td>Attached</td>
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Items for the Info Sheet should reach Anne (burnsa@mast.queensu.ca) by noon on Monday. The Info Sheet is published every Tuesday.

**Wednesday, January 21, 4:30 p.m. Jeffery 422**  
**Seminar in Free Probability and Random Matrices**  
Speaker: Jamie Mingo  
Title: Second Order Cumulants for Partially Transposed Wishart Matrices, II

**Abstract:** I will continue from last week.

**Thursday, January 22, 12:30 p.m. Jeffery 422**  
**CYMS Seminar**  
Speaker: Andrija Perunicic  
Title: Point counting à la Dwork

**Abstract:** I will discuss how to count points via trace of Frobenius in the Berglund-Hubsch duality setting.

**Thursday, January 22, 5:30 p.m. Jeffery 118**  
**Math Club**  
Speaker: Mike Roth  
Title: The number 142857

**Abstract:** This talk will discuss the magic property of the number 142857 and resulting questions.
Number Theory Seminar
Friday, January 23, 9:30 p.m. Jeffery 422
Speaker: Hector Pasten
Title: Should $\mathbb{Z}$ be Diophantine in $\mathbb{Q}$?

Abstract: In this talk I will try to convince you that the answer to the question in the title is "no".

Special Colloquium
Friday, January 23, 2:30 p.m. Jeffery 234
Speaker: Helen Alexander
Title: Applying Stochastic Processes to study Pathogen Evolutionary Dynamics

Abstract: I will give an overview of my research in the area of mathematical biology. I primarily study the dynamics of biological populations, with a particular focus on pathogens (infectious disease agents such as bacteria and viruses). An overarching goal is to understand the factors that influence whether a population successfully adapts to a new environment, to which it is initially poorly suited and thus at risk of extinction. This situation creates an interesting interplay between demographic dynamics (changes in population size) and evolutionary dynamics (changes in frequency of genetic variants) in a stochastic regime. I draw on past work for a number of examples in infectious disease contexts, such as the adaptation of a pathogen to a new host species or the adaptation of HIV to avoid immune recognition. In particular, I will discuss in detail a stochastic model for the emergence of drug resistance in viral infections, thus illustrating techniques of mathematical analysis. I will conclude by mentioning other current research directions (particularly statistical inference of population dynamic parameters from phylogenetic trees) and future research directions extending my work on pathogen adaptation.