



March 15, 2011

QUEEN'S UNIVERSITY AT KINGSTON  
Department of Mathematics and Statistics  
<http://www.mast.queensu.ca>

CALENDAR		
Wednesday, March 16	Curves Seminar  Time: 4:00 p.m. – 5:30 p.m. Place: Jeffery 319	Speaker: Mike Roth Title: Syzygies of algebraic varieties IV  <b>Abstract Attached</b>
Thursday, March 17	Math Club  Time: 5:30 p.m. – 6:30 p.m. Place: Jeffery 118	Speaker: Jamie Thind Title: How old is the Earth?  <b>Abstract Attached</b>
Friday, March 18	Number Theory Seminar  Time: 11:30 a.m. – 12:20 p.m. Place: Jeffery 422	Speaker: Michael Dewar, Queen's University Title: Higher Level Eisenstein Series  <b>Abstract Attached</b>
Friday, March 18	Department Colloquium  Time: 2:30 p.m. – 3:30 p.m. Place: Jeffery 234	Speaker: Tom Albers, University of Toronto Title: Polymers in Probability: Bridges, Brownian Motion, and Disorder on an Intermediate Scale  <b>Abstract Attached</b>

Items for the Info Sheet should reach Anne (burnsa@mast.queensu.ca) by noon on Monday. The Info Sheet is published every Tuesday.

**Wednesday, March 16, 4:00 p.m. Jeffery 319**

**Curves Seminar**

Speaker: Mike Roth

Title: Syzygies of algebraic varieties IV

**Abstract:** We will compute several examples of resolutions, and discuss the dictionary between ----- graded modules and sheaves on projective space.

**Thursday, March 17, 5:30 p.m. Jeffery 118**

**Math Club**

Speaker: Jamie Thind

Title: How old is the Earth?

**Abstract:** When Darwin proposed his Theory of Natural Selection, he realised that natural selection required the earth be much older than most people in the 19th Century believed it to be. Geologists of the time also thought it likely that the earth was much older than people believed.

Not long after Darwin proposed his theory, Lord Kelvin gave one of the first reasonable estimates for the age of the earth. Kelvin took a new approach to approximating the age of the earth, by treating the earth as an cooling sphere, and studying the corresponding heat equation. The temperature of a cooling object is a function of both position and time. The heat equation is a partial differential equation that describes the heat flow of such an object (in this case a sphere). In this talk we will discuss Kelvin's approach to estimating the age of the earth, as well as the heat equation and its solution.

**Friday, March 18, 11:30 a.m. Jeffery 422**

**Number Theory Seminar**

Speaker: Higher Level Eisenstein Series

Title: Higher Level Eisenstein Series

**Abstract:** We construct explicit bases for the Eisenstein spaces of modular forms of levels greater than one. No knowledge of modular forms is assumed.

**Friday, March 18, 2:30 p.m. Jeffery 234**

**Department Colloquium**

Speaker: Tome Alberts

Title: Polymers in Probability: Bridges, Brownian Motion, and Disorder on an Intermediate Scale

**Abstract:** Chemical polymers are long chains of molecules built up from many individual monomers. Examples are plastics (like polyester and PVC), biopolymers (like cellulose, DNA, and starch) and rubber. By some estimates over 60% of research in the chemical industry is related to polymers. The complex shapes and seemingly random dynamics inherent in polymer chains make them natural candidates for mathematical modelling. The probability and statistical physics literature abounds with polymer models, and while most are simple to understand they are notoriously difficult to analyze.

In this talk I will describe the general flavor of polymer models and then speak more in depth on my own recent results for two specific models. The first is the self-avoiding walk in two dimensions, which has recently become amenable to study thanks to the invention of the Schramm-Loewner Evolution. Joint work with Hugo-Duminil Copin shows that a specific feature of the self-avoiding walk, called the bridge decomposition, carries over to its conjectured scaling limit, the SLE(8/3) process. The second model is for directed polymers in dimension 1+1. Recent joint work with Kostya Khanin and Jeremy Quastel shows that this model can be fully understood when one considers the polymer in the previously undetected "intermediate" disorder regime. This work ultimately leads to the construction of a new type of diffusion process, similar to but actually very different from Brownian motion.