



February 1, 2011

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

CALENDAR		
Wednesday, February 2	Curves Seminar Time: 4:00 p.m. – 5:30 p.m. Place: Jeffery 319	Does not meet this week due to departmental meeting.
Wednesday, February 2	Department Meeting Time: 3:30 p.m. Place: Jeffery 234	Agenda circulated
Thursday, February 3	Math Club Time: 5:30 p.m. – 6:30 p.m. Place: Jeffery 118	Speaker: Mike Roth Title: Stacking Cannonballs <b>Abstract Attached</b>
Friday, February 4	Number Theory Seminar Time: 11:30 a.m. – 12:20 p.m. Place: Jeffery 422	Speaker: Ram Murty, Queen's University Title: Grimm's Conjecture and Smooth Numbers, II <b>Abstract Attached</b>
Friday, February 4	Department Colloquium Time: 2:30 p.m. – 3:30 p.m. Place: Jeffery 234	Speaker: Harm Derksen, University of Michigan Title: Counting Subrepresentations of Quivers <b>Abstract Attached</b>
Monday, February 7	Algebraic Geometry Seminar Time: 4:30 p.m. – 5:30 p.m. Place: Jeffery 319	Speaker: Tomoo Matsumura, Cornell University Title: Hamiltonian Torus Actions on Orbifolds <b>Abstract Attached</b>
Tuesday, February 8	Seminar on Random Matrices and Free Probability Time: 4:30 p.m. – 6:00 p.m. Place: Jeffery 101	Speaker: Noriyoshi Sakuma, Keio University Title: A new limit theorem related to free multiplicative convolution <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.

**Thursday, February 3, 5:30 p.m. Jeffery 118**

Speaker: Mike Roth  
Title: Stacking Cannonballs

**Math Club**

**Abstract:** This talk will focus on several problems with the theme of stacking -- in three dimensions and higher.

**Friday, February 4, 11:30 a.m. Jeffery 422**

Speaker: Ram Murty  
Title: Grimm's Conjecture and Smooth Numbers, II

**Number Theory Seminar**

**Abstract:** This is a continuation of my talk two weeks ago about Grimm's conjecture and its relationship with smooth numbers and gaps between consecutive primes.

**Friday, February 4, 2:30 p.m. Jeffery 234**

**Department Colloquium**

Speaker: Harm Derksen

Title: Counting Subrepresentations of Quivers

**Abstract:** A quiver is just a directed graph. If we attach vector spaces to the vertices and linear maps to the arrows we get a representation of that quiver. For a given representation one can count how many subrepresentations that representation has with fixed dimensions at each vertex. If we have infinitely many subrepresentations, we can take the Euler characteristic of the variety of subrepresentations. These numbers have interesting interpretations in Schubert Calculus and the theory of cluster algebras.

**Monday, February 7, 4:30 p.m. Jeffery 319**

**Algebraic Geometry Seminar**

Speaker: Tomoo Matsumura

Title: Hamiltonian Torus Actions on Orbifolds

**Abstract:** When a symplectic manifold  $M$  carries a Hamiltonian torus  $R$  action, the injectivity theorem states that the  $R$ -equivariant cohomology of  $M$  is a subring of the one of the fixed points and the GKM theorem allows us to compute this subring by only using the data of 1-dimensional orbits. The results in the first part of this talk are a generalization of this technique to Hamiltonian  $R$  actions on orbifolds and an application to the computation of the equivariant cohomology of compact toric orbifolds. In the second part, we will introduce the equivariant Chen-Ruan cohomology ring which is a symplectic invariant of the action on the orbifold and explain the injectivity/GKM theorem for this ring.

**Tuesday, February 8, 4:30 p.m. Jeffery 101**

**Seminar on Random Matrices and Free Probability**

Speaker: Noriyoshi Sakuma

Title: A new limit theorem related to free multiplicative convolution

Let  $\boxplus$ ,  $\boxtimes$  and  $\cup$  be the free additive, free multiplicative, and boolean additive convolutions. For a probability measure  $\mu$  on  $\mathbb{R}^+$  with second moment, we find a scaling limit of  $(\mu^{\boxtimes N})^{\boxplus N}$  as  $N$  goes to infinity. The  $R$ -transform of the limit distribution can be represented by the Lambert's  $W$  function and the distribution is a free compound distribution. We also find similar limit theorem by replacing the free additive convolution by the Boolean convolution. This talk is based on joint work with Hiroaki Yoshida of Ochanomizu University.