



# INFO SHEET

November 1, 2011

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

CALENDAR		
<b>Tuesday, November 1</b>	<b>Discrete Mathematics Seminar</b>  Time: 3:30 p.m. – 4:30 p.m. Place: Jeffery 115	<b>Speaker:</b> David Gregory, Queen's University <b>Title:</b> Expressing graphs in terms of complete bipartite  <b>Abstract Attached</b>
<b>Wednesday, November 2</b>	<b>Department Meeting</b>  Time: 3:30 p.m. Place: Jeffery 234	Agenda has been circulated.
<b>Friday, November 4</b>	<b>Number Theory Seminar</b>  Time: 11:30 a.m. – 12:20 p.m. Place: Jeffery 422	<b>Speaker:</b> Michael Dewar, Queen's University <b>Title:</b> The Hardy-Ramanujan formula without the circle method  <b>Abstract Attached</b>
<b>Friday, November 4</b>	<b>Department Colloquium</b>  Time: 2:30 p.m. Place: Jeffery 234	<b>Speaker:</b> Shahla Molahjloo, Queen's University <b>Title:</b> Diagonalization of Weyl Transforms and Heat Equations for Time-Dependent Hermite Operators  <b>Abstract Attached</b>
<b>Monday, November 7</b>	<b>Algebraic Geometry Seminar</b>  Time: 4:30 p.m. – 5:30 p.m. Place: Jeffery 319	<b>Speaker:</b> Mike Roth, Queen's University <b>Title:</b> Diophantine approximation and the Seshadri Constant  <b>Abstract Attached</b>
<b>Monday, November 7</b>	<b>Seminar in Free Probability and Random Matrices</b>  Time: 4:30 p.m. – 6:00 p.m. Place: Jeffery 422	<b>Speaker:</b> Mihai Popa, Queen's University <b>Title:</b> Non-Commutative Functions: Basic Theory and Applications in Free Probability  <b>Abstract Attached</b>
<b>Friday, November 18</b>	<b>Conference Room</b>  Time: 9:30 a.m. Place: Jeffery 521	<b>Ph.D. Student:</b> Jianfeng Xu <b>Title:</b> Statistical Modeling and Analysis for Survival Data with a Cure Fraction  <b>Supervisor:</b> P. Peng

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

## Tuesday, November 1, 3:30 p.m. Jeffery 115

Speaker: David Gregory

Title: Expressing graphs in terms of complete bipartite graphs

## Discrete Mathematics Seminar

**Abstract:** The following interesting problem (reworded) was posed by Niel de Beudrap on the internet.

Given a labelled graph  $G$ , express its edge-set as a symmetric difference of the edge-sets of complete bipartite graphs. We may ask for a minimum such decomposition by different ways:

1. each term has equal weight, or

2. a weight equal to the number of vertices it contains.  
We ask for the smallest total weight of such a decomposition.

When the complete bipartite graphs are constrained to be edge-disjoint, case 1 first arose in work of Graham and Pollak on routing packets of information through a network while case 2 was examined by Chung, Erdos and Spencer.

In the talk, the vertex addressing technique of Graham and Pollak will be reviewed and an exact formula will be obtained for case 1 of de Beaudrap's problem when the graph  $G$  is bipartite.

Seminar notes will be posted on Tuesday at <http://www.mast.queensu.ca/~gregoryd/>

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

**Number Theory Seminar**

Speaker: Michael Dewar

Title: The Hardy-Ramanujan formula without the circle method

**Abstract:** In 1918, Hardy and Ramanujan published an asymptotic formula for the partition function. They invented the "circle method" for their proof. We give a new proof for the Hardy-Ramanujan asymptotic which does not use the circle method. Our proof uses a recent algebraic formula for the partition function by Bruinier and Ono. This is joint work with Ram Murty.

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

**Department Colloquium**

Speaker: Shahla Molahajloo

Title: Diagonalization of Weyl Transforms and heat Equations for Time-Dependent Hermite Operators

**Abstract:** Weyl transforms with radial symbols are diagonalized in terms of explicit formulas for the eigenvalues with respect to the Hermite basis for  $L^2(\mathbb{R})$ . The exact solutions of heat equations governed by time-dependent Hermite operators are analyzed in detail. Formulas for the heat kernels of these time-dependent Hermite operators are derived.

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

**Algebraic Geometry Seminar**

Speaker: Mike Roth

Title: Diophantine approximation and the Seshadri Constant

**Abstract:** This is a report on joint work in progress with David McKinnon. The basic idea is to generalize the classic questions about diophantine geometry to algebraic varieties. Given a point  $x$  on a variety  $X$  defined over  $\mathbb{Q}$ , and an ample line bundle  $L$  on  $X$  (used as a "gauge"), we define a constant measuring the difficulty of approximating  $x$  by nearby rational points. What is surprising is that this approximation constant is closely related to a purely geometric notion -- the Seshadri constant -- measuring local positivity of a line bundle. This provides a new point of view on approximation questions, and also hints at possible local approaches to global arithmetic conjectures due to Bombieri-Lang or Batyrev-Manin.

**Monday, November 7, 4:30 p.m. Jeffery 422**

**Seminar in Free Probability and Random Matrices**

Speaker: Mihai Popa

Title: Non-Commutative Functions: Basic Theory and Applications in Free Probability

**Abstract:** The lecture will present the basics of non-commutative functions calculus together with some motivation from free probability. We will emphasize the properties of operational distributions and the use of non-commutative Cauchy transform.