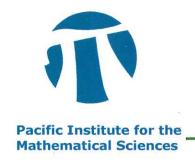
Mathematics & Computer Science, University of Lethbridge



## PIMS Distinguished Speakers Series

## Nassif Ghoussoub University of British Columbia

Title: A symmetric Monge-Kantorovich theory and applications

Given a probability measure  $\mu$  on a domain  $\Omega \subset \mathbb{R}^d$ , we consider the symmetric version of the Monge-Kantorovich theorem on the product space  $\Omega^N$ , where the cost function c is symmetric and all the prescribed marginals are equal to  $\mu$ . We show that the supremum is attained on a probability measure that is supported on the graph of functions of the form  $x \to (x, Sx, S^2x, ..., S^{N-1}x)$ , where S is a  $\mu$ -measure preserving transformation on  $\Omega$  such that  $S^N = I$  a.e. The result applies in particular to the case where c is given by the Newtonian potential associated to N electrons. It then yields the existence of "co-motion" functions that correspond to an interacting energy functional for "strictly correlated electrons". In another application, the result yields that for any integer N, essentially any non-degenerate vector field from  $\Omega$  into  $\mathbb{R}^d$  is N-cyclically monotone up to a measure preserving N-involution. This is joint work with Abbas Moameni.

Friday-February 8, 2013

12:00 to 1:00 p.m.-presentation

1:00 to 1:50 p.m.-reception

UHall B650