



Pacific Institute for the
Mathematical Sciences

PIMS Distinguished Speakers Series

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Mathematical and Statistical Sciences

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Title: *Multi-marginal optimal transport*

Abstract: Optimal transport is a problem first considered by Monge in 1781. Given a distribution of mines over a landscape, producing (say) iron, a distribution of factories over that same landscape, consuming iron, and a transport cost (x,y) to move one unit of iron from mine x to factory y , the problem is to move the iron from the mines to the factories as efficiently as possible. This simple problem has exploded over the past 25 years, and has many deep connections with PDEs, probability, geometric inequalities, economics, etc.

Abstractly, this is the problem of coupling two probability distributions (often called *marginals*) together to maximize efficiency. Recently, interest has arisen in *multi-marginal* optimal transport, which is the problem of aligning three or more probability distributions as efficiently as possible. The growth in this area has been driven by emerging applications, in, for example, matching problems in economics and electronic correlations in physics.

I intend to give an overview of what is known about both the two marginal and multi-marginal problems, with special emphasis on how the multi-marginal theory diverges from the two marginal cases.

Friday—April 11, 2014

12:00 to 12:50 p.m.

UHall D630