

## Department of Mathematics & Statistics

### GRADUATE STUDENT SEMINAR

**Speaker:** Luis Diego León Chi

**Title:** *Scaling limit of loop-erased random walk in  $d = 2$*

**Date:** April 27, 2007

**Time:** 9.30 am

**Location:** College West 307.20

**Abstract:** The loop-erased random walk (LERW) was first studied in 1980 by Lawler as an attempt to analyze the self-avoiding walk (SAW), which provides a model for a polymer molecule with excluded volume. The self-avoiding walk is simply a path on a lattice that does not visit the same site more than once. Proving things about the collection of all such paths is a formidable challenge to rigorous mathematical methods. Eventually, it was discovered that SAW and LERW are in different universality classes.

LERW existed as an interesting mathematical idea without any applicability until 1996, when Wilson discovered its use in finding spanning trees of graphs in an efficient way. This model has continued to receive attention in recent years, in part because of connections with uniform spanning trees (UST).

In 1999, Schramm introduced this one-parameter family of random growth processes based on Loewner's differential equation. This process is called the stochastic (or Schramm–Loewner) evolution  $SLE_\kappa$  where the parameter  $\kappa$  is the time scaling constant for the driving Brownian motion.

It was originally conjectured that the scaling limit of LERW in  $d = 2$  was  $SLE_2$ , and this conjecture was proved to be equivalent to the conformality of the LERW scaling limit.

In 2002 Lawler, Schramm and Werner established this conjecture and showed that the scaling limit of LERW in a simply connected domain  $D$ , where  $D \neq \mathbb{C}$ , is equal to radial  $SLE_2$  path.

**Supervisor:** M Kozdron

*Coffee & cookies will be served in the Lounge prior to the lecture*