The **TLA**s of the Conformally Invariant World

This will be an introduction to many of the important **TLA**s (three-letter acronyms; OK, some of them are four-letter) in the conformally invariant world. I give an outline below. Besides the prerequisites for the summer school, I will also be assuming familiarity with the following: Brownian motion and loop measure, Loewner differential equation, stochastic integral, Itô's formula, Girsanov theorem. I expect these topics to be covered in a combination of the main lectures of the first week and special afternoon sessions. However, participants may wish to read up some beforehand, especially the techniques of stochastic calculus.

- Lecture I: I will discuss several lattice models: **SRW** (simple random walk), **RWLM** (random walk loop measure), **LERW** (loop-erased random walk), **SAW** (self-avoiding walk), and λ-**SAW** (Lambda self-avoiding walk). These will give good intuition for understanding the nature of **SLE** (Schramm-Loewner Evolution).
- Lecture II: The definition of **SLE** and some of its major properties: existence as a curve, fractal dimension, phases, restriction to smaller domains. Relationship with BLM (Brownian loop measure). This lecture will focus on statements of results.
- Lecture III: Here I will demonstrate how to use stochastic calculus, in particular, Itô's formula, Girsanov theorem, and time changes, to prove results about **SLE**. I will take one or two results from Lecture II and explain the proofs in some detail.
- Lecture IV: **GFF** (Gaussian Free Field). I will define the **GFF** in both the discrete and continuous settings and give at least one coupling between **GFF** and **SLE**.
- Lecture V: LQG (Liouville Quantum Gravity), also known as **GMC** (Gaussian Multiplicative chaos) and Minkowski content. These are fractal measures arising from **GFF** and **SLE**.