Monday

9:30-10:30 Chuck Newman - Ground States of the Two-Dimensional Spin Glass

11-12 Christian Houdre - Asymptotics for the length of the longest common and increasing subsequence.

2-3 Scott McKinley - Anomalous Diffusion and the Microrheology of Biological Media

3:30-4:30 – Alexi Borodin - Directed random polymers and Macdonald processes

Tuesday

9 -10 Sandra Cerrai - On the averaging principle for systems of stochastic partial differential equations

10:30-11:30 Prasad Tetali - An interpolation method for scaling limits in sparse random graphs

1-2 Laurent Saloff Coste – Random walks driven by spread out measures

Abstracts:

Newman: This is joint work with Louis-Pierre Arguin, Michael Damron and Dan Stein.
It is an open problem to determine the number of infinite-volume ground states in the Edwards-Anderson (nearest neighbor) spin glass model on Z^d for d \geq 2 (with, say, mean zero Gaussian couplings). This is a limiting case of the problem of determining the number of extremal Gibbs states at low temperature. In both cases, there are competing conjectures for d \geq 3, but no complete results even for d=2. I report on results which go some way toward proving that (with zero external field, so that ground states come in pairs, related by a global spin flip) there is only a single ground state pair (GSP). Our result is weaker in two ways: First, it applies not to the full plane $Z^{\wedge 2}$, but to a half-plane. Second, rather than showing that a.s. (with respect to the quenched random coupling realization J) there is a single GSP, we show that there is a natural joint distribution on J and GSP's such that for a.e. J, the conditional distribution on GSP's given J is supported on only a single GSP. The methods used combine percolation-like geometric arguments with translation invariance (in one of the two coordinate directions of the half-plane) and uses as a main tool the ``excitation metastate'' which is a probability measure on GSP's and on how they change as one or more individual couplings vary.

Borodin: The goal of the talk is to survey recent progress in understanding statistics of certain exactly solvable growth models, particle systems, directed polymers in one space dimension, and stochastic PDEs. A remarkable connection to representation theory and integrable systems is at the heart of Macdonald processes, which provide an overarching theory for this solvability. This is based on joint work with Ivan Corwin.

Saloff-Coste: I will describe problems concerning random walks on groups that are driven by measures with large support. The simplest model of this is random walk on the integers driven by a power law. Many interesting problems arise for more general groups.