Analysis Seminar

"Directed polymers on a disordered tree with a defect subtree"

By
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Abstract: The question of how the competition between *bulk disorder* and a *localized microscopic defect* affects the macroscopic behavior of a system is an important and interesting problem in statistical physics. We study this problem in the directed polymer context at the free energy level.
We consider the directed polymer model on a disordered *d*-ary tree and represent the localized microscopic defect by modifying the disorder distribution at each vertex in a single path (branch), or in a subtree, of the tree. The polymer must choose between following the microscopic defect and finding the best branches through the bulk disorder. We describe three possible phases, called the *fully pinned, partially pinned* and *depinned* phases. When the microscopic defect is associated only with a single branch, we compute the free energy and the critical curve of the model, and show that the partially pinned phase does not occur. When the localized microscopic defect is associated with a non-disordered regular subtree of the disordered tree, the picture is more complicated. We prove that all three phases are non-empty below a critical temperature, and that the partially pinned phase disappears above the critical temperature.
This is a joint work with Neal Madras (York University, Canada).

Date: Tuesday, April 3, 2018
Time: 16:30-17:30
Place: Mathematics Seminar Room, SA – 141

Tea and cookies will be served before the seminar.