Pinning-depinning transition in Random Polymers.

Abstract : Random polymers are used to model various physical (Ising interfaces, wetting, etc.) and biological (DNA denaturation, etc.) phenomena They are modeled as a one dimensional random walk (X_n), with excursion length distribution $P(\mathcal{E}_1 = n) = \phi(n)/n^c$, $c > 1$, and $\phi(n)$ a slowly varying function. The polymer gets a random reward, whenever it visits or crosses an interface. The random rewards are realised as a sequence of i.i.d. variables (V_n). Depending on the relation between the mean value of the disorder V_n and the temperature, the polymer might prefer to stick on the interface (pinning) or undergo a long excursion away from it (depinning).

In this talk we will review some aspects of random polymer models. We will also discuss in more detail the pinning-depinning transition of the 'Pinning' model and prove that its annealed and quenched critical points are distinct. This is joint work with Ken Alexander.