Genetics, random walks and combinatorics: the Bolthausen-Sznitman coalescent

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In this talk we give some results in applied probability on genetics for rapidly adapting populations. It has been shown recently that the Bolthausen-Sznitman coalescent is a good model to represent their genealogies. We will describe this model as a particular example in the class of exchangeable coalescens. We will also link this object with random recursive trees and random walks with a barrier. This will permit to enunciate asymptotic results for the sites frequency spectrum, which is a very useful functional in genetics.