The exponential transform of a path: a faithful representation

Xi Geng (University of Oxford)

Time **Thursday, May 12, 2016 at 15:00**
Place **Campus Kirchberg, room B02**

The exponential transform of a vector-valued path, also known as the signature of a path, is the formal sequence of associated iterated path integrals. While the description of a path involves its local behaviors and their interactions, the signature is a global algebraic quantity encoding the total increment, geometric signed area and all higher order "areas" of the underlying path. It is widely believed (and surprisingly) that the signature contains essentially all information about the underlying path. In this talk, we will prove that every (rough) path is uniquely determined by its signature up to "tree-like" equivalence. Moreover, looking into its probabilistic counterpart, we will obtain stronger results for sample paths of Gaussian processes by applying the Malliavin calculus. I will also talk about the reconstruction of a path from its signature if time permits.