Stochastic geometric heat equations

Zdzislaw Brzezniak (University of York, UK)

Time **Tuesday, Sept 27, 2011 at 15:30**
Place **Campus Kirchberg, room B02**

I will show that an approach from the paper Brzeźniak and Ondreját (2007) can be applied to the stochastic heat flow equation in the case when the domain is one dimensional. The one dimensionality of the domain allows us to work with the energy space, i.e. the Hilbert space $H^{1,2}(\mathbb{S}^1, \mathbb{R}^d)$ as a state space since in this case the embedding of the energy space into the Banach space $C(\mathbb{S}^1, \mathbb{R}^d)$ of continuous functions holds. Some techniques that have been developed by the speaker in collaboration with Goldys and Jegaraj (2010) are essential. Let us point out a difference between our proof of the global existence and the one in the deterministic case by Eells-Sampson (1964) and Hamilton (1975). While in the latter papers the crucial step is to prove that the energy density solves certain scalar parabolic equation, in our case the crucial step is to prove an inequality for the L^2-norm of the gradient of the solution which is based on certain geometric property of the target manifold M. Based on a joint work of the speaker with B. Goldys and M. Ondrejat.