SPDEs with fractional noise in space

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Time **Monday, Sept 21, 2015 at 16:00**
Place **Campus Kirchberg, room A17**

In this talk, we consider the stochastic wave and heat equations on the real line and driven by a Gaussian noise which is white in time and behaves in space like a fractional Brownian motion of index H, with $H \in (1/4, 1/2)$. We assume that the diffusion coefficient is given by an affine function. We prove the existence and uniqueness of the mild solution for both equations by means of a Picard iteration scheme. We show that the solution is $L^2(\Omega)$-continuous and all its moments are uniformly bounded. The type of noise considered here does not fall in the framework of Dalang's theory of stochastic partial differential equations. Instead, the stochastic integrals arising in the corresponding mild forms are understood as integrals with respect to stationary random distributions. In this sense, a new criterion for integrability has been established thanks to some techniques of harmonic analysis.
The talk is based on joint work with Raluca Balan (University of Ottawa) and Maria Jolis (Universitat Autònoma de Barcelona).