Probabilistic Operator Algebra Seminar

Organizer: Dan-Virgil Voiculescu

October 23 **Fabio Cipriani**, Politecnico di Milano

Title: *Energy of vector bundles on Dirichlet spaces and relations with topology*

The aim of this discussion is to motivate and provide a definition of energy $E(V)$ of a vector bundle V on a Riemannian manifold and more in general, on a Dirichlet space X, using the intrinsic differential structure underlying the Dirichlet algebra $B(X)$.We then derive i) the structure nonlinear differential equation solved by a representative Swan projection $p(V)$ ii) the relation between $E(V)$ and the triviality of V, in low dimension and, if time permits, iii) how $E(V)$ bounds a K-theory-Hochschild cohomology coupling. The results are obtained in collaboration with D. Guido and T. Isola (Università di Roma Tor Vergata) and J.-L. Sauvageot (Université Paris VI).