ATHENS *Pr*OBABILITY COLLOQUIUM

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Math Dept, University of Athens

"**Statistical Mechanics on Sparse Random Graphs: Mathematical Perspective**"

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Abstract: Theoretical models of disordered materials lead to challenging mathematical problems with applications to random combinatorial problems and coding theory. The underlying structure is that of many discrete variables that are strongly interacting according to a mean field model determined by a random sparse graph. Focusing on random finite graphs that converge locally to trees we review recent progress in validating the "cavity" prediction for the limiting free energy per vertex and the approximation of local marginals by the belief propagation algorithm.

This talk is based on joint works with Anirban Basak, Andrea Montanari, Subhabrata Sen, Allan Sly, Nike Sun and Tianyi Zheng.

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