

# Probability Seminar

## *Mean field Ising models*

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Tuesday, March 1, 2016  
2:30-3:30pm, David Rittenhouse Lab 3C8 (Penn)

In this talk we consider the asymptotics of the log partition function of an Ising model on a sequence of finite but growing graphs/matrices. We give a sufficient condition for the mean field prediction to the log partition function to be asymptotically tight, which in particular covers all regular graphs with degree going to infinity. We show via several examples that our condition is “almost necessary” as well. As application of our result, we derive the asymptotics of the log partition function for approximately regular graphs, and bi-regular bi-partite graphs. We also re-derive asymptotics of the log partition function for a sequence of graphs converging in cut metric. This is joint work with Anirban Basak from Duke University.