1164-60-171 **Tyler Helmuth**, **Matthew Jenssen** and **Will Perkins*** (math@willperkins.org). *Efficient sampling from the Potts model on random graphs at all temperatures.*

Spin models on graphs (or Gibbs measures or probabilistic graphical models) are probability distributions on assignments of spins or colors to the vertices of graph with probabilities that depend on interactions across edges of the graph. The central computational tasks related to spin models are to produce a sample from the model or to approximate the partition function (the normalizing constant) of the distribution. Many approaches to these problems (including MCMC and the method of correlation decay) face a barrier of a phase transition in the underlying model. Can efficient sampling and approximation be performed despite the presence of a phase transition?

In this paper, we give an efficient algorithm to sample from and approximate the partition function of the q-color Potts model on random regular graphs at all temperatures, including critical, when q is large enough as a function of the degree. (Received January 18, 2021)