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The Hong Kong University of Science and Technology

Department of Mathematics

Seminar on Probability

Replica Symmetry Breaking for mean field spin glass models

By

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Abstract

Mean field spin glass models were introduced as an approximation of the physical short range models in the 1970s. The typical mean field models include the Sherrington-Kirkpatrick (SK) model, the (Ising) mixed p-spin model and the spherical mixed p-spin model. Starting in 1979, the physicist Giorgio Parisi wrote a series of ground breaking papers introducing the idea of replica symmetry breaking (RSB), which allowed him to predict a solution for the SK model by breaking the symmetry of replicas infinitely many times at low temperature. In this talk, we will show that Parisi's prediction holds at zero temperature for the more general mixed p-spin model. On the other hand, we will show that there exist two-step RSB spherical mixed p-spin glass models at zero temperature, which are the first natural examples beyond the replica symmetric, one-step RSB and Full-step RSB phases. This talk is based on joint works with Antonio Auffinger (Northwestern University) and Wei-Kuo Chen (University of Minnesota).

Date: **Friday, 15 February 2019**

Time: **3:00p.m. - 4:00p.m.**

Venue: **Room 4472, Academic Building, (near Lifts 25-26), HKUST**

All are welcome!