Dyson Models with Random Boundary Conditions

SPEAKER: Aernout van Enter, Groningen University

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VENUE: Room 310, Pudong Campus, 1555 Century Avenue
(上海纽约大学310教室, 上海市浦东新区世纪大道1555号)

ABSTRACT

We consider the behaviour of Dyson models (long-range Ising models with polynomial decay), with random boundary conditions. Random boundary conditions provide a simple form of quenched disorder, which has direct relations with Mattis spin glasses. At low temperatures, there is chaotic size-dependence, that is, non-convergence of the Gibbs measure in the infinite-volume limit in the phase-transition region, that is for decay with a power between 1 and 2.

The metastate, the distributional limit of the finite-volume Gibbs measures, as introduced by Newman and Stein, is shown to be dispersed, and qualitatively a difference is shown to occur between Dyson interactions decaying with a power faster than $3/2$ when the metastate is concentrated on mixed states and interactions decaying with a power slower than $3/2$ when the metastate is concentrated on extremal Gibbs measures.

This is a joint work with Eric Endo and Arnaud Le Ny.

BIOGRAPHY

Aernout van Enter is professor emeritus at Groningen University, the Netherlands, where he also obtained his education. He has worked at the University of Heidelberg, Germany, the Technion at Haifa, Israel, and the University of Texas at Austin, USA.

His research interest is in mathematical statistical physics. He has worked on the theory of Gibbsian and non-Gibbsian measures, on various types of phase transitions in lattice models, on disordered systems and spin glasses, on the theory of aperiodic order and on bootstrap percolation.