PAUL SCHERRER INSTITUT

CONDENSED MATTER THEORY SEMINAR

Geometrical phase transitions in the energy landscape of simple glassy and inference models

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Tuesday, Apr 09, 2019, 11:00-12:00

WHGA/121 (PSI-West)

Abstract:

Understanding the statistical properties of complex landscapes in high-dimensional spaces is becoming a central problem in a variety of different contexts, from glassy systems to computer science and machine learning, ecology and biology. Among these properties, an important role is played by the statistics of the number of stationary points, which is relevant in determining the evolution of local dynamics within the landscape. In this talk, I will discuss simple models which capture the competition between a deterministic signal term and a noisy contribution, and describe the geometrical transitions that occur in the structure of the associated landscape when the strength of the signal increases. I will comment on implications for the problem of tensor denoising (i.e, the problem of recovering a spike when it is submitted to a tensor of Gaussian noise) and on the impact of the geometrical transitions in the dynamical exploration of the landscape. The talk is based on joint work with G. Biroli, G. Ben Arous and C. Cammarota (Physical Review X 9 (1), 011003)

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