

Colloqui della Classe di Scienze

Anno Accademico 2015/2016

Aula Bianchi | Palazzo della Carovana
Scuola Normale Superiore
Piazza dei Cavalieri, 7 - PISA

29 GIUGNO 2016
ore 15.00

MARC MEZARD

École normale supérieure, Paris

*Boole, Shannon, and the Challenge of Data Science :
a Statistical Physics Perspective*

Abstract

In 1854, in his treatise on the Laws of Nature, George Boole had stated a clear goal: «to investigate the fundamental laws of those operations of the mind by which reasoning is performed». This led him to study the foundations of logic and of probabilities. A century later, Claude Shannon opened the way to a mathematical understanding of information and of its communication.

The fields of research initiated by these two giants play a major role in contemporary science, and in particular in the handling of large amounts of data, and in the extraction of information out of these data. However, in large-size problems, collective phenomena of the type studied in statistical physics, like phase transitions, start to play a major role. This talk will study the importance of phase transitions in some core problems of Boolean logics and of information theory, with a special focus on the importance of glassy phases.



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Info: Area Ricerca e Didattica - classi@sns.it