



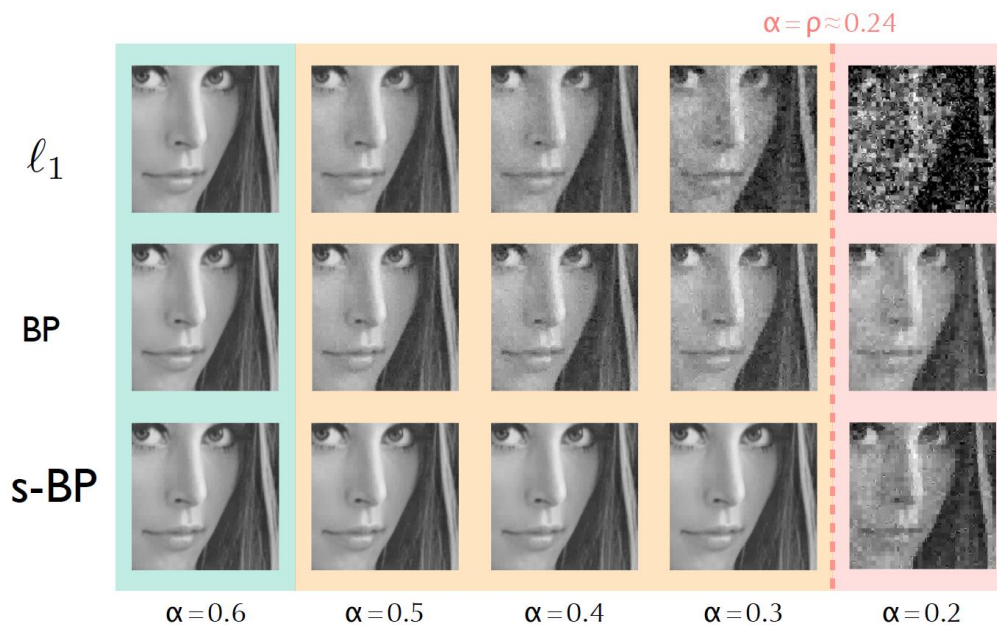
COLLOQUIUM DI FISICA

Giovedì 14 Gennaio 2016, ore 15.00
aula "A. Rostagni"

Prof. Marc Mézard

École Normale Supérieure, Paris

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



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.