LMU LUDWIG-MAXIMILIANS-UNIVERSITÄT MÜNCHEN

ARNOLD SOMMERFELD CENTER FOR THEORETICAL PHYSICS

# Sommerfeld Theory Colloquium

Professor Marc Mézard

Ecole Normale Supérieure, Paris

Statistical Physics and Information Theory : New Frontiers

Since the emergence of information theory in the middle of the 20th century, this new scientific field has been deeply entangled with statistical physics, as attested from the beginning by the use of entropy to quantify information content. The talk will explore the major impact of these trans-disciplinary exchanges, with a particular focus on the important new research topic called "compressed sensing". Starting from the observation that interesting signals can be compressed, and thus are sparse in some representation, compressed sensing aims at acquiring data directly in a compressed way, using then computational methods to reconstruct the original signal. It opens the way to faster, less destructive, and more effective signal acquisition, with possible applications in many branches of science, from magnetic-resonance imaging to astronomy, tomography, or gene interaction network reconstruction. The talk will describe the spectacular progress that can be made using various statistical physics ideas, from spin glass theory to crystal nucleation.

Wednesday, 23 April 2014, 16:15h, Room A348/349, Theresienstr. 37/III

Prof. V. Mukhanov