



The Galileo Galilei Institute for Theoretical Physics
Arcetri, Florence



AdS₄/CFT₃ and the Holographic States of Matter

August 30, 2010 - November 5, 2010

Galileo Galilei

The main topics of the workshop include:

- AdS₄/CFT₃ Correspondence
- M2 and M5 branes
- The holographic description of high-T_c superconductivity, superfluidity, quantum-Hall systems.
- Gravity and fluid dynamics
- Gravitational description of non-relativistic systems.

An exciting and largely unexpected consequence of holography is that string and M-theory can provide useful information for transport phenomena of strongly interacting theories in low dimensions, fluid mechanics and non-relativistic systems. Physical systems that may have dual holographic descriptions include quantum critical points in 2+1 dimensions, high-T_c superconductors, quantum Hall systems, systems that exhibit parity breaking, non-relativistic critical systems as well as fluid mechanics and turbulence.

Such systems - the Holographic States of Matter - have the potential to radically alter the perception of string theory and its relevance for physics. A basic theoretical setup for the holographic study of such systems is the AdS₄/CFT₃ correspondence. This is also a main framework for holographic studies of the mysterious M-theory. The subject has experienced great formal growth, driven by the discovery of various field theoretical models for M2-branes. It is fortunate and intriguing that progress in the more applied directions coincides with enhancement in the understanding of more formal aspects of M-theory. By bringing together experts in both the applied and formal directions we aim to create a fertile environment where future developments regarding the Holographic States of Matter in connection with our understanding of M-theory can be studied.

Organizing Committee:

Jose F. L. Barbon: IFT UAM/CSIC, Madrid
Christopher Herzog: Princeton University
Robert G. Leigh: University of Illinois at Urbana-Champaign
Anastasios C. Petkou: University of Crete
Antonello Scardicchio: ICTP, Trieste