



## The Galileo Galilei Institute for Theoretical Physics Arcetri, Florence



*Galileo Galilei*

# Supergravity: what next?

September 5, 2016 - October 28, 2016

The workshop will be centred around the latest developments in Supergravity, that after four decades since its discovery keeps providing new insights into String Theory, Physics beyond the Standard Model and Cosmology. Recent exciting results on the structure of the early universe and quantum gravity call for a thorough investigation of supergravity scenarios that today can be confronted with experimental data in cosmology. The unexpected finiteness unveiled by quantum calculations hints to some underlying structure yet to be understood. We have a detailed knowledge on classifying possible actions of supergravity, but recent results have shown that the embedding tensor formalism allows more solutions than we would have expected. Moreover this concerns only actions with up to two space-time derivatives, while the plethora of possibilities for higher-derivative actions is yet to be explored. Solutions of supergravity equations are crucial in the context of gauge-gravity duality, and towards understanding the quantum properties of black holes and other extended objects. These also have deep connections to corners of modern mathematics, where techniques of localisation in supergravity allow to analyse the non perturbative quantum corrections to black hole entropy and to improve our understanding of supersymmetric field theories.

### Topics:

- Cosmological applications to inflationary scenarios in relation with new observational data
- Exceptional structures of supergravity, exotic branes, and non-geometric fluxes
- Extensions of presently-known supergravities, including higher-derivative, or Dirac--Born--Infeld actions
- Quantum supergravity, including the conclusions to be drawn from surprising finiteness results
- Solutions of supergravity equations, including black holes and domain walls and implications for gauge-gravity dualities
- Mathematical aspects of supergravity, including hidden symmetries and dualities

**Local organizer:** Domenico Seminara

### Organizing Committee:

Eric Bergshoeff (Groningen U.)  
Anna Ceresole (INFN Turin)  
Gianguido Dall'Agata (Padua U.)  
Sergio Ferrara (CERN)  
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