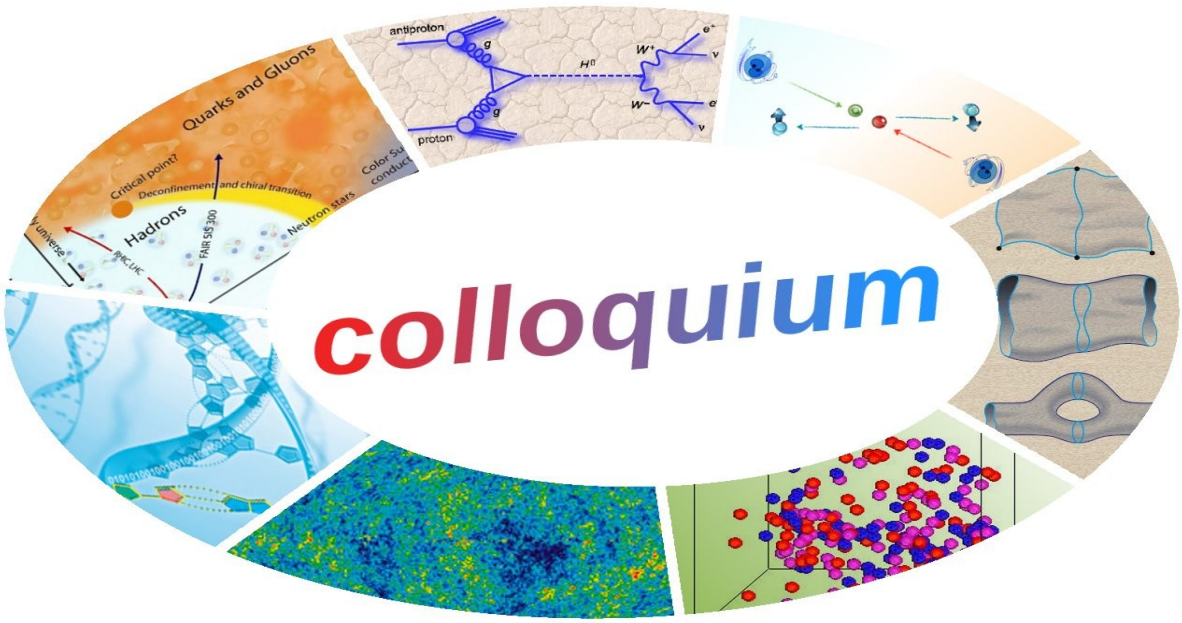
Università di Torino – Dipartimento di Fisica

Sezione di Fisica Teorica



Venerdi 13 Febbraio 2015, ore 14:30, Aula Wataghin

Timo Weigand
(University of Heidelberg)

Recent Advances in String Phenomenology

String Phenomenology is the study of four-dimensional solutions of string theory, which represents a promising ultra-violet completion of gravitational and particle interactions in ten spacetime dimensions. Many mechanisms have been identified in the past years to derive the foundations of the observed Standard Model of Particle Physics from string theory such as the origin of gauge symmetries, chiral matter and its interactions or, in the context of inflationary cosmology, candidates for scalar fields with suitably flat potentials. One of the current challenges is to understand the implications of the apparent multitude of four-dimensional string solutions, the so-called string landscape.
In this colloquium we will stress that one of the primary goals of string phenomenology is to identify string theoretic mechanisms to understand phenomena which are challenging to explain from the perspective of four-dimensional quantum field theory only. We will review, among other examples, how F-theory model building accepts this challenge in the context of Grand Unified Model building while at the same revealing fascinating connections between particle phenomenology and mathematics. Future directions of string model building will critically depend on the role of supersymmetry in explaining the electroweak hierarchy problem.