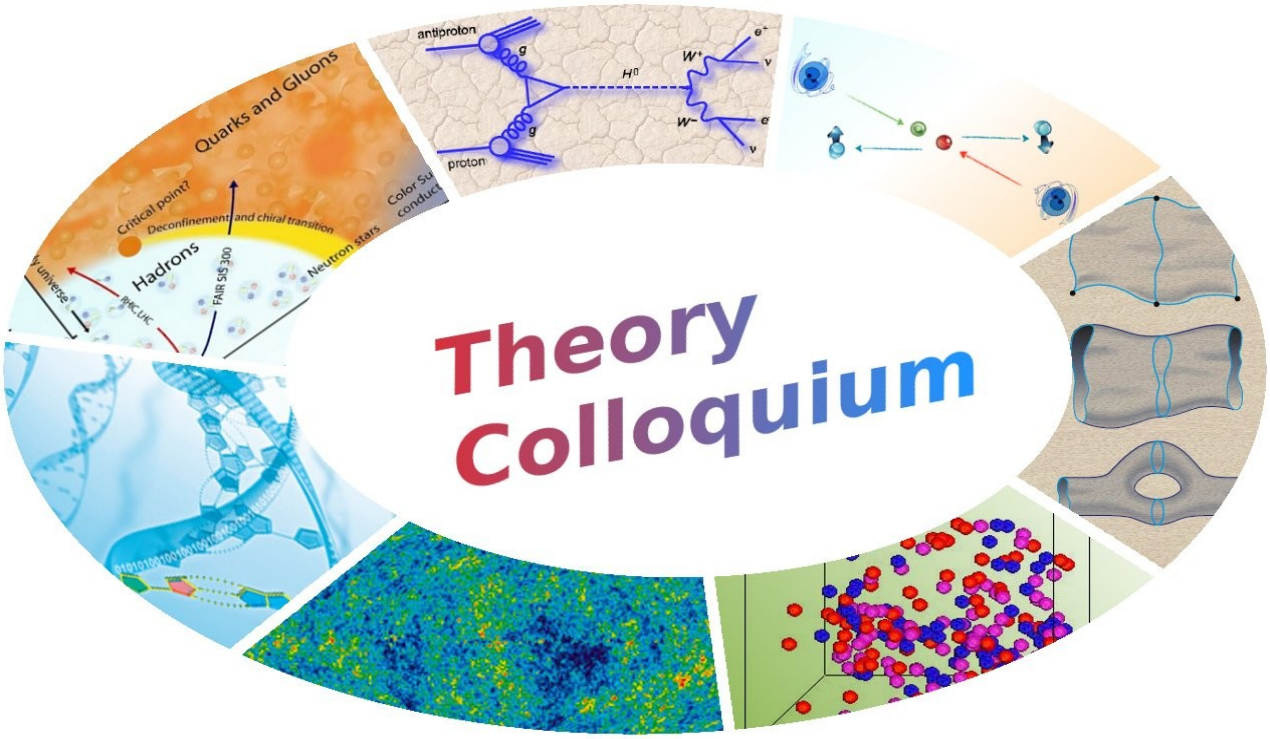
Dipartimento di Fisica e Sezione INFN di Torino



Venerdì 12 Maggio 2017, ore 14:30, Aula A

Jürgen Vollmer
(University of Göttingen)

Breaking Universality in Droplet and Nanoparticle Growth

Universality is a key concept in statistical physics. It has potent applications in the theory of critical phenomena and the description of growth processes. In the theory of critical phenomena the symmetries of the Hamiltonian uniquely select the set of critical exponents that govern power-law divergences of correlation functions and response properties. In the description of growth processes scaling theory has been adopted to predict a universal shape of particle- and droplet-size distributions. I will discuss the growth of droplets on a substrate (dew) and in the bulk (synthesis of nanoparticles). In the former case a critical exponent that characterizes the growth process is found to be non-universal. In the latter case the size distribution is not necessarily universal. We clarify why ripening processes and nanoparticle growth follow qualitatively different growth scenarios, and how this has been adopted to minimize particle-size dispersal. In an outlook I will briefly comment on non-universal aspects of the jamming critical point of granular shear flow, and formulate challenges for future work.