Organisé conjointement par
CPHT-École Polytechnique et Groupe Théorie IPN Orsay

SÉMINAIRE de PHYSIQUE des PARTICULES

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Phase structure and thermodynamics of strongly-interacting matter

Résumé :
Currently, large effort is undertaken, experimentally in heavy ion collisions and theoretically doing simulations on supercomputers, to explore the state of matter under the extreme conditions of the largest temperatures and densities in the universe. Effective models, such as Polyakov-loop-extended chiral models, which capture the main properties of the strong interaction, i.e. the creation of constituent quark masses and confinement, play the role of an important guidance that allow access at all temperature and density domains. Results of such a model, the Polyakov-loop-extended Quark-Meson truncation of QCD, for the phase diagram of strongly-interacting matter are presented and it will be discussed how constraints from the high-energy domain (lattice calculations) as well as low energy domain (astrophysics measurements on compact stars) can contribute to pin it down more precisely. The importance of including the quark backreaction on the gauge field dynamics is demonstrated and its impact on the structure of the phase diagram and on the surface tension for nucleation in a first order transition region discussed. Finally, the necessity to improve the description of the gauge part of the strong interaction with phenomenological Polyakov-loop potentials will be motivated and current ways to improve will be outlined.

Jeudi 28 Septembre 2017

11:00

Salle de conférences, bât. 6