

# QCD phase diagram in heavy-ion collisions and in compact stars

Speaker: Akira Ohnishi (YITP)

Date: 2011/12/6 (Tue.) 16:30~

Place: ES034(Lecture Room 9)



QCD phase transition from hadronic to quark-gluon matter is attracting much attention in recent years. High-energy heavy-ion experiments at RHIC and LHC have shown the formation of strongly interacting matter with very high energy density. Theoretical arguments and experimental data suggest that this matter is a strongly coupled quark-gluon plasma (sQGP) at small baryon density. Lower energy heavy-ion experiments at RHIC and SPS are expected to probe higher baryon density region, where we may find the QCD critical point, which connects the cross over transition at low density and the first order transition at high density. The transition to quark matter at high density also has an impact on compact astrophysical phenomena, such as neutron stars, supernovae, and black hole formation processes.

In this talk, I review our current understanding of the QCD phase diagram in lattice QCD and QCD effective models in connection with experimental observations. I also discuss recent theoretical attempts to describe QCD phase transition at high density in terms of strong coupling lattice QCD.