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Color superconductivity in lattice QCD

Wednesday, 16 December 2020 11:20 (40 minutes)

Exploring the QCD phase diagram is known to be extremely difficult at finite density due to the sign problem, which occurs in lattice QCD calculations. We show that this problem can be overcome by the complex Langevin method in a certain parameter region at low temperature and high density. This, in particular, gives us a hope to investigate color superconductivity in lattice QCD by first principle calculations. I will discuss the existence of a new phase with a quark-quark condensate based on the gap equation in the perturbative regime, and show some results of the complex Langevin method, which turn out to be consistent with this prediction.

Presenter: Prof. NISHIMURA, Jun (KEK)

Session Classification: Invited talks