UNIVERSITÄT BIELEFELD

Fakultät für Physik

Physikalisches Kolloquium
Antrittsvorlesung

Prof. Gergely Endrődi

Bielefeld University

Hot quarks and gluons on the lattice

What did our Universe look like shortly after the Big Bang? Why are neutron stars so massive and compact? What happens when two heavy ions, accelerated to almost the speed of light, collide with each other?

All the above questions are answered by the theory of the strong interactions, Quantum Chromodynamics. The strong force binds quarks and gluons together into protons and neutrons and is thereby responsible for almost all of the mass of the visible Universe around us. The equations of Quantum Chromodynamics cannot be solved analytically - but instead they can be discretized on a space-time lattice and simulated numerically.

In this talk I will provide a brief introduction to these lattice simulations and discuss some of the extraordinary features of the theory. In particular, I will focus on what we can learn from the behavior of quarks and gluons in hot, dense and strongly magnetized environments for the above mentioned systems: for example the early Universe and heavy-ion collisions.

Monday, November 29, 2021, 4:15 p.m.

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