Heavy-ion physics at the high-energy frontier

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Ultra-relativistic heavy-ion collisions create extreme conditions in temperature and energy density, such that a plasma of quarks and gluons, no longer confined in color-neutral hadrons, is produced. This is the state of matter, which existed a few microseconds after the Big Bang. Nowadays we investigate the properties of the hot, strongly-interacting plasma at accelerators such as the LHC at CERN, with fascinating instruments such as the ALICE experiment. I will guide you through this special wonderland and discuss the physics harvest of the last years of heavy-ion program at the LHC.

Furthermore, exciting plans lay ahead for the heavy-ion community: the high-luminosity era of the LHC for lead-ion collisions will start already in 2021, with interaction rates up to 50 kHz. The high statistics of precision data will open new frontiers in the field. At the same time, future opportunities at higher rates or/and energies are under consideration.