

# Open issues in heavy-ion theory and hot QCD

*Wednesday, 17 May 2017 10:00 (1h 30m)*

Over the last year, the notion “QGP-like phenomena in small systems” has been used to describe a set of newly established soft physics phenomena in proton-proton and proton-nucleus collisions, that share important commonalities with classical signatures of collectivity in nucleus-nucleus collisions. These include flow-like long-range rapidity correlations and higher-order cumulants of charged particle distributions in p-p and p-A, as well as characteristic multiplicity-dependences of the hadrochemical compositions. These data represent both, a formidable novel challenge to the “standard model of heavy ion collisions” according to which everything sufficiently soft flows, and a formidable novel opportunity for understanding the dynamical mechanisms that underlie the observed signatures of collectivity. I shall review the theoretical concepts and toolbox (fluid dynamic simulations, transport, parton saturation, underlying event models developed for pp collisions, calculations related to multi-parton interactions, color coherence etc etc) that is at our disposal for analyzing these phenomena, I shall show some own exploratory calculations, and I shall share my view of what the technical challenges are and how progress can be made in the coming years.

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