

School of Physics and Astronomy

COLLOQUIUM

Quark-gluon plasmas and how to simulate them



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In high energy collisions of lead nuclei at the LHC, densities and temperatures are believed to be high enough to form a quark-gluon plasma (QGP), allowing us to study this very exotic state of matter which was our Universe a microsecond after the Big Bang.

If such a plasma is formed at the LHC, it will decay almost immediately, and we can only study its properties indirectly by looking at the very large number of hadrons that are produced as the plasma transitions into normal hadronic matter.

Lately it has been noted that some of the signature features of a QGP are present also in collisions of individual protons where it seems unlikely that a thermalised plasma can be formed. This is raising a lot of questions: Does a plasma form also in small collision systems? Is there another mechanism in play in proton collisions? Is that mechanism also present in heavy ion collisions, and how does that affect our previous conclusion of the formation and properties of the QGP?

To find answers to these questions we are in Lund now using the detailed simulation models which very precisely describe most features of proton collisions to understand these QGP observables better and to develop a fully microscopic simulation model for heavy ion collisions.

Date: Wednesday 10 April

Time: 2pm

Venue: L1, Large Seminar Room 107, 10 College Walk, Clayton

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