



PHYSIKALISCHES KOLLOQUIUM

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Thema: **The quark-gluon plasma: hot QCD matter investigated by ALICE at the LHC**

Zeit und Ort: Dienstag, 23.01.2018, 16:40 Uhr
Rechnagel-Bau, Hörsaal REC/C213, Haeckelstr. 3

Leiter: Prof. Dr. Michael Kobel

Kurzfassung: At the Large Hadron Collider at CERN, collisions of heavy ions at ultra-relativistic energies produce small amounts of matter at extremely high temperatures and energy densities, for short times. Under these conditions, quantum-chromo dynamics predicts the transition from a hadron gas to a quark-gluon plasma, in which partons are no longer confined in hadrons. This state of matter is assumed to have existed a few microseconds after the Big Bang. ALICE is the experiment dedicated to the study of heavy-ion physics, with an exceptional detector system able to reconstruct the trajectory and the identity of the thousands of particles produced in every collision. Since the first heavy-ion campaign in 2010, a wealth of experimental results has been obtained, and contributes to shed light on the properties of this hot, strongly-interacting matter and on fundamental properties of QCD. A selection of observables sensitive to the properties of the quark-gluon plasma will be introduced, and recent results will be presented. Exciting plans lay ahead of 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, opportunities at future facilities reaching even higher energies are under consideration.

Biographie: My scientific career started with the development of silicon detectors for DELPHI, to study $e+e-$ collisions at LEP. The high-resolution semiconductor detectors accompanied and supported my interest in studying the production of hadrons with heavy quarks (charm and beauty) at WA89 (hyperon beam fixed-target experiment at CERN, for my PhD) and then at HERA-B (at DESY, for my first post-doc appointment). In 2006, still following the thread of heavy flavor investigations, I moved on to a slightly different field, the one of heavy-ion physics. Since then I am working at GSI, Darmstadt, in the ALICE group of which I took the leadership in 2011. At the same time, I also moved on to large volume gas detectors, with a deep involvement in the ALICE Time Projection Chamber. For its upgrade, we are currently building novel, large area GEM readout chambers. Since 2013 I am active at the University of Heidelberg with teaching and supervision of students.

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