

# XVII Polish Workshop on Relativistic Heavy-Ion Collisions: Phase diagram and Equation of State of strongly interacting matter



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## Comparative Analysis of Heavy-Ion Collision Results at RHIC and LHC

This paper presents a comparative analysis of experimental results from heavy-ion collision experiments conducted at two of the world's leading research facilities: the RHIC (Relativistic Heavy Ion Collider) in the United States and the LHC (Large Hadron Collider) in Switzerland. These studies aim to investigate the properties of strongly interacting matter under extreme temperatures and densities, providing crucial insights into the phase diagram and the equation of state of quark-gluon plasma.

The report covers several key aspects: the energy dependence of phase transitions, including the transition from hadronic matter to quark-gluon plasma; differences in collective effects such as flow phenomena (azimuthal anisotropy) and fluctuations; and the role of strange and heavy hadrons in the thermalization of the system. Particular attention is paid to hydrodynamic modeling, which helps to reproduce experimental data and offers a deeper understanding of the dynamics of the expanding system.

Furthermore, the study discusses femtoscopic data, which provide estimates of the spatial and temporal parameters of collisions, as well as fluctuations and correlations that may be linked to the existence of a critical point in the phase diagram. Comparing results obtained at different collision energies at RHIC and LHC allows for conclusions about the properties of strongly interacting matter and the evolution of the phase state of the Universe during its early stages.

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