

Applications of the AdS/CFT correspondence to strongly coupled dynamics

The dissertation deals with applications of the dualities between gravity theories in asymptotically anti de Sitter (AdS) space-times and conformal field theories (CFTs) formulated on the space-time boundary. Advances in understanding the strongly coupled dynamics of the quantum regime of gravity and of ordinary gauge theories via the AdS/CFT correspondence are discussed. The focus is on the study of cosmological singularities in AdS space-times and of the thermalization process of the quark-gluon plasma phase of matter produced at RHIC and LHC.