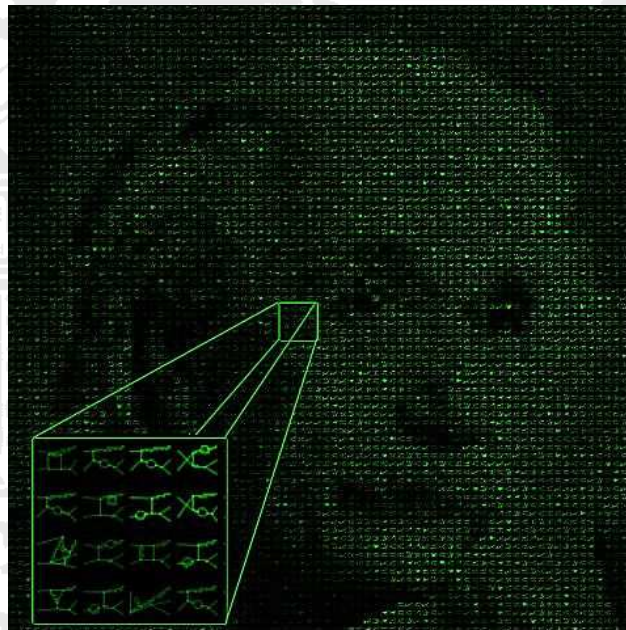


# PHYSIKALISCHES KOLLOQUIUM

## ANTRITTSVORLESUNG

AM 27. MAI 2013 UM 17 UHR C.T.  
 IM GROßEN HÖRSAAL



## NEW METHODS FOR QCD AND THEORIES OF QUANTUM GRAVITY

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Theory predictions play an important role for unlocking the dynamics of proton-proton collisions at the Large-Hadron-Collider (LHC) experiments. However, the required simulations of the collisions are often very challenging. Stimulated by the physics quests at the LHC, significant progress has been made with such computations recently. An important ingredient for these successes has been the inflow of new ideas and mathematical methods from formal quantum-field theory. Many previously unthinkable computations are now becoming available and allow to increase the reach of the high-energy experiments at CERN. In the opposite direction, methodology developed for describing proton collisions provides a new handle on formal quests. In particular, when applied to the quantisation of gravity surprising structures become manifest, which make this theory more tractable. In this talk we discuss this interplay of recent developments in perturbative quantum-field theory, state-of-the-art simulations of proton-proton collisions and formal considerations in theories of gravity.