Institut Henri Poincaré

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String Theory in Greater Paris

Rencontres Théoriciennes

“Supergravité, théorie des cordes et théorie M”

Jeudi 25 Janvier 2024, 13:45

Andrea Guerrieri

Perimeter

A Bootstrap bridge between Gravity and QCD

The numerical S-matrix Bootstrap establishes non-perturbative universal bounds on physical observables extracted from scattering amplitudes in any dimension. In this talk, I will review three results : rigorous model-independent bounds on Higgs couplings, the precise determination of the physical QCD spectrum from the Bootstrap, and no-go theorems for supersymmetric Quantum Gravity. These results are possible by going beyond the positivity of scattering amplitudes, including the non-linear unitarity inequalities. Taming the non-linear unitarity constraints requires both an analytic and technological effort. During the discussion, I will describe the Bootstrap methodology and the numerical challenges we face when tackling these problems. I will conclude with a list of possible future directions that are interesting for the development of the field.

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