

New approaches to scattering amplitudes: From on-shell diagrams to the Amplituhedron

Sebastian Franco^{*}

sfranco@ccny.cuny.edu; sebastian.franco@durham.ac.uk

Formidable progress in our understanding of scattering amplitudes in gauge theory has been achieved in the last two decades. The progress is especially impressive for amplitudes in $N = 4$ super Yang–Mills. This talk is devoted to a new formulation of scattering amplitudes in this theory based on on-shell diagrams, which provide a natural bridge connecting gauge theory to powerful mathematical structures such as the Grassmannian. We will then explore the classification of on-shell diagrams beyond the planar limit. Finally, we will discuss the Amplituhedron, a new algebraic geometric object that encodes scattering amplitudes in a maximally geometric way: They are simply given by its volume.

^{*}Physics Department, The City College of New York, 160 Convent Avenue, New York, NY 10031, USA.