Institut Henri Poincaré

11 rue Pierre et Marie Curie, 75231 Paris cedex 05

String Theory in Greater Paris

Rencontres Théoriciennes

"Supergravité, théorie des cordes et théorie M"

Jeudi 2 Fevrier 2023, 10:00

James Drummond

U. Southampton

Cluster algebras, Gröbner theory and massless amplitudes

Amplitudes in planar N=4 super Yang-Mills theory exhibit fascinating analytic properties which are intimately connected to cluster algebras. In this talk I will describe a different language for uncovering these features based on the theory of Gröbner bases for polynomial ideals. By applying this analysis to the Grassmannian Plücker relations we will recover the singularities, or 'symbol alphabet', and cluster adjacency relations satisfied by the N=4 amplitudes. We will then generalise this formalism to non-dual conformal and non-planar theories and show how to recover the alphabet for massless five-point amplitudes in QCD and gravity.

Institut Henri Poincaré, salle 314, 3ème étage