Department of Theoretical Physics

THE QUANTUM SPACETIME SEMINAR SERIES

Double Copy Variations

(Zoom Seminar)

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(Caltech)

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Time: 10:30 AM IST

Zoom link shall be shared separately

The double copy is an extraordinary structure relating the perturbative on-shell scattering amplitudes of gauge theory and gravity. In this talk, I describe progress towards a field theoretic understanding of the double copy from first principles, with an eye towards generalization to settings which are off-shell, beyond flat space, and non-perturbative. Focusing on scalar theories, I show how the double copy arises from a mapping of the color algebra to the diffeomorphism algebra. This permits an off-shell formulation of the double copy at the level of fields and equations of motion which immediately implies known amplitudes statements but also generalizes to correlators in curved geometries beyond AdS and dS. In the simplified case of two spacetime dimensions, the double copy can be implemented non-perturbatively at the level of the action, and some of the relevant theories are integrable. In this case I show how to double copy Wilson lines, charges, and non-perturbative field configurations, including numerical solutions.

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