

Theorie-Palaver

July 4, 2023 at 2 p.m.
Lorentz room (Staudingerweg 7, 5th floor)

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Integration over Riemann surfaces: String amplitudes and double copy

In this talk, I will discuss different types of integrals over moduli space of punctured Riemann surfaces. First, I start with string scattering amplitudes and progress to the intersection number of twisted forms over the Riemann surface. I will discuss the equivalency between the two integrals and how this relation can be used to produce QFT (tree-level) amplitudes. In particular, I explore the double copy construction in amplitudes, which states that gravitational amplitudes can be expressed in terms of two sets of Yang-Mills amplitudes i.e. $\text{gravity} = (\text{gauge} \times \text{gauge})$. I will motivate a formal construction of double copy in terms of the twisted cohomology and explain its relation to other forms of the double copy such as BCJ double copy and color kinematic duality. I will finish by discussing the possibility of extending this formalism into the loop level in both string and QFT amplitudes.