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String Theory in Greater Paris

Rencontres Théoriciennes

“Supergravité, théorie des cordes et théorie M”

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Piotr Tourkine

CERN

New duality symmetric theories from twisted strings

Twistor strings have undergone a renewal of interest since the discovery of the Cachazo-He- Yuan formalism for scattering amplitude in field theory in 2013. These formulae deeply challenge the way we think about scattering amplitudes in quantum field theory and are neatly explained by the so-called ambitwistor string, a cousin of the old twistor string.

The existence of these remarkable formalisms, which I shall present during the talk, cried for a connection to good old string theory. The answer to this question is now understood : it relies on counter-intuitive limits and crucially, the existence of a different quantization for string theory, which we called twisted strings. The first part of the talk will be concerned on making that connection to string theory clear. In the second part, I will report on recent results obtained with Eduardo Casali on the winding modes of these twisted strings. They give rise to new exotic target space theories, naively non unitary, but exhibiting features half way between string and field theory. In particular, they are T-duality symmetric.

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