Institut Henri Poincaré
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String Theory in Greater Paris

Rencontres Théoriciennes

“Supergravité, théorie des cordes et théorie M”

Jeudi 3 Octobre 2024, 11:40

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Local conformal field theory from long-range perturbation theory

Conformal field theory (CFT) plays a crucial role in understanding phase transitions, whether quantum or statistical. CFTs can be studied using perturbative methods, such as the 4-epsilon expansion and the large N expansion. In this talk, I will introduce an alternative approach : a fixed-dimensional perturbation theory that incorporates long-range, non-local interactions. I will demonstrate that by imposing the conformal Ward Identity, it is possible to recover the data of local CFTs. By re-summing the perturbative series using long- range solitons (solutions to the nonlinear equation of motion with fractional Laplacian), we obtain nice results for the critical exponents.

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