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Non-perturbative QFT methods inspired by holography (Emanuel Katz, Boston Univ.)

Tuesday, 3 April 2018 11:15 (1 hour)

I will describe a new numerical approach for calculating dynamical quantities in QFT in the non-perturbative regime.

In this approach any QFT (including a gauge theory) can be formulated as a relevant perturbation of a UV CFT.

The states of the CFT are used as a basis to describe the resulting RG-flow. Holography motivates a certain truncation
of the CFT basis which allows for numerical calculation. I will provide numerical evidence in certain 2D and 3D theories that this truncation provides for an effective approximation for evaluating certain non-perturbative quantities (like the Zamolodchikov c-function along an RG-flow). Implementing the method in the context of light-cone quantization has various advantages including greatly simplifying flows in the large-N limit. Whether such a simplification occurs depends on properties of the UV large-N CFT and can be checked via a certain diagnostic. Here, again, holographic models are useful in clarifying the issues faced by the light-cone approach.