

Tuesday, January 16th @ 2pm
Schwinger Lounge

“Averaged null energy and the renormalization group”

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Abstract: Averaged null energy, defined by integrating the null energy over a light ray, is known to be closely tied to causality in AdS/CFT, to deformations of the modular Hamiltonian in quantum field theory, and to the Lorentzian inversion formula in CFT. I will discuss a new connection between averaged null energy and the monotonicity of the renormalization group, and use the averaged null energy condition (ANEC) to derive the c-theorem in two dimensions and the a-theorem in four dimensions. The derivation is based on contact terms that appear in correlation functions of the light-ray operator. Combined with previous results, this also gives a new derivation of the c- and a-theorems from the monotonicity of relative entropy, and hints at a more general role for Lorentzian inversion in non-conformal QFTs.