## **Rethinking Quantum Field Theory**



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## **C-theorems and Entanglement Entropy**

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A great part of the problem of understanding the structure of the space of quantum field theories (QFT) is arguably reduced to the one of classifying possible critical points. In this picture, the theories with mass scales are obtained by perturbing critical points and following the renormalization group (RG) trajectories. However, interestingly, in the flow not all critical points can be joined with each other: there are constraints provided by c-theorems. These state that certain c-charge decreases from the UV to the IR fixed points showing the irreversible character of the RG flow.

The idea of relating the c-theorem with entanglement entropy is motivated by the result that central charges can be identified as coefficients of entanglement entropy for even dimensional space-time theories. In this scenario, the coefficient of the logarithmic term and the constant term in the entropy were suggested as c-functions, for even and odd dimensional theories respectively. We will discuss the d = 2 and 3 cases, where this proposal was confirmed

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