HIGH ENERGY PHYSICS COLLOQUIA

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FUNCTIONAL RENORMALIZATION GROUP EQUATIONS AND SOME APPLICATIONS

Abstract

The renormalization group is "a way to satisfy the Third Law of Progress in Theoretical Physics, which is that you may use any degree of freedom you like to describe a physical system, but if you use the wrong ones, you'll be sorry" (S. Weinberg, 1981). As such, it is a fundamental paradigm for modern theoretical physics. No wonder then, that representing physical theories by exact renormalization group equations turned out to be a powerful and outreaching idea. This was achieved since the seventies thanks to the "strong intuitive understanding of renormalization, due to Wilson, in terms of the scaling of effective Lagrangians" (J. Polchinski, 1983), and provides a well-established theoretical framework called functional, exact, or nonperturbative renormalization group. The talk will provide an introduction to it and to some of its modern applications.