

Andreas Stergiou - Uncovering the Structure of the ϵ Expansion

Thursday 17 August 2023 16:00 (50 minutes)

The ϵ expansion was invented more than 50 years ago and has been used extensively ever since to study aspects of renormalization group flows and critical phenomena. Its most famous applications are found in theories involving scalar fields in $4-\epsilon$ dimensions. In this talk, we will discuss the structure of the ϵ expansion and the fixed points that can be obtained within it. We will mostly focus on scalar theories, but we will also discuss theories with fermions as well as line defects. Our motivation is based on the goal of classifying conformal field theories in $d=3$ dimensions. We will describe recently discovered universal constraints obtained within the framework of the ϵ expansion and show that a “heavy handed” quest for fixed points yields a plethora of new ones. These fixed points reveal aspects of the structure of the ϵ expansion and suggest that a classification of conformal field theories in $d=3$ is likely to be highly non-trivial.