CONDENSED MATTER SCIENCES SEMINAR

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Host

Dr Kun Yang

Title

Conformal invariance and multifractality at Anderson transitions

Friday, November 8th, 2024

1st Floor – B101

15:00-16:00

Abstract

Multifractals arise in various systems across nature whose scaling behavior is characterized by a continuous spectrum of multifractal exponents Δ_q. In the context of Anderson transitions, the multifractality of critical wave functions is described by operators O_q with scaling dimensions Δ_q in a field-theory description of the transitions. The operators O_q satisfy the so-called Abelian fusion expressed as a simple operator product expansion. Assuming conformal invariance and Abelian fusion, we use the conformal bootstrap framework to derive a constraint that implies that the multifractal spectrum Δ_q must be quadratic in its arguments in any dimension $d \geq 2$.