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TATA INSTITUTE OF FUNDAMENTAL RESEARCH

ICTS Seminar

Title : Normal Form for Renormalization Groups

Speaker : Archishman Raju, Rockefeller University

Date : Tuesday, August 27 , 2019

Time : 1:30 PM

Venue : Emmy Noether Seminar Room, ICTS Campus, Bangalore

Abstract : The results of the renormalization group are commonly advertised as the existence of power-law singularities near critical points. The classic predictions are often violated and logarithmic and exponential corrections are treated on a case-by-case basis. We use the mathematics of normal form theory to systematically group these into universality families of seemingly unrelated systems united by common scaling variables. We recover and explain the existing literature and predict the nonlinear generalization for the universal homogeneous scaling functions. We show that this procedure leads to a better handling of the singularity even in classic cases and elaborate our framework using several examples.