KMI – Theory Seminar

Thursday, January 15, 2015

5:00 pm, KMI Science Symposia (ES-635)

"Recent Results on Renormalization-Group Evolution of Theories with Gauge, Fermion, and Scalar Fields"

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Abstract:

With We will discuss the renormalization-group evolution of several types of theories, both asymptotically free and infrared-free: (i) an analysis of asymptotically free non-abelian gauge theories with various fermion contents, including higher-loop calculations of the IR zero of the beta function and anomalous dimension of the fermion bilinear, and comparison with lattice measurements; (ii) an investigation of a possible UV zero of the beta function for a U(1) gauge theories up to five-loop order; (iii) a similar study for an O(N) $\lambda |\vec{\phi}|^4$ theory up to five-loop order; and (iv) an analysis of the RG flow diagram for a Yukawa theory in the space of quartic and Yukawa couplings. We also discuss scheme transformations and their effect on a zero of the beta function calculated to higher-loop order.