PDE/ANALYSIS SEMINAR

Topic: **Polynomial Chaos and Scaling Limits of Disordered Systems**

Speaker: **Dr. Sun Rongfeng**

Time: 14:30-16:30, 16 December 2013

Venue: Room 371, Geography Building, 3663 Zhongshan Road North, Shanghai

(华东师范大学中山北路校区，地理楼 371 室)

ABSTRACT OF THE TALK

Inspired by recent work of Alberts, Khanin and Quastel, we formulate general conditions ensuring that a sequence of multi-linear polynomials of independent random variables (called polynomial chaos expansions) converges to a limiting random variable, given by an explicit Wiener chaos expansion over the d-dimensional white noise. A key ingredient in our approach is a Lindeberg principle for polynomial chaos expansions, which extends earlier work of Mossel, O'Donnell and Oleszkiewicz. These results provide a unified framework to study the continuum and weak disorder scaling limits of statistical mechanics systems that are disorder relevant, including the disordered pinning model, the long-range directed polymer model in dimension 1+1, and the two-dimensional random field Ising model. This gives a new perspective in the study of disorder relevance, and leads to interesting new continuum models that warrant further studies. This is based on joint work with F. Caravenna and N. Zygouras.

BIOGRAPHY

Dr. Sun Rongfeng graduated from Courant Institute, NYU, in 2004 under the supervision of Chuck Newman. He spent two years as a postdoc at the research institute EURANDOM in the Netherlands. Then he spent another two years as a postdoc in TU Berlin. In 2008 he came to National University of Singapore as an assistant professor.