

Chez Pierre

Presents ...

Tuesday, May 1, 2012

4:00pm

MIT Room 4-331



SPECIAL CHEZ PIERRE SEMINAR

Leo P. Kadanoff

University of Chicago

The Perimeter Institute, Canada

“Realizations of Renormalization**”

In 1965-71, a group of people* formulated and perfected a new approach to physics problems, which eventually came to be known under the names of scaling, universality and renormalization.

Here I discuss how the renormalization group concept can be realized in an approximate manner in calculations in coordinate space, as distinct from momentum space.

I shall particularly focus upon the behavior of a scheme described as a “lower bound variational method” and the resulting approximate analysis of renormalization problems. I want to compare this scheme to an improved method based upon Singular Value Decomposition, that I particularly connect with the names of Prof. Xiao-Gang Wen and Michael Levin. An examination of these two approaches sheds light on the strengths and weaknesses of both methods.

* Important work in this period came from Cyril Domb, Michael Fisher, Benjamin Widom, A. Pashinski, V. Pokrovskii, and Kenneth Wilson and also myself.

** coworkers: Amy Kolan, Efi Efrati, Ilya Gruzberg