

MATHEMATICAL SCIENCES LECTURE SERIES

College of Liberal Arts & Sciences

Leo Kadanoff

University of Chicago

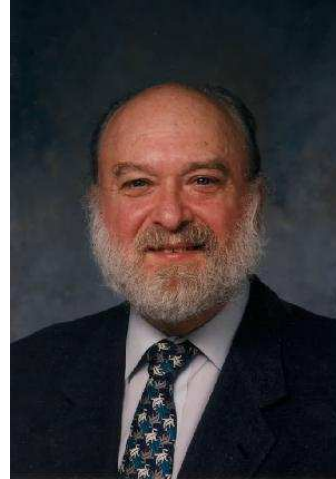
Computer Simulation and Prediction – The Good the Bad and the Awful

Date: Wednesday, February 15, 2006

Lecture: 4:05 – 4:55 pm

Location: Room 2205 New Physics Building

Refreshments: At 3:30pm



OPENING REMARKS BY

Janie Fouke, Provost

Abstract:

This is a talk about the role of computer simulations in science. This talk reviews a number of simulations, mostly connected with fluid mechanics. Some excellent work is reviewed. Less happy stories are recounted. An example of a supernovae calculation is traced in detail. The main goal is to trace out circumstances under which a simulation might

- Discover something new
- Help in establishing a scientific fact
- Help in constructing a scientific argument
- Be quite misleading
- Be entirely useless

Examples of each of these situations are provided.

Leo Kadanoff is John D. MacArthur Distinguished Professor in the Departments of Physics and Mathematics at the University of Chicago. He is a theoretical physicist and applied mathematician who has contributed widely to research in the properties of matter, the development of urban areas, statistical models of physical systems, and the development of chaos in simple mechanical and fluid systems. His best-known contribution was in the development of the concepts of “scale invariance” and “universality” as they are applied to phase transitions. More recently, he has been involved in the understanding of singularities in fluid flow.

This Lecture Series is co-sponsored by the Quantum Theory Project (QTP) and The Mathematical Sciences Committee. The Committee seeks to identify emerging scientific fields that have strong mathematical components; promote education in these fields; encourage and support collaborative research; coordinate responses to interdisciplinary proposal solicitations; and explore more formal organizational structures that will bridge the mathematical sciences and their applications.