Abstract: The fundamental laws of physics are very simple, but the world about us is very complex. Living things are very complex indeed. This complexity has led some thinkers to suggest that living things are not the outcome of physical law but instead the creation of a designer. Here I first examine how complexity is produced naturally in fluids, and then use that as a template to suggest how complexity might be produced more generally. Examples described in detail include splashes, the formation of drops, a square dance, and turbulence in a fluid heated from below.

Subsequent Talks by Dr. Kadanoff at Western:

Theoretical Physics Talk:
The Good the Bad and the Awful: Scientific Simulation and Prediction
Wednesday, March 20, 2:30pm, 204 Middlesex College
Abstract: Some excellent computer simulation work is reviewed. Less happy stories are recounted. I then concentrate my attention upon astrophysical simulations, describing a set of simulations that are not definitive but can suggest possible scenarios for stellar explosions. The value of such simulations is discussed.

Philosophy Talk:
Slippery Waves: Brilliance Brings Blind Spots
Friday, March 22, 1pm, 1145 Stevenson Hall
Abstract: Superfluidity and superconductivity are two remarkable phenomena in which, at low temperatures, materials abruptly gain the ability to flow without friction. Microscopic quantum theories of these new phases of matter were constructed in blockbuster papers of Lev Landau (1941) and John Bardeen, Leon Cooper, and J. Robert Schrieffer (1957). The actual explanation of the flow, however, is rooted in an Einstein paper of 1924 that introduces a quantum wave function for a condensed mode extending across the entire system. Neither blockbuster paper mentions Einstein or the crucial idea of a condensate. The reasons for this omission are discussed.

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