Roman Frigg: Reconsidering Reductionism in Statistical Mechanics

Abstract:

In general philosophy of science statistical mechanics (SM) is often proffered as the paradigm example of a reductionist enterprise. This contrasts starkly with the more sceptical outlook one finds large parts of the philosophy of physics. In this talk I re-evaluate the situation in the context of Boltzmannian SM and argue that if we adopt Schaffner's (Neo Nagelian) framework of reduction, then there is a sense in which SM provides a nontrivial reduction of the Second Law of Thermodynamics. The argument depends at least in part on relevant systems being almost ergodic. I introduce a precise version of "almost ergodic" and argue that the relevant sytstems possess this property.