Department of Mathematics and Statistics Colloquium

Understanding the Role of Computational Methods in Science

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Abstract: The first part of the talk offers an overview of the philosophical thought related to the scientific method (classically understood as the relation between theory and experiment), and it will show how the concept of model was introduced to account for the sciences lack of compliance to philosophical ideas. Simulation models follow quite naturally from this view, if one tries to explicate the role of computer methods in the sciences. I will conclude by giving some remarks on how those methods affect theory building in physics and how a new types of theory might emerge.
The second part of the talk focuses on computer simulations more specifically. It discusses three main philosophical approaches. First, I discuss the different attempts to define computer simulation. Although philosophers have offered several definitions, it seems that computer simulations are unable to be placed into a single conceptual corset. Second, I present the debate over the epistemological power of computer simulations, more specifically, their chances of being epistemically on a par to laboratory experimentation. Finally, I discuss several approaches that take computer simulations as units of study in and by themselves. To this end, I present several problems raised by computer simulations in their own right.

Monday, March 12 at 3:50 in Roop 103

Refreshments at 3:30