



NIMBioS

National Institute for Mathematical
and Biological Synthesis

“Manipulative strategies and their evolution”

Dr. Peter Hammerstein

Institute for Theoretical Biology, Humboldt University Berlin

NIMBioS Postdoctoral Fellows Invited Distinguished Visitor

Tuesday, March 1, 2011

3:30 p.m.*, Room 403, Blount Hall, 1534 White Ave.

*In social psychology, the term manipulation refers to a process by which one affects the decisions of others to one's own advantage. Advertisers, for example, act to their own advantage when they induce an interest in the products of companies from which they receive their income. The advertisers' success depends on how well they understand the mechanisms of our mental machinery and whether they are able to make strategic use of this knowledge. At an appropriate level of abstraction there are interesting parallels in biology. Microorganisms often manipulate regulatory networks of their hosts in ways that deserve to be called "strategic" and are based on subtle interference with these networks. Intracellular bacteria of the genus *Wolbachia* are a good case in point, since they modulate basic processes of their hosts, such as cell division and differentiation, in most impressive ways. These modulations follow a strategic logic that can be revealed through an analysis inspired by evolutionary game theory. It turns out that some of the 'tricks' used by *Wolbachia* (e.g., to establish a poison-antidote system) are not unheard of in the human world. The second part of the talk deals with the ways in which plants manipulate brains. It is important to understand these manipulations in order to develop preventive measures against drug addiction. Inspired by game theory one would ask whether there is any strategic logic to the effect nicotine has on our mesolimbic reward pathways? This question leads into the "paradox of drug reward." Dr. Hammerstein will present this paradox and an attempt to resolve it.*

**Join us for refreshments in the NIMBioS Lobby on the 4th floor at 3 p.m*