

COE セミナー

日 時 : 2006 年 11 月 21 日(火) 15:00～

場 所 : 大阪大学サイバーメディアセンター・

豊中教育研究棟 7 階大会議室

題 目 : Statistical mechanics of agent-based systems: learning dynamics
and complex co-operative behaviour in Minority Games

講演者 : Tobias Galla 氏

(The Abdus Salam International Centre for Theoretical Physics, Trieste, Italy)

要 旨 :

Over the past years the analysis of socio-economically inspired agent-based models with the methods of statistical physics has turned out to be extremely fruitful and interesting: the Minority Game (MG) and related models can be solved exactly with the techniques of disordered systems and neural networks theory, and on the other hand they exhibit non-trivial off-equilibrium dynamics, novel types of complexity, and co-operative behaviour.

In this talk I will first introduce the MG, and will then describe how the macroscopic behaviour and phase diagrams of agent-based models can be obtained with methods such as dynamical generating functionals and replica theory. Characteristic observables including the volatility and predictability of the resulting time-series can here be computed exactly.

We will compare the phenomenology of the MG with that of models of spin-glass physics, and will discuss similarities as well as differences.

In the last part of the talk I will address the question, whether simple stylised models such as the Minority Game can reproduce the statistical features of the time-series generated by real financial markets.