



Meiji University Global COE Program

4th Mathematical Sciences based on Modeling, Analysis and Simulation seminar



Date : April 22. 2009, 16:30~17:30

Location : Meiji Univ. Ikuta Campus, Build 2 Annex A, Room A205

Shu-ichi Kinoshita (Meiji Univ.)

Title : Fitness landscapes and the gene regulatory
dynamics in complex networks

Abstract :I would like to report two issues: (1) How does the gene network structure influence the fitness landscape in an evolutionary process; (2) How does it influence the dynamics in the gene regulatory network. Long time ago, S. A. Kauffman introduced the so-called "NK-model" that reproduces an evolutionary process of a random network, and he studied fitness landscape under the process, on the one hand. On the other hand, he introduced and studies the famous "Random Boolean network model (RBN)" that describes temporal development of state dynamics of a random network. Both models have been successful to elucidate many important aspects of the random network dynamics. However, recent developments of gene network study have shown that the gene-gene interaction in living cells is not homogeneous like random network but heterogeneous such as scale-free network. Therefore, we need some generalizations of the NK-model and the RBN .So, we have generalized the NK model and the RBN to incorporate the various network structures into the models. Using this generalization, I will discuss the above issues.

Everyone is welcome to attend the MAS seminar.

Meiji institute for Advanced Study of Mathematical Science (<http://www.mims.meiji.ac.jp/>)

(Organizers: M. Mimura, D. Ueyama, Y. Wakano and K. Ikeda)

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Access: 10 minutes on foot from Ikuta St. Odakyu line,
Or 10 minutes by bus No.13 「明治大学正門前」, get off at the last stop.
See http://www.meiji.ac.jp/koho/campus_guide/ for details.