



# Meiji University Global COE Program 42<sup>th</sup> Mathematical Sciences based on Modeling, Analysis and Simulation seminar



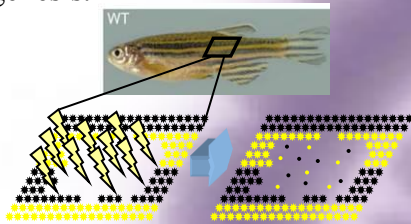
Date: June 23, 2011, 16:30~18:00

Location: Meiji Univ. Ikuta Campus, Build 2 Annex A, Room A207

**Akiko Nakamasu** (Meiji University)

**Title : From Pigment Pattern to Morphogenesis  
– The Turing Pattern in Developmental Biology**

Abstract: In 1952, Alan Turing put forward the idea of a reaction-diffusion system that explained the autonomous formation of patterns in regions where none had pre-existed. Such patterns could provide the positional information that is thought to be used in various developmental processes. But it had long been difficult to prove whether the patterns were actually dependent on a reaction-diffusion system. With this background, I had participated in experiments using the skin pigment pattern on fish (specifically, the model organism zebrafish) which is a living example of a pattern formation system. In this seminar, I will show that the interactions among zebrafish pigment cells include short range activation and long range inhibition which satisfy the conditions necessary to form a Turing pattern. Then, I will talk about the potential for using the reaction-diffusion model to explain plant leaf morphogenesis.



(a), Series of laser ablation to measure the relationship between the pigment cells



(b), Phenotypic plasticity in the leaf morphology of *Neobeckia aquatica*

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, K. Ikeda and S. Kinoshita)

MAS seminar is partly supported by Meiji University Global COE program “Formation and Development of Mathematical Sciences Based on Modeling and Analysis” (<http://goe.mims.meiji.ac.jp/>), the Grant-in-Aid for Scientific Research (S), “Mathematical Theory of Nonlinear-Non-equilibrium Reaction-Diffusion Systems” by M. Mimura (<http://nnrds.math.meiji.ac.jp/>).



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/](http://www.meiji.ac.jp/koho/campus_guide/) for details.