



The Graduate University for Advanced Studies

Sokendai



2006 Second Semester
Student Seminar
October 12 - 13

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Welcome message

New students, congratulations for your admission to SOKENDAI!!! The student seminar committee members welcome you to the student seminar 2006 2nd Semester. We are thrilled to meet all of you from various parts of the world and hoping this seminar will provide you direct information about life and studies at SOKENDAI. The challenge of studying in Japan is big, but the one to become a researcher is even bigger, so we hope you take advantage of this opportunity to enjoy this cultural exchange and to start a successful program. Enjoy research, enjoy SOKENDAI and enjoy JAPAN!!!

Student seminar committee members:

Shigeko Toita (Basic biology) *Chairperson
Tsuyoshi Aoyama(Basic biology)
Kazuya Hashiyama (Basic biology)
Yoko Mano (Physical Sciences)
Rumiko Suzuki (Genetics)
Luis Fernando Encinas Ponce (Genetics)
Katsutoshi Thuda (Genetics)
Xu Qi (Fusion Science)
Lukasz Tadeusz Radosinski (Accelerator Science)
Masaya Ando (Cyber Society and Culture)
Nararat Ruangchaijalupon (Informatics)

About the seminar...

In Sokendai, the students are encouraged to interact with others in the opportunities such as the Student Seminar which is organized and present by the students for the students. Since 1990 the Student Seminar is held annually after the enrollment ceremony and every organizing committee chooses a central idea that represents it. This year, "Challenge" is the central idea of the Student Seminar and three lecturers who all have challenging spirits are invited. During the first day, the lecturers are going to share their experiences, give advices and convey messages for the new students. In the same way, we will have group discussion session with invited speakers to exchange ideas on different topics of interest. On the second day, a water-rocket activity is planned. Students are divided into teams and are asked to create an accurate flying water-rocket. This activity is thought to provide to new students an opportunity to interact with others and the time to think of their own way of "Challenge". We are sure you will contribute to the planned activities with energetic discussions and active participation; furthermore, we hope you enjoy the informative atmosphere you can experience at Hayama campus. Thank you for your active participation!!!!

The central idea, Challenge...

This year, the central idea of our Student Seminar is "Challenge". As the word "Challenge" encompasses several meanings, we chose "Challenge" in the sense of the ability to endure difficult times that you will be facing in your life. As a student, life can be filled with hurdles and obstacles before claiming success at the end of the journey. In order to succeed as a researcher, one has to be focused and to stand up to overcome the many obstacles with a positive attitude.

While keeping self-motivated in the process of attaining a doctoral degree at Sokendai is already a challenge in itself, the essence of academic research is in fact the challenge to explore the unknown, the quest to gain a deeper understanding of our own nature and the world around us. With such idea in mind, we believe the word "Challenge" makes a good candidate to describe your research at Sokendai. Good luck in your program!!!

Shigeko Toita, Chairperson of the committee

Schedule of Student Seminar 2006 (2nd Semester)

Date	Start	End	Activity
10/12 Thu	15:30	15:40	The Opening Ceremony (Sokendai Main Building)
	15:40	16:20	Lecture-1 Lukasz Tadeusz Radosinski (Sokendai student) (Department of Accelerator Science, Sokendai)
	16:20	16:30	Coffee Brake
	16:30	17:10	Lecture-2 Professor Mariko Hasegawa (Hayama Center for Advanced Studies, Sokendai)
	17:10	17:20	Coffee Brake
	17:20	18:00	Lecture-3 Professor Hajime Fujisawa (Neuron Network Formation Unit, Nagoya University)
	18:00	18:10	Information
	18:10	18:40	Move to Shonan Village Center /Check in
	18:40	20:00	Dinner, Social Gathering (Shonan Village Center)
	20:00	20:10	Move to Discussion Rooms
10/13 Fri	20:10	22:10	Free Discussion (Shonan Village Center)
	07:30	08:30	Breakfast (Shonan Village Center, Cafeteria OAK)
	08:30	09:00	Check out / Move to Sokendai Main Building
	09:00	12:30	Water-Rocket Activity
	12:30	12:40	Move to Main Building
	12:40	13:00	Closing Ceremony, Photographing (Sokendai Main Building)
	13:00	14:00	Lunch

Lectures

Lecture 1

*"From local contest to space training
- my fourteen days of being an astronaut"*

Lukasz Tadeusz Radosinski



In 2001 Polish private company with cooperation with Space Adventures Company, bought a "ticket" for non professional astronaut to fly space. It supposed to be a short sub-orbital flight by a hyperbolic trajectory with a great similarity to first American space flight conducted by Alan Shepard. In February 2001 I was selected from more than 30000 contestants to join five people group directed to Cosmonaut Training Centre in Russia for final qualification and short training. Those five months I spend for selection and training where the most challenging and adventurous part of my life.

The main goal of our stay in Russia was to check if we are medically qualified for the space flight. Through these days in the Space Centre we had a number of tests which supposed to check our mental and physical abilities. Moreover we had a short but very intensive training on basic systems that are operated in space i.e. space suits, life supporting systems, toilet or how to prepare food. For this purpose we had theoretical and practical classes with Soyuz TMA spaceship simulator, Sokol space suits, weightless, g-loads and low pressure chamber trainings. In this lecture I want to present memories of this incredible adventure.

Present post:

- Sokendai student in High Energy Accelerator Research Organization (KEK)

Profile:

1999: Student of Technical University of Wrocław, Fundamental Problems of Technology Department, mathematics faculty,

2001: Yu. Gagarin Cosmonauts Training Centre (Graduated 17.03.2001),

2002 – 2003: Loughborough University, Physics Department, physics faculty

2004: Msc. Eng. of Mathematics, Mathematics Applied to Computer Science

2005: Msc. Eng. of Physics, Solid State Physics

Lecture 2

"Inspiration, Intuition and Cultural Influence"

Prof. Mariko Hasegawa



I am originally from physical anthropology but now a field biologist working on animal behavior, ecology and evolution. Generally speaking, many biologists specialize in the details of the micro-levels of organisms, and some of them claim that they are very good at carrying out meticulously fine-tuned, difficult experiment, others claim that they are good at making very fine specimens and taking beautiful pictures of them by electron microscopy. Now, what is my specialty? What am I good at, to boast to the other scientists? I think I am a very keen observer of natural world, taking notice of any tiny movements around me when I am walking through a bush, I think I am quite skillful at identifying animals individually, and I flatter myself that I am rather a good wildlife photographer. The only scientific equipment which I can use as a natural extension of my body is a pair of binoculars. Well, not much.

So far, I have studied wild Japanese monkeys, wild chimpanzees in Tanzania, free-ranging fallow deer in Petworth Park, Sussex, England, wild soay sheep in St. Kilda, Outer Hebrides, free-ranging peafowl in Japan, wild counterparts in Sri Lanka, and wild elephants in Sri Lanka. The focus of my research is on the sexual strategies and male-female conflict. Nowadays much of my research efforts are spent on humans, but it not a field study, but a statistical analysis.

In this talk, I would like to talk about my research methods, putting emphasis on how I got inspiration or intuition for my research and some cultural influence on the methods of my research. I hope you can enjoy it.

Present Post:

Professor, School of Advanced Sciences, The Graduate University for the Advanced Studies.

Profile:

Graduated from the Department of Anthropology, the University of Tokyo, and got a PhD in Anthropology, the University of Tokyo in 1986. Wildlife research officer, the Government of Tanzania from 1980 to 1982. The Research Associate at the Faculty of Science, the University of Tokyo from 1983 to 1990. Taught at Senshu University, Yale University, and Waseda University afterwards, and moved to the present post at the beginning of this year.

Lecture 3

"How are neurons wired up into networks?"

Prof. Hajime Fujisawa



Neurons extend axons and synapse each other to form networks. For an example, in the human brain more than 10^{10} neurons are wiring up into enormously complicated but well organized networks to provide anatomical bases for various brain functions, including animal locomotion, memory, emotion and so on.

I am interested in the development of vertebrate brains, and have been studying on the molecular mechanisms that govern neuron wiring by way of targeted gene disruption. Here, I will talk about the molecules (genes) that play essential roles in the organization of PNS and CNS neuron networks.

Present posts:

- Professor at The 21st Century COE Program, Nagoya University Graduate School of Science

Profile:

- PhD in Zoology, (Kyoto University) and MD (Kyoto Prefectural University of Medicine)
- 1971-1990: Research Associate, Assistant Professor and Associate Professor at Kyoto Prefectural University of Medicine
- 1990-2004: Professor at Nagoya University, School of Science (Department of Biology), and Professor at Nagoya University, Graduate School of Science (Division of Biological Science)
- 2004: Professor Emeritus at Nagoya University
- 2004: Professor at The 21st Century COE Program, Nagoya University Graduate School of Science (Division of Biological Science)

Topics of research:

Developmental Neurobiology, Axon Guidance, Neuron Network Formation

「ニューロンネットワークはどのように作り出されるか」

藤澤 肇 (ふじさわ はじめ)

神経細胞(ニューロン)は突起を伸ばし、他の神経細胞とシナプス結合し、ネットワークを形成する。例えば、ヒトの脳皮質には 10^{10} を超える神経細胞があり、これらの神経細胞は組み合わせたりきわめて複雑ではあるが秩序立ったネットワークを形成している。このようなニューロンネットワークが動物の行動、記憶、情動などさまざまな脳機能の基盤となっているのです。

私は、脊椎動物の脳の発生に興味を持ち、遺伝子破壊マウスを作製する手段を用いてニューロンネットワークの形成を制御する分子機構の解明を行ってきています。ここでは、末梢神経系、中枢神経系の秩序立ったニューロンネットワークを生み出す分子(遺伝子)についてお話をしようと思います。

所属及び職名:

名古屋大学大学院理学研究科特任教授 (生命理学専攻、21世紀COEプログラム)

略歴:

- 理学博士 (京都大学)、医学博士 (京都府立医科大学)
- 1971-1990: 京都府立医科大学医学部助手、講師、助教授 (解剖学)
- 1990-2004: 名古屋大学理学部教授 (生物学科)、名古屋大学大学院理学研究科 (生命理学専攻) 教授
- 2004: 名古屋大学名誉教授
- 2004-: 名古屋大学大学院理学研究科特任教授 (生命理学専攻、21世紀COEプログラム)

専門分野及び研究活動概要:

神経生物学、軸索ガイダンス、神経回路形成

Free Discussion Session

Discussion Leaders:

- Kentaro Arikawa (Prof. of Sokendai)
- Hajime Fujisawa (Prof. of Nagoya University)
- Mariko Hasegawa (Prof. of Sokendai)
- Lukasz Radosinski (Sokendai Student)
- Yoko Satta (Prof. of Sokendai)

* Satoru Ikeuchi (Prof. of Sokendai) (Guest)

About the leaders...

- **Prof. Kentaro Arikawa** (Neuroethology of insect color vision)

Personal history and research outline:

DSc at Sophia University, Tokyo (1984)

After 22 years as assistant, associate, and full Professor of Biology at Yokohama City University (1983-2005), I moved to Sokendai in 2006. I also worked as a visiting research fellow at Australian National University (1982-1983), a research fellow at NIH (1987-1989), and a researcher of PRESTO-JST (1997-2000).

What do animals see? Do they see colors, and if so, how and why? These are the questions we are asking by using flower-visiting insects as the model. The spectrum of our experimental techniques is broad; it includes behavioral analysis, neurophysiology, anatomy, molecular biology, etc. We recently demonstrated that the eyes of butterflies typically contain more than six different classes of spectral receptors, whereas we humans have only three. We also showed that they see colors as we do at least when they search for food among flowers.

Message for new students:

Observe your subjects well. 'Play' with the subjects. Collect data carefully. Polish your data. Then think about your story. Enjoy doing science to entertain people by your stories.

- **Prof. Yoko Satta** (Population Genetics)

Personal history and research outline:

I received my PhD in Science from Kyusyu University on the study of molecular population genetics and evolution of *Drosophila* mitochondrial DNA. After I completed the degree, I spent two years as a postdoc at the National Institute of Genetics in Mishima and then moved to the Max Planck Institute for Biology in Tuebingen, Germany and spent three years there. During these five years, I studied the population genetics and evolutionary genetics of MHC (Major Histocompatibility Complex), a key molecule for our immune system. I came back from Germany in 1996 and began a position of Associate Professor in Sokendai.

Through studying MHC, I have become interested in the interrelationship between environments and genomes. I am now working on Evolutionary Physiology: How organisms acquire their specificity in physiology upon changes of the surrounding environment.

Message for new students:

"Interest" or better "Passion" is the most important element for individual researchers to drive motivation. Throughout your career, you will face some difficulties and may lose your direction at times. When you encounter such problems, it is important to regain a connection to your initial passion or interest. Then you can certainly find your direction again.

Water-Rocket Activity

Purpose of the activity:

Making a water-rocket is easy enough even for elementary schoolchildren. However, some basic knowledge of physics is required for understanding why water-rockets fly. It would be a "Challenge" for you to understand the mechanisms of water-rockets if you haven't studied physics or mechanisms of rockets. If you are an expert, we want you to try to make a better rocket with your own "Creativity". That would be also a "Challenge". We hope that all participants try to have a good "Communication" and a "Discussion" with interchanging your ideas to make better rockets.

We believe that these four keywords, "Challenge", "Creativity", "Discussion" and "Communication", are important things for our research life. So we hope you to realize these four things through this activity. And we also hope that this activity will be a good opportunity to enjoy not only playing a water-rocket but also making a friendship with other students.

Schedule:

9:00 - 10:00	Introduction to water-rocket
10:00 - 10:20	Break
10:20 - 12:30	Creating and launching the water-rockets. Cleaning up the field *

* In case of bad weather, the lecturer will evaluate each group's modification and ingenuity.

Lecturer's profile

To be determined...

Activityの趣旨

ペットボトルロケットは小学生でも作れる簡単なものですが、その原理を理解するには簡単な物理学の知識が必要です。このアクティビティを通してロケットの原理を学ぶことは、今まで物理学やロケットに馴染みのなかった人にとっては、きっと新たな「チャレンジ」になるはずですし、物理学やロケットに詳しい人には、自分自身の「クリエイティビティー」を使ってより良いロケットを作るという「チャレンジ」となるでしょう。また、参加者全員がこのアクティビティを通して、互いに「コミュニケーション」をはかり、「ディスカッション」しながら作業を進めていければ、さらに素晴らしいロケットを作ることができるはずです。

ここに出てきた4つのキーワード「チャレンジ」「クリエイティビティー」「コミュニケーション」「ディスカッション」は我々の研究生活においてもとても重要なものであり、参加者が協力してロケットを作製して飛ばすという取り組みを通して、これらの重要性を認識することができればと考えています。またこれを機会に、ペットボトルロケットの作製・打ち上げを楽しむだけでなく、学生同士の良い交流が持てるようになれば幸いです。

Activityの進行手順

9:00 - 10:00	ペットボトルロケットの講義
10:00 - 10:20	休憩（移動）
10:20 - 12:30	作製・打ち上げ・後片付け

*・・・小雨の場合は決行しますが、大雨&暴風の場合は講師の先生による評価（各グループの工夫に対して）をしていただく予定です。

講師の紹介

未定（当日の資料として配布致します。）