

Report on Workshop for Interdisciplinary Global Engineers at KTH & ETH 2014



September 16–25, 2014



東京大学 大学院工学系研究科
School of Engineering The University of Tokyo

Contents

Preface		2
Schedule		3
Introduction to KTH and ETH		4
Individual Reports		
Civil Engineering	Hiroaki Ikeuchi	6
Architecture	Yang Shuting	7
Urban Engineering	Masatomo Suzuki	9
Mechanical Engineering	Kenya Fujimoto	10
Precision Engineering	Michitaka Kawano	11
Aeronautics and Astronautics	Toshihiko Azuma	12
Electrical Engineering and Information Systems		
	Masanobu Honda	13
Applied Physics	Takehiro Serikawa	14
Systems Innovation	Wataru Kondo	15
Materials Engineering	Yuki Muto	16
Applied Chemistry	Tomoyuki Tasaki	17
Chemical System Engineering	Yuki Shinohara	18
Chemistry and Biotechnology	Yuki Tokimaru	19
Nuclear Engineering and Management		
	Junpei Hoshino	20
Bioengineering	Ayaka Kamada	21
Technology Management for Innovation		
	Yukari Ueno	22

Preface

This program was organized as part of the *Re-Inventing Japan Project*. 16 students delegated by the University of Tokyo School of Engineering visited the Royal Institute of Technology (KTH) in Sweden and the Swiss Federal Institute of Technology (ETH) in Switzerland.

By visiting the world's highest level universities and interacting with the students, we were able to dramatically expand our views. We also felt that these foreign universities became much closer to us.

We truly thank everyone who worked on this program, especially those who accompanied us: Su-san, Furuichi-san, Mike-san, Sekiguchi-san, Ishihara-san, Nakai-san, and Tsujimoto-san.

We'd like to contribute to the success of this program next year through this report. We hope that more students can succeed internationally in the future.

(From all the students in the KTH/ETH Workshop)



Schedule

September 16 th	
10:25	Depart from Narita Airport
15:50	Arrive at Zurich Airport
16:35	Depart from Zurich Airport
20:30	Arrive at Stockholm Arlanda Airport
September 17 th	
9:30	Welcoming and KTH introductory presentation
11:00	Tour of main campus
13:30	Sound in therapy applications / Japanese language lecture
15:00	Introduction to the Swedish language
17:00	Socializing with KTH students
September 18 th	
9:00	Tour and lab visits arranged by KTH
September 19 th	
9:30	Visit to SciLife Lab
16:30	Socializing with KTH students
September 20 th	
15:30	Depart from Arlanda Airport
17:55	Arrive at Zurich Airport
September 21 st	
	Field Work
September 22 nd	
11:00	Socializing with ETH students
13:00	Visit to Lab / Lecture
September 23 rd	
9:00	Visit to Lab / Lecture
12:15	Japanese language lecture
18:00	Wrap-up session
September 24 th	
13:00	Depart from Zurich Airport
September 25 th	
7:50	Arrive at Narita Airport

KTH

The Royal Institute of Technology (Kungliga Tekniska Högskolan, KTH) is a university in Stockholm. It was founded in 1827 as Sweden's first polytechnic and it is one of Scandinavia's largest institutions of higher education in technology. KTH accounts for one-third of Sweden's technical research and engineering education capacity at university level. It offers programmes leading to a Master of Architecture, Master of Science in Engineering, Bachelor of Science in Engineering, Bachelor of Science, Master of Science, licentiate or doctoral degree. The university also offers a technical preparatory programme for non-scientists and further education.



There are a total of over 14,000 full-year equivalent undergraduate students, more than 1,700 active postgraduate students and 4,600 full-time-equivalent employees. KTH is one of the leading technical universities in Europe and highly respected worldwide, especially in the domains of technology and natural sciences.

In 2014/2015 the university was ranked 110th in the world by QS World University Rankings, and it was ranked 33rd in the world for engineering and technology, the highest ranked institution in Scandinavia, and 74th in the natural sciences. (KTH Wikipedia, 2014)



ETH

ETH Zürich (*Eidgenössische Technische Hochschule Zürich*) is an engineering, science, technology, mathematics and management university in the city of Zürich, Switzerland. Like its sister institution Swiss Federal Institute of Technology in Lausanne (EPFL), it is an integral part of the Swiss Federal Institutes of Technology Domain (ETH Domain) that is directly subordinate to Switzerland's Federal Department of Economic Affairs, Education and Research.

Founded in 1855, ETH Zürich today has more than 18,000 students from over 110 countries, including 3,900 doctoral students. To researchers, it offers an inspiring working environment, to students, a comprehensive education.



ETH Zürich is consistently rated among the top universities in the world. It is considered the best university in continental Europe by the Shanghai Ranking ARWU, the Times Higher Education World University Rankings and

Key statistics	2013	2012	2011
Students (headcount)	18,178	17,781	17,187
Professors (headcount)	497	482	462
Personnel (headcount)	10,478	10,242	10,040

the QS World University Ranking. It is currently ranked 4th in Europe overall, and 3rd best university in the world in engineering, science and technology. Twenty-one Nobel Prizes have been awarded to students or professors of

the Institute in the past, the most famous of which is Albert Einstein in 1921, and the most recent is Richard F. Heck in 2010. It is a founding member of the IDEA League and the International Alliance of Research Universities (IARU) and a member of the CESAER network. (ETH Zürich Wikipedia, 2014)



Eidgenössische Technische Hochschule Zürich
Swiss Federal Institute of Technology Zurich

Civil Engineering M1 Hiroaki Ikeuchi

Visit to research institutes in Sweden & Switzerland

September 18: Surface Hydrology and Climate Research Group, Uppsala Universitet

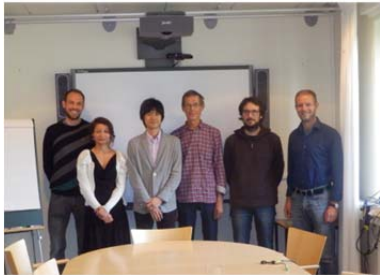
A two hour journey took me from Stockholm to Uppsala Universitet. Established in 1477, the University is the oldest in Scandinavia. I visited Prof. Dr. Allan Rodhe's research group, where the research theme is similar to mine. I had the opportunity to give a short presentation about my research to the group members. The thriving discussion yielded many reviews and comments, resulting in connections between our respective researches. It was quite a successful visit, and I was able to expand my international connections as a researcher.

September 19: Science for Life Laboratory, Karolinska Institutet

Outside of my major, I visited one of the most prestigious medical research institutes in the world, Karolinska Institutet. While the technical aspects of the research were difficult for me to fully understand, the tight-knit cooperation between industries and the University had an educational implication.

September 22: Laboratory of Hydraulics, Hydrology and Glaciology (VAW), ETH Zürich

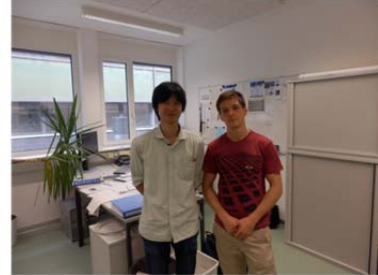
Prof. Dr. Benjamin Hohermuth in ETH guided me on a tour of his laboratory, focusing on hydraulic experiment facilities. It was surprising that quite a large space was assigned to them. The most impressive model was a one-thirtieth scale model for river flow and sediment transport around Zürich HB station. Because Zürich HB station located in a fluvial fan of Sihl River and Limmat River is vulnerable to floods, measures to control floods and sediment deposition are of great importance. There was also an experimental facility that researchers from Kyoto University in Japan came to use just a week before my visit. Facilities were of truly excellent quality.



With Uppsala Univ. members



At VAW, ETH



With Prof. Dr. Hohermuth

Other activities

The best thing I experienced during the visit to KTH was communication with students (including a homestay). Through my attendance at Japanese language classes and at parties I got acquainted with many KTH students. Also in Switzerland I had a chance to socialize with Japanese students who are now studying at ETH.

Because my major is civil engineering, I visited many places to see the infrastructure in Sweden and Switzerland: Uppsala, Stockholm, Bern, Zürich, Pilatus, and Luzern. Strict urban planning made these cities attractive by preserving landscapes during the Middle Ages. The beautiful scenery and reasonable transportation systems greatly inspired me.

Acknowledgements

In sum, I had invaluable experiences such as single-handed visits to laboratories, exciting interactions with various students, and excursions to amazing places. I want to express my gratitude to the staff who accompanied us, the supervisors at the Department of Civil Engineering who recommended me to this program, and everyone that I got to know through this experience.

Architecture M1 Shuting Yang

It was such an honor to be selected as a member of the international intensive workshop this year, and such a great pleasure to meet so many excellent students from different majors in the School of Engineering. Ten days is not short period of time, but it is also not long. During this period, many things happened and I made some of the most unforgettable memories of my life.

- **Visiting KTH, Sweden**

The first stop on our trip was KTH, which is regarded as one of the leading universities in Sweden. The Department of Architecture at KTH is located about a five minute walk off campus. I visited Prof. Andersson, an expert in architecture for frail older people. We discussed my research on regional planning with consideration for the locations of aging welfare facilities, and compared the differences between the Swedish and Japanese welfare systems and facility services.

After that, I attended a lecture given by Swedish architects on parameter-based architectural design. To make the formations of architecture more convincing and reasonable, architects calculate heat convection, air convection and other parameters to make the building more reliable and eco-friendly.

I also took a regular lecture called Transport and Geodata Analysis together with Mr. Suzuki from the Dept. of Urban Engineering. The lecture was inspiring, especially the portions about how to read data and get a more accurate result.

- **Visiting ETH, Switzerland**

With one of the best departments of architecture in the world, I could feel how much pressure both the professors and students have. I visited the lab and had a talk with the students there. The architectural studio there is simple and clear; there are real sites and real urban issues to be solved.

I also went to the undergraduate diplomat design exhibition. The skill level was quite high, and with such a deep consideration of material and the balance of space, the precision was really admirable.

- **Foreign Language Study**

I attended the Japanese language class at KTH and found how hard it is for Europeans to study Japanese. For me, a foreign student attending Japanese language class at Todai every semester, Japanese was easy to study at first, but gradually became difficult after making some progress. For advanced foreign language study, it is really important to learn at a challenging level to prompt yourself. If there is no progress, you will probably fail to continue language studies. I think this is not only true for those learning Japanese, but also for Japanese speakers learning English as well.

Architecture M1 Shuting Yang

- **Homestay life**

My host Maria Angeliki was a Greek girl who could speak fluent English, Swedish, French, Norwegian, and her mother tongue Greek, of course. Actually, she even knows more languages than that. She studied as an Urban Engineering exchange student at Todai for one year. She loves almost everything about Japan. She recently received her master's degree from KTH and started planning her next trip for somewhere in the world.

Maria Angeliki and I shared our knowledge about urban regeneration issues and foreign language studies. We both believe that the best way to make progress in a foreign language is to set a high target and keep practicing. She definitely gave me the courage and confidence to make my Japanese better. I really had a great time staying with her and we are still in touch even though the workshop has finished.

10 days are really short and it is not possible to write everything down due to the limitations of this paper. However, through my participation in this workshop, I gained not only knowledge and experience, but also friendship and an open-minded spirit, qualities which will definitely become important treasures throughout my lifetime.

Urban Engineering M1 Masatomo Suzuki

Through this workshop, I visited some laboratories, participated in classes and programs and visited actual city planning sites relating to my research and study.

- Lab visits

At KTH, I visited Prof. Hans Lind's laboratory at the School of Architecture and the Built Environment. His research is conducted through economic analysis, and focuses on real estate from the city planning perspective. This is very similar to my research interest, and I got a number of inspiring comments after my presentation about my research. Because research in the field of urban engineering is confined within each country (because of societal relationships), it was important to get some insight about the role of my research field in Europe.

At ETH, I visited Prof. Dr. Bernd Scholl's lab at the Institute for Spatial and Landscape Planning. He researches city planning policy through actual projects, and I got some comments about my research through comparing the city planning situations between Japan (Asian countries) and Switzerland (European countries). Also, I talked with some Ph.D. candidates and postdoctoral researchers and understood the importance of comparative research in different planning cultures.



Panel about the department (ETH)

- Lecture

I participated in the lecture "Transport and Geodata Analysis." The style of the lecture was similar to lectures in Japan, but was more interactive, with many questions from students.

- Program

I talked with students from my major about the difficulties and importance of international comparative research, and about future careers in their countries. It was very impressive when thinking about my own career.

- Field trip

In Stockholm, I visited the central business and shopping district, which was redeveloped in the 1960s and 70s, and realized the ideal of city planning at that time. It was a nice experience to visit the actual sites I had learned about through textbooks.

It was a good opportunity for me to feel the atmosphere of the research in foreign universities when thinking about my career in the future. Thank you very much.

Mechanical Engineering M1 Kenya Fujimoto

Visit to Sweden & Switzerland

I went to Sweden and Switzerland as a member of the workshop program.



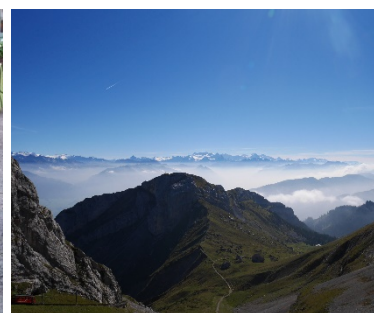
In Sweden, I visited Prof. Gustav Amberg's lab in KTH. I gave a presentation about my study and had a discussion with the lab members. It was a very good experience. There were many exchanges with KTH students, including parties and homestays. They seemed to be interested in Japanese culture. So, they asked us about our everyday life, Japanese college education, and trends, etc. We

managed to become good friends by going to parties, talking, and sightseeing together. Though we were surprised at our cultural differences, we were able to understand different views and values by talking about our differences again and again.

In Switzerland, I visited Prof. Petros Koumoutsakos' lab in ETH. I had the opportunity to make a presentation in front of all the lab members and had active discussions. On my free day, I traveled all around Switzerland. I felt an atmosphere and culture that is different from Japan. It was very nice to have had such a good experience.

This workshop was so flexible that I could not only visit labs but also go out for sightseeing and meet with my friends. Also, making the workshop schedule on my own was beneficial to me.

I spent fulfilling days in Sweden and Switzerland because I encountered nice people, including the workshop members. I'm very glad I participated in this workshop program.



Precision Engineering M1 Michitaka Kawano

1. Sweden

➤ Laboratory visitation

In Sweden, I visited Professor Wouter's laboratory which is world-famous in the field of MEMS.

Professor Wouter is very friendly and told me about the overview of the projects in his laboratory for about an hour in spite of his busy schedule. From among their projects, I was especially interested in rapid diagnosis for infectious diseases using electric precipitators and virus sensors via bio-photonics. Then, I was shown around the laboratory by a 2nd year master course student from Keio University who belongs to Professor Wouter's laboratory and who is now studying abroad. The students in the laboratory can use a 3D printer (Figure. 1) and fabricate devices (Figure. 2). Therefore, they can quickly embody what they want to fabricate. In addition to this, they develop a polymer called OSTE. If this polymer is exposed to light (Figure. 3), it will harden, so they can fabricate flexible devices using this polymer. I was shown the exposure process and hardened the polymer (Figure. 4).

After that, I asked the student from Keio University about student life at KTH and learned about experiences studying abroad which cannot be had in Japan. Thanks to that, I was motivated to study abroad and to do more research, so my visit to the laboratory was meaningful.

2. Switzerland

➤ Academic conference participation

I attended MNE 2014 (Figure. 5) in EPFL. From my laboratory, a 2nd year doctor course student had a poster presentation and Professor Kim, who is my boss, gave a lecture. I enjoyed participating in an international conference for the first time.

3. Acknowledgements

Finally, I would like to thank all the members of Center for International Affairs, especially Ms. Ishihara, for giving me the opportunity to participate in the excellent workshop.



Figure. 1 3D printer



Figure. 2 Devices

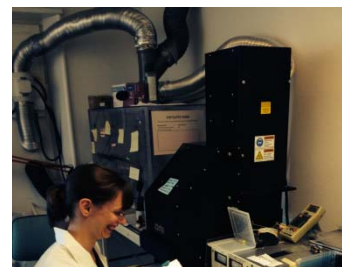


Figure. 3 Exposure equipment



Figure. 4 OSTE



Figure. 5 Conference venue

Aeronautics and Astronautics M1

Toshihiko Azuma

In this workshop, I had good experiences such as tours of KTH & ETH, visiting laboratories, staying with KTH students, and so on.

Stockholm (9/16-20)

I visited the Heat & Power Laboratory at KTH. The laboratory has a turbine blade wind tunnel and a 2.5 stage compressor rig testing facility. That's why the laboratory has become one of the main laboratories in the turbomachinery area. I was impressed by the large experiment room and great testing facilities. I told the other members of the research laboratory about my research and got some feedback, but I felt like I needed to improve my English ability.

My hosts, Hampus and Helena, were very kind and friendly. They made a lunch box for me! I enjoyed chatting about Japan with my hosts when we drank wine after dinner. We went to a lot of places in Stockholm to look for souvenirs. Although it was a very short time, I made a good relationship with them.

Zurich (9/21-24)

I visited the Laboratory for Energy conversion at ETH. This laboratory is the second oldest laboratory at ETH, and many companies support this laboratory. I was surprised that about 20 papers are published from this laboratory every year, about five of which win awards. This laboratory focuses on turbomachinery and wind energy and they also have great facilities. I enjoyed meeting and chatting with PhD students. The most interesting thing was the UAV system (Unmanned Aerial Vehicles system). The UAV system can measure the actual flow around a real wind turbine. There were a lot of impressive things.



Fig.1 Dinner with my hosts



Fig.2 With PhD student at ETH

This program was a great opportunity for me. I'm thankful for my supervisor who recommended me to this program, all the staff who took care of us, and the other members who joined this workshop.

Electrical Engineering and Information Systems

M1 Masanobu Honda

Through this program, I could feel that foreign universities are very close to me. This program was very effective.

KTH (Sweden)

I visited KTH and stayed at one of the KTH students' houses.

Thanks to the tour prepared by the KTH staff members, I was able to visit many facilities. The whole campus was very beautiful. Each laboratory had state-of-the-art instruments. Some of the laboratories have joint projects with Todai. Unlike Japanese engineering universities, KTH has many female students. In KTH, classes are given in English, which is very good for international students. Swedish students don't have to pay tuition.

During the homestay, I could experience life in Sweden with my host student. We talked a lot about Japan and Sweden. I went to an old district called Gamla stan, which was indescribably beautiful. It was amazing that all the Swedish people I met could speak English very fluently.

ETH (Switzerland)

I participated in Japanese class at ETH, and visited Prof. Benini's and Prof. Huang's laboratories.

At the Japanese class, I was surprised that many students were taking the class and they were planning to study in Japan.

Prof. Benini and Prof. Huang are studying VLSI. Their facility was almost the same as that of my laboratory, but they had a more student-friendly environment. They had a database of the chips they had designed, which can be accessed on the Internet. They also had a class in which students could design, order, and measure VLSI chips. Any student at ETH can take the class.

The city of Zurich was beautiful. We could move around the city very easily by tram. I felt that they were taking good care of the old buildings and the scenery.

Applied Physics M1 Takehiro Serikawa

I visited KTH and ETH for this workshop, and saw the research being conducted in these universities. Here is my report on it.

- KTH, Stockholm

I participated in lab tours, and learned about subjects such as molecular biology, plasma physics, naval architecture, and mechanical engineering. I was impressed that mechanical engineering includes industrial designing and marketing, which enables students to work as all-around contributors to the mechanical industry.

- Homestay with KTH student

I stayed at a student's house in Stockholm. By chance, my host student is going to enter my lab at Todai, so I told him about lectures at Todai and daily life in Tokyo. We also talked about cultures and politics in our own countries.

Additionally, I gave a presentation on Todai at a party with KTH students.



- ETH, Zurich

I visited some labs related to my study at ETH.

First, I visited Imamoglu Atac's laboratory, where they are working on coherent control of semiconductor quantum dots via optics. The lab is studying two subjects, experiments for the application of quantum dots and theoretical analysis of nuclear spin (electron spin coupling), so they are not restricted to one research area.

Second, I visited Andreas Wallraff's lab, where they are studying quantum information experiments based on Circuit-QED. Dr. Mintu Mondal (in the picture on the right) showed me an experimental setup of quantum teleportation between superconductor qubits. This lab has very sophisticated technology for superconductor device design and low-temperature environments. I was very impressed.



System Innovation M1 Wataru Kondo

Visit to KTH

This was my first time visiting an institute of technology in a foreign country, but as I had expected, the campus was really spacious and surrounded by beautiful nature such as rivers and forests, so I felt pretty comfortable just being there. Also, there were lots of good-looking guys and girls, so I was like, “This is exactly what my image of Sweden is like!” On my first day in KTH, I attended a Japanese class and I was excited to find that most of the students there had been to Japan and were very interested in Japan. At the welcome party and farewell party that we had with them, I got to talk with almost every single student, so it was really interesting and I had a great time. Although our homestay was really short, my host was such a friendly guy and he was kind enough to take me out around Stockholm. We had a lot of fun. I want to cherish the connections that I was able to make there.

Visit to ETH

At ETH, I visited Prof. Martin’s process engineering lab. He showed me a bunch of experimental devices that I couldn’t use at Todai, and gave precise explanations of posters of their research results, even though his field is slightly different from my research field. The information really arose my curiosity and at the same time, I realized how difficult it was to fully understand his technical English and that my English skills still had a long way to go. In that sense, the visit to the lab was a really valuable experience to me. On my second day at ETH, I attended another Japanese class. I was really surprised that the level of the class was pretty high, despite the students there having just started learning Japanese a couple of weeks before. Although the teacher taught it in German, it was so interesting because it was helpful for my German studies.

At both KTH and ETH, I got to talk with some Japanese students who were currently studying there. I found it really meaningful because I got to know how interesting and tough it is to study abroad. Last, I would like to express my deep gratitude to those concerned for giving us this precious opportunity. Thank you so much!



Material Engineering M1 Yuki Muto

I am very grateful for the opportunity I had to go to KTH in Sweden and ETH in Switzerland.

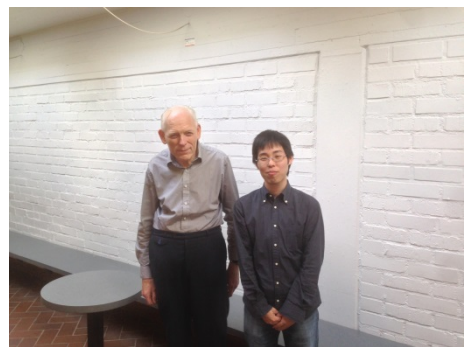
Sweden

At KTH, many lesson programs were prepared, and I attended lessons on sound in therapy applications and limited interactions, inter-cultural communication, and introduction to Swedish language. I also visited the SciLife Lab. I listened to speeches which I could not listen to in Japan. I visited Professor Rolf Sandstrom's laboratory on my own. During my visit, the Professor told me about his studies and led me to the experiment room himself. In the room, there were a lot of big experimental devices and I was overwhelmed by how large they were.

Outside of my studies, there were a lot of opportunities to meet many students at KTH, and I came to understand the culture and way of thinking of KTH students. All of the students were very kind, particularly Annosh, my host for my homestay.

Switzerland

At ETH, I was given the chance to talk to students in the Japanese class. I visited the Laboratory of Professor Andreas Mortensen in EPFL (located in Lausanne) on my own. In this laboratory, I talked to the professor. In addition to this, I met all of the members of the laboratory. After that, the lab members were kind enough to show me their equipment and explain their studies. I was surprised at how much equipment they had. I was inspired by the very high level of study being conducted by students who are almost the same age as I am.



During the course of the workshop, I was inspired by interchanges with overseas students and visits to laboratories. In addition to these experiences, I also enjoyed interchanges with the other students participating in the workshop from the University of Tokyo. I feel I had a very significant experience. To make good use of this experience, I will continue to do my best in the future.



Applied Chemistry M1 Tomoyuki Tasaki

■Homestay

We participated in a homestay for 3 days in Stockholm. Although most of the hosts were people who live alone, my host lived with his family. It was a great experience for me to learn about lives in a foreign country because this was my first experience with a homestay. The host was a student at KTH, so I was able to feel what it is like to go abroad to study. I was surprised to find that Japanese culture is very popular in Stockholm.

At first, I felt uneasy in communicating in English. But soon I could manage to communicate, even though my English was not perfect. I also felt impatient when I could not be fully understood, so I want to work to improve my English skills.



■ Campus tour

A student from KTH guided us around the campus. The campus was kept clean and beautiful. There was an open space like a garden where many students were relaxing and communicating with each other. The library, where some people were talking, was also bright. It seemed that the atmosphere throughout the campus was bright, which made it easy to communicate with each other. I want the campus of Todai to be like that.

■ Lab visit

Gen Larsson lab (9/18 15:00~16:00)

Gen Larsson's group does research on biorefinery processes which convert wood into useful resources. I decided to visit this lab because some of the research in the lab is about an enzyme, Cellulase, which I'm studying. Although I wasn't able to discuss my research in detail, this visit was a very good experience for me. I saw big machines which are rare in Japan.

ETH

■ Lab visit

Petra S. Dittrich lab (9/22 14:00~16:00)

The Dittrich group does research on micro/nano devices. The main research areas are *single cell analysis* and *lipid bilayers*. There are six members in the group, so it has a homelike atmosphere. In the lab, I gave a presentation and held a discussion about my research. I was a little nervous about discussing things in English, but it was a great experience for me.

I also had a look around the experiment room. It was good to see that the machines were not so different from the machines in my lab.

Chemical System Engineering M1

Yuki Shinohara

I learned a lot by taking part in this program. I applied to this program because I wanted to gain motivation for my research by talking with front-line researchers in my research field, and wanted to get cues for deciding whether I would go to a doctoral course or not by participating in this program. Now I can confidently say that I have been able to achieve these goals. I would like to say thank you to the staff for giving me such a fulfilling program.

In this workshop, I visited two labs in Sweden and one lab in Switzerland. In Sweden, I visited Professor Marika Edoff (Uppsala university, CIGS • CZTS solar cell) and Professor Licheng Sun (KTH, water splitting photocatalyst). Both labs do research which is closely related to my research, and having discussions with professors and students was very fruitful for me.



Particularly, when I visited Uppsala University, I engaged in deep discussions and received advice from them for my research, like “How about changing your experiment like this?” or “This problem is still under discussion, even at conferences.” This kind of advice can only be obtained by talking directly, and the experience motivated me.

The thing that stood out the most to me when I visited the laboratory was the fact that each lab had communication rooms (a room for taking a coffee break and for chatting with one another). One student told me that usually every laboratory has a room like that. In that room, people don't care about age differences. Professors and students tell each other jokes, discuss research, etc. I feel that such communication on a routine basis would lead to great research results. This kind of communication room is very rare in Japan, so I really feel that we Japanese researchers have to pay more attention to positive communication between students and professors.

This program was really stimulating, and was a great opportunity for me to rethink my research and future career. I re-realized the importance of seeing my research field with a global perspective. I would like to bear this in my mind when I proceed to a doctoral course. I would like to again say thank you to all staff. Lastly, I also would like to give special thanks to Daniel (KTH student) and Sara for welcoming me and allowing me to stay in their home for 4 days.



Chemistry and Biotechnology M1

Yuki Tokimaru

Before departure

In this workshop, the schedules at each university were not determined, except for the program prepared by University of Tokyo. Each person had to determine their plans on their own. This meant that preparation before departure was quite important for this workshop. Preparations included ① making appointments with foreign professors via e-mail and ② making the documents to introduce research. Personally, ① was a valuable experience which I would never have done if I had not joined this program.

KTH (Stockholm)

During our stay in Stockholm, we communicated with the students in KTH via programs prepared by KTH. Personally, I was surprised that almost all Swedish people, not only students at KTH but store attendants, speak English fluently. If Japanese store attendants were spoken to in English, they would just be confused. Also, the campus at KTH was impressive. A lot of nature and organized buildings made it comfortable. If I have the opportunity I would like to visit KTH again.

ETH (Zurich)

During my stay in Zurich, I visited Diedrich laboratory and talked with its members. Visiting Diedrich laboratory was one of my motivations for applying to this program. I was interested in their work in chemistry, which is very similar to my research topics. I was very attracted to the environment, one where students can conduct research at a high level with lab members from all over the world. I did feel that the University of Tokyo was not to be outdone with respect to research facilities.



KTH students



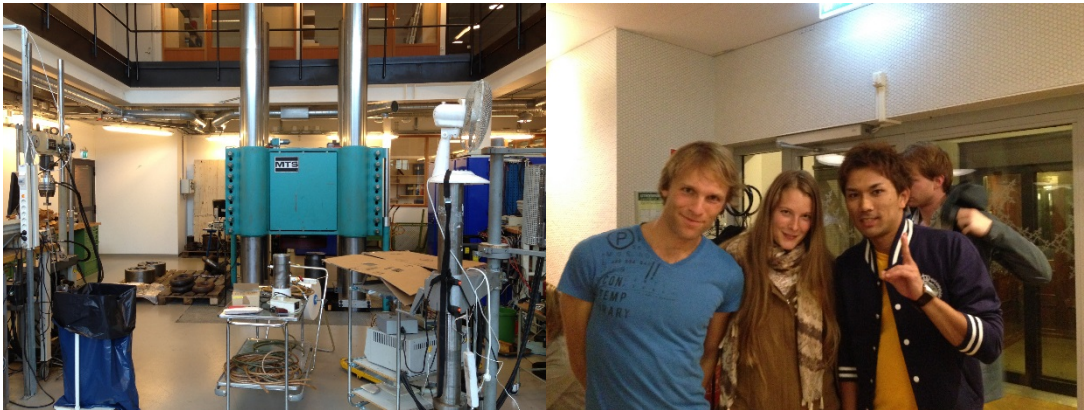
The members of Diedrich lab.

Nuclear Engineering and Management M1

Junpei Hoshino

In this workshop, we visited KTH Royal Institute of Technology and ETH Zurich, which is one of the most famous institutes of technology in the world, and extended our knowledge.

In KTH, I visited the laboratory of Prof. Per-Lennart Karsson, who does research similar to mine. During my tour of the large laboratory, it became clear that they regard experiments with as much importance as simulation. In the laboratory, there were various experimental devices, including huge tesla coils, and I was surprised at the different scale of the laboratory. Through discussions with Ph.D. students and master students, I better understood university life in foreign countries. I also realized how improved education is in foreign countries, that university tuition is completely free, and Ph.D. students can get at least 400,000 yen for income.



I also participated in Japanese classes at KTH and ETH. There are various reasons why the students there are learning Japanese; for anime or comics, for studying abroad, or for business. I was happy to see that foreign students were interested in Japan and were studying Japanese.

In Stockholm, I had a good time staying with KTH students for three days. I talked to them and interacted with them as much as I possibly could. Of course, we presented our research and discussed the differences in nuclear policies and election systems in Japan and Sweden. I was really impressed when they asked me why most young Japanese don't vote in elections. Moreover, their house was near the lake, so I swam in the lake in 17°C water because they said it was a Swedish tradition. This was also a great memory.

Lastly, I want to thank all staff and participants for all their help. I will make the best use of these great experiences from now on.

Bioengineering M1 Ayaka Kamada

I participated in this program because I'm planning to study abroad as an exchange student and I want to get more information in detail. In particular, I can't decide which I will focus on: researching or taking lectures during my studies abroad.

This workshop was meaningful for me because I could talk a lot about research opportunities and master's programs with professors and students. At the same time, I also realized that my English is not good enough to enhance my studies in a foreign country. The laboratories I visited are below;

9/17 KTH, Royal Institute of Technology:

13:00-15:00 Prof. Martin Edin Grimheden, the Department of Machine Design, School of Industrial Engineering and Management

9/23 ETH, Swiss Federal Institute of Technology Zurich:

14:00-15:30 Prof. Peter Gunter, Rainbow Photonics Co.

16:30-18:00 Prof. Fumiya Iida, Bio-inspired Robotics Lab., Institute of Robotics and Intelligent Systems

At KTH, I participated in a lab seminar and met with master's students. They said that they usually focused on doing projects more than writing a thesis during the Master's course. Some projects collaborate with famous companies. This opportunity seems enjoyable and fulfilling because this offers a chance to work with other students and associate with society. I think this system is great.

At ETH, I met with a Japanese professor. He talked about the reason why he aimed to go abroad and the difference between Japanese universities and foreign universities. The talk was very impressive for me and I was surprised with the salary of Ph.D students at ETH. Their salary is more than \$4000 per month, though Japanese students do not receive any salary!

Through this workshop, I could meet with many people (especially my host Lila) and expand my views. I'll be sure to use this experience for career in the future.



With Lila my homestay host



With Prof. Grimheden at KTH

Technology Management for Innovation M2

Yukari Ueno

The visit to Sweden and Switzerland in this workshop gave me several important insights.

In Sweden, I got three useful ideas. First, I got some useful advice about my master thesis from Prof. Patrik Hedefjall and Dr. Niklas Zethraeus at Kalorinska Institutet. I analyzed patients' length of stay in acute care hospitals, but from an inclusive point of view, it is also important to consider the cost or care needed after discharge as well as during hospital stay.

Second, I recognized the importance of a cross-sectional point of view at SciLifeLab, where joint researches in the bioengineering field are undertaken in collaboration with four universities: Karolinska Institutet, KTH Royal Institute of Technology, Stockholm University and Uppsala University. A researcher told us that, even when the clinical meaning of some facts remains unclear, engineering could reveal the way to detect wrong cells. She wanted to develop methods via technology because she liked engineering. I was impressed by that comment because the situation is the same as mine; I don't have clinical knowledge either, but I analyze medical data. I believe that collaboration between various people from different backgrounds can make it possible to prove some new facts and that it is required to have a deep knowledge on one's own study field.

Third, I saw some clues as to why people in Sweden have an agreement on the "high benefits for high burden" welfare system. I was surprised that some people in Sweden told me that they don't hesitate to pay taxes to their government, which is not the case in Japan. I asked a researcher from Japan the reason for this and he told me that they have great trust in their government. It seems to be the shortest way to realize optimized taxation to remove deep-rooted distrust to the government from people's minds in Japan.

In Switzerland, I obtained two views. First, students were really active in asking questions during the lecture of principles of macroeconomics. Five different students asked the professor what they didn't understand and the lecturer answered immediately. Compared to lectures in Japan, the most different point seemed to be neither the way the lecturer spoke nor the level of the materials, but the attitudes of the students taking the course.

Second, many international students are studying there and many have interests in foreign countries like Japan. In the macroeconomics class, students came from various countries. It was really stimulating to talk to those challenging their abilities in a foreign country. Moreover, when I visited the Japanese language courses held at ETH and Zurich University, around 40 students were attending classes of this minor and difficult language. It will become a big advantage in future to have an understanding of other languages and cultures.

Adding to those five thoughts, this workshop made me think seriously about studying abroad. I also realized that the University of Tokyo has a good environment where students can study hard. To acquire abilities to survive in the world, I decided to make the best use of my circumstances and challenge the new world. I would like to thank all the staff who planned this workshop for giving me a wonderful opportunity to widen my view.