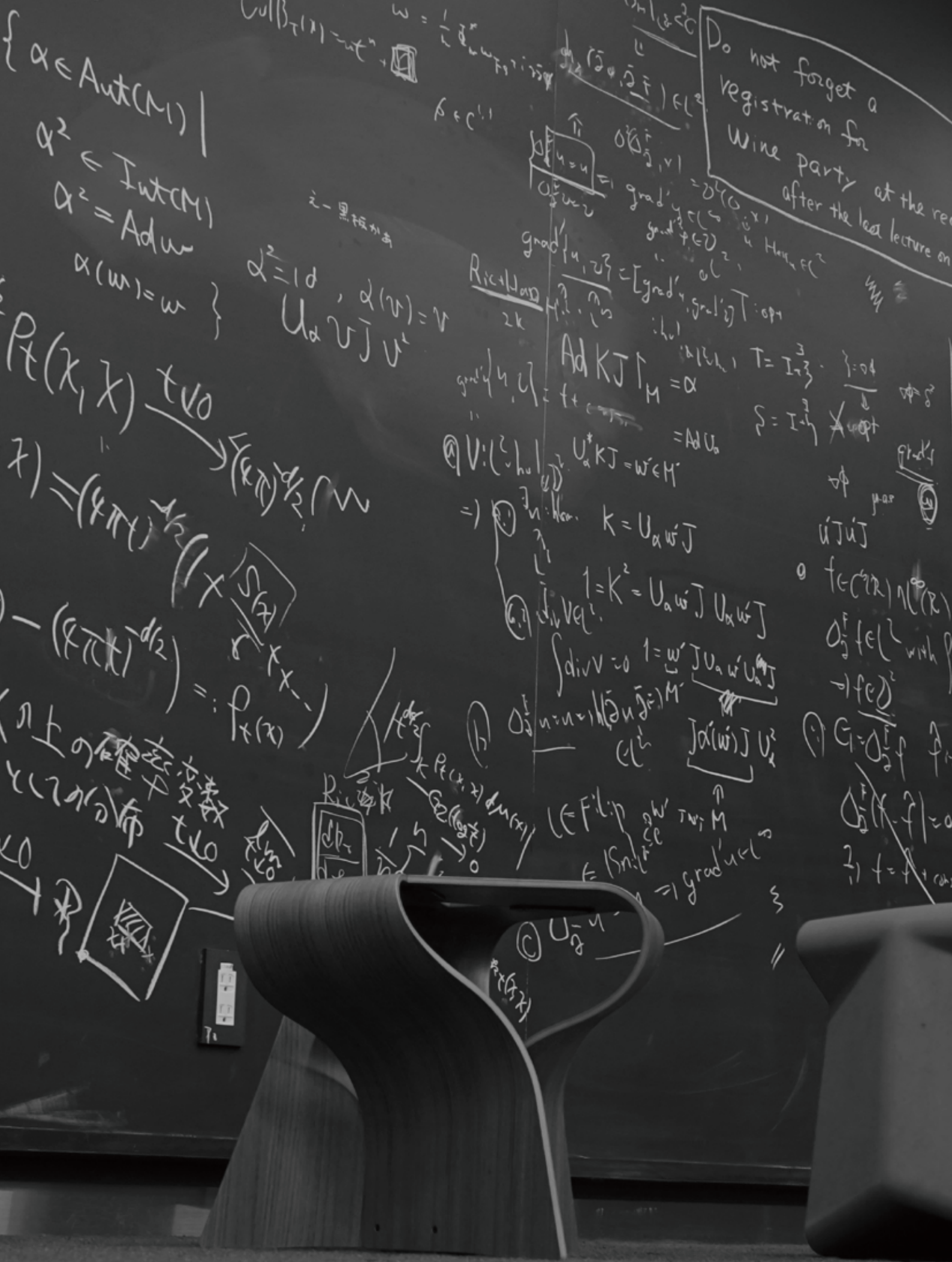
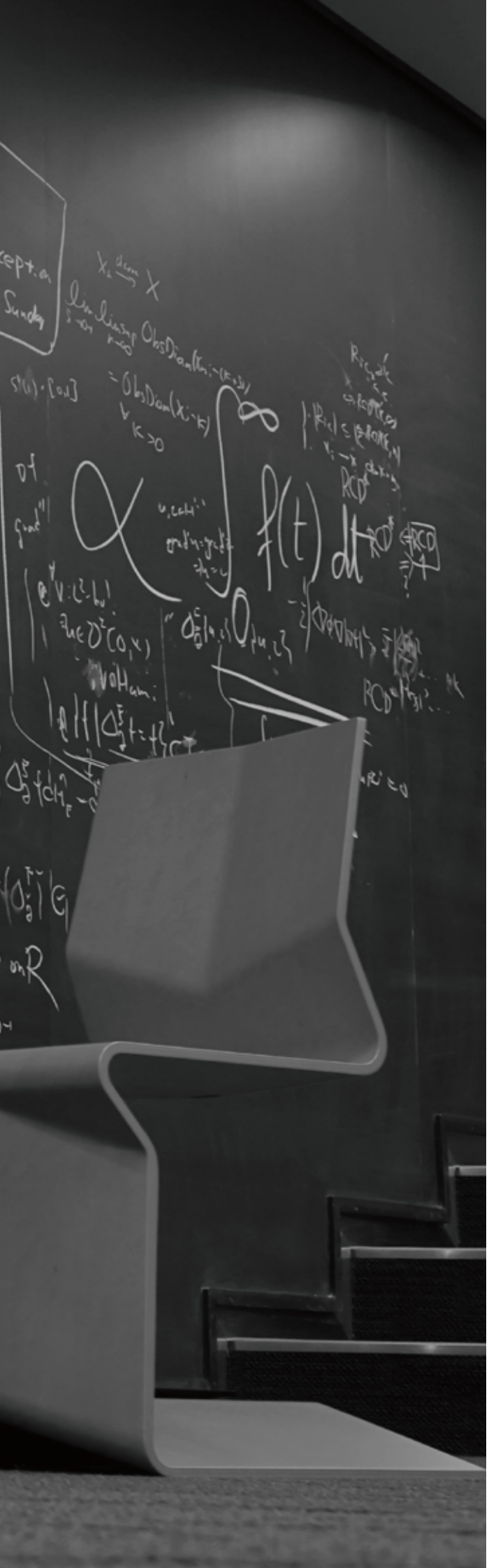
TOHOKU
UNIVERSITY

Annual Report 2014

Tohoku Forum for Creativity



TOKYO ELECTRON House of Creativity
Lounge



In issuing the Annual Report

For more than a century, Tohoku University's tradition of “Research First”, philosophy of “Open Doors”, and ethos of “Practice-Oriented Research and Education” have produced excellent graduates, generated numerous research achievements, and contributed to the development of a peaceful and just society.

In August of 2013, I compiled the Satomi Vision which reaffirms the modern significance of the fundamental ideals and mission that Tohoku University has retained though its history. This document outlines the direction that our university will take over the next five years, and the policies and schedule that will lead us there.

This vision aims to develop Tohoku University as a fellowship of knowledge, open to the world, where people can gather, learn, and create. In doing so, this will allow us to achieve our two goals of achieving World-Class Status and Leaping Ahead, and Leading the Post-earthquake Restoration and Regeneration.

In order to realize one part of the Satomi Vision, we have established Thematic Programs organized by the Tohoku Forum for Creativity (TFC). These programs will act as an international brain circulation initiative which will allow us to strengthen our research interests, and are being carried out with support from the program for promoting the enhancement of research universities from the Ministry of Education, Culture, Sports, Science and Technology (MEXT).

The TFC hold’s Thematic Program’s, which are research programs in which world leading scientists, including Nobel Laureates, are invited to Tohoku University for a specified period of time in order to engage in joint research with junior researchers, and to participate in daily debates with students. The aim of these programs is to contribute to the solution of the important problems which humanity faces through the creation of new interdisciplinary research fields. Therefore, the TFC’s activities are positioned at the core of the university’s strategic international brain circulation initiative.

To promote the Thematic Programs, in October 2013 we established the TFC, which is the first International Visitor Research Institute in Japan, while in February 2015 we completed the construction of the TOKYO ELECTRON House of Creativity, which will be the location of the TFC’s activities. As such, the TFC hold’s an extremely important position within the research activities of Tohoku University, and we have great expectations for what we can achieve in the near future.

This Annual Report has been created to provide all stakeholders in the program with an overview of the activities of the TFC. Accordingly, we ask for your continued understanding and cooperation with the Tohoku Forum for Creativity in the future.

Tohoku University President

Susumu Satomi

Message from the Director

For promoting the Thematic Programs

The Tohoku Forum for Creativity's Thematic Programs play a central role in the framework for international brain circulation outlined in the Satomi Vision. The research focuses of these Thematic Programs were selected based on global trends and the current challenges facing humanity. At each thematic program, world leading researchers, including Nobel Laureates, are invited to the TOKYO ELECTRON House of Creativity for a period of between one and three months to carry out groundbreaking research. As such, the Tohoku Forum for Creativity is Japan's first International Visitor Research Institute. The TFC's activities also aim to develop the next generation of global research leaders by creating a wide array of opportunities for talented junior researchers to interact and discuss their ideas with eminent scholars.

For our pilot program, in October 2013 the TFC hosted a program entitled "Particle Physics and Cosmology after the discovery of the Higgs boson". Following on from this, last year we hosted our first full thematic programs on the subjects of: "Challenges for Big Data in our Society: Statistical Analysis of Large Scale, High Dimensional Data for Socio-Economic Problems," a program about the subject of big data; "Recovery from the Great East Japan Earthquake and Tsunami: Future Strategies for Disaster Risk Reduction," a program covering the subject of large scale natural disasters, and; "A Health Informatics Infrastructure for a New Era," a program about the uses of genomic data in personalized medicine.

The TFC also carries out outreach activities with the aim of promoting recent advances in science to the general public. These include hosting, in collaboration with the Falling Walls Foundation of Germany, the Falling Walls Lab Sendai, which was notable as it was the first regional Falling Walls Lab to be held in Asia. In addition, we also hosted the "Sketches of Science" exhibit held together with the Nobel Museum, and hosted a public lecture by the Nobel Laureate Hiroshi Amano, in cooperation with the Tohoku University Institute of Multidisciplinary Research for Advanced Materials. The TFC also organizes the Quattro Seminar program, which allows junior researchers to find the seeds for new research by providing a platform for interdisciplinary research discussions across the humanities and social sciences.

I would like to take this opportunity to express my gratitude, not only for the great efforts of those involved in the promotion of these programs, but also for the immeasurable support and cooperation that we have been given since the very beginning of this project by Tokyo Electron Ltd.

In the future, Tohoku University aims to contribute even more to facilitate international research and education. The TFC is expected to play a central role in this endeavor, and we will continue to work towards achieving that goal while receiving the opinions and advice from all of our stakeholders. Accordingly, I ask for your continued cooperation and support.

Tohoku Forum for Creativity Director
Tohoku University Executive Vice President (for Research)

Sadayoshi Ito

Overview of the Tohoku Forum for Creativity

Mission

The Tohoku Forum for Creativity (TFC) is an international visitor research institute which was established in 2013 at Tohoku University to facilitate collaborative research. In order to identify important problems across all of the sciences and humanities, the TFC brings together both junior and senior researchers in a stimulating environment that promotes creative approaches to new and interdisciplinary research areas.

The TFC especially encourages junior researchers, such as graduate students and postdoctoral fellows, to participate in the thematic programs. Through discussions and close contact with distinguished researchers, including Fields Medallists and Nobel Laureates, junior researchers will be stimulated to develop their own original ideas and to eventually become pioneers in new research areas.

A Fellowship of Knowledge which Contributes to the Solution of the Major Issues Faced by Humanity

The TFC calls for thematic programs from throughout the world covering all academic domains, from the humanities and social sciences to the natural sciences. The TFC then selects themes for concentrated discussions over a three-month period, for which leading international researchers are invited to Tohoku University to develop new areas of research and to contribute to the solution of the major problems facing humanity, through joint research and the hosting of international symposiums. Furthermore, the TFC provides an ideal location for the promotion of interdisciplinary cooperation across a diverse range of research areas in order to tackle the increasingly advanced and complex issues facing society.

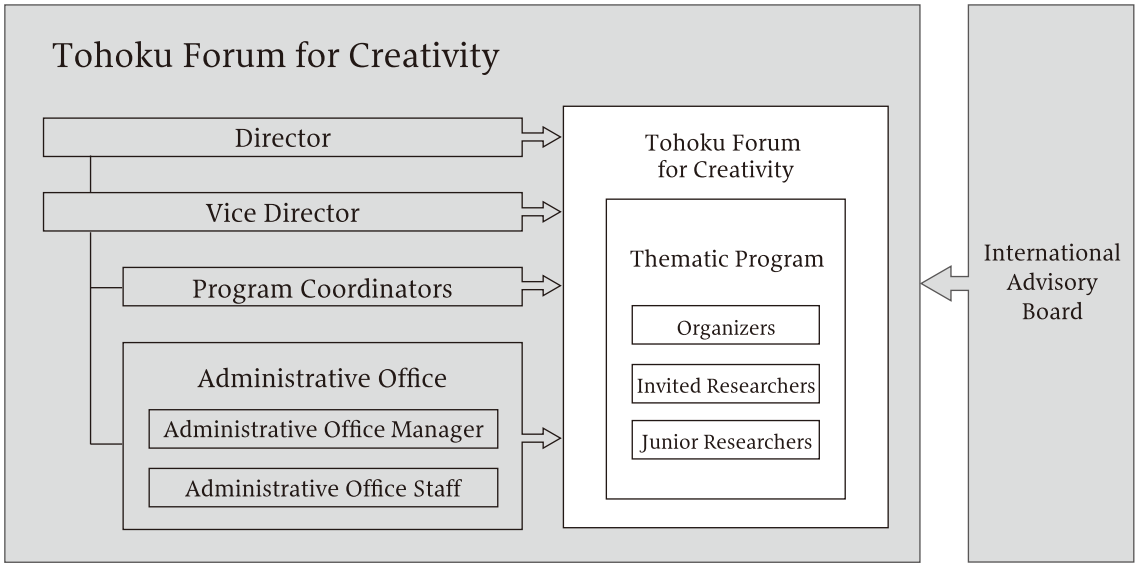
Educating Global Leaders to Build the Future of Humanity

The TFC will establish itself as a center for the cultivation of international research leaders, by promoting the participation of junior researchers from throughout the world in our thematic programs. In this way, the TFC will foster an environment in which young researchers can interact closely with world class researchers.

Contributing to Society by Sharing Academic Advances

The TFC provides opportunities for intellectual exchange between participating researchers and the general public, including the children who will lead society in the future, through the planning and hosting of public events. This initiative aims to promote the sharing of knowledge, further internationalization, and the development of a prosperous society, by providing opportunities for the public to interact directly with world-leading researchers.

Organization



International Advisory Board

The International Advisory Board was established as an organization to evaluated the proposed thematic programs gathered from throughout the world, and to provide advice on the activities of the TFC.

Reiko Aoki	Exective Vice President, Professor Kyushu University
Jean-Pierre Bourguignon	The Former Director and Honorary Professor at IHÉS Institut des Hautes Études Scientifiques
Arjen Doelman	Director of Lorentz Center Lorentz Center, International Center for workshops in the Sciences
Makoto Kobayashi	Nobel Laureate in Physics 2008 Director of Research Center for Science Systems Research Center for Science Systems, Japan Society for the Promotion of Science
Kiyoshi Kurokawa	Adjunct Professor National Graduate Institute for Policy Studies
Oliver Smithies	Nobel Laureate in Physiology or Medicine 2007 D. Phil. Weatherspoon Eminent Distinguished Professor Department of Pathology and Laboratory Medicine, University of North Carolina at Chapel Hill

Observer of the Tohoku Forum for Creativity

Yuko Harayama	Executive Member of Council for Science, Technology and Innovation Council for Science, Technology and Innovation

Support for the Tohoku Forum for Creativity

This project hosts approximately three thematic programs per year, with support from the program for promoting the enhancement of research universities from the Ministry of Education, Culture, Sports, Science and Technology (MEXT). In order for this program to continue to aggressively tackle the challenges faced by society, we must create opportunities to communicate with society and our supporters in the private sector in order to gain their assistance in promoting our activities.

The TFC will continue to publish information widely throughout the world, and work to gain the understanding and support of numerous individuals and organizations.

Support was provided by the following corporations in FY2014

FY2014

Comprehensive support for the TFC

- Tokyo Electron Limited

Support for the "Recovery from the Great East Japan Earthquake and Tsunami: Future Strategies for Disaster Risk Reduction" theme program

- Tokio Marine & Nichido Fire Insurance Co., Ltd.
- IPPO IPPO NIPPON Project (Japan Association of Corporate Executives)

A Message from our Sponsor

In issuing the Annual Report of the Tohoku Forum for Creativity, Tohoku University

Since our foundation in 1963, Tokyo Electron Limited has been providing semiconductor production equipment and flat panel display production equipment and growing together with the times as a leading company in the leading-edge tech industry.

Based upon our corporate philosophy: "We strive to contribute to the development of a dream-inspiring society through our leading-edge technologies and reliable service and support," we promote various initiatives in support of education for generations of the future.

Tohoku University and our company have been exchanging people and technology by industry-university collaboration in the semiconductor sector. Through this cooperative activity, we became aware of the Satomi Vision which establishes the future framework for Tohoku University to build a community of wisdom where people gather together, learn, and create, with an open doors to the world, and to achieve the two goals of leaping ahead to become a world class university while taking the lead in recovery and building a new life, and these initiatives have our full support. Further, we feel that the Tohoku Forum for Creativity（TFC）, as the first significant international visitor research institute for a Japanese university, is a meaningful endeavor with a long term view to the future. With a desire to contribute to the realization of the initiative, we have supported not only the program itself, beginning with the pilot program of the TFC in 2013, but also the construction of the TOKYO ELECTRON House of Creativity to serve as the center for the program.

Hearing that the students and participating researchers including the Nobel Laureate Gerard 't Hooft have already begun their studies at the TOKYO ELECTRON House of Creativity since the official opening in April 2015, it fills me with great pleasure to imagine the motivated and energetic researchers who hope to change the future of society gather and debate.

I really hope that the TFC program will serve as a symbol for recovery and a new life for the Tohoku region, and as a leading example as an open world forum with great momentum. Further, relating to educating the next generation promoted by our company, my great expectation is that participants of the Tohoku Forum for Creativity will be one of the front running leaders of the world in the next 20 or 30 years.

I would like to express my hope for the continued development and prosperity for the Tohoku Forum for Creativity at Tohoku University.

Tokyo Electron Limited
Chairman, President & CEO

Terry Higashi

TOKYO ELECTRON House of Creativity

Construction was completed on the TOKYO ELECTRON House of Creativity in March 2015 at the Tohoku University Katahira Campus, to serve as the center for the TFC. The TFC aims to use this center as the principle location for the realization of "building a community of wisdom where people gather together, learn, and create, with an open doors to the world."

*Tokyo Electron Limited provided immeasurable support for the construction of this facility.

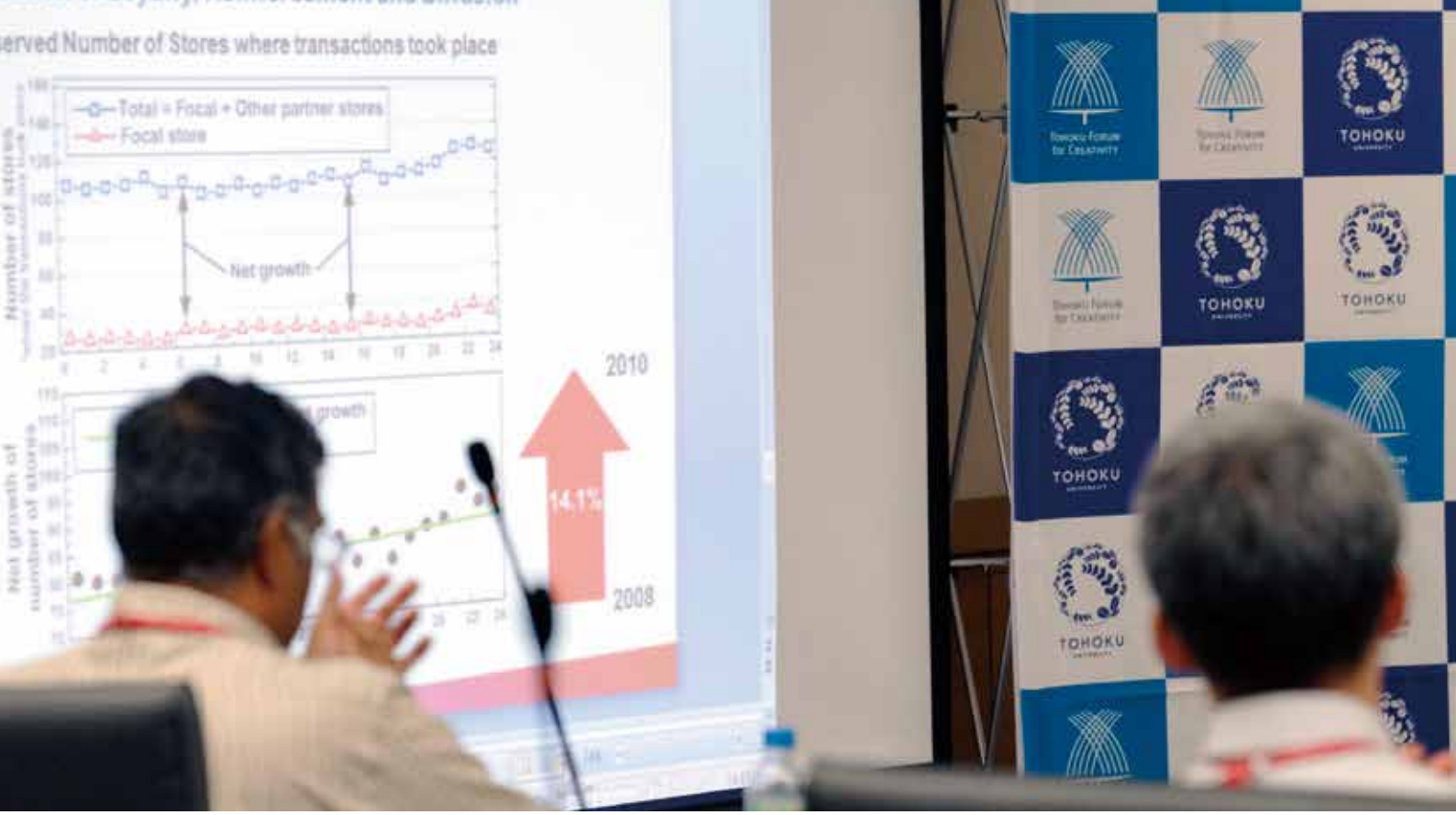



Activity Report 2014

Thematic Programs

Other Activities

Support for Young Researchers



Thematic Program | July 2014 – November 2014

Challenges for Big Data in our Society:

Statistical Analysis of Large Scale, High Dimensional Data for Socio-Economic Problems

So-called “Big Data,” which is increasingly being generated due to the advancement of information technology, can be considered a new type of resource that is appearing in every sector of modern society. The applied use of this big data has the potential to transform society in numerous ways. For instance, trends in purchasing behavior and preferences of shoppers can be predicted from analysis of their purchase histories on the Internet, enabling services that suggest the ideal product for each individual. Further, with the Internet of Things (IoT), productivity can be increased by installing sensors on production lines at factories to analyze operational or inventory data. These are just some examples of the ways that the use of big data can have a major impact in transforming our society.

However, the use of big data in Japan is still somewhat behind when compared to other advanced nations, which in itself represents a significant social loss. Thus, the effective use of big data is an urgent issue. In response, this program developed new big data analysis methods that combine data science with economic management principles. Furthermore, research was carried out to apply cutting edge data analysis techniques to various modern challenges faced by our society.

Important Goals and Degree of Achievement

The goals of this project were to 1) develop new big data analysis methods that combine data science with economic management principles for the effective utilization of big data, a common issue shared today by advanced nations, 2) to carry out research on applying big data to the modern socio-economic problems faced by our society, and 3) to share the results thereof with leading international researchers. Regarding the analysis and application of big data characteristic to the social economic domain, leading researchers were invited from overseas to engage in discussions regarding the future developments of big data.

Further, leading international researchers from such fields as service science, finance, marketing, and financial time series were all invited to participate in our this program. This enabled us to achieve the above goals by discussing society's socio-economic problems and cutting edge data analysis methods from diverse and wide-ranging perspectives.

Specifically, we were able to learn that in the process of analyzing big data, it is not necessary to analyze the entire data set, but rather that the theory and knowledge behind big data could be applied to enable effective analysis based on an appropriate sampling of the data, or a subset thereof. It was also found that in addition to numerical structured data, the information contained in the unstructured data recorded as text could also be used in big data analysis in the social science domain.

In addition, the program was able to provide junior researchers, including graduate students, an opportunity to focus on the latest research results in the field, which was effective from the standpoint of training junior personnel.

Program Organizers

Nobuhiko Terui

(Professor and Director of Tohoku University Center for Data Science and Service Research at Graduate School of Economics and Management, Tohoku University)

Prof. Terui completed his doctorate course at the Graduate School of Economics and Management, Tohoku University. He took his current position after serving at the Yamagata University Faculty of Literature and Social Sciences as Assistant Professor, Associate Professor, and then, at the Tohoku University Faculty of Economics, as Associate Professor. He also serves as a visiting professor at the Institute of Statistical Mathematics, specializing in statistics, marketing, and econometrics. Dr. Terui was awarded the Tjalling C. Koopmans Econometric Theory Prize in 1992 and the 18th Japan Statistical Society award in 2013. His primary publications include "Bayesian Statistical Analysis Using R" published by Asakura Publishing Co., Ltd.

Yasumasa Matsuda

(Professor at the Graduate School of Economics and Management, Tohoku University)

Prof. Matsuda completed his doctorate program at the Dept. of Mathematical and Computing Sciences, Tokyo Institute of Technology. He took his current position after serving as an Associate Professor at the Faculty of Economics, Niigata University, and at the Faculty of Economics at Tohoku University. He specializes in statistics and time series analysis. Dr. Matsuda was awarded the 7th Japan Society for the Promotion of Science award in 2010 and the Japanese Society of Applied Statistics award in 2008. He has also served as Associate Editor for the Annals of the Institute of Statistical Mathematics.

Program Highlights

The highlights of this program were the two international symposia and the lectures given by visiting researchers. At the “International Symposium on Service Science,” world-leading researchers in the application of big data to service science in the business domain were invited for focused discussions on the present situation and future developments. At the “ International Conference on Statistical Analysis of Large Scale High Dimensional Socio-Economic Data,” front line researchers were invited for discussions on the analysis and application of big data for marketing, finance, and financial time series in the social economics domain. The hosting of an international meeting on big data to which eminent international researchers were invited to discuss the broad themes of service science, finance, marketing, and financial time series, proved to be an unparalleled initiative. Many participants of the symposiums commented that being able to learn from the cutting edge methods and approaches used in a broad range of social science research was particularly effective in allowing them to understand the interdisciplinary aspects of big data analysis.

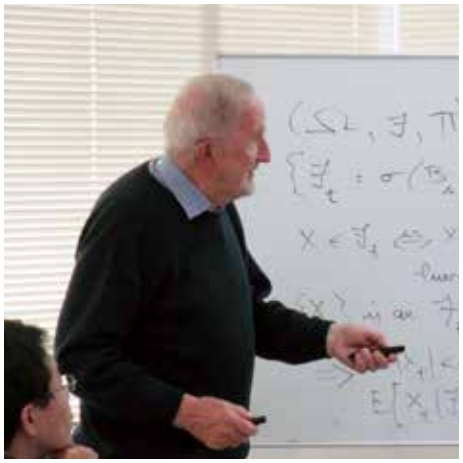
In the “Lecture Series on Continuous Time Models for High Dimensional Financial Time Series,” Professor Peter Brockwell (Colorado State University), an expert on time series analysis, was invited to give a series of lectures for graduate students and junior researchers. In addition to learning the latest theory and application of time series analysis, the junior researchers were also able to converse directly with Professor Brockwell, gaining an intellectual influence that positively affected their motivation for research.

Specific Strategies for International Research Exchange

1) Purpose of international research exchange and level of achievement

The Center for Data Science and Service Research, the host of this program, is promoting international collaboration through its academic agreements with the University of Maryland and Korea University, and this was strengthened through the course of the program, as two researchers from each university were invited to participate in our discussions.

In addition, Prof. Kannan served as the central researcher for the program, and took a position as a visiting professor at Tohoku University for roughly one month. This extended visit enabled us to have extensive discussions on strengthening future collaborations.



2) Potential for joint research or joint papers

A pathway was opened for the development of joint research in the areas of service science, marketing, and time series analysis. Prior to the program, one international joint research project had already been carried out, the results of which had been submitted to a relevant journal. During the research visits with our collaborators that took place during the program, focused discussions on revising the joint paper were carried out, which allowed us to successfully resubmit our manuscript. Further, there is a specific plan to carry out joint research on high dimensional Lévy processes, and researchers will visit Colorado University this coming summer to continue this work.

3) Other specific notable results of research exchange

As a result of this TFC program, we received an invitation to attend the University of Maryland as a visiting professor, which will allow us to continue our ongoing discussions on strengthening research networking, including international joint research, and young researchers’ exchange.

Principle Invited Researchers

Greg Allenby
(Ohio State University, USA)

A specialist in Bayesian statistical modeling. Fellow of Informs Society for Marketing Science and the American Statistical Association who served as editor and associate editors of top marketing journals.

Peter Brockwell
(Colorado State University, USA)

Professor Emeritus. Lead author of the text "Time Series: Theory and Methods," a highly acclaimed global classic in time series analysis.

Piotr Fryzlewicz
(London School of Economics, UK)

World authority on time series analysis, specializing in time series models. Recipient of the Royal Statistical Society Guy Medal in Bronze, 2013. Editor of the top statistical journal, Journal of the Royal Statistical Society, Ser. B.

Dominique Hanssens
(University of California, Los Angeles, USA)

World authority in marketing science. Recipient of the AMA Mahajan Award for Career Contributions to Marketing Strategy Research in 2013. Also advises a big data consulting company.

P.K.Kannan
(University of Maryland, USA)

A specialist in marketing science. Past director of the Center for Excellence in Service, a global leader in service science. Recipient of the prestigious John Little Best Paper Award in 2008. Visiting Professor at Tohoku University in 2014.

Jaehwan Kim
(Korea University, Korea)

Specialist in marketing modeling, principle works include Variety: Models of Multiple-Discreteness, in Allenby, G. M. and Rossi, P. E. (eds), The Marketing & Management Collection.

William Rand
(University of Maryland, USA)

Director of the Center for Business Complexity. Specialist in computer science and agent based simulation.

George Tiao
(University of Chicago, USA)

Professor Emeritus. Pioneer in Bayesian statistics, and co-author of the classic work "Bayesian Inference in Statistical Analysis (1973)". Recipient of the Statistician of the Year Award in 2005.

International Training for Young Personnel

As part of the educational activities to train young researchers to take action on the international stage, two full time academics at the associate professor level were given opportunities to give presentations at the program's international symposia. Graduate students were instructed ahead of time to prepare questions and engage in proactive debate during the presentations, and they fully lived up to expectations. Further, during the program, junior faculty and graduate students were called on to give presentations on their own research in front of the visiting researchers, giving them multiple opportunities to receive comments directly from world-leading international researchers. We hope to continue to train young researchers to able to perform on the global stage by involving them in international joint research projects. Our plan is to conduct international joint research by encouraging graduate students to participate in the joint research with Colorado State University mentioned above. Furthermore, we hope to send our young academics overseas, including graduate students, using the global network created through this program.

Strategies Following the Completion of the Program

The international symposia held under the program were hosted by the Center for Data Science and Service Research, and there are plans for the center to develop this into a regular series of events. There are plans to hold an additional international symposium in two years as a follow up on the same theme. Further, we will collaborate with other departments, such as in the school of Information Sciences, under the international data science program, part of the "Super Global University Project" framework.

Thematic Program | July 2014 – March 2015

Recovery from the Great East Japan Earthquake and Tsunami:

Future Strategies for Disaster Risk Reduction

Since the beginning of the 21st century, there have been a series of low frequency major natural disasters, such as the Great East Japan Earthquake, which have occurred in multiple regions around the globe. Given this trend, the contributions of the International Research Institute of Disaster Science (IRIDeS), Tohoku University are needed in disaster risk reduction (DRR) in a wide range of domains. This forum invited researchers, specialists and practitioners from the private sector, the government, international organizations, and NGOs to provide an opportunity for sharing the research results of practical DRR with the international community. The forum included a summer school, study group discussions, and an international symposium. The summer school included participation by students and instructors from the member universities of the Association of Pacific Rim Universities (APRU), and carried out discussions on the experiences and lessons from the Great East Japan Earthquake and the increase in disaster preparedness at universities. The study group discussions included thematic discussions on DRR and analysis of these issues by disaster researchers and specialists.

For the international symposium, world leading specialists and researchers in DRR were invited to give lectures and participate in panel discussions. The participation by graduate students and junior researchers in these meetings and their proactive involvement in discussions was particularly notable. DRR strategy requires a shared understanding of the issues, and a global involvement that extends beyond national borders. We hope that this initiative evokes such awareness among young researchers, and gives rise to new research areas.

Important Goals and Degree of Achievement

The summer school aimed to share the experiences and lessons from the Great East Japan Earthquake with as many researchers as possible, and discuss future issues. A further aim was to discuss future international DRR issues in preparation for the World Conference on Disaster Risk Reduction. In addition to the IRIDeS faculty, members of local governments and invited researchers served as speakers, and projects were introduced such as the "Kakeagare! Japan," a joint initiative between the IRIDeS and a private company. Further, regarding campus safety, which was one of the themes of the forum, priority activities were proposed to improve disaster preapredness, and action plans, and check lists were developed from group discussions. A field trip to Kesennuma city was carried out on the third day where participants learned about the experiences of the disaster from local residents, and further learned about the disaster and recovery efforts from the Kesennuma office of the IRIDeS and from the local Shark museum and the Rias Ark museum of art. The tour was particularly appreciated by participants as highly worthwhile.

The purpose of the study group discussions was to discuss research and initiatives regarding the important themes in DRR, and to share knowledge. The sessions included 70 specialists who gathered to discuss the five themes of disaster education and digital archiving, disaster science and risk assessment, disaster medicine, construction for DRR and land use planning, and industry-public-academic partnerships for early warning and evacuation training. After announcing statements on issues and necessary initiatives for each theme, reports were prepared to share the content of the discussions as widely as possible. The output of these sessions were reported at the international symposium on March 10 and the IRDR Tokyo conference in January using posters and other methods.

At the final event, the international symposium and film screening, presentations and reports were given on the state of recovery from the Great East Japan Earthquake, the role of universities and academia in DRR and the outcome of the study groups. Further, DRR specialists were invited from throughout the world to carry out a panel discussion on initiatives following the World Conference on Disaster Risk Reduction, and the steps necessary to increase the contribution of academia to disaster prevention in the future. Graduate students and junior instructors and researchers were particularly proactive in preparing and running these meetings, which enabled them to deepen their interaction with each other.

Program Organizers

Fumihiko Imamura

(Professor of Tsunami Engineering and Director of IRIDeS, Tohoku University)

Prof. Imamura completed his doctoral course at the Tohoku University in 1989. After becoming an assistant professor from 1992 and, professor from 2000, both at the Disaster Control Research Center, he became the Director of the IRIDeS. His primary areas of specialization are tsunami engineering, the development of technology for disaster prevention and reduction, and damage assessment. He is the head of the international Tsunami Inundation Modeling Exchange (TIME) project for numerical tsunami modeling, a member of the Reconstruction Design Council in Response to the Great East Japan Earthquake, and the Special Investigative Group of the Central Disaster Management Council.

Yuichi Ono

(Professor and Assistant Director of IRIDeS, Tohoku University)

Prof. Ono completed his doctorate course at the Kent State University in 2001. He took his current position after participating in disaster prevention planning at the U.N. He is involved in sharing the results of research at the IRIDeS domestically and internationally. He has also served as Chairman of the Multi-Hazards program of the Association of Pacific Rim Universities, and as Director of the Global Center for Disaster Statistics. His original specialty is climatic disasters such as tornadoes.

Takako Izumi

(Associate Professor, IRIDeS, Tohoku University)

Dr. Izumi completed her doctorate program at Kyoto University. She has been involved in disaster response and recovery coordination, and development programs at various United Nations organizations and international NGOs, including the United Nations Office for the Coordination of Humanitarian Affairs (UNOCHA), and the UN Office for the Recovery Coordinator for Aceh and Nias. She is currently involved in program planning and operations as the Multi-Hazards Program coordinator for the Association of Pacific Rim Universities (APRU). Her publications include co-authorship of "Disaster Management and Private Sectors" (Springer, 2015) and others.

Program Highlights

The highlights of this program were the international symposium entitled “A Memorial Symposium on the 2011 Great East Japan Earthquake” and the screening of the 3D Documentary, “The Great March Eleven Tsunami - Remembering for the Future -.” Participation for this event reached 400 people, including those from the general public. The aim of this event was to discuss the steps toward recovery following the Great East Japan Earthquake, the role of universities and academia in DRR initiatives following the World Conference on Disaster Risk Reduction, and what can be done to improve the contribution by academia to DRR. The international symposium invited researchers and specialists from throughout the world for lectures and panel discussions, including the presentation of four case studies on the contributions of science to DRR.

During these presentations, the points raised included that taking a scientific approach during the government decision making process was extremely important, and that in order to involve academia in the government planning process, it was important to establish a forward thinking collaborative relationship between academia on the one hand and the UN and governments on the other, in which academia could share the outcome of research and give presentations at international conferences, such as the World Conference on Disaster Risk Reduction. All of the panelists also agreed that it was necessary to continue dialogue and discussions between a variety of stakeholders following the World Conference on Disaster Risk Reduction.

The screening of the 3D documentary, “The Great March Eleven Tsunami” highlighted the importance of connections between people, and of developing a daily awareness of disaster preparedness. The most notable message was that learning methods and skills to protect one’s self from disasters through government and community cooperation, such as evacuation training and drills, were absolutely essential.

Specific Strategies for International Research Exchange

The summer school featured reports on the latest research of foreign researchers, recovery initiatives by local governments and companies, and a variety of research domains involving the Great East Japan Earthquake, as well as the vigorous exchange of views between students and instructors from throughout the world. Further, vigorous group discussions were carried out between foreign researchers and students regarding a statement for the World Conference on Disaster Risk Reduction, and regarding campus safety. Finally, the field visit enabled participants to learn from the lessons and experiences of the disaster, and to share this information with the world at large. Progress was achieved on various initiatives during the study group discussions, including the development of an international network for the disaster education domain, interdisciplinary research, the establishment of an “International Center for Cooperation in Disaster Education” to promote human resource development, and the establishment of a “Global Center for Disaster Statistics.” World famous researchers were invited to the international symposium, such as the Chairman of the International Council for Science, to share their knowledge of the application of the latest scientific technology with the general public. As the researchers and specialists who gathered for the event are extremely important personnel for the planning and promotion of future strategies for disaster prevention, the event was used to consider a new framework of cooperation to achieve and develop the international disaster prevention framework adopted by the World Conference on Disaster Risk Reduction.

Both Professor John Rundle of the University of California, Davis, who visited us for a long period, and Professor Reid Basher, former senior advisor to the UNISDR, expressed their desire to support the IRIDeS in strengthening cooperation in the area of joint research and international conferences, and for the preparation thereof, including the World Conference on Disaster Reduction.

Principle Invited Researchers

Walter Ammann
(Founder and President of the Global Risk Forum)

Graduate of ETH Zurich. A specialist in risk management. Serves as a member on the science and technology advisory group of the United Nations Office for Disaster Risk Reduction (UNISDR). Serves as a visiting professor at the Harbin Institute of Technology.

Andrew Gordon
(Harvard University, USA)

Took a position as a professor in the history department of Harvard University in 1995 after serving as a professor at Duke University. Served as the head of the Reischauer Institute of Japanese Studies from 1998 to 2004, and later became Dean of the Harvard University History Department. His areas of specialization are contemporary Japanese history and labor history.

Gordon McBean
(International Council for Science, President)

Served as chairman of the World Climate Research Program (WCRP) and Integrated Research on Disaster Risk (IRDR), and as the Assistant Deputy Minister of the Meteorological Service of Canada from 1994 to 2000. Currently serves as a professor at the University of Western Ontario while serving as the Chairman of the International Council for Science (ICSU).

John Rundle
(University of California, Davis, USA)

Took his current position as a Distinguished Professor of Physics and Geology at the University of California, Davis in 2009 after serving as head of a hazard research center at the University of California. His specialty is seismology. He also serves as the Executive Director of the APEC Collaboration for Earthquake Simulations.

Reid Basher
(Former Senior Advisor to the United Nations Office for Disaster Risk Reduction - UNISDR)

Played a role in launching international early warning programs for international organizations and in planning international disaster prevention measures. Currently a visiting professor at the Massey University, and a non-resident professor at the Victoria University of Wellington.

Karl Kim
(University of Hawaii, USA)

Graduate of the Massachusetts Institute of Technology. Currently a professor in the Department of Urban and Regional Planning at the University of Hawaii. His areas of research include accident analysis and prevention, urban planning, disaster management, and humanitarian support.

Badaoui Rouhban
(Former Director of the UNESCO Unit for Natural Disasters)

Worked in the Science, Environment, and Disaster departments at UNESCO from 1981 to 2013. Served as the Director of the Unit for Natural Disasters from 2008 to 2012, and as Special Advisor to the Director General in 2013.

International Training for Young Personnel

Many junior researchers participated in and contributed to this program. The summer school in particular focused primarily on training students and junior researchers, many of whom were able to develop an interest in a wider range of disaster prevention domains by learning from the recovery processes from the Great East Japan Earthquake, including disaster prevention education, disaster medicine, and collaboration between industry, the public sector, and academia. The study group discussions provided a great opportunity for junior researchers to widen their networks to include researchers from overseas. The international symposium enabled the attendance of junior researchers from many other universities as well. Finally, many junior researchers participated in the preparations for and management of the program, enabling them to learn about how to manage international conferences. The two long term visiting researchers contributed to educational activities and exchanged views with junior researchers through seminars and lectures for students and instructors from the IRIDeS, the Research Center for Prediction of Earthquakes and Volcanic Eruptions, and other universities.

These and similar activities will be continued in the future, and the program will tackle the challenge of support for networking among students, junior researchers, and faculty.

Strategies Following the Completion of the Program

Based on the outcome of this program, future strategies and challenges will include 1) implementing and achieving joint research projects, 2) continued strengthening of international cooperation, including international forums on disaster prevention and 3) strengthening collaboration between industry, the public sector, and academia. High-level joint research will be carried out with such partners as the University College London, Harvard University, and the University of California, Davis, and we will also cooperate with research organizations such as NASA to widen our research scope. We hope to maintain this opportunity for high level global sharing of information in Sendai, to maintain the high level of interest in disaster prevention nurtured at the World Conference on Disaster Reduction, and to spread world-class research and case studies from Sendai to the world. We intend to continue the proactive exchange of views regarding international disaster prevention forums throughout the world, including the Miyagi Round Table on Disaster Prevention and Reduction established through the cooperation of Tohoku University with industry, academia, the public sector, and media in Miyagi Prefecture. Furthermore, as part of this forum, we aspire for the realization of the “Sendai Disaster Prevention Framework,” a new international disaster prevention framework, based on central cooperation between industry, the public sector, and academia.

Thematic Program | November 2014 – February 2015

A Health Informatics Infrastructure for a New Era

Biomedical research in the field of genetics has been revolutionized by the advent of new technologies such as next-generation DNA sequencing. In order to provide a research infrastructure for population genomics, many exciting and cutting edge projects, such as the construction of large biobanks and the undertaking of genome cohort studies, are currently ongoing in many different countries around the world. These projects will produce huge quantities of data related to human health, and this new data will be used to generate new ideas for medical therapies with wide-ranging clinical applications. To maximize the effectiveness of the new interactions between clinical medicine and basic research we need to develop a new type of network: a health informatics infrastructure. This network should have the ability to constantly respond to updated medical information for the benefit of the entire healthcare community. Thus, the aim of this thematic program was to discuss the future of medical informatics and big data science as they relate to population genetics, biobanking and prospective cohort studies, in order to create an integrated plan which governments can use to build integrated healthcare networks.

Important Goals and Degree of Achievement

The aim of the program was to exchange views and develop a sustained relationship with leading overseas researchers on the three major projects being undertaken by the Tohoku Medical Megabank Project: cohort studies, biobanking, and basic science research including medical informatics. Three separate events were held and leading researchers involved in the three major topics were invited. The expected outcome, building a sustained relationship with world-leading scientists, was achieved. With regard to cohort studies, Professor Ronald Stolk, who implemented the Lifelines three-generation cohort in the Netherlands, was invited to the third conference, at which we discussed the methodologies in recruitment to three-generation cohort studies. We established a relationship with Dr. Stolk to collaborate in epidemiological research using the three-generation cohorts in the future. Furthermore, regarding the operation of biobanks, Professor Mark Divers at the Swedish Karolinska Institutet was invited to the first conference to discuss biobanking with Professor Naoko Minegishi at ToMMo. The second conference was devoted to an area of basic research, blood cell differentiation and transcriptional regulatory mechanisms, and many intriguing scientific ideas were exchanged with a wide range of researchers inside and outside of Japan. Further, the latest findings relating to several topics were introduced by experts in their respective fields, including presentations on myeloid leukemia by Professor Ruud Delwel from the Erasmus Medical Center, and on lymphocytic leukemia by Professor James Douglas Engel from the University of Michigan. With regard to the aim to developing a Learning Health System, a medical informatics system that uses machine learning, we will produce a report in collaboration with Professor Charles Friedman from the University of Michigan in which we will summarize the progress made at the third conference. Professor Peter Tsai from the National Health Research Institute, Taiwan and others were also consulted on the possibility of hosting a series of international conferences on the same topics in the future. In this way, we believe we achieved the expected aim of this thematic program, as researchers at the Tohoku Medical Megabank organization have successfully formed close relationships with world-leading researchers.

This program was an opportunity to demonstrate our activities on large-scale genome cohort studies and biobanking to the attending international researchers. For the organization's junior faculty researchers, the program provided an opportunity to engage in discussions in English over long sessions. The discussions in English stimulated new ideas in the young researchers' minds, through which they learned how to reach constructive and reasonable agreements with the other scientists who have different opinions.

Program Organizers

Masayuki Yamamoto
(Executive Director, Tohoku Medical Megabank Organization)

Prof. Yamamoto graduated from the Tohoku University Graduate School of Medicine in 1983 and obtained M.D., Ph. D. He has been a professor at the Tohoku University School of Medicine since 2012. He was a postdoctoral fellow at Northwestern University. Then he successively served as a lecturer at Tohoku University, and as a professor at the University of Tsukuba. He was the Dean of the Tohoku University Graduate School of Medicine and councilor of school of medicine from 2008 to 2011. His areas of specialty include medical biochemistry and molecular biology. Honors: Medal with Purple Ribbon in 2012 and the Japan Academy award in 2014

Lorenz Poellinger
(Karolinska Institutet, Sweden)

Prof. Poellinger graduated from the Karolinska Institutet Department of Medicine in 1978. He was a postdoctoral fellow at Rockefeller University from 1987 to 1989 and has been a professor in the area of cellular and molecular biology at the Karolinska Institutet since 1996. He is also a professor at the Cancer Science Institute of the National University of Singapore from 2009. He received an award from the Swedish Society for Biochemistry and Molecular Biology in 1996. He is a member of the Nobel Assembly for Physiology and Medicine.

James Douglas Engel
(University of Michigan, USA)

Prof. Engel has been a professor and the chair of department of cell & developmental biology at the University of Michigan Medical School since 2004. He was a postdoctoral fellow at the California Institute of Technology and served as a professor at Northwestern University. He also served as the chairman of the review board for science funding at the US National Institutes for Health. His areas of specialty include the molecular biology of gene regulation and blood diseases.

Charles P. Friedman
(University of Michigan, USA)

Prof. Friedman graduated from the Massachusetts Institute of Technology in 1971. After obtaining his PhD. from the University of North Carolina, he served as a professor and research director in the areas of bioinformatics and medical informatics at various universities in the US. Following this he served as senior researcher at the US National Library of Medicine from 2003 to 2006, and as the chief information officer at the National Heart, Lung, and Blood Institute. Prof. Friedman served as the Chief Scientific Officer of the United States Department of Health and Human Services until 2011.

Program Highlights

The highlight of this program was the final conference on the “Learning Health System and Tohoku Medical Information Highway.” The ultimate goal of this event was to develop a platform for medical informatics which will greatly reduce the time required for the spread of the new knowledge and efficient medical technologies throughout a regional medical network. Thus, the event was held to work towards the development of a Learning Health System (LHS) in the Tohoku region. A LHS is an infrastructure for medical informatics which has self-learning abilities that combines the growing body of medical information, such as prescriptions and electronic medical records, with the big data of basic medical research derived from genetic data, epidemiological data, cohort data, and biobanks. By integrating the medical information and automatic feedback through self-learning, a LHS will generate new value for clinical practice. Five leading overseas researchers and three researchers from Japan were invited to give lectures and engage in group discussions to examine the future directions for identifying and solving potential issues through the direct exchange of views. The organizer, Professor Charles Friedman, proposed that we carry out group discussions in order to thoroughly examine the various aspects of a LHS. This was a major opportunity for the Japanese junior researchers, who were not experienced in debating in English, to gain vital experience. To summarize the various opinions of the scientists during the three-day discussions, three junior researchers were assigned to each group to record the discussions, at least in outline form, and to collect the diverse opinions quickly and accurately. The discussions themselves were extremely meaningful, and the junior researchers in particular engaged in lively debate.

Specific Strategies for International Research Exchange

Direct meetings and discussions were carried out with leading researchers in the areas of cohort studies, biobanks, basic research and medical informatics (LHS in particular). ToMMo researchers interacted with research facilities such as the Karolinska Institutet, the University of Michigan, and Lifelines, through which we have developed close relationships. An agreement for collaboration was signed between the Karolinska Institutet and Tohoku University in 2013 and this forum was placed as the first research exchange between the two institutions. The biobank project will take the central position in future research exchange between the two universities. Regarding cohort studies, Dr. Stolk and the epidemiologists from ToMMo discussed various aspects required to establish close collaboration between the two major three-generation cohort studies. The topics of the discussions included how to execute joint research in numerous areas, the sharing of recruitment methods, and the distribution and use of information in biobanks. As a result of these discussions, a foundation was formed for future collaboration. Regarding basic research, the participants had very fruitful scientific exchanges with Professor Ruud Delwel from the Erasmus Medical Center and Professor James Douglas Engel and Dr. Tomonori Hosoya from the University of Michigan, and shared data with the intention of publishing a joint research paper. Related to the joint research, Professor Engel agreed to accept students from the Tohoku University School of Medicine for short term exchange studies. The students will visit the research lab at the University of Michigan in the near future.

Principle Invited Researchers

Ruud Delwel
(Erasmus Medical Center, the Netherlands)

Professor of Molecular Leukemogenesis at the Hematology department of Erasmus Medical Center.

Mark Frisse
(Vanderbilt University, USA)

Accenture Professor of Biomedical Informatics, Vanderbilt University School of Medicine. Specialist in medical informatics and health economics. Member of the American College of Physicians and the American Medical Informatics Association.

Mark Divers
(Karolinska Institutet, Sweden)

Leader of the BioBanking and Molecular Resource Infrastructure of Sweden（BBMRI.se）since its founding in 2010.

Ronald Stolk
(University Medical Center Groningen, the Netherlands)

Professor at the University of Groningen. Chief Science Officer of Life Lines, a major three generation cohort research project and biobank in the Netherlands, with 160,000 participants.

Shih-Feng Tsai
(National Health Research Institutes, Taiwan)

國家柔生唆瞬硼分子靴基因福學燈瞬和主任。Specialist in human genetics and cancer genome sequencing. Recipient of the 東元獎 in 2005.

Tomonori Hosoya
(University of Michigan, USA)

Graduated from the University of Tsukuba doctoral program in 2001. Joined the University of Michigan Medical School in 2007. Promoted to Associate Professor in 2010. Specializes in molecular immunology.

International Training for Young Personnel

The purpose of this program was for junior faculty researchers to interact with leading scientists from overseas in English and, if possible, to discuss the possibility of conducting joint research in the future. An opportunity was provided to junior researchers to make presentations, and superb results were presented by the junior researchers from Tohoku University at the second and third conferences. As mentioned previously, the junior researchers were able to engage in debate directly with leading scientists in the group discussions on medical informatics. In fact, the junior researchers who participated in the group discussions were able to present very constructive and insightful arguments. They successfully participated in the debate in English and were able to successfully achieve the goal of the conference. As a result of this program at the TFC, the laboratory of Prof. Engel at the University of Michigan has agreed to regularly accept medical exchange students from the Tohoku University School of Medicine, during which they can undertake part of fundamental training.

Strategies Following the Completion of the Program

The following two goals were established as a result of these TFC activities. Regarding the biobank, one possible goal is to develop a relationship for ongoing discussions with the Karolinska Institutet Biobank and Lifelines in order to move forward with planning for collaboration on critical topics including sample management, information management, and distribution policy as a public biobank. Regarding medical informatics, the establishment of a system for utilizing medical big data as part of the megabank plan became an additional goal. Based on the opportunity provided by this exchange, we hope to develop an international biobank network by leveraging discussions on the standardization of data in medical informatics while reflecting the results on specific distribution policy. Furthermore, we will aim to apply the concept of the Learning Health System to the genome data and medical information obtained via the megabank plan, and will develop a data analysis system that can provide feedback efficiently in order to improve the health of residents in disaster affected areas.

Other Activities | July 30, 2014 – August 31, 2014

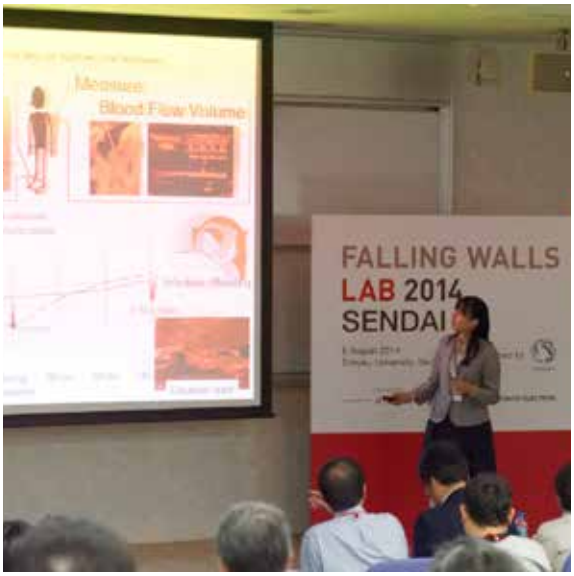
Sketches of Science at Tohoku University

The Sketches of Science at Tohoku University exhibit was held jointly with the Nobel Museum in Sweden from July 30 to August 31, 2014. In addition to attracting over 5,000 academics and members of the general public, the event also featured a lecture by the director of the Nobel Museum on August 23.

Other Activities | August 8, 2014

Falling Walls Lab Sendai 2014

The Falling Walls Lab Sendai was a presentation competition for junior researchers which we held on August 8, 2014, in collaboration with the Falling Walls foundation, based in Germany. This Lab was the first preliminary competition held in Asia, and featured participation by 26 individuals from Tohoku University and other institutions. The top three contestants were invited to travel to Berlin on November 8 to participate in the final round of the competition.



Other Activities | December 2014

Special Lectures

Special lectures were held by the 2007 Nobel laureate in Physiology or Medicine, Professor Oliver Smithies along with Professor Nobuyo Maeda, both from the University of North Carolina at Chapel Hill, on December 8 for the School of Medicine, and on December 9 for the School of Pharmaceutical Sciences. The events saw participation by numerous faculty and students.

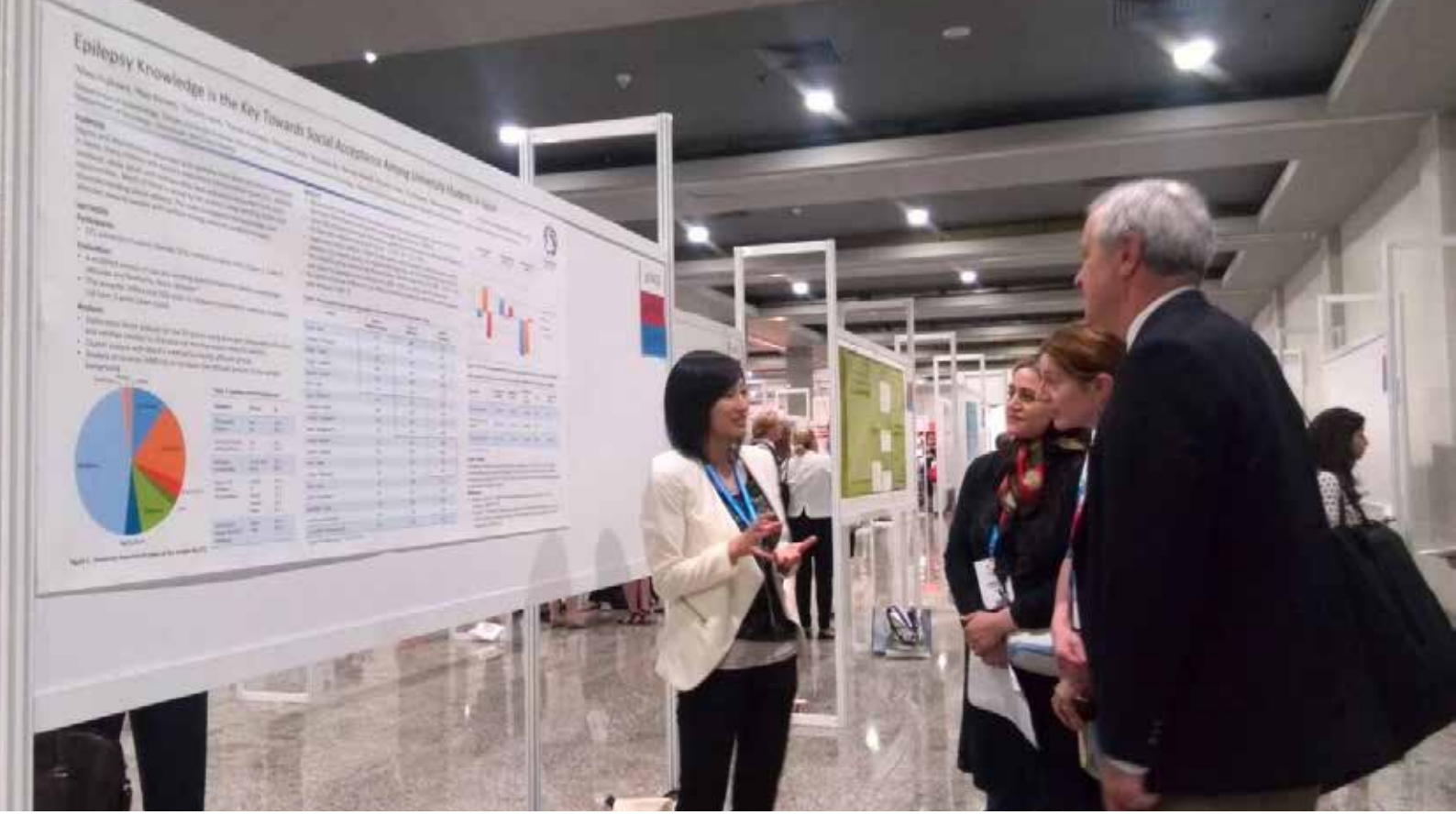
In addition, a commemorative public lecture was given by the 2015 Nobel laureate in Physics, Professor Hiroshi Amano (Nagoya University), on December 26. Participants included approximately 1,300 members of the general public, including many high school students, from both inside and outside of Miyagi prefecture.

Other Activities | October 2014 – February 2015

Quattro Seminars

The TFC has regularly held a series of seminars, commonly known as the "Quattro Seminars," on the humanities and social sciences as part of the URA and Tohoku Forum for Creativity Collaboration Project. The Quattro Seminars aim to deepen collaboration between the four schools of the humanities at Tohoku University and to explore interdisciplinary research themes, and are opened widely to outsiders. The seminars were held five times in 2014. Each seminar saw the participation of 35 researchers who were able to use the seminars as an opportunity to engage in vigorous discussion and strengthen their interpersonal connections.

*The term Quattro in the common name of the series stands for "4," representing the four faculties including the Faculty of Arts and Letters, the Faculty of Education, the School of Law, and the Faculty of Economics. The series is hosted through cooperation by the TFC and the URA center.



Support for Young Researchers | September 2013 – March 2015

Leading Young Researcher Overseas Visit Program

This program is one of the central pillars in transforming the research environment at Tohoku University, with support from the program for promoting the enhancement of research universities from the Ministry of Education, Culture, Sports, Science and Technology (MEXT) in 2013, and implemented in cooperation with the University Research Administration Center, Tohoku University. The program deploys junior researchers (researchers and faculty under the age of 40, as well as graduate students in the second semester of their doctoral programs and postdoctoral fellows at our graduate schools) overseas to cultivate leadership skills and an international viewpoint. The strategic deployment of highly motivated, outstanding junior researchers to excellent universities and research organizations overseas will help those researchers develop into leaders in the international academic world, while enabling then to develop new cutting-edge research projects and interpersonal networks. For this reason, we prioritized the selection of applications which clearly stated the importance of this program for career development, in addition to providing a new strategy for improving the university's research capabilities. Under normal circumstances, this program will support medium-term overseas studies for periods from six months to one year. From the start of the program in October 2013 to the end of 2014, a total of 22 junior researchers were sent to overseas research institutions. Upon their return, the leading young researchers gave presentations about their research experiences, and further follow-up will be provided in the future so that they may develop into global leaders.

Pick Up!
Report 1

Visiting institute： New York University Comprehensive Epilepsy Center（USA）
Research theme： Development of comprehensive epilepsy care model based on psychosocial evaluation
Visiting period： January 22, 2014 – March 28, 2014

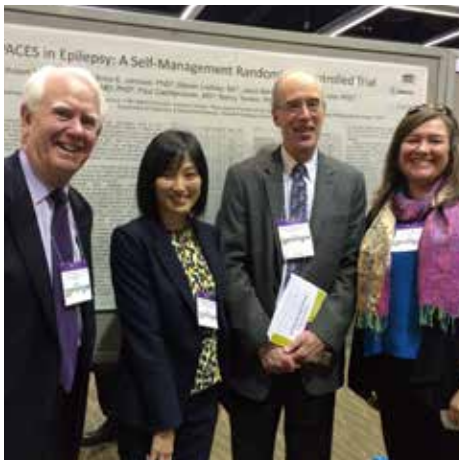
Visitor： Mayu Fujikawa (Assistant Professor, Department of Epileptology, Tohoku University School of Medicine)

Project Outcome

The purpose of this overseas training was to ascertain the role and function of psychologists at the New York University Comprehensive Epilepsy Center（CEC）in the US, and to develop collaborative research between Japan and the US. The program included site-visits and clinical training at four epilepsy centers around New York, attendance at two academic conferences, and phone-conferences with two out-of-state CECs. Research meetings with neuropsychologists led to specific plans examining the efficacy of neuropsychological testing and psychosocial assessment in epilepsy care including surgical treatment. Further, a multi-site project was discussed with psychologists at epilepsy centers that already offer psychosocial intervention, verifying patients' psychosocial needs and establishing psychologists' role in Japan.

At the National Council on Rehabilitation Education conference, rehabilitation psychologists discussed international dissemination of evidence-based research. In particular, publishing outcomes of epilepsy rehabilitation from Japan is urgent, as Japan has made significant development in epilepsy care. The editor of the association's journal requested the author to participate in the international committee.

In summary, the program was a great opportunity to expand the academic network with international collaborators within the field of psychology and epilepsy care. I plan to ensure the implementation of evidence-based psychosocial rehabilitation as part of the comprehensive epilepsy care at Tohoku University.



Further Development and Networking

Upon my return, psychosocial assessment and intervention on patients with epilepsy was implemented as part of the clinical routine in our department, and a research database was developed. In 2015, our project received national funding from the KAKENHI Grant-in-Aid for Challenging Exploratory Research, investigating how psychosocial assessment and intervention could maximize surgical outcomes encompassing patients' quality of life. Further, in order to ameliorate the quality of long-term care for patients, a new multidisciplinary care model for patients and families is now underway particularly in the area of pediatric-adult transitional care, community and vocational support. Academically, I was assigned to become a board member of the newly established Japan Society for Epilepsy Rehabilitation to facilitate multi-site research and training of medical staff specific to epilepsy care. Internationally, I am working on neuropsychiatric research as a task force member in the International League Against Epilepsy and the American Epilepsy Society. I plan to continue patient education and public advocacy towards eliminating stigma and enhancing patients' quality of life.

Pick Up!
Report 2

Visiting institute： Foundation for Applied Molecular Evolution（USA）

Research theme： Investigation on the origin of RNA on the early Earth by collaboration between Earth science and Organic chemistry

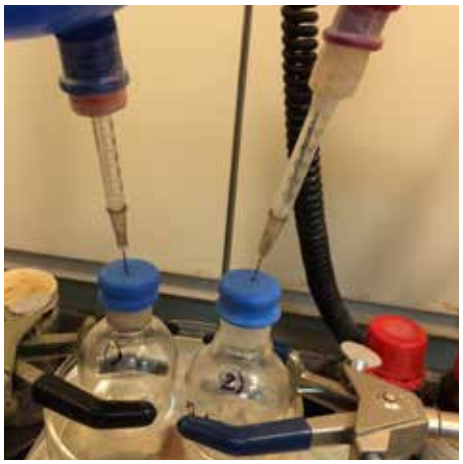
Visiting period：Feburary 3, 2014 – May 2, 2014

Visitor： Yoshihiro Furukawa (Assistant Professor, Graduate School of Science, Tohoku University)

Project Outcome

I visited the Foundation for Applied Molecular Evolution (FfAME) in Gainesville, Florida for three months, to work on two research themes on the origin of RNA, which is believed to have played an important role in the origins of life. At this institution, Steven Benner, the distinguished fellow of the foundation, was my advisor, and I worked on these themes collaborating with other researchers at FfAME. In nucleoside phosphorylation, one step in the process of RNA formation, three phosphorylation sites exist. However, only two such bonds exist in the RNA molecule itself, and no natural mechanism to control the phosphorylation sites had been found. During my research visit, I was able to clarify that boric acid could form a complex on a specific part of the nucleoside to control the phosphorylation sites and selectively form the nucleotide found in RNA.

In addition, I also worked on the next step in RNA formation, the nucleotide polymerization. While this reaction is an extremely important step in the origin of life, previous research has shown that this reaction largely does not progress within an aqueous solution. Therefore, while at FfAME, I used a mineral surface as a substrate and attempted to evoke a nucleotide extension reaction. While this second research project was not completed during the visit, I was able to gain signs of an ultimate positive outcome.



Further Development and Networking

The research on the selective nucleoside phosphorylation was published in the US journal Astrobiology (Furukawa et al., Astrobiology 15, 259–267, 2015), and featured on the cover page of the issue it was published in. Further, this work was featured on the web page of the NASA astrobiology institute. We are also preparing a new paper submission on related joint research carried out primarily by researchers at FfAME.

To complete the second research theme, nucleotide polymerization, I submitted a KAKENHI proposal and the project was selected as a Grant-in-Aid for Challenging Exploratory Research project in the form of joint research with FfAME. I'm planning to visit FfAME again in the future to discuss this research, in addition to new projects.

Pick Up!
Report 3

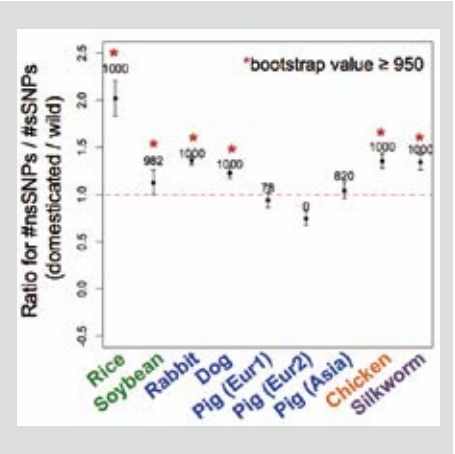
Visiting institute： Uppsala University（Sweden）
Research theme： Distribution of deleterious mutations on domestic animal genomes
Visiting period：February 1, 2014 – April 30, 2014

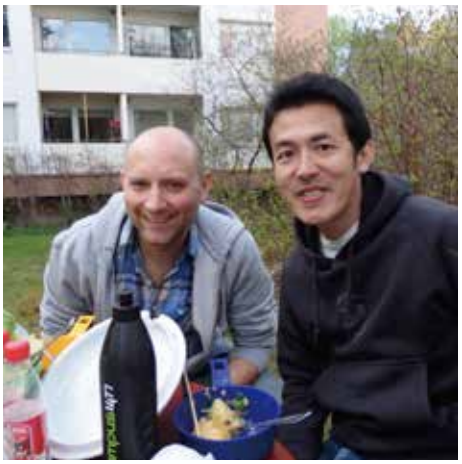
Visitor： Takashi Makino （Associate Professor, Graduate School of Life Sciences, Tohoku University）

Project Outcome

With the support of the program to dispatch junior researchers overseas, I was able to visit Uppsala University in Sweden for three months beginning on February 1, 2015, to carry out research on the accumulation of detrimental mutations in domesticated species. During my visit, I carried out joint research with Matthew Webster, PhD., a specialist in this research field. In this research, we focused on domesticated species and cultivated species for which we had single nucleotide polymorphism（SNP）data from known genome sequences to survey the genomic accumulation of deleterious mutations. This research showed that the group of domesticated and cultivated species were accumulating more deleterious mutations in their genomes compared to wild species.

Uppsala University is home to Leif Andersson, PhD., a researcher who has achieved major results in research on the genomes of domesticated species, and during my stay I was able to engage in discussions with him regarding this research. Furthermore, Dr. Andersson and other members of his research group participated in this research, providing SNP data on pigs vs. boars, and domesticated vs. wild rabbits, and I am currently writing a paper with my fellow researchers in order to publish our results.





Further Development and Networking

Since returning from the dispatch, I continue to stay in close contact with Matthew Webster PhD. in preparation for announcing the research results in a paper. Further, I am able to remain in contact with the other joint researchers at Uppsala University for ongoing research discussions.

Finally, I also submitted and gained approval under the JSPS “Invitation Fellowship Program for Research in Japan” to invite Andreas Wallberg, PhD., a researcher who belongs to the research group of Dr. Webster and achieved success in research on the domesticated honey bee genome（Wallberg et al. Nature Genetics 2014）. During his visit here in December, I plan to work on sequencing the honey bee genome with Dr. Wallberg and further promote international joint research.

TOKYO ELECTRON House of Creativity
Lecture Theater

Information 2014

Thematic Program 2014

Invited Researchers List

Program Code: 2014BIG
Challenges for Big Data in our Society: Statistical Analysis of Large Scale, High Dimensional Data for Socio-Economic Problems

P.K. Kannan (University of Maryland)
Jaehwan Kim (Korea University)
William Rand (University of Maryland)
Jae Wook Kim (Korea University)
Hiroshi Maruyama (The Institute of Statistical Mathematics)
Takeaki Kariya (Meiji University)
Yoshinori Kawasaki (The Institute of Statistical Mathematics)
Atsuyuki Kogure (Keio University)
Greg Allenby (Ohio State University)
Michael Trusov (University of Maryland)
George Tiao (University of Chicago)
Tomoyuki Higuchi (The Institute of Statistical Mathematics)
Dominique M. Hanssens (UCLA)
Jaehwan Kim (Korea University)
Yusuke Kumagae (NTT Corporation)
Piotr Fryzlewicz (LSE)
Daniel Nordman (Iowa State University)
Yoshihiro Yajima (University of Tokyo)
Peter Brockwell (Colorado State University)

Program Code: 2014DIS
Recovery from the Great East Japan Earthquake and Tsunami: Future Strategies for Disaster Risk Reduction

John Rundle (University of California, Davis)
Denise Konan (University of Hawaii)
Andrew Gordon (Harvard University)
Reid Basher (Victoria University of Wellington)
Gordon McBean (President of the International Council for Science)
Reid Basher (Former Advisor to the UN Special Rep. of the Secretary-General for DRR)
Shuzo Koshino (Iwate University)
Yoshihito Ozawa (Vice President of Fukushima University)
Karl Kim (University of Hawaii)
Andrew Gordon (Harvard University)
John Rundle (University of California, Davis)
Satoru Nishikawa (Vice President of Japan Water Agency)
Badaoui Rouhban (Former Director of Section for Disaster Reduction, UNESCO)
Walter Ammann (Founder and President of the Foundation GRF Davos)

Program Code: 2014TMM
A Health Informatics Infrastructure for a New Era

Lorenz Poellinger (Karolinska Institute)
Mark Divers (Karolinska Institute)
Randall Johnson (Karolinska Institute)
Arne Holmgren (Karolinska Institute)
Jon Lundberg (Karolinska Institute)
Lucia Coppo (Karolinska Institute)
Ryuichi Nishinakamura (Kumamoto University)
Masaomi Nangaku (University of Tokyo)
Motoko Yanagita (Kyoto University)
Tove Rylander Rudqvist (Karolinska Institute Biobank)
James Thompson (Karolinska Institute Biobank)
Jun Lu (Karolinska Institute)
Ruud Delwel (Erasmus MC)
Atsushi Iwama (Chiba University)
James Douglas Engel (University of Michigan)
Ichiro Taniuchi (RIKEN)
James Douglas Engel (University of Michigan)
Charles Friedman (University of Michigan)
Brendan Delaney (King's College London)
Rebecca Kush (Clinical Data Interchange Standards Consortium)
Shih-Feng Tsai (NHRI, Taiwan)
Ronald Stolk (University Medical Center Groningen)
Mark Frisse (Vanderbilt University)
Hiroshi Tanaka (Tokyo Medical and Dental University)
Michio Kimura (Hamamatsu Medical University)
Mihoko Okada (Kawasaki University of Medical Welfare)

Thematic Program 2014 | Program Code: 2014BIG

Challenges for Big Data in our Society:
Statistical Analysis of Large Scale, High Dimensional Data for Socio-Economic Problems

International Workshop on Data Science and Service Research

■ Date: Friday, July 18, 2014
■ Venue: Large Conference Room, 11F, Graduate School of Education, Kawauchi South Campus, Tohoku University
■ Cosponsor: East Asia Project (Graduate School of Economics and Management, Tohoku University)
■ Invited Researchers
- P.K. Kannan (University of Maryland)
- Jaehwan Kim (Korea University)
- William Rand (University of Maryland)
- Jae Wook Kim (Korea University)
- Hiroshi Maruyama (The Institute of Statistical Mathematics)

■ Participants: 42
■ Time Schedule

[Welcome remarks]

10:00 - 10:15 Nobuhiko Terui (DSSR, Tohoku University)

[Session]

10:15 - 11:00 **Impact of Attribution Metrics on Return on Keyword Investment in Paid Search Advertising**
P.K. Kannan (University of Maryland)

11:00 - 11:45 **An Economic Model for Charitable Donations**
Jaehwan Kim (Korea University)

11:45 - 12:30 **The Complex Network of Social Media**
William Rand (University of Maryland)

12:30 - 14:00 Lunch

14:00 - 14:45 **Is Loyalty Transferable? An Evidence from Partnership Loyalty Program Network**
Jae Wook Kim (Korea University)

14:45 - 15:30 **Developing Data Analytics Skills in Japan: Status and Challenge**
Hiroshi Maruyama (The Institute of Statistical Mathematics)

15:30 - 16:30 Coffee Break

16:00 - 16:45 **A Large-Scale Marketing Model using Dimension Reduction and Variational Bayes Inference**
Tsukasa Ishigaki (Tohoku University)

16:45 - 17:30 **Rich Vehicle Routing Problems and Our Challenges**
Akifumi Kira (Tohoku University)

[Reception]

18:00 Reception@Café REPOS

International Conference on Statistical Analysis of Large Scale High Dimensional Socio-Economic Data

■ Date: Thursday, November 6, 2014 - Friday, November 7, 2014
■ Venue: Large Conference Room, 11F, Graduate School of Education, Kawauchi South Campus, Tohoku University
■ Cosponsor: JSPS KAKENHI Grant Number (A)25245054 (Representation: Nobuhiko Terui)
■ Invited Researchers
- Takeaki Kariya (Meiji University)
- Yoshinori Kawasaki (The Institute of Statistical Mathematics)
- Atsuyuki Kogure (Keio University)
- Greg Allenby (Ohio State University)
- Michael Trusov (University of Maryland)
- George Tiao (University of Chicago)
- Tomoyuki Higuchi (The Institute of Statistical Mathematics)
- Dominique M. Hanssens (UCLA)
- Jaehwan Kim (Korea University)
- Yusuke Kumagae (NTT Corporation)
- Piotr Fryzlewicz (LSE)
- Daniel Nordman (Iowa State University)
- Yoshihiro Yajima (University of Tokyo)

■ Participants:58
■ Time Schedule

Thursday, November 6, 2014

[Opening Address]

10:15 - 10:30 Nobuhiko Terui (Tohoku University)

[Finance] Chair: Yoshihiko Tsukuda (Tohoku University)

10:30 - 11:00 **An Efficiency of a GLSE in Regression Model with AR Errors and Its Application to Kariya's Bond Pricing Model An Efficiency of a GLSE in Regression Model with AR Errors and Its Application to Kariya's Bond Pricing Model**
Takeaki Kariya (Meiji University)
11:00 - 11:30 **Time Series Residual Momentum and Momentum Crash**
Hongwei Chuang (Tohoku University)
11:30 - 12:00 **Predictive Modeling in Socio-Economic Data Using Smooth-Thresholding**
Yoshinori Kawasaki (The Institute of Statistical Mathematics)
12:00 - 13:30 Lunch
13:30 - 14:00 **A Bayesian Approach to Longevity Derivative Pricing under Stochastic Intertest Rates with a Two-Factor Lee-Carter Model**
Atsuyuki Kogure (Keio University)
14:00 - 14:30 **R-Estimators for Generalized Lehmann's Alternative Models When Observations are a Weakly Dependent Sequence: The Cases of Residuals in a Linear Regression**
Ryozo Miura (Tohoku University)
14:30 - 14:45 Coffee Break

[Marketing I] Chair: Hajime Wago (The Institute of Statistical Research)
14:45 - 15:15 **Latent Topic Modeling of Consumer Reviews: Linking Text Evaluations to Customer Satisfaction and Brands**
Greg Allenby (Ohio State University)
15:15 - 15:45 **A Direct Utility Model for Economics of Scope**
Jaehwan Kim (Korea University)
15:45 - 16:00 Coffee Break

[Keynote Lectures] Chair: Nobuhiko Terui (Tohoku University)
16:00 - 16:50 **Panel Data Analysis, Bayesian Approach and Forecasting**
George Tiao (University of Chicago)
17:00 - 17:50 **Big data and Personalization technology: Imputation, Linkage, and Stream Computing**
Tomoyuki Higuchi (The Institute of Statistical Mathematics)

[Reception]
18:00 Reception@Café REPOS

Friday, November 7, 2014

[Marketing II] Chair: Takuya Satomura (Keio University)
10:00 - 10:30 **Perfomance Growth and Vigilant Marketing Spending**
Dominique M. Hanssens (UCLA)
10:30 - 11:00 **Crumbs of The Cookie: User Profiling in Customer-Base Analysis and Behavioral Targeting**
Michael Trusov (University of Maryland)
11:00 - 11:15 Coffee Break
11:15 - 11:45 **View and Purchase: Purchase Behavior Analysis via Topic Model**
Yusuke Kumagae (NTT Corporation)
11:45 - 12:15 **A Dynamic Marketing Model Based on Topic Modeling for Large-Scale Customer Data**
Tsukasa Ishigaki (Tohoku University)
12:15 - 13:30 Lunch

[Economic Time Series] Chair: Seisho Sato (University of Tokyo)
13:30 - 14:00 **The Use of Randomness in Time Series Analysis**
Piotr Fryzlewicz (LSE)
14:00 - 14:30 **A Frequency Domain Empirical Likelihood for Irregularly Spaced Dependent Data**
Daniel Nordman (Iowa State University)
14:45 - 15:15 **On Statistical Testing for Spatio-Temporal Stationary Random Fields**
Yoshihiro Yajima (University of Tokyo)
15:15 - 15:45 **Wavelet Analysis of Land Price Data in Tokyo**
Yasumasa Matsuda (Tohoku University)

[Concluding Address]
15:45 - 16:00 Yasumasa Matsuda (Tohoku University)

Lecture Series: Continuous Time Models for High Dimensional Financial Time Series

■ Date and time:
The 1st time Thursday, November 20, 2014 15:00 - 18:00
The 2nd time Thursday, November 27, 2014 15:00 - 18:00
■ Venue: Seminar room 21, 10F, Graduate School of Education Kawauchi South Campus, the Tohoku University
■ Lecturer: Peter Brockwell (Colorado State University)
■ Participants: 22

Thematic Program 2014 | Program Code: 2014DIS

Recovery from the Great East Japan Earthquake and Tsunami:
Future Strategies for Disaster Risk Reduction

Multi-hazard Summer School

■ Date: Tuesday, July 22, 2014 - Friday, July 25, 2014
■ Venue: Katahira Kitamon Commons 2F, Tohoku University
■ Invited Researchers
- John Rundle (University of California, Davis)
- Denise Konan (University of Hawaii)

■ Participants: 47
■ Time Schedule

Tuesday, July 22, 2014

09:00 - 09:40 **Opening**
09:40 - 10:25 **Introduction to IRIDeS**
Makoto Okumura (IRIDeS)
10:25 - 10:55 Coffee break
10:55 - 11:55 **Disaster Medical and Public Health Management as DRR/DRM**
Shinichi Egawa (IRIDeS)
11:55 - 13:00 Lunch
13:00 - 14:00 **A Practical Guide to Global Earthquake Forecasting**
John Rundle (University of California, Davis)
Eric Heien (University of California, Davis)
14:00 - 15:00 **Disasters**
Shinya Horie (Graduate School of Environmental Studies, Tohoku University)
15:00 - 15:20 Coffee break
15:20 - 16:20 **Disaster Recovery from the Great East Japan Earthquake and Tsunami**
Yasuaki Onoda (IRIDeS)
16:20 - 17:20 **Hyogo Framework for Action: international framework for disaster risk reduction**
Osamu Murano (IRIDeS)

Wednesday, July 23, 2014

09:00 - 10:00 **Disaster evacuation drill: Run-up, Japan!**
Dentsu Inc.
10:00 - 11:00 **Disaster risk reduction around the Pacific Lim**
Denise Konan (University of Hawaii)
11:00 - 11:20 Coffee break
11:20 - 12:40 **Towards disaster resilient city**
Manabu Suzuki (Tagajo City)
12:40 - 13:40 Lunch
13:40 - 14:00 **Campus safety survey**
Takako Izumi (IRIDeS)
14:00 - 15:30 **Group discussion1: Campus safety**
15:30 - 15:45 Coffee break
15:45 - 17:00 **Group presentation and discussion**

Thursday, July 24, 2014

Field visit to Kesennuma

Friday, July 25, 2014

09:30 - 10:45 **Disaster education**
Mari Yasuda (IRIDeS)
10:45 - 11:05 Coffee break
11:05 - 12:00 **UN World Conference on Disaster Risk Reduction**
Kazuyuki Numata (Sendai City)
12:00 - 13:00 Lunch
13:00 - 15:00 **Group discussion 2: Recommendations towards 2015 UNWCDRR**
15:00 - 15:20 Coffee break
15:20 - 16:30 **Group presentation and discussion**
16:30 - 16:45 **Closing**

International Workshop on Implementing of Practical Disaster Risk Reduction

■ Date: Friday, November 7, 2014 - Monday, November 7, 2014
■ Venue: International Research Institute of Disaster Science (IRIDeS), Tohoku University
■ Invited Researchers
- Andrew Gordon (Harvard University)
- Reid Basher (Victoria University of Wellington)

■ Participants: 70

■ Time Schedule

Friday, November 7, 2014

09:00 - 09:10 **Opening remarks**
Fumihiko Imamura (IRIDeS)

09:10 - 09:20 **Opening remarks**
Yoshiaki Maeda (Tohoku Forum for Creativity)

09:20 - 09:40 **Introduction of IRIDeS**
Makoto Okumura (IRIDeS)

09:40 - 10:10 **Keynote speech**
Andrew Gordon (Harvard University)

10:10 - 10:40 **Keynote speech**
Reid Basher (Victoria University of Wellington)

10:40 - 10:50 Group photo

10:50 - 11:05 Coffee break

11:05 - 11:10 **Overview of the workshop**
Takako Izumi (IRIDeS)

11:10 - 11:40 **Presentation by Group 1: Disaster education and Disaster Digital Archive**

11:40 - 12:10 **Presentation by Group 2: Disaster science and risk assessment**

12:10 - 13:10 **Lunch & Lecture: HFA IRIDeS Review Report**
Osamu Murao (IRIDeS)

13:10 - 13:40 **Presentation by Group 3: Disaster medicine and public health Preparedness**

13:40 - 14:10 **Presentation by Group 4: Architecture and Land Use Planning for Disaster Mitigation**

14:10 - 14:40 **Presentation by Group 5: Early Warning System and Evacuation/Building Partnership towards and beyond the 2015 UN World Conference on Disaster Risk Reduction**

14:40 - 15:00 Coffee break

15:00 - 17:00 **Group discussion I**

Saturday, November 8, 2014

09:30 -10:45 **Group discussion II**

10:45 - 11:00 Coffee break

11:00 - 12:30 **Group discussion III**

12:30 - 13:30 Lunch

13:30 - 15:00 **Presentation and Discussion (Plenary) (30mins x 3 groups)**

15:00 - 15:20 Coffee break

15:20 - 16:20 **Presentation and Discussion (Plenary) (30mins x 2 groups)**

16:20 - 16:45 **Wrap-up**
Yuichi Ono (IRIDeS)

Sunday, November 9, 2014

Field trip (Kesennuma)

Monday, November 10, 2014

10:00 - 11:00 **Report of the group discussion and future vision of IRIDeS (English)**

11:00 - 12:00 **Report of the group discussion and future vision of IRIDeS (Japanese)**

A Memorial Symposium on the 2011 Great East Japan Earthquake & a Screening of the 3D Documentary: The Great March Eleven Tsunami -Remembering for the future-

■ Date: Tuesday, March 10, 2015

■ Venue: Tohoku University Centennial Hall (Kawauchi Hagi Hall)

■ Invited Researchers

- Gordon McBean (President of the International Council for Science)
- Reid Basher (Former Advisor to the UN Special Rep. of the Secretary-General for DRR)
- Shuzo Koshino (Iwate University)
- Yoshihito Ozawa (Vice President of Fukushima University)
- Karl Kim (University of Hawaii)
- Andrew Gordon (Harvard University)
- John Rundle (University of California, Davis)
- Satoru Nishikawa (Vice President of Japan Water Agency)
- Badaoui Rouhban (Former Director of Section for Disaster Reduction, UNESCO)
- Walter Ammann (Founder and President of the Foundation GRF Davos)

■ Participants: 400

■ Time Schedule

[Section 1: Towards disaster-resilient societies] MC: Shunichi Koshimura

12:30 - 12:35 **Opening Remarks**
Fumihiko Imamura (IRIDeS)

12:35 - 13:05 **Keynote Speech**
Gordon McBean (President of the International Council for Science)

13:05 - 13:25 **Report on the International Workshop on Implementing Practical DRR**
Reid Basher (Former Advisor to the UN Special Rep. of the Secretary-General for DRR)

13:30 - 14:15 **Report on the Recovery Status after 2011 GEJE—Implementation of DRR in the Affected Areas**
Shuzo Koshino (Iwate University)
Nobuyoshi Hara (Executive Vice President of Tohoku University)
Yoshihito Ozawa (Vice President of Fukushima University)

14:15 - 14:30 Break

14:30 - 17:00 **Panel Discussion: "Has the academic research that aims to establish DRR society responded to the social needs?"**
Facilitator: Yuichi Ono (IRIDeS)

14:30 - 15:50 **Panel 1**
Karl Kim (University of Hawaii)
Andrew Gordon (Harvard University)
John Rundle (University of California, Davis)
Reid Basher (Former Advisor to the UN Special Rep. of the Secretary-General for DRR)

15:55 - 16:55 **Panel 2**
Satoru Nishikawa (Vice President of Japan Water Agency)
Badaoui Rouhban (Former Director of Section for Disaster Reduction, UNESCO)
Walter Ammann (Founder and President of the Foundation GRF Davos)
Gordon McBean (President of the International Council for Science)
Fumihiko Imamura (IRIDeS)

16:55 - 17:00 **Closing Remarks**
Makoto Okumura (IRIDeS)

[Section 2: Pass on our memories to future generations] MC: Kiyoshi Ito (IRIDeS)

18:00 - 18:05 **Message**
Sadayoshi Ito (Executive Vice President, Director of TFC, Tohoku University)

18:05 - 18:35 **Talk show**
Fumihiko Imamura (IRIDeS)
Atsunori Kawamura (Movie Director)
Hideo Yanagisawa (NHK News Commentator)
Satoko Yagyu (NHK Newscaster)

18:45 - 20:00 **NHK 3D Documentary Film: The 3.11 TSUNAMI**

20:00 - **Closing Remarks**
Fumihiko Imamura (IRIDeS)

Thematic Program 2014 | Program Code: 2014TMM

A Health Informatics Infrastructure for a New Era

Karolinska-Tohoku Joint Symposium on Medical Sciences

■ Date: Saturday, November 8, 2014 - Sunday, November 9, 2014
■ Venue: Conference room of Tohoku Medical Megabank Organization, Tohoku University
■ Invited Researchers
- Lorenz Poellinger (Karolinska Institute)
- Mark Divers (Karolinska Institute)
- Randall Johnson (Karolinska Institute)
- Arne Holmgren (Karolinska Institute)
- Jon Lundberg (Karolinska Institute)
- Lucia Coppo (Karolinska Institute)
- Ryuichi Nishinakamura (Kumamoto University)
- Masaomi Nangaku (University of Tokyo)
- Motoko Yanagita (Kyoto University)
- Tove Rylander Rudqvist (Karolinska Institute Biobank)
- James Thompson (Karolinska Institute Biobank)
- Jun Lu (Karolinska Institute)

■ Participants: 122
■ Time Schedule

Saturday, November 8, 2014

12:00 - 13:10 Reception
13:15 - 13:25 **Opening Remarks**
Masayuki Yamamoto (ToMMo, Tohoku University)
13:25 - 13:30 **Greetings from Tohoku Forum for Creativity**
Liam Baird (Program Coordinator of TFC)

[Session Ⅰ: Clinical Application and Management of Biobanks]

13:30 - 14:10 **Biobanking value: reflections from the Swedish experience**
Mark Divers (KI Biobank)
14:10 - 14:40 **Aim and progress of Tohoku Medical Megabank project**
Masayuki Yamamoto (ToMMo, Tohoku University)
14:40 - 15:05 **Opportunities and challenges with medical biobanking**
Tove Rylander Rudqvist (KI Biobank)
15:30 - 15:55 **High throughput developments in medical biobanking**
James Thompson (KI Biobank)
15:55 - 16:20 **Biobank construction based on cohort studies after the seismic disaster of 2011**
Naoko Minegishi (ToMMo, Tohoku University)
16:20 - 16:45 **Data management and bioinformatics of thousands Japanese whole-genome project**
Masao Nagasaki (ToMMo, Tohoku University)
16:45 - 17:20 **Perspectives towards the development of personalized medicine by the ToMMo genome cohort**
Jun Yasuda (ToMMo, Tohoku University)
17:20 - 18:00 **Tour around Tohoku Medical Megabank Organization**

Sunday, November 9, 2014

[Session Ⅱ: Oxygen and Medicine]

09:30 - 10:10 **Epigenetic mechanisms of gene regulation in hypoxia and cancer**
Lorenz Poellinger (Karolinska Institute & National University of Singapore)
10:10 - 10:35 **A novel pharmacotherapy of preeclampsia**
Nobuyuki Takahashi (Tohoku University)
10:35 - 11:05 **Drug discovery in kidney disease - From serendipity to rationality**
Toshio Miyata (Tohoku University)
11:20 - 12:00 **The role of HIF isoforms in the physiology of hypoxia**
Randall Johnson (Karolinska Institute & University of Cambridge)
12:00 - 12:30 **Hypoxia as the appropriate and realistic therapeutic target in kidney disease**
Masaomi Nangaku (University of Tokyo)
13:30 - 17:30 **Redox and Diseases**
13:30 - 14:10 **Redox regulation and signaling by thioredoxin and glutaredoxin systems**
Arne Holmgren (Karolinska Institute)
14:10 - 14:40 **Renal fibrosis and anemia: cause, trigger and plasticity**
Motoko Yanagita (Kyoto University)
14:40 - 15:05 **Thioredoxin and glutaredoxin systems in relation to superoxide dismutase**
Jun Lu (Karolinska Institute)

15:05 - 15:35 **tRNA metabolism and mitochondrial dysfunction**
Takaaki Abe (Tohoku University)
15:55 - 16:20 **Glutathione and Grx2 in Alzheimers disease**
Lucia Coppo (Karolinska Institute)
16:20 - 16:50 **Creating the kidney in vitro**
Ryuichi Nishinakamura (Kumamoto University)
16:50 - 17:30 **Inorganic nitrate and nitrite in health and disease**
Jon Lundberg (Karolinska Institute)
16:50 - 17:30 **Inorganic nitrate and nitrite in health and disease**
Jon Lundberg (Karolinska Institute)
17:30 - 17:40 **Closing Remarks**
Susumu Satomi (President of Tohoku University)

Functional Genomics and Experimental Medicine

■ Date: Tuesday, February 3, 2015
■ Venue: Auditorium of Building No. 6, Tohoku University Graduate School of Medicine
■ Invited Researchers
- Ruud Delwel (Erasmus MC)
- Atsushi Iwama (Chiba University)
- James Douglas Engel (University of Michigan)
- Ichiro Taniuchi (RIKEN)

■ Participants: 72
■ Time Schedule

09:30 - 09:40 **Opening remarks**
Liam Baird (Program Coordinator of TFC)

[Session 1: Cis-regulatory mutation and leukemia]

09:40 - 10:40 **Molecular breakdown of inv(3)/t(3;3) AML with aberrant EVI1 expression**
Ruud Delwel (Erasmus MC)
10:40 - 11:20 **A novel mouse model harboring human inv(3)(q21;q26) allele reveals mechanisms underlying EVI1-expressing leukemia**
Mikiko Suzuku (Tohoku University)
11:20 - 12:10 **Epigenetic Regulation of Hematopoiesis and Disease**
Atsushi Iwama (Chiba University)

[Session 2: Environment, genome and human diseases]

13:30 - 14:15 **Genome cohort and incidental findings: a case of ETP-ALL followed up by NGS**
Jun Yasuda (ToMMo, Tohoku University)
14:15 - 15:00 **Return of individual genetic results in genomic biobank research: Points to consider**
Hiroshi Kawame (ToMMo, Tohoku University)

[Session 3: Cellular defense against environmental stresses]

15:20 - 16:10 **The Keap1-Nrf2 System Regulating Environmental Stress Response**
Masayuki Yamamoto (ToMMo, Tohoku University)
16:10 - 17:00 **GATA3 Regulation of T cell Development**
James Douglas Engel (University of Michigan)
17:00 - 17:50 **Transcriptional Regulation of T Cell Development in the Thymus**
Ichiro Taniuchi (RIKEN)
17:50 - 18:00 **Closing remarks**
James Douglas Engel (University of Michigan)

The Learning Health System & Tohoku Medical Information Highway

■ Date: Monday, February 23, 2015 - Wednesday, February 25, 2015
■ Venue: Auditorium of Building No. 6, Tohoku University Graduate School of Medicine
■ Speakers in the group discussion session
- James Douglas Engel (University of Michigan)
- Charles Friedman (University of Michigan)
- Brendan Delaney (King's College London)
- Rebecca Kush (Clinical Data Interchange Standards Consortium)
- Shih-Feng Tsai (NHRI, Taiwan)
- Ronald Stolk (University Medical Center Groningen)
- Mark Frisse (Vanderbilt University)
- Hiroshi Tanaka (Tokyo Medical and Dental University)
- Michio Kimura (Hamamatsu Medical University)
- Mihoko Okada (Kawasaki University of Medical Welfare)

■ Participants: 101

■ Time Schedule

Monday, February 23, 2015

09:30 - 09:35 **Opening Remarks**
Liam Baird (Tohoku Forum for Creativity)

09:35 - 10:00 **A Policy Perspective of the Tohoku Medical Megabank Project**
Tomohiko Arai (ToMMo, Tohoku University)

10:00 - 10:30 **Introduction to the Tohoku Medical Megabank Project**
Masayuki Yamamoto (ToMMo, Tohoku University)

[Panel 1: The Learning Health System and Tohoku Medical Information Highway]

10:30 - 11:20 **Keynote Address - Envisioning the Tohoku Learning Health System**
Charles Friedman (University of Michigan)

11:20 - 12:10 **Tohoku Medical Information Highway and the Miyagi Medical Welfare Information Network**
Jun Nakaya (ToMMo, Tohoku University)

[Panel 2: Information Infrastructure in the U.S. and Europe]

13:40 - 14:20 **The Role of Standards in a Learning Health System**
Rebecca Kush (Clinical Data Interchange Standards Consortium)

14:20 - 15:00 **Learning and Applying Knowledge within Electronic Health Record Systems - the European Perspective**
Brendan Delaney (King's College London)

15:00 - 15:40 **Cultivation of a Learning Health System**
Mark Frisse (Vanderbilt University)

16:05 - 16:15 **Small Group Assignments**
Charles Friedman (University of Michigan)

16:15 - 17:35 **Small Group Meetings**

17:35 - 18:15 **Lab tour**
Masayuki Yamamoto (ToMMo, Tohoku University)

Tuesday, February 24, 2015

09:30 - 10:00 **Keynote Address - Getting Data out of HIS in a Standardized Way**
Michio Kimura (Hamamatsu Medical University)

[Panel 3: ToMMo Details]

10:00 - 10:30 **ToMMo Biobank System for Ensuring the Quality and Accuracy of Biospecimens**
Naoko Minegishi (ToMMo, Tohoku University)

10:30 - 11:00 **One Thousand Japanese Whole Genome Reference Panel and Bioinformatics in ToMMo**
Masao Nagasaki (ToMMo, Tohoku University)

11:00 - 11:30 **Integrated Database and Knowledge Base for Genomic Prospective Cohort Study in the Tohoku Medical Megabank Project**
Soichi Ogishima (ToMMo, Tohoku University)

11:30 - 12:00 **Genome Medicine Based on the ToMMo Prospective Genome Cohort**
Shigeo Kure (ToMMo, Tohoku University)

[Panel 4: Genome Cohorts]

13:30 - 14:00 **Disaster Experience and Disease Appearance in Japan**
Shin-ichi Kuriyama (ToMMo, Tohoku University)

14:00 - 14:40 **Lifelines for Healthy Ageing**
Ronald Stolk (University Medical Center Groningen)

14:40 - 15:20 **Whole-Genome Sequencing for Healthcare Management - A Taiwanese Perspective**
Peter Tsai (NHRI, Taiwan)

15:50 - 17:50 **Small Group Meetings**

17:50 - 17:55 **Closing Remarks**
Jun Yasuda (ToMMo, Tohoku University)

Wednesday, February 25, 2015

09:00 - 09:30 **Closing Keynote - Healthcare Delivery 2015: Denouement : how did medical science evolve over the last 40 years to devise an integrated learning health system?**
James Douglas Engel (University of Michigan)

[Panel 5: Medical Informatics in Japan]

09:30 - 10:00 **Integration of Genomic and Phenomic Information in Medicine - Big Data Approach for Medical Knowledge Discovery**
Hiroshi Tanaka (Tokyo Medical and Dental University)

10:00 - 10:30 **Medical (Health) Informatics and Health Information Technology for Quality Care - Action Plan of Japan Association for Medical Informatics (JAMI)**
Mihoko Okada (Kawasaki University of Medical Welfare)

10:30 - 11:30 **Integrated Closing Discussion**

11:30 - 12:00 **Closing Remarks and Farewell**
Masayuki Yamamoto (ToMMo, Tohoku Univeristy)
Charles Friedman (University of Michigan)

Other Activities

Sketches of Science at Tohoku University

[Exhibition]

■ Date: Wednesday, July 30, 2014 - Sunday, August 31, 2014 (Closed: Saturday, August 9, 2014 - Sunday, August 17, 2014)
■ Venue: Extended Education & Research Building and Tohoku University Archives, Katahira Campus, Tohoku University
■ Hosted by:
- Tohoku University
- Nobel Museum
- Lindau Nobel Laureates Meetings
- Tohoku Forum for Creativity

■ Supported by:
- Education in Miyagi Prefecture
- Sendai City Board of Education
- The Yomiuri Shimbun Tohoku General Office
- Japan Society for the Promotion of Sciece

■ Visitors: 5,292

[Special Lecture]

■ Date: Saturday, August 23, 2014
■ Venue: The Westin Sendai
■ Participants: 87
■ Program

15:30 - 15:40 **Opening Remarks** Dr. Susumu Satomi, President of Tohoku University
15:40 - 16:40 **Special Lecture** Dr. Olov Amelin, Director of the Nobel Museum
"The Origin of the Nobel Prize and the Impact on the World in the Future"
16:40 - 17:20 **Public Dialogue** Dr. Olov Amelin and Prof. Masayuki Yamamoto, Executive Director of the Tohoku Medical Megabank Organization
"The Selection Process of the Nobel Prize"

Falling Walls Lab Sendai 2014

■ Date: Friday, August 8, 2014
■ Venue: 4F Conference, Laboratory for Nano-electronics and Spintronics, Research Institute of Electrical Communication, Katahira Campus, Tohoku University
■ Hosted by: Tohoku University
■ In association with: Tohoku Forum for Creativity
■ Supported by: Tokyo Electron Limited
■ Participants: about 70
■ Time Schedule

13:30 - 14:05 Registration
14:05 - 14:15 Opening Ceremony
14:15 - 15:00 Presentations (scholar presentations 1-9)
15:00 - 15:15 Networking Break
15:15 - 16:00 Presentations (scholar presentations 10-18)
16:00 - 16:15 Networking Break
16:15 - 17:00 Presentations (scholar presentations 19-27)
17:00 - 17:45 Evaluation Session (jury) and Award Ceremony
18:00 Farewell Reception at The Westin Sendai

Tohoku Forum for Creativity Opening Ceremony

■ Date and time: Monday, November 10, 2014 14:00 - 15:30
■ Venue: IRIDeS New Building, Aobayama Campus, Tohoku University
■ Participants: 127
■ Program MC: Prof. Yoshiaki Maeda, Vice Director of Tohoku Forum for Creativity

Address from Prof. Susumu Satomi, President of Tohoku University
Addresses from special guests
- Mr. Hiroki Takebuchi, Corporate Consultant of Tokyo Electron Miyagi Limited
- Mr. Yoshio Yamawaki, Deputy Director-General, MEXT
- Prof. Reiko Aoki, Hitotsubashi University

Address from Prof. Sadayoshi Ito, Director of Tohoku Forum for Creativity and Executive Vice President (for Research)
Keynote Lectures
1) Prof. Andrew Gordon, the Former Director of Reischauer Institute of Japanese Studies, Harvard University
"Recovery from the Great East Japan Earthquake and Tsunami: Future Strategies for Disaster Risk Reduction"
2) Prof. Masahiro Mizuta, Hokkaido University
"Introduction to Big Data"

Special Lectures : Prof. Oliver Smithies & Prof. Nobuyo Maeda

■ Date and time (Venue)
Monday, December 8, 2014 10:00 - 11:50 (Main lecture room, 1F Building No.6, Seiryo Campus, Tohoku University)
Tuesday, December 9, 2014 16:30 - 18:30 (Main lecture room, Graduate School of Pharmaceutical Sciences, Aobayama Campus, Tohoku University)

■ The lecture
"Where do ideas come from?"
Dr. Oliver Smithies
Weatherspoon Eminent Distinguished Professor
The University of North Carolina at Chapel Hill
Nobel Laureate in Physiology or Medicine 2007

"Genetic risk factors of atherosclerosis in mice"
Dr. Nobuyo Maeda
Robert H. Wagner Distingished Professor
The University of North Carolina at Chapel Hill

Special Lecture from the Nobel Laureate Prof. Hiroshi Amano

■ Date: Friday, December 26, 2014
■ Venue: The Sendai Civic Auditorium
■ Hosted by:
- Institute of Multidisciplinary Research for Advanced Materials, Tohoku University
- Tohoku Forum for Creativity, Tohoku University

■ Supported by
- Education in Miyagi Prefecture
- Sendai City Board of Education
- The Japan Society of Applied Physics, Tohoku Chapter

■ Assisted by: incorporated nonprofit organization natural science
■ Supervisor: Special Lecture from the Nobel Laureate Executive committee (Chairman: Shigefusa Chichibu, Institute of Multidisciplinary Research for Advanced Materials, Tohoku University)
■ Participants: About 1,300
■ Program
16:00 - 16:45 **Lecture** Prof. Takashi Matsuoka (Institute for Materials Research, Tohoku University)
16:45 - 17:45 **Special Lecture** Prof. Hiroshi Amano (Nagoya University)
17:45 - 19:00 **Q&A, Discussion Session** (with 10 High School Students from Miyagi)

Quattro Seminars

■ The 1st Seminar Thursday, October 2, 2014 16:30 - 18:00
Venue: Room 206, 2F, General Research Building (Seminar Building of Graduate School of Education), Kawauchi South Campus, Tohoku University
Title: **"Interdisciplinary Methodology of Social Sciences: Focusing on Research Clarifying the Creation Process of General Trust Using Computer Simulation"**
Speaker: Prof. Yoshimichi Sato (Graduate School of Arts and Letters, Tohoku University) Participants: 30

■ The 2nd Seminar Wednesday, November 26, 2014 16:30 - 18:00
Venue: Room 206, 2F, General Research Building (Seminar Building of Graduate School of Education), Kawauchi South Campus, Tohoku University
Title: **"New Directions of Statistics as Methodology of Sciences: Analytics of Big Data and Small Data"**
Speaker: Prof. Nobuhiko Terui (Graduate School of Economics and Management, Tohoku University) Participants: 41

■ The 3rd Seminar Wednesday, December 10, 2014 16:30 - 18:00
Venue: Large Conference Room, 11F, General Research Building (Seminar Building of Graduate School of Education), Kawauchi South Campus, Tohoku University
Title: **"Humanities and Social Sciences After The Great East Japan Earthquake"**
Speakers: Prof. Satoru Masuda (Graduate School of Economics and Management, Tohoku University), Associate Prof. Eiichi Aoki (Graduate School of Education, Tohoku University), Associate Prof. Michimasa Matsumoto (International Institute of Disaster Science, Tohoku University)
Commentator: Prof. Tatsurou Niikawa (Graduate School of Policy and Management, Doshisya University) Participants: 33

■ The 4th Seminar Wednesday, January 14, 2015 16:00 - 18:00
Venue: Large Conference Room, 11F, General Research Building (Seminar Building of Graduate School of Education), Kawauchi South Campus, Tohoku University
Title: **"The Next Stage of Statistics: Practice and Development of Statistical Analyses for Public Social Sciences"**
Speakers: Associate Prof. Shigeto Tanaka (Graduate School of Arts and Letters, Tohoku University), Associate Prof. Yoshikuni Ono (Graduate School of Law, Tohoku University), Associate Prof. Hiroaki Chigira (Graduate School of Economics and Management, Tohoku University)
Commentator/Moderator: Associate Prof. Satoshi Miwa (Graduate School of Education, Tohoku University) Participants: 42

■ The 5th Seminar Saturday, February 28, 2015 16:00 - 17:30
Venue: Large Conference Room, 11F, General Research Building (Seminar Building of Graduate School of Education), Kawauchi South Campus, Tohoku University
Title: **"The Roles and Responsibility of Humanities among Sciences: In Terms of Philosophy and History of Sciences"**
Speakers: President-appointed Extraordinary Prof. Keiichi Noe (Institute of Liberal Arts and Sciences, Tohoku University)
Participants: 22

Support for Young Researchers

Leading Young Researcher Overseas Visit Program

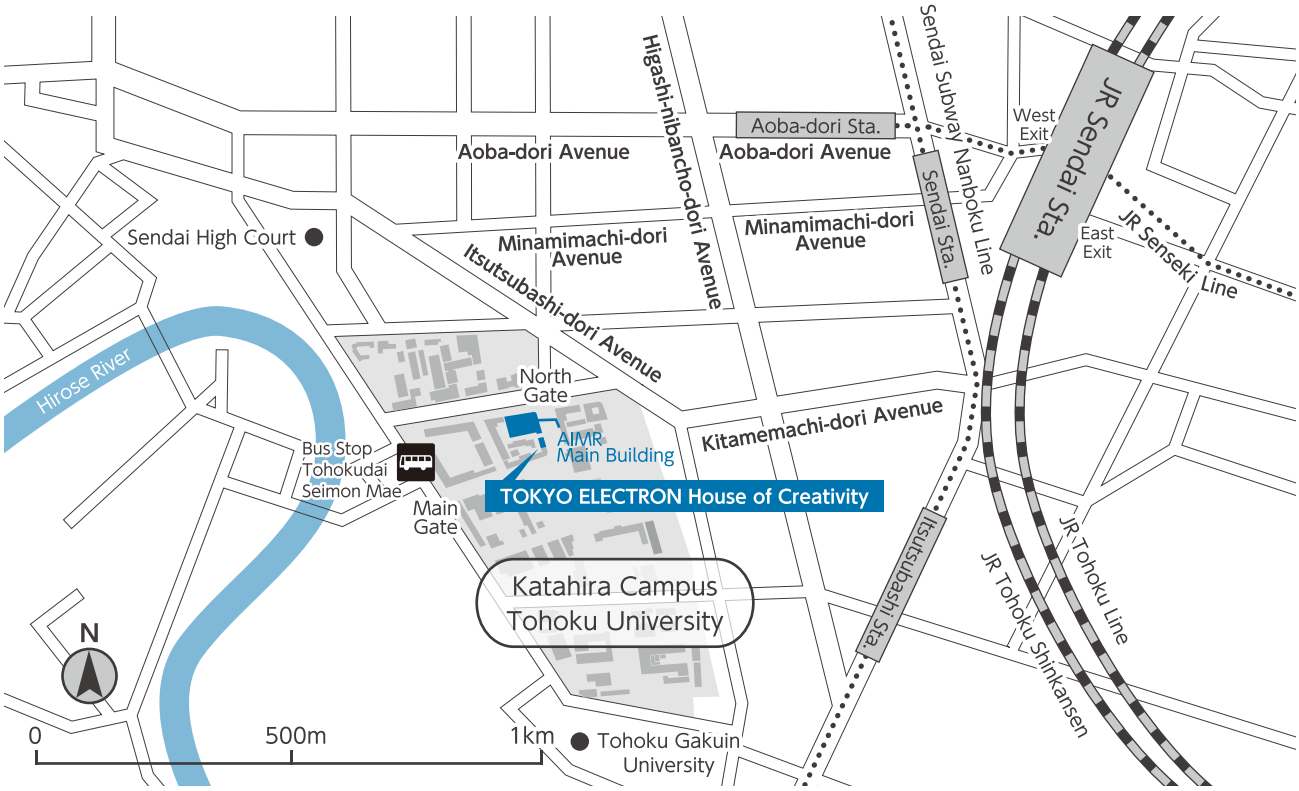
Visitors List

Priod	Name	Affiliation	Position	Visiting institute	Research theme
Jan. 06, 2014 Fab. 27, 2014	Masanori Muroyama	AIMR	Assistant Prof.	Interuniversity Microelectronics Center (Belgium)	Development of SiGe-based Integrated Touch Force Sensor
Jan. 12, 2014 Mar. 31, 2014	Ryo Horii	Economics	Prof.	Groupement de Recherche en Economie Quantitative D'Aix-Marseille (France)	Study on R&D, Knowledge Accumulation, and Economic Growth
Jan. 22, 2014 Mar. 28, 2014	Mayu Fujikawa	Medicine	Assistant Prof.	New York University Comprehensive Epilepsy Center (USA)	Development of comprehensive epilepsy care model based on psychosocial evaluation
Feb. 01, 2014 Apr. 30, 2014	Takashi Makino	Life Sciences	Associate Prof.	Uppsala University (Sweden)	Distribution of deleterious mutations on domestic animal genomes
Feb. 03, 2014 May 02, 2014	Yoshihiro Furukawa	Science	Assistant Prof.	The Foundation for Applied Molecular Evolution (USA)	Investigation on the origin of RNA on the early Earth by collaboration between Earth science and Organic chemistry
Feb. 10, 2014 Feb. 24, 2014	Ryoichi Yokoyama	Medicine	3rd Year PhD	University of California, Berkely (USA)	Neural basis of decision making for matching problem
Feb. 14, 2014 Apr. 21, 2014	Satoshi Okumura	Science	Assistant Prof.	University of Orléans (France)	Experimental study on fluidization of crystal-rich magmas by gas bubbles
Feb. 21, 2014 Mar. 16, 2014	Natsuhiko Yoshinaga	AIMR	Assistant Prof.	Kavli Institute for Theoretical Physics (USA)	Theory of active matters motivated by cell motility
Feb. 23, 2014 Mar. 14, 2014	Naoki Uchida	Science	Assistant Prof.	University of California, Berkeley (USA)	Periodic slow slip offshore Tohoku
Feb. 24, 2014 Mar. 15, 2014	Asuka Inoue	Pharmaceutical Sciences	Assistant	University of Montreal (Canada)	A versatile assay system to analyze G protein coupled receptor signaling
Mar. 03, 2014 May 10, 2014	Sodai Takyu	Biomedical Engineering	2nd Year PhD	University of California, Davis (USA)	A study to improve the detector performance for the realization of PET scanner with the world's best resolution
Mar. 10, 2014 Mar. 31, 2014	Noriko Hamada-Kawaguchi	Life Sciences	Research Associate	Karolinska Institutet (Sweden)	The analysis of the regulation of germ cell proliferation by the non-receptor type tyrosine kinase Btk29A
Mar. 10, 2014 May 30, 2014	Hiroki Sekine	Medicine	Assistant Prof.	Karolinska Institutet (Sweden)	Research on Hypoxia-inducible chromatin opening of HIF-2α target gene by Poly (ADP-ribose) polymerase-1.
Mar. 16, 2014 Mar. 26, 2014	Hatsuru Morita	Law	Associate Prof.	Max Planck Institute for Comparative and International Private Law (Germany)	Corporate Law Reform and Political Environment: An Empirical Analysis Employing a Notice-and-Comment Procedure Data
Apr. 13, 2014 Jul. 13, 2014	Joji Mogami	Engineering	Assistant Prof.	Northwestern University (USA)	A study on the relationship between the hydration and the function of catechol-Fe3+ ion polymers
Jul. 15, 2014 Oct. 15, 2014	Kosuke Ino	Environmental Studies	Assistant Prof.	Harvard Medical School Brigham and Women's Hospital (USA)	Electrochemical devices for construction and evaluation of three-dimensional tissue organs
Jul. 31, 2014 Mar. 29, 2015	Hiroki Takikawa	FRIS	Assistant Prof.	Stanford University Institute for Research in the Social Sciences (USA)	Mathematical sociology on mechanisms generating social inequality
Sep. 26, 2014 Sep. 21, 2015	Yohsuke Matsushita	Engineering	Associate Prof.	Loughborough University (UK)	Numerical simulation of pulverized coal combustion and gasification with Large Eddy Simulation
Oct. 06, 2014 Aug. 30, 2015	Koichiro Miyamoto	Engineering	Associate Prof.	Institute of Nano- and Biotechnologies Aachen University of Applied Sciences (Germany)	Development of novel analytical system by combining chemical image sensor and microfluidic device
Oct. 07, 2014 Mar. 28, 2015	Kazuki Takashima	RIEC	Assistant Prof.	Dept. Computer Science, University of Calgary (Canada)	Dynamic Space Formation for Interpersonal Communication with Productive Humanity
Mar. 01, 2015 Feb. 28, 2016	Tetsuji Aoyagi	Medicine	Lecturer	University of Michigan (USA)	IL-36 of Novel IL-1 Family Members in Acute Lung Injury and Acute Respiratory Distress Syndrome
Mar. 01, 2015 Feb. 29, 2016	Toshiya Takahashi	Tohoku Univ. Hospital	Clinical Fellow	University of California San Diego (USA)	The Recycle System of Organelle by Macroautophagy in Epidermal Development

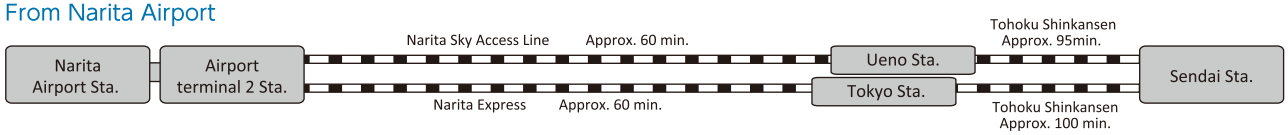
Achievement

- Furukawa Y., Kim H.-J., Hutter D., Benner S.A. (2015). Abiotic regioselective phosphorylation of adenosine with borate in formamide. *Astrobiology*. **15**(4), 259-267.
- Yokoyama R., Nozawa T., Sugiura M., Yomogida Y., Takeuchi H., Akimoto Y., Shibuya S., Kawashima R. (2014). The neural bases underlying social risk perception in purchase decisions. *NeuroImage*, **91**, 120-128.
- Shirzaei M., Burgmann R., Uchida N., Hu Y., Pollitz F., Matsuzawa T. (2014). Seismic versus aseismic slip: Probing mechanical properties of the northeast Japan subduction zone. *Earth and Planetary Science Letters,* **406**, 7-13.
- Hamada-Kawaguchi N., Nore B.F., Kuwada Y., Smith C.I.E., Yamamoto D. (2014). Btk29A promotes Wnt4 signaling in the niche to terminate germ cell proliferation in Drosophila. *Science*, **343**(6168), 294-297.
- Tojo Y., Sekine H., Hirano I., Pan X., Souma T., Tsujit T., Kawaguchi S.-I., Takeda N., Takeda K., Fong G.-H., Dan T., Ichinose M., Miyata T., Yamamoto M., Suzuki N. (2015). Hypoxia signaling cascade for erythropoietin production in hepatocytes. *Molecular and Cellular Biology*. **35**(15), 2658-2672.
- Miyamoto K.-I., Sakakita S., Wagner T., Schoning M.J., Yoshinobu T. (2015). Application of chemical imaging sensor to in-situ pH imaging in the vicinity of a corroding metal surface. *Electrochimica Acta*.
- Miyamoto K.-I., Bing Y., Wagner T., Yoshinobu T., Schoning M.J. (2015). Visualization of defects on a cultured cell layer by utilizing chemical imaging sensor. *Procedia Engineering*. **120**, 936-939.
- Yoshinobu T., Miyamoto K.-I., Wagner T., Schoning M.J. (2015). Recent developments of chemical imaging sensor systems based on the principle of the light-addressable potentiometric sensor. Sensors and Actuators, *B: Chemical*. **207**(PB), 926-932.
- Harris J., Law S., Takashima K., Sharlin E., Kitamura Y. (2014). Calamaro: Perceiving robotic motion in the wild. *HAI 2014 - Proceedings of the 2nd International Conference on Human-Agent Interaction*. 59-66.

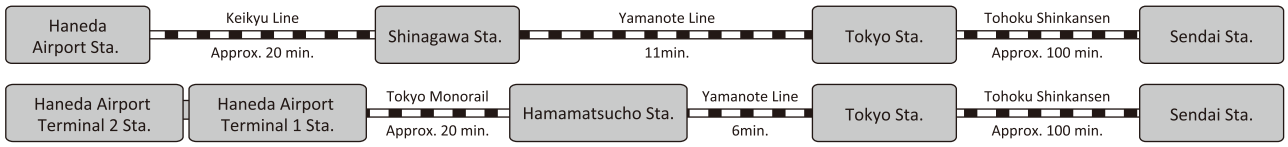
Access and Contact



From Narita Airport



From Haneda Airport



From Sendai Airport

From Sendai Station

By taxi :
Approx. 10 min. by taxi from the West Exit on the first floor of Sendai Station

By foot :
Approx. 15 min. walk from the West Exit of Sendai Station

Contact

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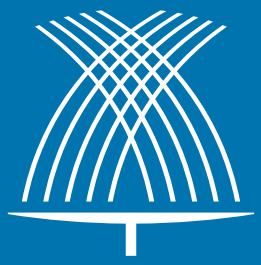
TOKYO ELECTRON House of Creativity
Meeting Room



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