

Tohoku Forum for Creativity

YOSHIAKI MAEDA
TOHOKU FORUM FOR CREATIVITY, JAPAN

OVERVIEW

The Tohoku Forum for Creativity (TFC) is an international visitor research institute. It is essentially the first research institute in Japan dedicated for this purpose. The TFC was established in 2013 at Tohoku University to facilitate collaborative research. In order to identify important problems across the sciences and the 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 its thematic programs. Through discussions and close contact with distinguished researchers, including Fields medalists and Nobel Laureates, junior researchers can become motivated to develop their own original ideas and eventually become pioneers in new research areas.

Therefore, the TFC has the following missions:

- A fellowship of knowledge that contributes to solving some of the major issues faced by humanity: the TFC calls for thematic programs from around the world, and the calls cover all academic domains, from the humanities and social sciences to the natural sciences. The TFC then critically evaluates and selects the appropriate themes for intensive discussions over a three-month period. In this period, leading researchers from around the world are invited to Tohoku University to develop new areas of research and to contribute to the solution of these problems, through joint research and the hosting of international symposiums. The TFC provides an ideal location for the promotion of interdisciplinary cooperation across a diverse range of research areas in



Fig. 1: Tokyo Electron House of Creativity (TFC building).

order to take on the crucial and increasingly complex issues faced by society.

- Educating global leaders to better the future: The TFC has established itself as a center for the cultivation of research leaders from around the world, by promoting the international participation of junior researchers in our thematic programs. In this way, the TFC fosters an environment where 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 participation of young students, through the planning and hosting of public events. This initiative aims to promote the sharing of knowledge, enhancing the internationalization of the forum, and the development of a prosperous society, by providing opportunities for the public to interact directly with world-renowned researchers.

The TFC is also dedicated to the enrichment of Tohoku University's research environment by supporting academics, hosting a number of international visitors, and enhancing the experience of postgraduate students and early career scholars. Since the appointment of Professor Sadayoshi Ito as the first director, the TFC has supported innovative research and interdisciplinary collaborations across a wide range of research topics. The TFC has become an important part of the university, representing all faculties and departments and representing Tohoku University both nationally and internationally.

In the future, the TFC's goal is to increasingly facilitate international research and education. The TFC is expected to play a central role in this endeavor, and will work toward achieving this goal through the opinions and advice from all of our stakeholders. In particular, one of the strongest sources of support for the TFC is Tokyo Electron Limited, a semiconductor and electronics company.

ORGANIZATION

Sadayoshi Ito, Director of the TFC, is responsible for the overall control of the TFC budget, and for its short-term and long-term financial planning. The director is responsible for providing essential advice and support for fund-raising activities, and for staff employment at the TFC. The vice-director, Yoshiaki Maeda, is responsible for day-to-day operations under the director's supervision. The staff of the TFC consists of program coordinators and an administrative office. The program coordinators work with proposers, both on the initial development of the thematic programs and on preparing complete proposals. They also coordinate thematic program events. The TFC's administrative office functions as a research reception office, and handles appointments of program organizers, housing, facilities, publicity, and general oversight of all activities of the TFC. The administrative office aims to facilitate to the fullest possible extent the smooth and effective running of the TFC's visitor research programs, and all related activities.

THE INTERNATIONAL ADVISORY BOARD (IAB) OF THE TFC

An International Advisory Board (IAB) oversees the research program at the TFC. The IAB consists of seven distinguished researchers and meets once every year.

The director and vice-director are ex officio members. Proposals to be considered at these meetings should be submitted by August 31. Successful proposals are usually developed through a series of discussions between the proposers and the TFC.

HOUSE OF CREATIVITY

The House of Creativity was established in 2015 as the physical base for the TFC's programs. The House of Creativity consists of a lounge, offices for visitors, a conference room, and a lecture theatre. All public wall spaces in the House of Creativity are covered with blackboards to encourage discussion.

VISITOR RESEARCHERS AT THE TFC

One of the characteristic features of the TFC is its commitment to host programs in any branch of research including: the social sciences, the humanities, the physical sciences, engineering, and the life sciences. The TFC is open to all research fields and all researchers around the world. On average, the TFC hosts nearly 200 visitor researchers and 2000 participants annually. Beyond the mere number of visitors, we are deeply committed to preserve the outstanding quality of the TFC's programs. In fact, we have invited many distinguished researchers each year, including Nobel laureates and Fields medalists, in addition to other distinguished scientists.

CALL FOR PROPOSALS

Thematic programs are normally proposed two years in advance and will be chosen by the International Advisory Board. The TFC is currently inviting proposals for three thematic programs in the 2019 academic year (April 2019 - March 2020) in any branch of research including: the social sciences, the humanities, the physical sciences, engineering, and life sciences. Researchers working at any institution around the world are welcome to submit a thematic program proposal to the TFC. However, at least one member of the organizing committee must be a member of Tohoku University. The TFC is also currently inviting proposals for junior research programs.

MAIN ACTIVITIES

The core activities of the TFC consist of Thematic Programs and Junior Research Programs.

Thematic Programs

We hold 3-4 thematic programs each year. A thematic program focuses on a single theme for a period of three months, while hosting long-term visits of world-class researchers, and is comprised of multiple academic events. The TFC provides a budget of up to 15 million JPY for each program.

It is hoped that the TFC can make substantial contributions to important problems in our society through these thematic programs, in addition to developing new research fields. The TFC also hopes to nurture the next generation of global leaders through these programs.



Fig. 2: The Lounge at the TFC.

The thematic programs for 2014 were as follows:

- 1) Challenges for Big Data in our Society: Statistical analysis of large scale, high dimensional data for socio-economic problems.
Program organizers: Nobuhiko Terui (Tohoku University), Yasumasa Matsuda (Tohoku University)
- 2) Recovery from the Great East Japan Earthquake and Tsunami: Future strategies for disaster risk reduction
Program organizers: Fumihiko Imamura (IRIDeS, Tohoku University), Yuichi Ono (IRIDeS, Tohoku University), Takako Izumi (IRIDeS, Tohoku University)
- 3) A Health Informatics Infrastructure for a New Era
Program organizers: Masayuki Yamamoto (Tohoku Medical Megabank Organization, Tohoku University), Lorenz Poellinger (Karolinska Institute, Sweden), James Douglas Engle (University of Michigan), Charles P. Friedman (University of Michigan)

The thematic programs for 2015 were as follows:

- 1) Fundamental Problems in Quantum Physics: Strings, black holes and quantum information
Program organizers: Tohru Eguchi (Rikkyo University), Tadashi Takayanagi (Yukawa Institute, Kyoto University), Masahiro Yamaguchi (Tohoku University), Satoshi Watamura (Tohoku University)
- 2) Frontiers of Brain Science
Program organizers: Toshio Iijima (Tohoku University), Noriko Osumi (Tohoku University)
- 3) Spintronics: From mathematics to devices
Program organizers: Gerrit Bauer (Tohoku University), Yoshiro Hirayama (Tohoku University)
- 4) The Effects of Technological Changes on Social Mobility and Income Distribution
Program organizers: Yoshimichi Sato (Tohoku University), Kenji Mori (Tohoku University)

The thematic program for 2016 were as follows:

- 1) Modern Interactions between Algebra, Geometry and Physics
Program organizers: Shigetoshi Bando (Tohoku University), Giuseppe Dito (University of Bourgogne), Toshiki Mabuchi (Osaka University), Reiko Miyaoka (Tohoku University)
- 2) Earth and Planetary Dynamics
Program organizers: Eiji Ohtani (Tohoku University), Michihiko Nakamura (Tohoku University), Tomoki Nakamura (Tohoku University), Toshio Suga (Tohoku University), Kunio Inoue (Tohoku University)
- 3) Comprehensive Research on Materials, Systems and Energy for the Sustainable Future of the Earth
Program organizers: Toshiyuki Takagi (Tohoku University), Hiroo Yugami (Tohoku University), Takashi Goto (Tohoku University), Koshi Adachi (Tohoku University), Naoto Wada (Tohoku University)
- 4) The 21st Century Hasekura Project: Japanese studies as the interface of new knowledge
Program organizers: Akihio Ozaki (Tohoku University), Hiroo Sato (Tohoku University), Akinori Takahashi (Tohoku University), Enrico Fongaro (Tohoku University)



Fig. 3: Public lecture for the 100th anniversary of general relativity, Nov. 14, 2015.



Fig. 4: Lecture hall at the TFC.

Furthermore, we have selected the following thematic programs for 2017:

- 1) Aging Science: From molecules to society
- 2) Nonlinear Partial Differential Equations for Future Applications,
- 3) New Horizons in Food Science via Agricultural Immunology.

Junior Research Program

The purposes of the TFC junior research programs are as follows: to focus on a single theme for a period of one month, to discuss the program theme with international and domestic researchers, and to include academic events (e.g. an international conference or workshops). The TFC will offer support of up to three million JPY for each program.

Through this program, we anticipate the following outcomes:

- To give talented young researchers the opportunity to organize workshops and carry out collaborative research with distinguished international scientists;
- To offer programs which have ambitious, interdisciplinary, high-impact content with the potential to generate new research fields.

For 2016, our Junior Research Programs was entitled “Interdisciplinary Approaches to the Protection of Human Rights: Building integrated networks between academic, state and societal actors”. The program organizers were Ayako Nakamura (Tohoku University), Claret

Vergas (Stanford University), and Laura Hackney (NGO AnniCannons)

Furthermore, we have selected the following Junior Research Programs for 2017: 1) Nanostructured Magnetic Materials: Challenges for Next-Generation Materials and 2) Political and Social Dynamics of Crisis and Innovation in Japan, Asia and the World.

LEADING YOUNG RESEARCHER OVERSEAS VISIT PROGRAM

This program is one of the central pillars to transform 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 by the Tohoku Forum for Creativity in cooperation with the University Research Administration Center, Tohoku University. The program deploys junior researchers (i.e., researchers and faculty under the age of 40, graduate students in the second semester of their doctoral programs, or postdoctoral fellows at our graduate schools) overseas to cultivate leadership experience with an international perspective. The strategic deployment of highly motivated, outstanding junior researchers to excellent universities and research organizations overseas helps those researchers develop into leaders in the international academic world, and helps create new currents of academic research.

Through this program, we expect to strengthen the presence of our junior researchers and of the university, through the researchers’ participation in elite academic

research communities, and by employing the research results and new interpersonal networks to create future leaders in these domains. For this reason, we select junior researchers who clearly recognize the importance of this program in the formation of their careers, and whose participation strengthens Tohoku University's research capabilities. Normally, we support mid-term overseas studies from periods of six months to one year. This program sends approximately five junior researchers to overseas research organizations each year. These researchers give presentations upon their return, and further follow-up aid is provided to help the researchers on their path toward international leadership positions.

Falling Walls Lab Sendai

A presentation competition is held each year jointly with the Falling Walls Foundation of Germany for junior researchers aged 35 or younger. This constituted the first preliminary competition held in the Asian region, and included approximately 40 participants from Tohoku University and other Japanese universities.

The top three contestants were invited to Berlin to enter the final round. The TFC, in cooperation with the University Research Administration (URA) center, conducted coaching sessions for the applicants and training sessions for the three winners in order to improve their presentation skills.

Other activities

The TFC encourages the organization of individual seminars and short period workshops. The Quattro Seminars are a series of 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 collaborations between the four schools of the humanities, the Graduate School of International Cultural Studies, and the Center for Northeast Asian Studies at Tohoku University. These seminars explore interdisciplinary research themes, and are widely advertised to the general public. The seminars were held



Fig. 5: Seminar at the TFC.

seven and six times in 2014 and in 2015, respectively. Each seminar saw the participation of 30-40 researchers, who used the seminars to engage in vigorous discussion and to strengthen their interpersonal connections.

The TFC has an important role in reaching out to the community, and in particular, to young people with ambitious career goals. For this reason, we organize public lectures delivered by distinguished researchers. These lectures provide a rare opportunity for young people to meet and engage in face-to-face discussions with eminent researchers. In 2014, we invited Professor Hiroshi Amano, Nobel Laureate of Physics in 2014, for a public talk. The talk was attended by more than 1000 high school students.

FURTHER DEVELOPMENTS

In 2016, we initiated a partnership agreement with the Lorentz Center to coordinate our programs. To further enhance the TFC's activities, it is certainly necessary to strengthen our networking with similar institutions around the world. The Forums of the Asian Institutes for Advanced Study provides an excellent opportunity for such types of cooperation.



Yoshiaki Maeda is the vice-director of the Tohoku Forum for Creativity. His research area is in mathematical physics focusing on geometry and global analysis. He is also an honorary professor at the Mathematics Institute, the University of Warwick, UK.