To go further in education and research
Environment, Organization, and Management for creation of new knowledge

Funding Program for World-Leading Innovative R&D on Science and Technology

Selections of the "Funding Program for World-Leading Innovative R&D on Science and Technology (FIRST Program)"were made at a meeting of the Council for Science and Technology Policy on September 4, 2009.

The FIRST program is an all new system that places top priority on researchers as a part of government strategy that supports innovative R&D efforts to reach world-leading excellence within a 3–5 year period. It aims to reinforce Japan's global competitiveness and lay a groundwork for industry, security control etc., and also to steadily distribute R&D results to people and our society. From Tohoku University, two research projects by Prof. Masayoshi Esashi and Prof. Hideo Ohno were successfully designated amongst 565 applicants across the country. Furthermore, a research project by Nobel Laureate Koichi Tanaka at Shimazu Corporation was also designated; he is a visiting professor of Tohoku University and an initiator of the "joint lectures for fusion research" program at the university.

Research Project	Research and Development of Integrated Microsystems	Research Project	Research and Development of Ultra-low Power Spintronics-based Logic VLSIs
Core-Researcher	Masayoshi Esashi	Core-Researcher	Hideo Ohno
Outline	This project aims to increase added value in connection with advanced electronics,through more integration of not only transistors, but also various components, with their integrated circuits. Universities/Institutions will conduct R&D projects driving growth in industrial applications, and support industries by utilizing their facilities and know-how, which will help the country lead the world in the field of microelectronics, including applications for mobile phones.	Outline	The project aims to contribute to the realization of a low-carbon and energy-saving society and to the strengthening of international competitiveness in the field of next generation VLSIs, through the development of innovative energy-saving logic VLSIs that fuse spintronics devices and logic-integrated circuits.

Micro System Integration Center (μSIC)

By integrating human resources, organizations and technologies across different fields and businesses, the Micro System Integration Center (μSIC) is engaged in Microsystems R&D activities for high added value, which requires a vast range of knowledge and technology.

It will create an R&D center that can provide a platform, from basic research to design, prototyping, and packaging steps, with the best technology, people, information and opportunities/themes at the most appropriate time and cost.

Thus, the μSIC will establish an open R&D model where multiple companies and research institutions participate, a goal which has so far been difficult to realize, and found an industry-academia cooperation model that contributes to efforts for high-mix low-volume production in industrial applications. It will generate new merged areas and improve the competitiveness of Japanese industry.

Center for Spintronics Integrated Systems

Under the project "Research and Development of Ultra-low Power Spintronics-based VLSIs" (PI: Hideo Ohno), which started in March 2010 and is supported by JSPS's "Funding Program for World-Leading Innovative R&D on Science and Technology" (FIRST), the Center for Spintronics Integrated Systems aims at assuming a leading role in achieving innovative change by the fusion of spintronic devices and logic integrated circuits. In this way, the center intends to play a pivotal role in the world-wide innovation cycle of logic VLSIs.

The center concurrently promotes the research and development of spintronics materials, devices and circuits. In doing this, it aims to establish a peerless technology structure for spintronics logic integrated circuits that includes research and development, processing and production technology and circuit design as well as a circuit integration prototyping environment.

Furthermore, the center plans to demonstrate high performance of spintronics logic integrated circuits at ultra-low power far surpassing conventional levels as well as a high performance ultra-low power integrated computing system that combines processing and memory through logic-in-memory architecture using nonvolatile spintronics memories and CMOS. An open innovation center for spintronics logic integrated circuits will be established at the center, creating a standard for high performance ultra-low power systems. Through these dynamic processes, the center plans to play a critical role in the education and training of researchers and engineers, giving hands on knowledge of all aspects of spintronics-based VLSIs.

Global Centers of Excellence Program (Global COE Program)

The Global COE Program is an initiative by the Ministry of Education, Culture, Sports, Science and Technology in order to support internationally excellent centers for education and research in a concentrated manner to promote internationally competitive universities with the intention of developing creative human resources to lead the world.

During the selection process, they are reviewed in terms of their possibility of growth as education and research centers with the function of human resource development on the precondition that they have world-leading, original and epoch-making research bases.

At Tohoku University, 12 programs in eight research fields were designated in FY2007 and FY2008.

Titles of Selected Global COE Programs

- Basic & Translational Research Center for Global Brain Science
- International Center of Research & Education for Molecular Complex Chemistry
- Materials Integration International Center of Education and Research
- Center of Education and Research for Information Electronics Systems
- Global Nano-Biomedical Engineering Education and Research Network Center
- Global COE for Conquest of Signal Transduction Diseases with "Network Medicine"
- Weaving Science Web beyond Particle-Matter Hierarchy
- Global Education and Research Center for Earth and Planetary Dynamics
- World Center of Education and Research for Trans-disciplinary Flow Dynamics
- Center for the Study of Social Stratification and Inequality
- Gender Equality and Multicultural Conviviality in the Age of Globalization
- Center for Ecosystem Management Adapting to Global Change

Evaluation Team Visits: the Institutional Evaluation Programme (IEP) of the European University Association (EUA)

Tohoku University participated in the Institutional Evaluation Programme (IEP) of EUA in FY2009, which is performed as an external evaluation with global viewpoints. This was the first time it was performed not only in Japan but also in Asia.

After submitting self-evaluation reports in English, the university had two visits by an evaluation team of the IEP during the 27th–30th (4 days) of October 2009 and 13th–15th (3 days) of January 2010. The teams interviewed concerned people inside and outside the university. On the final visit day, they made an oral report with a Q&A session to the university executives and division directors, so the university as a whole shared their advice.

In the process for preparing the self-evaluation report, we conducted a SWOT analysis, which led to clarifying some challenges in our university.

It was extremely fruitful to receive an external evaluation by the EUA. Not only the evaluation result itself, but also the self-evaluation process and the visits, including interviews and report meetings, produced a very beneficial outcome.

Inspection of the University Library

Interview with directors of research institutes

Ranked World's 3rd of ESI's Most Cited Papers in Materials Science

Topics

Thomson Reuters Scientific analyzed their statistical database of researchers and research institutions ranked in the top one percent of the world, *Essential Science Indicators*^{SM}, by the citation counts of academic papers, which provides data on the trend of citations in papers; Tohoku University ranked world's 3rd (1st in Japan) in "Materials Science" and world's 10th (2nd in Japan) in "Physics" over the decade of 2000–2010. This data shows that Tohoku University is attracting attention as a research institution with outstanding academic achievement throughout the world.

3rd in the world (1st in Japan): Materials Science

10th in the world (2nd in Japan): Physics
20th in the world (6th in Japan): Chemistry
61st in the world (3rd in Japan): Pharmacology/Toxicology

(Period of Academic Paper Citation: January 1, 2000–April 30, 2010)