



Sendai Cyber Forest Cluster

# Sendai Area

## Realizing a high-level welfare/environment society by forming a network of clusters, based on technological innovation in the intelligent electronics field

### Cluster Vision

In order to realize a high-level information society, this project is working to create an industrial cluster focusing on medical, health and welfare solutions. This is being done by forming an industry core centering on key technologies where the Sendai area has an advantage (information technology, semiconductors, materials, and manufacturing technology) and linking with various other projects in the region. Through the participation of a broad-based and diverse range of industries and companies with technology and knowledge both inside and outside the region, we aim to realize a technological innovation cluster which will be an international model.

### Project Overview

To create new industries and new businesses using pioneering technologies in this area, we set 11 themes: Next-generation Photonics, Next-generation Wireless Technology, Intelligent Network Security Management, Intelligent Communication Interfaces, Intelligent Monitoring, Intelligent Universal Communication, Next-generation Micro systems, Next-generation Circuit Systems, Intelligent Semiconductor Processes, Intelligent Multi-Band Antennas, and Intelligent Analyzers. Since our research must be not only cutting-edge, but also competitive, we make technological roadmaps and conduct research on technical trends and market research. Through our project, we developed many products such as stabilized lasers that lay the foundation for ultrahigh-speed optical communication and universal speech communication systems using new piezoelectric bone-conduction vibrators that can play higher-pitched tones.



frequency stabilized and mode-locked fiber laser

### Project Director Hideo HIRAMA



Hideo HIRAMA was involved in the startup of a variety of projects while at Seiko Instruments, Inc.

### Ogare! Cyber Forest! (Ogare means "Grow!" in the Sendai dialect)

When the Ministry of Education, Culture, Sports, Science and Technology launched the first knowledge cluster initiative to build "innovative clusters" through industry-university-municipality cooperation, the City of Sendai and Miyagi Prefectural Government agreed that they would promote R&D and stimulate the regional economy by building an Intelligent-Electronics Cluster. Initially, our need to enhance our efforts at commercialization was noted, so we organized a commercialization-oriented management system including elements such as a patent management committee. As a result, participating companies succeeded in developing several products. Then, science and technology coordinators were provided to support R&D as a whole, i.e. fundamental research, commercialization, IP rights management, and so on. This is probably what drove rapid development in such a limited period. Diverse industrial-university-municipal cooperative projects are expected to take place as a result of the knowledge cluster initiative in Sendai from now on.

### Cluster Headquarters

President.....Katsuhiko UMEHARA (Mayor of the City of Sendai)  
 Vice president.....Katsuhiko ITOH  
 (Deputy Governor of Miyagi Prefectural Government)  
 Project Director.....Hideo HIRAMA  
 Chief Scientist.....Yasuji SAWADA  
 (Executive Vice-President, Tohoku Institute of Technology)  
 Science and Technology Coordinator...Makoto YAMADA, Hiroki SHOHJI, Shun-ichi ITABASHI

### Core Organization

Intelligent Cosmos Research Institute Co., Ltd.

### Participating Research Organizations (Bold: Core Research Organization)

Industry...ADVANTEST Corporation, Cyber Solutions Inc., Nippon Telegraph and Telephone East Corporation, FUDOKI Co., Ltd., NEC Engineering Ltd., KEPCO the Kansai Electric Power Co., Inc., Device Co., Ltd., YAMATAKE Corporation, JCI Inc., I.T. Research Co., Ltd., IRIS OHYAMA Inc., DSS Inc., SUZUKEN CO., LTD., NEC TOKIN Corporation, Tsuken Electric Ind Co., Ltd., RION Co., Ltd., MEMS CORE Corporation, ZEON Corporation, JRC Nihon Musen Co., Ltd., Pioneer System Technology Inc.  
 Academia...**Tohoku University**, Tohoku Institute of Technology, Tohoku Gakuin University, Sendai National College of Technology, Ritsumeikan University, Hirosaki University, Miyagi National College of Technology, Kumamoto University

### Main Results

- Commercialization of network security management systems**  
 We built support systems to track attackers (Integrated Tracking System) and to automatically detect attacks and failures (Automatic Signature Generation System.) Since these systems enable stable network administration, there is a great demand for them from companies and government offices.
- Development of a portable physical activity measurement device**  
 We built an "Intelligent Calorie Counter (ICC)" portable measurement device that can accurately estimate types of activities (e.g. walking, running, and climbing,) the range of movement (path of movement), and amount of energy consumed in the activity. It is epoch-making in that it enables measurement of vertical movement since it is equipped not only with accelerometers and gyroscopes but also barometers. It is now being prepared for mass production as a kinesitherapy appliance.
- Development of a rapid quantitative analysis system for microbial sensitivity testing**  
 We have successfully commercialized a rapid quantitative analysis system for microbial sensitivity testing, and we established microbe detection technology with a n order of magnitude faster than previous technologies.



### Realizing a high-level welfare/environment society

