



Shinshu Smart Device Cluster

Nagano Prefecture region

Realizing the advanced use of new nanotechnology and materials from industry academia collaboration and forming globally dominant Shinshu-type Clusters.

Cluster Vision

With the Knowledge Cluster Initiative Program (1st stage)'s achievements as a core, Nagano Prefecture's forte in high-precision processing technology, precision molding technology and device technology with the support of Shinshu University in nanotechnology and improving wide and international collaboration at government-industry-academia collaborative research,, advantage in the world on smart devices and promoting commodification and industrialization for the one lank upped super module thus we create world class cluster formation within Nagano Prefecture.

Project Overview

The following three important points will be emphasized to promote industry-academia-government collaborative research through regional collaboration and creation of worldwide dominance in smart devices and super modules. Cultivating and fulfilling nanotechnology and materials supply companies in Nagano Prefecture. Set up "Supporting Center for Nanotech and Materials utilization (tentative name)" and promoting efficiency of research and development by providing and centralizing information about nanotechnology and materials. Promoting practical use of research achievements by nurturing company researchers through collaboration of research organizations and universities, improving the partial ability of graduate students through internships in companies.

Research and Development of Smart devices using Nanocarbon.

With the Shinshu University Faculty of Engineering as the core, the project will 1) Create new composite materials using carbon nanotubes (CNTs) and other carbon nano materials, 2) Conduct research on energy application, composite plating, development and practical application of composite materials, and bio-application, 3) establish new technologies, 4) Create new devices.

Research and development of Smart Devices using organic and inorganic Nanomaterials.

With the Shinshu University Faculty of Textile Science and Technology as the core, the project will 1) Seek synthetic organic nano materials, 2) Create organic EL and related devices, polymeric actuators, devices utilizing sol-gel technology such as high-strength heat-resistance films, odor/VOC sensors utilizing polymer, and devices using nano-diamond films.

Research and development of Smart Devices using Interfacial Nano technology

With the Tokyo University of Science as the core, the project will 1) Create nano-scale particles such as nano-scale hollow particles, nano porous polymers and colloidal crystals, 2) Develop high-performance identification sensors and catalysts.

Research and development to create and prototype devices.

With the Nagano Prefecture General Industrial Technology Center as the core, the project will 1) Develop nano-particle composites, and commercialize various materials and parts, 2) Research and develop high-quality thin films and commercialize various high-capacity devices using such films.

Project Director (General Manager)
Tetsuo Yamagishi



Director of Applied Development Headquarters, and Intellectual Properties Headquarters at Seiko Epson Corporation. Former President of Shinshu T.O. Abundant experience at technology transfer and collaboration in the government-industry-academia collaborative field.

Smart Devices and Industry-Academia Cooperation in Nagano

Based on 1st stage achievements, "Forming Shinshu-type super cluster" was positioned as a middle and long-term basic strategy of "Industrial Development Plan" aimed at further development.

In the 2nd stage of Shinshu Smart Device Cluster, promoting commercialization by a wide-area system of government-industry-academia collaborative research and aiming to create smart devices and super module.

Succeeding 1st stage activity of neighboring prefecture's wide area cooperation with Niigata, Yamanashi, and Shizuoka and forming internationally competitive clusters by establishing a cutting-edge nanocarbon R&D Center.

To creating sustainable cluster forming, setting up the "Nagano Prefecture Nanotech and Material Utilization Support Center (tentative name)"with management and provision of information by creating databases, Raw materials supply, supporting research on nanotech.

In human resource development, indispensable for the sustainable cluster forming, we strive to cultivate university and company researchers through the effective use of efforts such as internships to dispatch collaborating graduate students to companies.

Cluster Headquarters

- President.....Hiroyuki Hagimoto, (CEO, Nagano Techno Foundation)
- Project Director.....Tetsuo Yamagishi
- Chief Scientist.....Kiyohito Yamasawa
(Dean, Faculty of Engineering, Shinshu University)
- Deputy Chief Scientist.....Toshihiro Hirai (Dean, Faculty of Textile Science and Technology, Shinshu University)
- Science and Technology Coordinators...Shingo Morimoto, Hiromitsu Todoroki, Kazutoshi Kusano, Katsuro Yamaoka

Core Organization

Nagano Techno Foundation

Participating Research Organizations (Bold: Core Research Organization)

- industry...Art Metal MFG. Co., Ltd., ACTEIVE Co., Ltd., E and F Corporation, INOAC Technical Center Co., Ltd., Usui Kokusai Sangyo Kaisha Ltd., MESA Afty Corporation, MK Seiko Co., Ltd., Engineering System Co., Ltd., Orion Machinery Co., Ltd., Olympus Corporation, GAST Japan Co., Ltd., KOA Corporation, Cosina Co., Ltd., SYVEC Corporation, Sun-kk Corporation, GAC Corporation, Citizen Fine Tech Co., Ltd., Citizen Miyota Co., Ltd., Shinano Kagaku Co., Ltd., Shinano Kenshi Co., Ltd., Shinano Fujitsu Co., Ltd., Japan Gore-Tex Inc., SEIKEN Co., Ltd., Seiko Epson Corporation, Ceratech Japan Co., Ltd., Tamagawa Seiki Co., Ltd., Chinontech Industries Inc., Tsukada Riken Industry Co., Ltd., Totoku Electric Co., Ltd., TOKKI Corporation, Nano Carbon Research Institute Co., Ltd., Nano Frontier Technology Co., Ltd., Napac Co., Ltd., Nichicon Corporation, Nissin Kogyo Co., Ltd., Nissei Plastic Industrial Co., Ltd., NihonDenetsu Co., Ltd., Nomura Unison Co., Ltd., Fujikura Ltd., Fujikura Rubber Ltd., Fuji Electric Advanced Technology Co., Ltd., Fujimori Kogyo Co., Ltd., Permelec Electrode Ltd., Hodogaya Chemical Co., Ltd., Micro Coatech Co., Ltd., Matsuyama Giken Co., Ltd., Mikuni Kogyo Co., Ltd., Misuzukogyo Co., Ltd., Minebea Co., Ltd., Mimaki Engineering Co., Ltd., MEFS Co., Ltd. As of November, 2007
- Academia...**Shinshu University**, Nagano National College of Technology, **Tokyo University of Science**, Matsumoto Dental University, Yamagata University
- Government...**Nagano Prefecture General Industry Technology Center**

Research and development of functional ink for ink-jet printers (Collaboration with relevant Ministries)

In order to further explore the highly-advanced ink-jet technology possessed by Nagano Prefecture, the project, with the Shinshu University Faculty of Textile Science and Technology as the core, will develop: 1) Organic EL, Fluorescent ink, 2) Edible ink, 3) Conductive ink, Insulating ink, 4) Ink for inorganic devices, and 5) Weather-resistant ink, non-bleeding ink.

Establishing a Cutting-edge Nanocarbon R&D Center (Collaboration with international partners)

With the Faculty of Engineering and the institute of Carbon Science & Technology of Shinshu University as the core, the project will facilitate interactions with overseas researchers and organizations specializing in Nanocarbon technology, promote researcher exchange, and thus establish a cutting-edge Nanocarbon R&D center in Nagano.

Human Resource Development

In order to develop and train nanotechnology researchers, special educational programs called the Nanotechnology Super College and the Nanotechnology Practical College will be held. Participants in the programs will be able to learn nanotechnology through both classroom lectures and practical courses. The programs will also send graduate students to participating private firms in order to foster young researchers and facilitate R&D activities for the cluster.

Regional Projects to Establish Intellectual Clusters.

There have been various regional projects to help establish Intellectual Clusters. They include projects to conduct research on the utilization of new materials, nurture technology seeds, and support firms intending to enter new industries. The activities of the Nanotech Forum Nagano also follow this category.

