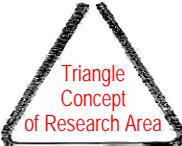
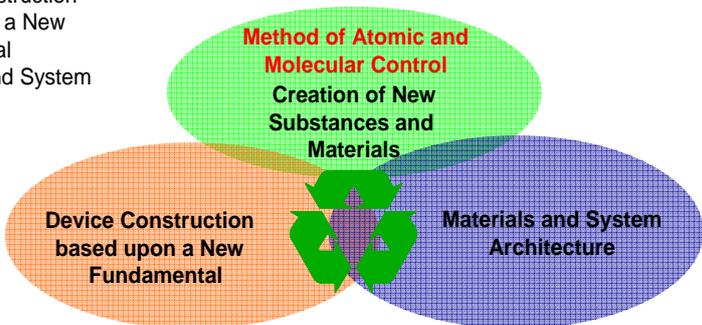


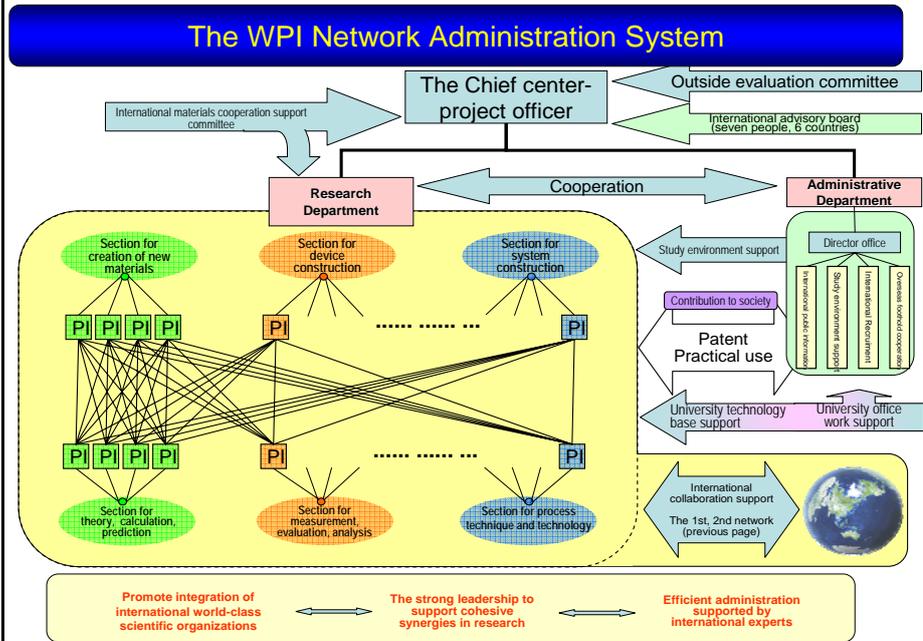
Research Center Project

Host institution name	Tohoku University
Head of host institution	Akihisa Inoue, President, Tohoku University
Title of center project	The WPI Research Center for Atom · Molecule · Materials
Center name	WPI Advanced Institute for Materials Research
Project summary	<p>Brief Description of the Project Plan</p> <p>The main objective of the Center is to promote the development of new materials under a world-leading organization for interdisciplinary research in functional materials, by use of an innovative method of atomic and molecular control, departing from the typical approaches and moving towards the next generation. In addition to basic research, the Center will pursue (1) the creation of new compounds and materials with innovative functions which exceed existing ones, (2) the construction of devices based upon a new fundamental paradigm, and (3) the promotion of applied research projects on materials and system architecture that will generate direct societal impacts (see the Figure shown below). In addition, the Center will establish innovations in understanding diverse material functions through the creation of new basic materials and compounds which brings significant benefits for the future of humanity.</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p style="text-align: center;">Objective of the Research Center</p> <div style="display: flex; align-items: center;">  <div style="border: 1px solid gray; padding: 5px; font-size: small;"> <p>The main objective of the Center is to promote the development of new materials under a world-leading organization system of interdisciplinary research, by use of an innovative method of atomic and molecular control, departing from the stereotype and heading forward the next generation. In addition to basic research, the Center will attempt to (1) create new substances and materials with innovative functions which exceeds existing materials, (2) construct device based upon a new fundamental, and (3) promote applied research projects on materials and system architecture in order to return outcomes to society. The Center also endeavors to establish innovations in understanding diverse material functions through creation of new basic materials which brings beneficial influences on the safety and future of humanity.</p> </div> </div> </div> <div style="margin: 10px 0;"> <ul style="list-style-type: none"> • Creation of New Substances and Materials • Device Construction based upon a New Fundamental • Materials and System Architecture </div> <div style="text-align: center; margin: 10px 0;">  </div> <p>A wide range of materials including metals, semiconductors, superconductors, ceramics, and organic and biological compounds will be the subjects of our investigation, aiming at the creation of innovative functions: (1) the creation of new structural materials, electronic materials, nanomolecular materials, materials for surface and interface systems, and materials having molecular assembling properties;. (2) the development and elaboration of these materials leading into devices and systems; and (3) the construction of new architectures, using these devices and materials leading to the betterment of society. The synergy of the above three stepwise strategies is anticipated, and the merging of the five research fields (physics, chemistry, materials science, electrical engineering, and mechanical engineering) is strongly thrust to the forefront, thereby we are convinced that the WPI Research Center for Atom· Molecule· Materials must be established at Tohoku University. “From atom and molecule to</p>

social welfare through materials” is the guiding principle for the center as outlined in the detailed items on the research theme and the organization of the center as shown in the attached presentation.

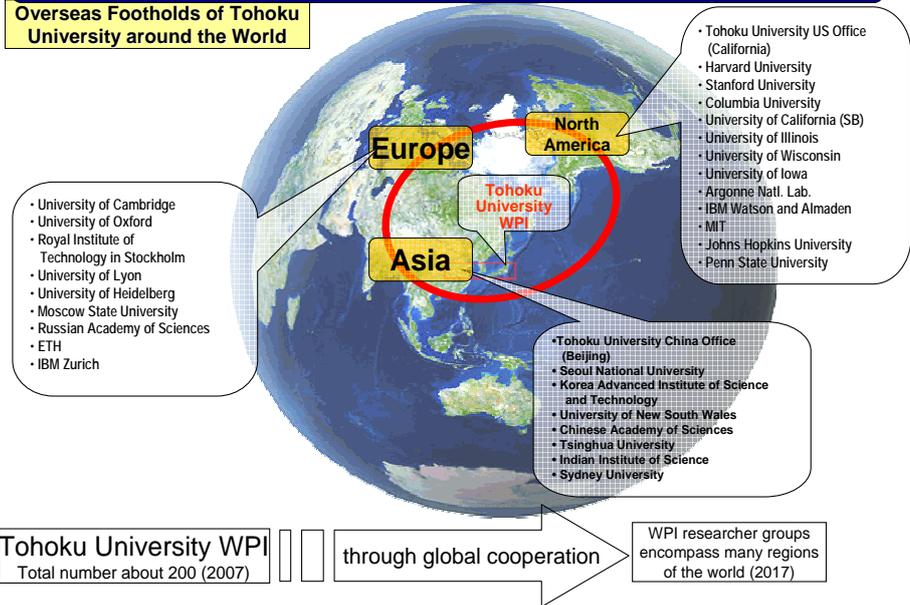
The Center’s Overall Structure Including its Collaborative Linkages

The overall structure is shown in the Figures shown below. The world class Principal Investigators (PIs), whose specialties are physics, chemistry, materials science, electronic and informational engineering, and mechanical engineering, gather at the Center in Tohoku University, from other domestic universities and institutes, and from abroad. Aimed for the support of a center director’s top-down decision making system, an “International Advisory Board” which includes Nobel Laureate board members, will be established directly under the Center Director.



Concerning collaboration linkages, the merging of the five disciplines mentioned above through collaboration between PIs is thrust forward. Based on the intra-collaboration in the WPI research center and the many overseas offices (liaison office and overseas office), we plan to promote and operate a unique formula for a successful international research center(see Figure shown below).

Overseas Network



External Evaluation, and Management Framework

As for the evaluation of researchers, Tohoku University has already stipulated a university-wide method for the assessment of individual faculty, with a researcher evaluation scheme at each department. The performance of center researchers will be strictly evaluated in accordance with this system, and the researchers' salary assessments (pay-raise system and diligence allowance) and incentives such as priority allocation of research funds will be determined based on the evaluation results. We will establish an international advisory board, including Nobel Prize recipients as members, which will report directly to the Center Director to support top-down type decision making by the Center Director. The Center Director and the international advisory board will organically cooperate and exchange opinions, and positively implement reforms to build up a global top-level research center. The environment provided by the WPI research center, in which the PIs can devote themselves exclusively to their research, is similar to that for Distinguished Professors in USA. We will arrange a flat research organizational structure with as few hierarchical relations as possible to create an environment where even young researchers can develop their own ideas. We will assign the necessary technical staff to ensure the smooth development of research apparatus to support superior state-of-the-art research and creative research.

(1) Research fields

Research Field

"From Atom and Molecule to Materials," means the merging of physics, chemistry, materials science, and engineering to generate functional materials.

Interdisciplinary Fields

Chemistry, Material sciences, Electronics engineering and information sciences, Precision and mechanical engineering, Physics. Our project addresses the interdisciplinary fields consisting of the above 5 disciplines.

Importance

Materials science is one of the most important fields for future of science and technology in Japan as well as in the world. Materials science is the most important basis for all materials in the present society and should be continued as a core technology in future in order to maintain the present high technology endeavors in our country.

The research activities of materials science at Tohoku University have been world class. Our present research activities and their excellence, over those of European and American countries, in material science should be maintained and, in the next 10 years, extended to the discovery of new materials and compounds with innovative functions by the combination of the above five disciplines and to produce devices and systems applicable and useful to the benefit of society. Furthermore, it is expected that an entirely new paradigm is born through the fusion approach.

Expected Achievements with the Ten-year WPI Program

Motivations:

- Novel design and Development of New Materials at the atomic and molecular level
- Multidiscipline Collaboration in basic and applied materials research:
Innovating materials with advanced functions and discovering new physical and chemical phenomena which lead to new systems.

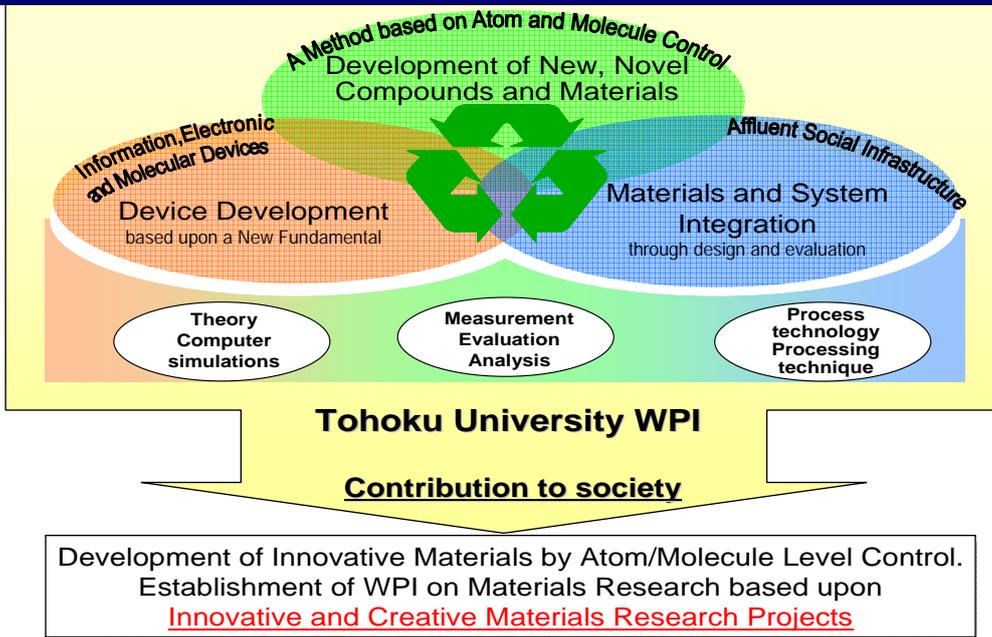
Expected Achievements:

- Invention of various new materials with innovative functions by multidiscipline research among physics, chemistry, materials science, electronic information engineering, and precision mechanical engineering.
- Discovery of new dimensions in physics and chemistry based on the newly developed materials.
- Development of a new academic discipline and contribution to the welfare and prosperity of mankind.



However, to create truly innovative materials in the future and to be the world leader in material and related research fields, the construction of the WPI research center is urgently needed based on this new paradigm. The basic concept for accomplishing the mission is to thrust forward the amalgamation of the above mentioned research areas.

Research Strategy I : From Atom/Molecule Control to Benefiting Society



The creation of entirely new materials and systems, with innovative functions, through control and deep understanding at the atomic and molecular level and through the fusion of 5 disciplines must become feasible and beneficial, leading to contribution to social welfare. We already have established strong research in the following individual fields; materials science, No 3; physics, No 9; chemistry, No 18, based on the citation analysis of ISI.

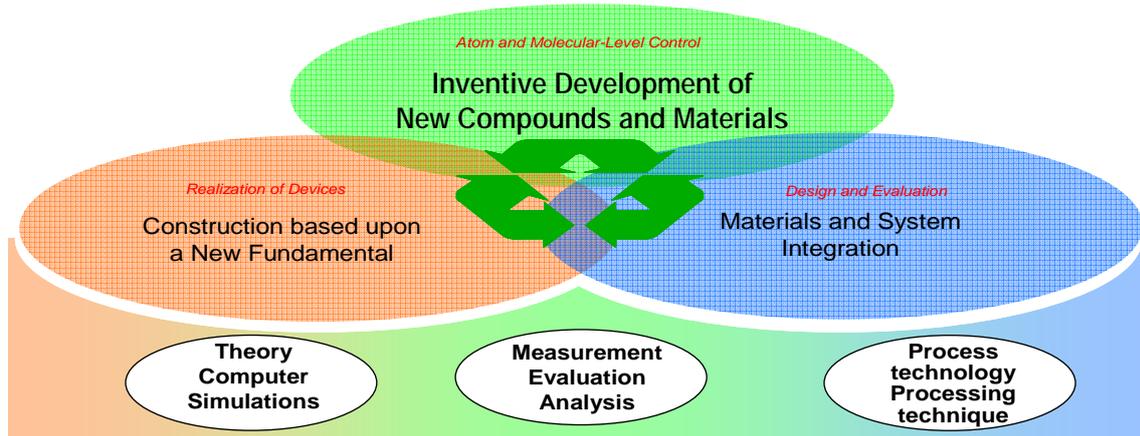
(2) Research objectives

Expected Impact

The research objective is summarized in the Figure shown below.

Objectives of the WPI Materials Research Center

The main objective of the Center is to promote the development of new materials under a world-leading organization system of interdisciplinary research, by use of an innovative method of atomic and molecular control, departing from the stereotype and heading forward the next generation. In addition to basic research, the Center will attempt to (1) create new substances and materials with innovative functions which exceeds existing materials, (2) construct process based upon a new fundamental, and (3) promote applied research projects on materials and system architecture in order to return outcomes to society. The Center also endeavors to establish innovations in understanding diverse material functions through creation of new basic materials which brings beneficial influences on the safety and future of humanity.

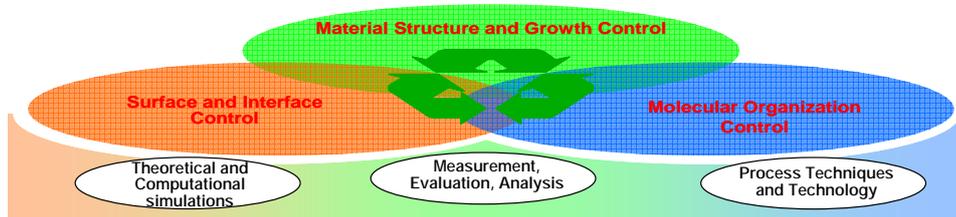
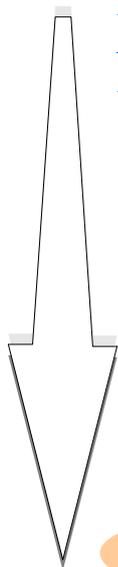


It is expected that a new domain between atomic and molecular levels is pioneered by the fusion of the five disciplines (physics, chemistry, material science, electronic and informational engineering, and precision mechanical engineering), although physics at the atomic level and chemistry in molecular level are becoming mature in their individual discipline. Therefore a new domain of materials science is based on deep and fundamental understanding from atomic and molecular stages. For example, the following scientific issues are sought to be solved; (1) controlled growth of material structures, (2) surface and interface control, and (3) molecular assembly and ordering.

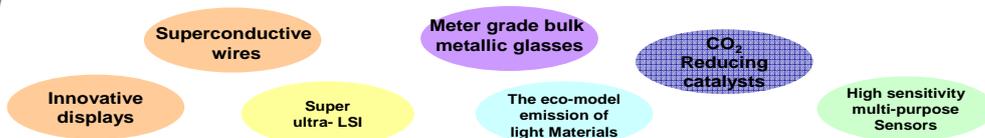
Research Strategy II : From Atom and Molecule to New Materials

---- Establishing a World-Leading Center for the Generation of Innovative Materials ----

- (1) [Initiate Control of Material Structure and Growth](#)
with the aim of constructing materials from nano- to macro- scale
- (2) [Initiate Surface and Interface Control](#)
with the aim of materials and system architecture
- (3) [Initiate Molecular Organization and Self-assembly](#)
with the aim of constructing molecular systems



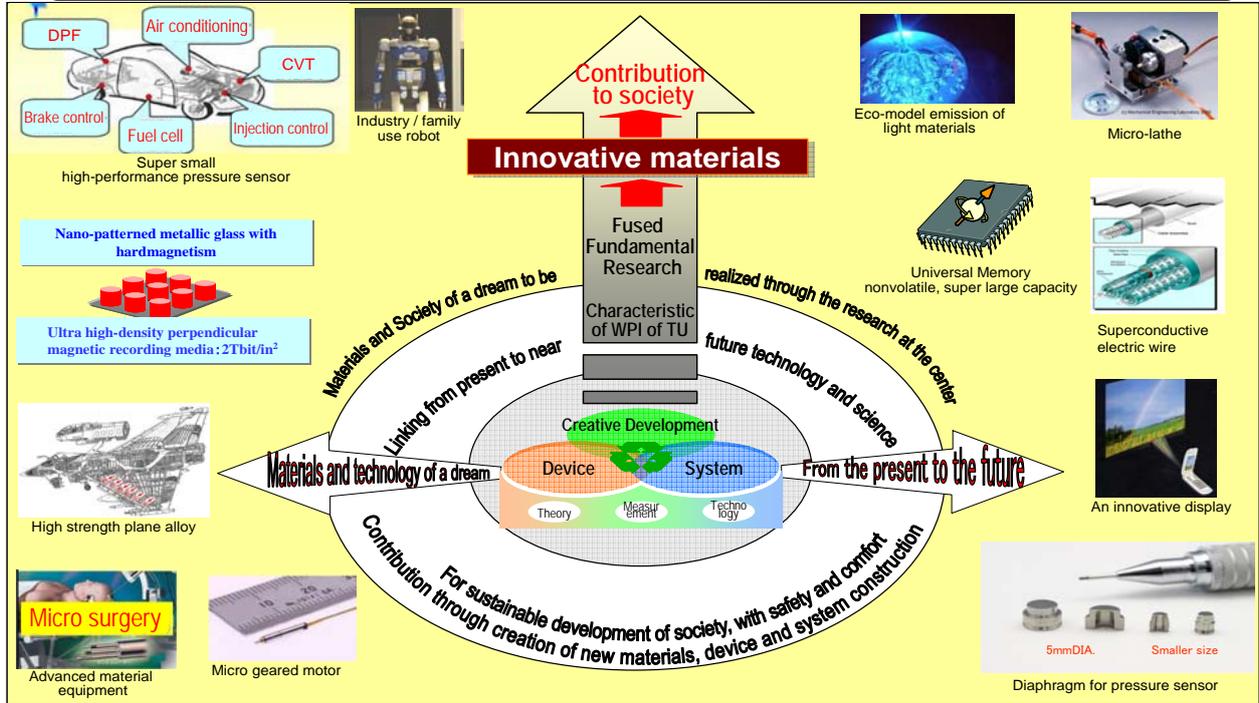
Creation of innovative materials that benefit the future welfare & prosperity of mankind



Expected impact of the scientific advances to be achieved on society in the future

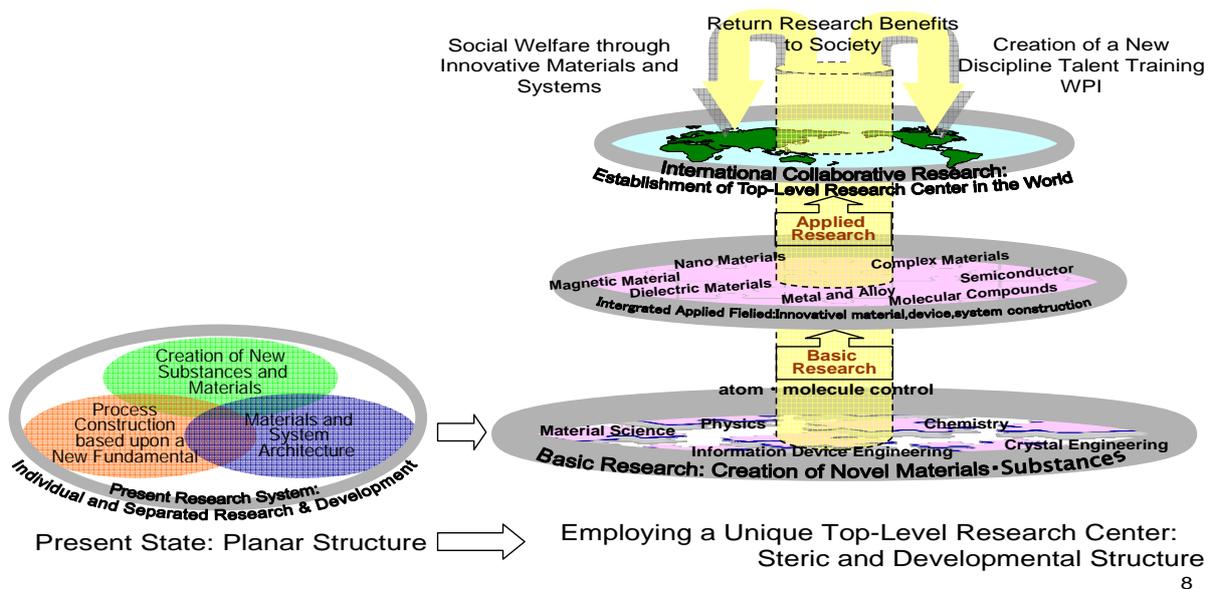
For example, innovative materials for superconductive electric wire, eco-model emission of light materials, information · communication part, industrial · household robot, high strength parts (aircraft), microsurgery, supermicro-gearred motor, molecular device, high performance pressure sensor (automobile), and innovative display are expected to be produced in 10 years. Those visible outputs exert significant impact to society and contribute to welfare of human beings.

A Synergetic Effect of the WPI Materials Research Center



Research plan to achieve the objectives, and related past achievements

Overall Concept for Establishment of Top-Level Research Center in the World



As shown in the above Figure, the bottom-up approach from atom/molecule level is used to achieve the objectives. At present, very active research is being pursued in a planar structure in individual discipline. At the WPI research center, a developmental structure is employed as shown above, leading to contribution to social welfare. Some visible past achievements at TU and by people graduated from TU are the researchers on optical communication (Nishizawa), on carbon nanotube (Iijima), on TOF mass (Tanaka), and on bulk metallic glasses (Inoue).

(3) Management

i) Center director

Prof. Yoshinori Yamamoto, 64 years old, WPI Advanced Institute for Materials Research, Tohoku University. His specialties are Organic Chemistry, Organic Synthesis, Organometallic Chemistry, and Catalytic Reactions. He has achieved notable international research excellence and as of the 1st of March 2007, successfully ranked as the top 17th among 6359 chemists in Essential Science Indicators (ESI). He also possesses a wealth of experience in professional management, as Vice President for University Evaluation (April 2006- March 2007) and Program Leader of a 21st COE program "Unexplored Chemistry: Giant Molecules and Complex Systems" (2002-2006).

Prof. Yamamoto will fully utilize his research accomplishments for this newly project, and in particular fulfilling his role as the Senior Mentor for the field of organic synthesis concentrating also on the management and operation of the Research Center.

ii) Administrative director

Prof. Toshio SAKURAI, 62 years old, has dedicated himself to the development of surface physics research as a professor at Institute for Materials Research and in particular, he has many remarkable research achievements in the field of surface measurement concerned with the proposed center project "New Materials through Control at Atomic and Molecular Levels and Innovation of Their Functions".

Prof. Sakurai is currently the Director of International Frontier Center for Advanced Materials, Institute for Materials Research. He has demonstrated outstanding coordinating talents and leads a number of successful materials science-related international conferences, including those involved with Nobel Laureates participants, and established the networking system on a global basis.

Prof. Sakurai will assume the duties of an administrative director at the Research Center, and focus upon its fullest responsibilities.

iii) Composition of administrative staff

Our Administrative staff provides logistic support which allows researchers to conduct their studies flawlessly. We also intend to actively invite the eligible experts who can handle proactive research development and together with the researchers, aid in the expansion of research results. Consequently, this formation can significantly contribute to the Center's research goal activities.

In specific daily routines such as in accounting, human resources and research support are managed by highly experienced staff who can accomplish their duties without difficulties. They will be selected mainly from intramural administrative staff. To satisfy the means of the Center's official language, which is English, staff who have supportive abilities in English language will be preferentially assigned, and extrinsic staff with a good command of English are also planned to be recruited.

Besides the duties above, a Program Officer, Project Manager, and other senior positions will be occupied by excellent and experienced personnel from various fields including researcher evaluation, international research coordination, activating expansion and public relation of research results, planning and support of research workshops. We will proactively hire diverse professionals; not only experienced at the University, but also from private sector or non-Japanese with international experience or former researchers etc. utilizing an annual salary system.

iv) Decision-making system

In the bid for a rapid and flexible decision making process, we will not specifically launch a decision making organization, but set up a top-down command system governed by our center director.

Aimed for the support of a center director's top-down decision making system, an "International Advisory Board" which includes Nobel Laureate board members, is to be established directly under the center director position. We will also develop a proper environment utilizing Internet Technology, so that the center director and board members can effectively exchange and share their views together on implementation of system reform and other issues for creation of a world premier international research center.

Also, the university will implement a taskforce team at the Administration Bureau, led by Office of the President, which will activate environmental improvements for a center director top-down management concerning flexible approaches, revisions and betterment of the university's system upon the center director's request.

v) Allocation of authority between the center director and the host institution's side

To secure the independence of the center administration, the host institution will limit its authority to extremely important items such as the appointment and dismissal of the Center Director, and leave all other personnel, budget execution and other items effectively under the discretion of the Center Director.

For personnel matters, the host institution will only retain authority over the appointment and dismissal of the Center Director, and have all other personnel items within the center including the employment of lead researchers determined by the Center Director.

The budget allotted to the center (personnel expenses and non-personnel expenses) will be turned over in its entirety for free execution at the judgment of the Center Director, and it will be possible to carry over funds allocated for budget items that are not implemented by the end of the fiscal year to the subsequent fiscal year.

(4) Researchers and other center staffs

i) The "core" to be established within the host institution

a) Principal Investigators (full professors, associate professors or other researchers of comparable standing)

	numbers		
	At beginning	At end of FY 2007	Final goal (1,October,2008)
Researchers from within the host institution	1 5	1 5	1 5
Foreign researchers invited from abroad	1 1	1 1	1 1
Researchers invited from other Japanese institutions	4	4	4
Total principal investigators	3 0	3 0	3 0

As shown in the above table, all the PIs (30 people) start their research activities at their own research laboratories at the beginning and continue the research at the newly build WPI center around the end of March, 2008. The final goal (October 1, 2008) is set with caution in case unexpected situations may occur, bringing about a delay of start-up.

b) Total members

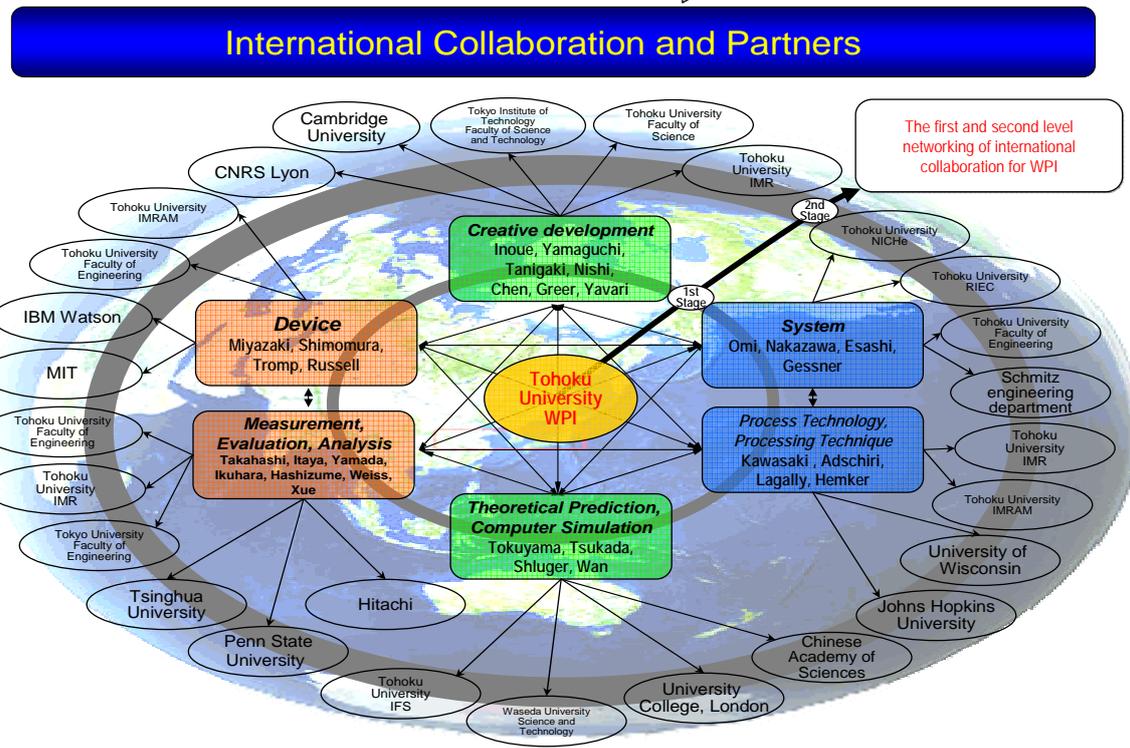
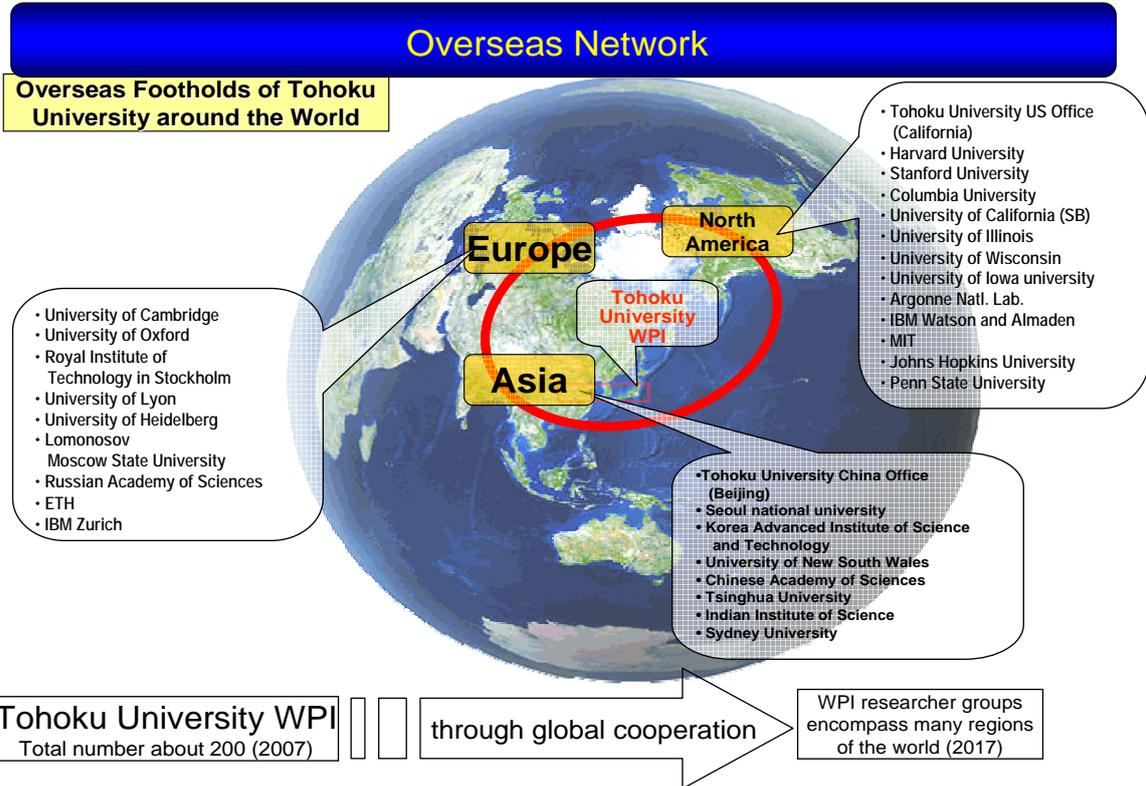
	Numbers		
	At beginning	At end of FY 2007	Final goal (1,October,2008)
Researchers (Number of foreign researchers among them and their percentage)	6 0 (1 9) (3 1 %)	9 0 (2 8) (3 1 %)	1 2 0 (3 8) (3 1 %)
Principal investigators (Number of foreign researchers among them and their percentage)	3 0 (1 2) (4 0 %)	3 0 (1 2) (4 0 %)	3 0 (1 2) (4 0 %)
Other researchers (Number of foreign researchers among them and their percentage)	3 0 (7) (2 3 %)	6 0 (1 6) (2 6 %)	9 0 (2 6) (2 7 %)
Research support staffs	4 4	4 4	5 3
Administrative staffs	3 5	3 5	4 0
Total number of people who form the "core" of the research center	1 3 9	1 6 9	2 1 3

At the beginning, 30 PIs are ready to start their research projects as mentioned above, and 30 other researchers (including 7 foreign investigators) can start the research together with the PIs. We can gather the research support staff and administrative staff. Also, right from the beginning, we will recruit postdoctoral fellows and young researchers through open inter- and intra-national solicitations. Accordingly, the funds for the recruitment are needed at the initial stages of the center. The number of researchers and supporting staff will gradually increase and as the final goal (October 1, 2008) the

total number of people at the WPI center reaches 213.

ii) Collaboration with other institutions

In this program, we do not set up a satellite organization; do not coordinate with other national / international institutions. This is because we already have many overseas offices (liaison office and overseas office) and based on that international relationship, we will operate our plan to promote to formula for an international research center (see the next Figure). For example, IFCAM (International Frontier Center for Advanced Materials) has been established at IMR and fruitful collaboration has been carried out with international and domestic partners. At the WPI center, which includes physics, chemistry, and engineering besides the core materials science, collaboration is expanded to a multitude of other top-class institutes and the representative partners are shown in the following Figures.



(5) Research Environment

) Provide an environment in which researchers can devote themselves exclusively to their research, by exempting them from other duties and providing them with adequate staff support to handle paperwork and other administrative functions.

We will arrange the environment so that the researchers participating at this center can devote themselves exclusively to research to the greatest possible extent. The environment provided by the Center to PIs is similar as that for Distinguished Professors in US.

We will make arrangements so that the researchers themselves will not be involved in the managerial works of the host institution, provide thorough time management (effort management) for the researchers, and otherwise secure ample time for the researchers to engage in research at this center as much as possible.

We will also prepare strong staff backup functions for accounting, personnel, research support, liaison and public relations works so that the researchers can devote themselves to research. These staff functions will implement various procedures and management works on behalf of the researchers. In addition to individuals who will perform day-to-day accounting and other administrative tasks, we will assign as program officers other individuals with outstanding experience in such fields as researcher evaluation, international research coordination, the ordered development of research findings, the publication of research findings, and the planning and support of research conferences. To these ends, in addition to utilizing university staff, we will make use of the annual salary system to positively employ individuals with experience in the private sector, foreigners (individuals with international experience), distinguished researchers, and other diverse personnel. We will also assign the technical staff required for the smooth progress of the research.

Besides the scientific and research issues, it is needed to provide the PIs not only enough facilities and space in laboratories, but also enjoyable living environments at home, especially for people from abroad. We will do our best for arranging comfortable environments.

) Provide startup research funding as necessary to ensure that top-caliber researchers invited to the center do not upon arrival lose momentum in vigorously pursuing their work out of concern over the need to apply immediately for competitive grants.

At the discretion of the Center Director, the necessary start-up funds will be provided in cases when the invited researchers require funds to vigorously continue their own research when they are initially transferred to the center.

We will also promptly provide the invited researchers with opportunities for brainstorming and research and information exchange with Tohoku University researchers and for examining the potential for joint research at the university, support their access to common university experimental and other facilities, and otherwise support the vertical advance of their research.

) As a rule, fill postdoctoral positions through open international solicitations.

(Recruitment Method)

In the recruitment of post-doctoral researchers, we will secure superior international personnel via international recruitment using Tohoku University's website (English and Japanese), international scientific journals, and Tohoku University's overseas bases, specifically as follows.

- 1) International recruitment via Tohoku University's website (English and Japanese).
- 2) International recruitment through recruitment advertisements in *Nature*, *Science* and other international scientific journals, and in the publications of academic societies in which the lead researchers are members.
- 3) International recruitment via the website of the JREC-IN (Japan Research Career Information Network) personnel database (English and Japanese) administered by the Japan Science and Technology Agency.
- 4) International recruitment using Tohoku University's US office, China office, and other overseas offices and bases, and by asking renowned universities worldwide to post the recruitment information on their Web sites including global universities which have academic exchange agreements with Tohoku University (119 institutions), and members of university consortia (The Association of East Asian Research Universities [AEARU], etc.).
- 5) Other international recruitment utilizing the international networks that the lead researchers have developed in each academic field.

(Employment Screening Method)

Post-doctoral researcher employment screening committees comprised of several members will be organized for each lead researcher, with the lead researcher serving as the committee chairperson. The post-doctoral candidates will be determined through an initial selection by examination of documents and a secondary selection by interviews. The final employment decisions will be made by the Center Director. This process will positively employ post-doctoral researchers with superior results in interdisciplinary research as well as in their field of specialization, in order to promote comprehensive interdisciplinary research efforts. The Center Director will directly make the employment decisions to secure promising post-doctoral researchers in accordance with the center concept.

) Establish English as the primary language for work-related communication, and appoint administrative personnel who can facilitate the use of English in the work process.

We will prepare an environment which permits researchers to carry out their work duties in English.

We will prepare an environment whereby the exchanges between researchers and administrative staff can always be conducted in English right from the launch of the center by assigning multiple staff members to each section who can perform their work duties in English.

To these ends, we will assign university staff with superior English skills, in addition to expertise in such fields as accounting, personnel and research assistance, as administrative staff on a priority basis. Additionally, to supplement the English abilities of those staff, we will also secure administrative staff that is proficient in English by utilizing dispatched workers and the annual salary system to employ outside personnel, to assign to the center administrative staff who can execute work duties in English.

Furthermore, we will arrange systematic opportunities for administrative staff to participate in English training and constantly improve their English ability (including English in areas of expertise).

Documents for internal use that must be filled out personally by the researchers will be prepared in English, so that the foreign researchers will be able to submit all relevant documents.

We will also incrementally boost the ability to use English in the performance of duties at the center, and progressively shift to a system whereby English will become the official language for all meetings inside the center and English will be used whenever possible for all documents drafted inside the center.

In principle, all research papers by center researchers will be written in English.

) Adopt a rigorous system for evaluating research and a system of merit-based compensation. (For example, institute a merit-based annual salary system primarily for researchers from outside the host institution. As a basic rule, the salaries of researchers who were already employed at the host institution prior to the centers' establishment are to be paid by the host institution.)

As for the evaluation of researchers, Tohoku University has already stipulated a university-wide method for the assessment of individual faculty, with a researcher evaluation scheme at each department. The performance of center researchers will be strictly evaluated in accordance with this system, and the researchers' salary assessments (pay-raise system and diligence allowance) and incentives such as priority allocation of research funds will be determined based on the evaluation results. For salaries in particular, in addition to the active adoption of the annual salary system, special allowances will be granted to researchers who make outstanding contributions.

We will establish an international advisory board, including Nobel Prize recipients as members, and an external evaluation board. They help to evaluate not only the research of individual PI but also the system and organization of the WPI center.

Additionally, "invitation allowances" (maximum period of 5 years) will be granted to prominent invited researchers from outside the host institution in accordance with their research accomplishments and most recent salaries.

Moreover, new systems will be introduced including a "Fellow Professor" (tentative name) system for professors playing leading roles in the research, as well as a system for preparations payments or contract conclusion payments to provide additional incentives when trying to attract Nobel Prize-class researchers, etc.

Tohoku University's "University Professor System" will also be actively used for the invitation of prominent researchers.

) Provide equipment and facilities, including laboratory space, appropriate to a top world-level research center.

To prepare a facilities environment suitable for a global top-level center, the host institution will operate a new core facility (building) for the center's activities so it can be used from around April 2008 as a target date. This facility will be equipped with flexible water supply and drainage equipment, air conditioning equipment, and power sources so that it can be a research space that meets the respective room arrangement, equipment, apparatus and other usage demands of the individual researchers. Considering the great importance of information exchange and brainstorming among the researchers, the researchers' office wing will be arranged with a library section, discussion corners and other spaces where the researchers can gather in a central zone, with the individual offices located on the outskirts of this common area. The security arrangements will ensure safety by zone, covering each research room or each department and the entire building. Energy conservation equipment will be adopted to mitigate pressure on research funds.

In addition to this new building, research space in existing buildings will also be used to conduct the business of center research. In those cases as well, while there will be some limitations on the room arrangements, the research rooms and offices will be upgraded as deemed suitable for a global top-level center with improvements based on the above approach, starting with reinforcement of the structures' earthquake resistance.

Private-sector facilities will also be actively utilized to flexibly secure sufficient research space in accordance with the progress of the research.

Arrangements will be made to provide the researchers with priority access to high-performance electron microscopes and other state-of-the-art research equipment through close coordination with the Technology Center for Research and Education Activities and other related Tohoku University organizations.

) Hold international research conferences or symposiums regularly (at least once a year) to bring the world's leading researchers together at the center.

We will advance international development via researcher and other personnel exchanges and institutional relations for international joint research by positively utilizing Tohoku University's US office, China office, 11 liaison offices and other overseas offices and bases, and via liaison with global universities which have academic exchange agreements with Tohoku University (119 institutions), and members of university consortia (The Association of East Asian Research Universities [AEARU], and Top Industrial Managers for Europe [TIME]).

Specifically we will first organize an international materials cooperation support committee among leading global universities to advance research on the topic "new substances and materials from atomic and molecular control, and functional innovation" and establish a structure to advance research and development under international institutional cooperation.

Then, using this international consortium along with Tohoku University's existing global network described above, we will arrange periodic opportunities for mutual exchange including the short-term overseas dispatch of center researchers and the invitation of global researchers to Japan, hold pacesetting cutting-edge international research conferences assembling top-level global researchers on a regular basis, and otherwise prepare an environment in which the center's researchers can engage in international research exchange, information exchange and brainstorming with the world's leading researchers.

) Other measures to ensure that top-caliber researchers from around the world can comfortably devote themselves to their research in a competitive international environment.

We will advance the following approaches to build a center that compiles and advances the latest global information and research, and attracts the top minds initiating dramatic scientific developments.

- 1) We will establish an international advisory board, including Nobel Prize recipients as members, which will report directly to the Center Director to support top-down type decision making by the Center Director. The Center Director and the international advisory board will organically cooperate and exchange opinions, and positively implement reforms to promote a global top-level research center.
- 2) We will arrange a flat research organizational structure with as few hierarchical relations as

possible to create an environment where even young researchers can develop their own ideas. We will provide young researchers with research support from senior mentors and otherwise promote the organic development of research.

- 3) We will assign the necessary technical staff to ensure the smooth development of research apparatus to support superior state-of-the-art research and creative research. We will prepare a system to provide highly detailed lifestyle and education advice to support the daily life in Japan of foreign researchers at the center and the education of their children.

) Criteria and methods to be used for evaluating the center's global standing in the subject field

We evaluate each PI and researcher by the following indicators; publication in internationally well-recognized top-class journals, citation number of those papers, invited and plenary lectures at the well-recognized international symposiums, receiving international awards, and acquisition of research funds. As possible as we can, we want to use numerical and objective factors for evaluation. The center's global standing is primarily evaluated by the ranking of institutions of each discipline, based on citation analysis made by ISI. Besides, other factors, such as visible contribution to society by providing really useful materials, are used for evaluation.

ii) Results of current assessment made using said criteria and methods

Evaluation of the PIs based on the above criteria is attached to their CVs. The institution ranking of material science in TU is the number 3 among 536 institutes in the world. According to the citation analysis, Max-Planck is the number 1 and Chinese Academy is the number 3 in materials science, but they are large organizations including several independent institutions in different cities. The ranking of physics in TU is the number 9 among 592 institutes, and that of chemistry is the number 18 among 774 institutes in the world

iii) Goals to be achieved through the project (at time of interim and final evaluations)

As one of the outcomes, in the basic research fields, we strongly expect the world premier award in science will be given to a researcher (or hopefully researchers) in our institute, at the very least a world top-class international award will go to researchers. Also, it is expected that the ISI citation ranking of Tohoku University will be elevated dramatically. In the applied research fields, we are sure that many new systems will be developed on the basis of the newly created materials with their innovative functions will become commercially realizable and contribute very much to society's wellbeing. We think that the second issue (contribution to social welfare) is more and more important than the first one for evaluating accomplishments in our WPI center. In the interim, the relative indicators similar as above mentioned will be employed.

(7) Securing research funding

) Past record

	(US dollars)
FY2002	10,554,000
FY2003	8,460,000
FY2004	14,689,000
FY2005	12,439,000
FY2006	10,528,000
Total	56,670,000

ii) Prospects after establishment of the center

The host institution constructs a new building for the WPI research center until April, 2008. The salary for PIs, who have been researchers at each institute or Faculty in TU, is essentially paid by TU, even after they join the WPI center. Further, the fund for research, setting up instruments and equipments necessary for research at the Center, renovation of research space and laboratory, and smooth management of the Center will be supported by TU. For this purpose, TU will prepare approximately 1700000 US \$ annually.

Others

After the implementation term of this program is completed, the center will continue with its activities in order to enhance the potential for research at this center.

Also, within this program, we will actively introduce new research methods incorporating new concepts into the existing graduate course and research center at our university.

Noteworthy of Tohoku University, is its offering of the Institute for International Advanced Research and Education Organization (established in April, 2007) on basis of the 21st Century COE Program achievements. Incorporating the Institute for International Advanced Research and Education (initiated in April, 2006), it supports the graduate students who pursue integrated research; and the Institute for International Advanced Interdisciplinary Research (introduced in April, 2007)

which promotes research in the many areas. We will initiate and develop a method reform and human resources cultivated in this center for enhancing the level of the fusional areas, fostered into the organization's activities, to rank as one of the best centers in the world. In order to insure that the research institutes collaborate intimately and to increase its research abilities of emerging or fusional areas, we contemplate about the reorganization and integration of existing graduate course and research center in our university as well.