

**No. 1**  
Feb. 2009

MANA  
RESEARCH  
FOR  
TOMORROW

## Interview

Create an environment where young researchers can aspire  
Professor Emeritus of Kyoto University Hiroo Imura

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International Center for Materials Nanoarchitectonics (MANA)

## Create an environment where young researchers can aspire

Forming a “melting pot” of people from different disciplines and fields

Professor Emeritus of Kyoto University Hiroo Imura

Dr. Hiroo Imura is a former president of Kyoto University who is now serving as Chairperson of the World Premier International Research Center Initiative (WPI) Program Committee. Today we would like to ask him about the conditions to conduct original research and the expectations for the International Center for Materials Nanoarchitectonics (MANA) project sponsored by WPI.

Interviewer: Akio Etori, Public Relations Advisor, NIMS

### ◆ Nurturing research with an excellent flat organization

—What is needed to become a leading researcher?

I believe that human ability can be nurtured in the right environment. We don't yet know how the human brain grows, but environmental factors are extremely important. Therefore, since people grow and develop by coming into contact with each other, it may be extremely important how they come into contact.

—Dr. Imura, is this something that you have learned from your own experience?

Yes, it is. One such experience was when I was studying in America, and the people around me were truly multifarious. For example, there were some doctors who were very good at math, and there was even one who had studied art. There are so many different types of people in the profession because students there enter medical school after graduating from a 4-year university. However, in Japan all doctors are alike. That is, they have the same education and grow in the same way.

—It's just as you say.

Moreover, the professor at the American university where I was studying was quite of advanced age. He told me to “do what I want” and he let me do my research with a high degree of freedom. I think I was very fortunate to be able to conduct research in this free environment amidst people from a wide variety of backgrounds. At that time Japanese universities had rigid hierarchies, and professors were treated with awe. However, in America even the assistant professors were on a first-name basis. In fact, they became angry when they were called by their last names. They thought that “since we work together every day, we like to be called by our first names.” I think that such a “flat” organization is needed to do original research.

—How were things after you returned to Japan?

After incubating some ideas, I returned to Japan. But I soon found myself in the midst of turmoil on university campuses, so I could not satisfactorily implement these ideas. Then, just at the time when the “campus turmoil” ended in 1971, I was given a position as professor in the newly established Department of Internal Medicine at Kobe University. However, because the “campus turmoil”

caused a delay of 3 years, the national budget run out, and even though there was no money, a faculty still had to be established. This was an extremely difficult time.

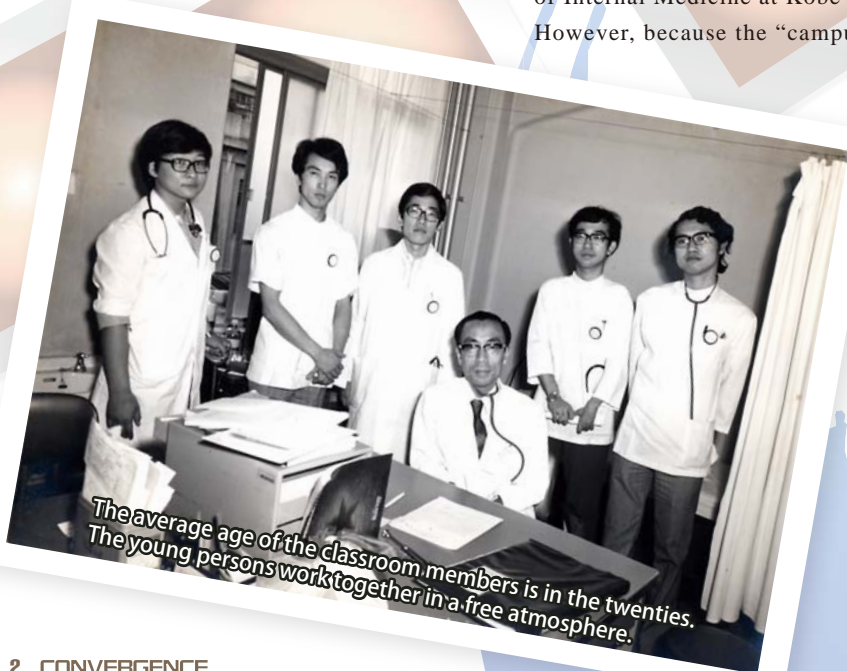
The good thing about all this was that since it was a new department, there were only young people in the faculty. In one sense, we could form a “flat” faculty. The average instructor was in his or her twenties. It was said that one could not find such a department of internal medicine anywhere else in Japan with such an extremely free atmosphere. This meant that young people could really aspire. In just 2 or 3 years, members were writing papers that could be published in top-ranked foreign journals. So, yes, I really think that environment is extremely important. What we can do for young people is to create an environment that will allow them to aspire.

### ◆ The pioneering of new interdisciplinary fields is blazing a trail toward an important new era

—It seems like this type of experience provided a base for your work at WPI.

I think so, too. I would like to build a world-class Center of Excellence in Japan that can be compared with, for example, the Rockefeller Institute of the US, or the Cavendish Laboratory of the UK. It will not be so easy to do, but... One of the main attributes of such a Center of Excellence will have to be a “flat” organization. Another will be having an extremely international perspective.

Therefore, the WPI is encouraging as many foreigners as possible to come to Japan. Different cultures will come together and interact. This means that one of the goals will be creating such a new melting pot. I feel that if an environment can be created that will allow young people to engage in lively discussions and debates, then it will be conducive for good work. Japan creates a hierarchy wherein the people at the top are prone to is-



The average age of the classroom members is in the twenties. The young persons work together in a free atmosphere.



## Profile

### Dr. Hiroo Imura

Ph.D. in Medical Science from Kyoto University Faculty of Medicine (1962), Assistant Professor of Medicine, Kyoto University Faculty of Medicine (1965), Professor, Department of Medicine, Kobe University Faculty of Medicine (1971), Professor and Chairman, Second Division, Department of Medicine, Kyoto University Faculty of Medicine (1989), President of Kyoto University (1991), Member of the Council for Science and Technology Policy (2001), Professor Imura has also served as Cabinet Office Chairman of the Inamori Foundation; Principal Fellow of the Center for Research and Development Strategy; President of the Foundation for Biomedical Research and Innovation; Member of the Japan Academy; and is an Honorary Foreign Member of the American Academy of Arts and Sciences. His major field is endocrinology.

reform 2 of the 3 institutes I had planned to reform. What was created at that time was the Institute for Frontier Medical Sciences. This is where, in its 10th year, Professor Shinya Yamanaka's iPS cells made their appearance. It truly appears to have been a good thing that I established the new institute.

**—Such a firm resolution is certainly an example of producing excellent results.**

Even though it could be said to be creating, it still couldn't completely transform everything. So I

had people transfer from the major sections of the former Research Institute for Chest Diseases, the Biomedical Engineering Research Center, and the Faculty of Medicine. I also had people coming from the departments of Engineering and Science. Now it is the time to pioneer interdisciplinary fields. Top-down fusion is very difficult to do. What the people at the top can do is "create catalysts." I don't know if there is a reaction or not, but a catalyst can be created. Therefore, I hope WPI will increasingly be able to attract leading researchers from around the world. I believe that this is important for creating an atmosphere that allows for free research and for people from many different disciplines to interact with each another.

**◆ Promoting research that probes deeply and has a wide perspective**

**—Given what you have said, it certainly seems like the way of nurturing researchers is very important for successfully establishing the WPI.**

That's what I believe. The Japanese stake out their own territory and close themselves up in it. Perhaps because they were an agrarian people. I felt like that when I went to America. I was in an internal medicine department, where making the rounds with patients was called "Grand Round." Actuality more important than seeing patients, was

looking at and discussing medical histories. Because it was internal medicine, it covered an extremely wide range of topics. However, because my research became interesting when it started to get into a groove, I ducked out of "Grand Round" to conduct my research. Thereupon my boss called me into the office to tell me that "even if I was busy with my research, I should allot time for other things." Even if I wasn't being taught by people from my own major, I was doing research, and I could understand things by reading books. However, outside of my major, I couldn't do things very well with just my own ability. Therefore, I was admonished to go to such places to study.

Research must probe deeply. It becomes deep and narrow, but at the same time it should have a wide perspective, and one has to know how one's research fits in with the flow of academics as a whole. Since this is an age where the structure of research itself is changing dramatically, it is important to have an even wider perspective.

**—One last question. What are your expectations for MANA?**

It's not a very large organization, so under the leadership of the Chief Project Officer I think it is easy to make various changes. I would really like to take advantage of MANA's special attributes of adaptability and flexible response. However, since the scope of research is always going to be limited, some problems may turn up that cannot be seen from inside. At such times, I would like for MANA to make successful alliances with universities and other institutes, and pull people in from universities when the need arises. Therefore, I think strong alliances will have to be made with outside organizations. Of course, as I said before, it's necessary to make sure that we do not fail to recognize our own position. Japan is entering an era of declining birth rates, and the number of people who can be leading researchers is also dwindling. Therefore, creating an environment where leading researchers from overseas can come and work easily is one of the main goals of WPI. I hope that WPI will be a pioneer in this field.

suing proclamations, as it were. That destroys young people's ability to think freely, but I would like for young people to elaborate and expand on their ideas as much as possible. Thus, today, academics are undergoing big changes.

**—What do you mean by that?**

Japanese universities have basically maintained the major disciplines of the Meiji era (1868-1912). Therefore, if there is Information Science, information research is part of the Engineering department. However, engineering originally entailed making things, and efforts always focus on the tangible. However, true information is in an intangible world where such thinking does not exist.

The thing I most keenly felt when I was President of Kyoto University was that the departments in old universities had a lot of autonomy, such that if a president got involved in their affairs, it was like he was meddling. Thus, the president's office decided to transcend departments. Specifically, that entailed creating 4 new research schools: the Graduate School of Informatics, the Graduate School of Energy Science, the Graduate School of Bioscience, and the Graduate School of Asian and African Area Studies. This was done with an interdisciplinary approach in mind. Therefore, while I wanted to reform the research institutes, I managed to

# "INTER"

## Opportunities and Chances of MANA

### Heinrich Rohrer

### Nobel Laureate in Physics 1986

In the wake of global euphoria, "interactive" (read cooperative), "international", and "interdisciplinary" obtain more and more attention as omnipresent, important criteria for selection and review of scientific research by science promotion groups of all kinds - from program responsables to money agencies - and in particular by science political bodies. We should, however, remember that the prevalent values in science arise from the choice and the solution of a problem both of which should be guided by novelty and by the expected impact, in words: "What would change if it could be done?". Only afterwards come the questions of how to go about, whether and which new methods have to be developed and which and how much of the above "Inter" are possibly required. We also should remember, that a mandate on any level has to articulate clearly what is expected and what has to be done and not how it should be executed, like e.g. by some "Inter" above.

"Inter" is in many ways a salient ingredient for scientific progress and was common practice in science since ever. Science was the first international enterprise on a global scale, long before air travel, satellites and data highways. Science has long been living global practices out of necessity and kept them with remarkable consistency. The standards are global and unique, set by first rate scientists worldwide, little diluted by particular interests of local, commercial or national nature. Of course, also in science there exist insider groups and local matadors; they, however, are irrelevant for scientific progress. Open and free dissemination of scientific results worldwide is the basic pillar of a worldwide interaction and cooperation.. "Inter" means not "instead of" but always "in addition to", it is so to speak the graduate school of discipline, of national, and of action. The skeleton for interdisciplinary is excelling in

a discipline, that for cooperation extraordinary individual ability, and that for international one's solid home base. "Inter" bridges two or more constituents, the better the latter the more outstanding the result. It is neither a medicine for breakthroughs nor a compensation for lack of ideas, creativity, and innovation. The source of the latter is local, somebody's brain. We have to take utmost care of those brains and not let them suffocate in some dense "Inter"-network. However, "Inter" could be the best help to get them to blossom and to bear on general progress

I see the opportunities and chances of MANA in quite a few regards. One is the long leash in science topics and in research operation, characteristic for a WPI, - at least that is what I understood about them, and also appreciate very highly. The second one concerns the intrinsic interdisciplinary nature of both Materials Science and of science and technology on the nm scale or short of Nanotechnology. The third one is the large worldwide reservoir of excellent Nanoscientists, in particular also of young ones of both sexes, the high expectations into nano, and the reputation of the MANA responsables. Finally, the long time scale of the WPI should indeed allow for desirable adventurous research projects. The sky is wide open for MANA. I am aware that it is quite a demanding task to create an identity for a research operation with many off-site Principal Investigators and to find the balance between "Inter" and "Self". "Inter" can be a most powerful tool to reach a goal, but it should never become the goal itself, in analogy with a saying of Montesquieu: "If it is not necessary to make a law, then it is necessary not to make law".

Wollerau, Dec.9, 2008  
H. Rohrer



#### Profile

Graduated from the Swiss Federal Institute of Technology (ETH), received his doctorate from ETH Zurich. After two post-doc years at Rutgers University, USA, he joined IBM's Zurich Laboratory and became an IBM Fellow. In 1979, Dr. Rohrer invented the scanning tunneling microscope (STM) with Gerd Binnig, and in 1986, he was awarded the Nobel Prize in Physics for this achievement.

# CREATING TOMORROW

## *Reaching the World's Highest Summit with MANA*

After being nominated in 2007 as the only independent administrative institution to receive a grant from the World Premier International Research Center Initiative Program, the National Institute for Materials Science (NIMS) established the International Center for Materials Nanoarchitectonics (MANA) in October of the same year. MANA was created with the vision of being a recognized focal center that would attract the participation of various levels of researchers from across the globe—not only global leading and renowned scientists but also young researchers, postdoctoral fellows, and both graduate and undergraduate students.

NIMS being equipped with cutting-edge research facilities and instrumentation enjoys a front-line research environment

that very few other Japanese research institutes can match. MANA uses the slogan 'CONVERGENCE,' thus pointing the way toward the integration and rearrangement of differing research fields. And by continuing to serve as an internationally diverse academic 'melting pot' for researchers, MANA also aspires to be a front-runner in the fields of nanotechnology and nanomaterials.

The host institution NIMS offers every possible support for MANA's programs and activities. The NIMS headquarter proactively supports the MANA management by providing human, financial, technological and infrastructural resources. Me too, I'm determined to make my best effort in leading NIMS to reach with the MANA project the world's highest summit, which



we envision as being one of the world's leading state-of-the-art research center.

***Teruo Kishi***  
***President, NIMS***

## *Pioneering a new Paradigm*

Materials are sometimes referred to as the 'mother of science and technology', thus leading to the conclusion that epoch-making scientific and technological breakthroughs are unachievable without innovative development of them first taking place.

It is now indispensable for us humans living in the 21st century to develop groundbreaking technologies that will enable sustainable development to take place across a wide range of areas encompassing environmental protection, a supply of energy, information and telecommunications, and medicine and biotechnology. Advances being made in nanotechnology are envisaged to possibly greatly contribute to these fields. However, those types of demands will not be met if we remain stuck in the conventional paradigm of nanomaterials development and processes. The urgent requirement now is to pioneer a new paradigm of nanotechnology-based development of new materials across the conventional disciplinary framework of metallurgy, materials chemistry, solid state physics, and so on, as well as with the division of inorganic, organic, and biological materials.

We therefore are involved in substantiating the concept of 'materials nanoarchitectonics' in creating a new research paradigm, the concept of which epitomizes nanotechnology-based creation of epoch-making materials and systems with novel functions that surpass ordinary imaginations and expectations, and which can only be achieved through complete control of the arrangement and interactions of nano-structures.

Researchers attracted by the concept of material nanoarchitectonics have gathered together at the International Center for Materials Nanoarchitectonics (MANA) from different parts of the world. And through encouraging their creativity and originality MANA is promoting challenging leading-edge research projects that integrate and make full use of the five key technologies bolstering the conceptual framework. This then also means that MANA is aggressively advancing the integration and rearrangement of the areas and institutional structure required in research. MANA has identified the four leading fields of basic and applied science—Nano-Materials, Nano-Systems, Nano-Green, and Nano-Bio—and intends to make positive



contributions to sustainable human development through achieving scientific and technological innovations with the creation of new materials, new devices, and new systems.

I hope that you too understand MANA's unique forward-thinking approaches to new materials development as well as its enthusiasm to contribute to the future of mankind. I would also like to take the chance to cordially request your continued support.

***Masakazu Aono***  
***Director-General, MANA***

# MANA's Research Targets

## WPI Program and MANA

The WPI Program (World Premier International Research Center Initiative Program) by MEXT provides priority support for projects creating world-top level research centers with "global visibility" that attract top researchers from all over the world. In October 2007 the International Center for Materials Nanoarchi-

tectonics (MANA) at NIMS has been selected as one of five WPI institutes. The others are Tohoku University, the University of Tokyo, Kyoto University and Osaka University.

The WPI Program will provide support to the five institutions for 10-15 years.

Host Institution	WPI Research Center	Research Field
Tohoku University	Advanced Institute for Materials Research (AIMR)	Materials science
University of Tokyo	Institute for the Physics and Mathematics of the Universe (IPMU)	Astrophysics
Kyoto University	Institute for Integrated Cell-Material Sciences (iCeMS)	Meso-control stem cells
Osaka University	Immunology Frontier Research Center (IFReC)	Immunology
NIMS	International Center for Materials Nanoarchitectonics (MANA)	Materials science

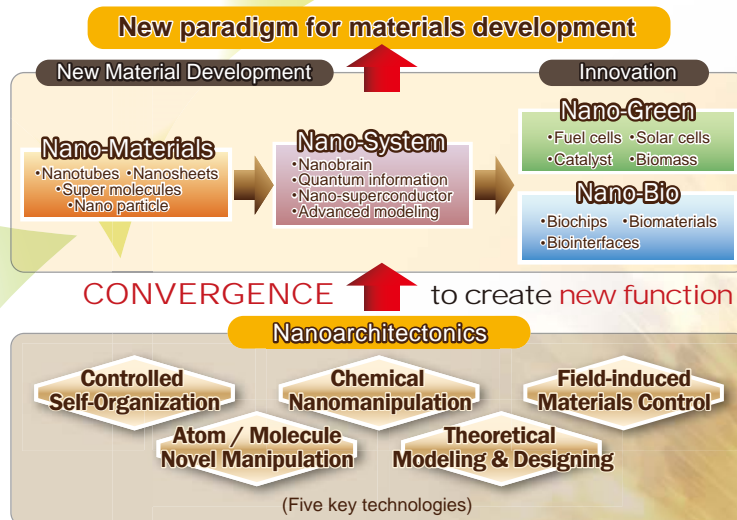
## Mission of MANA

To achieve the goals of the WPI Program, MANA aims to develop innovative materials by using nano-technology as a fundamental research center, especially for next-generation nano-science and technology. The four major missions of MANA are:

- Challenging research by materials nanoarchitectonics
- Creation of a "Melting Pot," where top-level researchers gather from around the world
- Fostering and securing young scientists, who are rich in originality
- Construction of a network, which links the world's top-notch nano centers

## Materials Nanoarchitectonics and Research Fields

Materials nanoarchitectonics is a new research paradigm of materials development which attempts to extract and use the ultimate functions of materials based on a profound understanding of the mutual interaction between individual nanostructures and arbitrary arrangement of those nanostructures. MANA uses the five key-technologies: 1) Atom/Molecule Novel Manipulation, 2) Chemical Nanomanipulation, 3) Controlled Self-Organization, 4) Field-Induced Materials Control, and 5) Theoretical Modeling & Designing. Utilizing outcome from the convergence of these five key-technologies, MANA will focus on four research-fields (Nano-Materials, Nano-System, Nano-Green, and Nano-Bio) to develop novel materials and create epoch-making innovations for a sustainable society in the future.



## Organizational Structure

In light of MANA's missions and research targets a total of 30 world-top class researchers and scientists from national and international institutions have already been appointed as MANA Principal Investigators. In addition to NIMS, the institutions include the University of Cambridge, the University of California in Los Angeles (UCLA), the Centre National de la Recherche Scientifique (CNRS), the Georgia Institute of Technology, the University of Tsukuba, Tokyo University of Science, and Hokkaido University.

With these 7 institutions, called "satellites", MANA will

efficiently promote research at the world's highest level. At the same time foreign satellite institutes function as overseas bases for NIMS.

The MANA team of currently about 170 people has more than 120 researchers, postdocs and graduate students, along with about 20 administrative and technical staff. 44% are non-Japanese, which surpasses the original WPI program target of at least 30% of foreigners. The new MANA target is to reach at least 50% of foreigners.

## MANA Principal Investigators (PIs)

PIs are internationally known world-top class scientists, who take the main role to achieve the MANA research targets and serve as mentors for younger researchers. MANA has selected Principal Investigators from NIMS and other domestic and overseas institutes.

### Nano-Materials Field



T.Sasaki NIMS, Y.Bando NIMS, K.Ariga NIMS, K.Kitamura NIMS



O.Yaghi UCLA, E.T.-Muromachi NIMS, Y.Sakka NIMS, K.Hono NIMS



N.Ohashi NIMS, Z.L.Wang GIT, D.Golberg NIMS

### Nano-System Field



M.Aono NIMS, J.Gimzewski UCLA, M.Welland U.Cambridge, C.Gerber Univ.Basel



C.Joachim CNRS, D.Fujita NIMS, X.Hu NIMS, T.Hasegawa NIMS



K.Kadowaki Univ.Tsukuba, T.Nakayama NIMS, H.Takayanagi Tokyo Univ. Sci., K.Tsukagoshi NIMS

### Nano-Green Field



K.Uosaki Hokkaido U., L.Han NIMS



J.Ye NIMS, K.Tomishige Univ.Tsukuba



E.Traversa NIMS

### Nano-Bio Field



Y.Miyahara NIMS



Y.Nagasaki NIMS

## MANA Independent Scientists

MANA Independent Scientists are younger researchers at NIMS, who work full-time for MANA and can perform his or her own research independently.



A.Belik, N.Fukata, M.Higuchi, S.Moriyama



T.Nagao, J.Nakanishi, Y.Tateyama, S.Tsuda



L.Vayssieres, A.Vinu, Y.Yamauchi, C.Yoshikawa

## ICYS-MANA Researchers (Postdocs)

ICYS-MANA Researcher is a position for postdoctoral fellows selected from all over the world by open recruitment. ICYS-MANA Researchers perform their own research independently by receiving advice from Mentors and MANA Principal Investigators.



S.Achara, J.Chen, X.Fang, U.Gautum



C.Gomez, M.Imura, M.Lee, C.Liu



R.Scipioni, T.Shibata, Y.Shirai, P.Srinivasu

## Research Environment

In order to create one of the world's premier research centers with "global visibility", the following excellent management will be strongly promoted at MANA.

MANA provides a "melting-pot" environment for gathering researchers of different fields, cultures, and nationalities in one space, based on the know-how accumulated in the operation of the NIMS International Center for Young Scientists (ICYS) since 2003. Melting pot environment has characteristics of In<sup>4</sup> ("International", "Interdisciplinary", "Independent", "Innovative").

Young researchers in MANA will be involved in interdisciplin-

ary research in the 3D system with Double-affiliations (MANA and a satellite or affiliated institution), Double-discipline (double specializations), and Double-mentors (Principal Investigators and visiting advisors).

MANA will achieve internationalization at all levels, using English as a common language. Technical and administrative documents are provided in English.

MANA researchers will be able to use many highly sophisticated, world-renowned facilities in NIMS, which include medium- and large-scale devices.

## Goal of MANA

The goal of the MANA concept is not only to develop MANA into a world-top-level research center in the field of nanotechnology/nanomaterials within 10 years, but also to ensure that NIMS itself evolves into the world's top materials

research institute with MANA. MANA and NIMS will develop innovative materials that contribute to realize a sustainable society in the 21st century.

# Upcoming and Past Events

## MANA International Symposium 2009

The MANA International Symposium 2009 will be held from February 25th (Wed) to 27th (Fri) 2009 at the Tsukuba International Congress Center.

Presentations will include:

- Lectures by eight renowned researchers from Japan and abroad.
- Oral and poster presentations by MANA Principal Investigators, MANA Scientists, MANA Independent Scientists and ICYS Researchers.

Everybody is welcome to attend the MANA International Symposium 2009 free of charge (on-site registration is available).

For further information, please visit the symposium web site.

[http://www.nims.go.jp/mana\\_2009/](http://www.nims.go.jp/mana_2009/)

**MANA International Symposium 2009**  
Jointly with ICYS

**Invited Talks:**  
 Prof. Anthony K. Cheetham, University of Cambridge  
 Prof. Kazuyuki Kuroda, Waseda University  
 Prof. Gerhard Wenz, University of Saarland  
 Prof. Masashi Kawasaki, Tohoku University  
 Prof. Roland Wiesendanger, University of Göttingen  
 Prof. Nicola Marzari, Massachusetts Institute of Technology  
 Prof. Kazuhiko Hashimoto, University of Tokyo  
 Prof. Teruo Okano, Tokyo Women's Medical University

**Oral and Poster:**  
 MANA Principal Investigators,  
 MANA Scientists,  
 MANA Independent Scientists and  
 ICYS Researchers

**2009**  
**2/25 (WED) - 27 (FRI)**

Venue: Epochal Tsukuba, Japan  
 Details: [http://www.nims.go.jp/mana\\_2009/](http://www.nims.go.jp/mana_2009/)

### News Release

**May 7, 2008**

Vinu Ajayan, MANA Independent Scientist, received the Asian Excellent Young Researcher Lectureship Award from the president of the Chemical Society of Japan



**July 9, 2008**

Kenji Kitamura, MANA Principal Investigator, won the Inoue Harushige Prize.



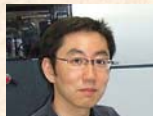
**September 4, 2008**

Kohei Uosaki, MANA Principal Investigator, became International Society of Electrochemistry Fellow.



**September 25, 2008**

Masayoshi Higuchi, MANA Independent Scientist, was awarded the Society of Polymer Science (SPSJ) Hitachi Chemical Award.



**October 6, 2008**

Yoshio Bando, MANA Chief Operating Officer, became American Ceramic Society Fellow.



**October 10, 2008**

Takayoshi Sasaki, MANA Principal Investigator, and Minoru Osada, MANA scientist, were granted the 2008 Tsukuba Prize.



**December 1, 2008**

Naoki Fukata, MANA Independent Scientist, won the MRS Best Poster Award.



**December 11, 2008**

MANA was nationally televised on the NHK Program "Ohayou Nippon (Good Morning Japan)".



### MANA History

- 2007.10.1 Official inauguration of MANA
- 2007.10.18 MANA opening ceremony (at Okura Frontier Hotel Tsukuba).
- 2008.3.10-13 First MANA International Symposium held at NIMS.
- 2008.3.24 MANA signed a MOU with UCLA, USA.
- 2008.4.1 ICYS-MANA started.
- 2008.4.16 First on-site visit by WPI Program Committee members
- 2008.5.6 MANA signed a MOU with the Georgia Institute of Technology, USA.
- 2008.5.20 First Followup Meeting.
- 2008.5.30 MANA signed a MOU with the CNRS, France.
- 2008.6.2 NIMS Overseas Operation Office opened at the University of Washington, USA.
- 2008.6.20 MANA signed a MOU with the University of Cambridge, UK.
- 2008.7.19 Prof. Sir Harry W. Kroto visited MANA.
- 2008.7.28-8.1 Fifth NIMS-IRC-UCLA Nanotechnology Summer School held at NIMS.
- 2008.10.1 Celebration of first anniversary of MANA. Organizational reform of MANA.
- 2008.11.27-28 Second on-site visit by WPI Program Committee members



### Visitors

(April 2008 – January 2009)



**Prof. Carty**  
Canada  
Former National Science Advisor to the Prime Minister



**Prof. Kurzydowski**  
Poland  
Undersecretary of State, Ministry of Science and Higher Education



**Mr. Lim**  
Singapore  
Agency for Science, Technology and Research



**Dr. Umbach**  
Germany  
Chairman of Executive Board, Forschungszentrum Karlsruhe

In addition MANA received a total of 138 international visitors: 46 from the EU, 42 from the USA, 43 from Asia and 7 from other areas.

### New Principal Investigators



Since January 2009  
Prof. Enrico Traversa  
Italy  
from University of Rome



Since January 2009  
Dr. Kazuhito Tsukagoshi  
Japan  
from National Institute of Advanced Industrial Science and Technology



**International Center for Materials Nanoarchitectonics (MANA)**  
National Institute for Materials Science

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 URL: <http://www.nims.go.jp/mana/>

'CONVERGENCE' is the logo of MANA, which functions as an academic melting pot for first-class scientists and researchers from all over the world. It symbolizes the convergence of key nanoarchitectonics technologies used in the development and innovation of new functional materials.

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