



## NanoSquare Newsletter (English) Vol. 9

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# NanoSquare Newsletter

Vol. 9 February 1, 2013



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## The NanoSquare program and the philosophy of the University

**Mr. Tadao Murata**  
Executive Director of General Affairs



Understanding and interpreting the details of the science and technology organized in the NanoSquare program is very difficult for me, so I would like to share my opinions regarding the role of this program.

In order to achieve the principle of this university, “Cutting-edge research for a global age,” the viewpoints of diversity, integration, and globalization have been emphasized and promoted by the university. I have no idea when this principle was established, but have recently been thinking about how they are well-considered viewpoints. In other words, the key to the development of this university lies in the specific arrangements attuned to these viewpoints.

In Japanese, there is the word “不易流行 *fueki ryukou*,” originally came from *Haiku* poetry and refers to a balance between permanence and change. However, especially in traditional fields with reputation, there is a fear that if something is changed, then the field will become weak. As a result, it is difficult to venture out of the current status. This trend is true even for universities. In such an environment, the NanoSquare, which has born in the nano science/material field of great advantage to this university, and is expected to challenge the existing framework, while aiming for realization of the above important viewpoints.

Within those viewpoints, I think diversity has special meaning for young people today. Japan’s social system as a whole, including the educational research field such as a university, is influenced by its aging society with an average age of 45 years, and there seems to be an increasing sense of confinement especially among young people. It becomes more and more important to provide a greater challenge so that they can play a more active role, otherwise survival into the next generation is doubtful. Even at university, positions for researchers are limited due to the low birth rate, and there are few seats for young people. We must establish a new system to develop various career paths and pave the way to activate research. This program can serve as a plausible way to address issues like this.

The activities of the NanoSquare can be viewed as evidence that Osaka Prefectural University is not resisting change for evolution. If these efforts and actions can lead to greater achievements, this program can be considered as a model of diversity, integration, and globalization, with spillover effects into other fields. Furthermore, it can move the university little by little, and greatly affect the development of this university. With such high expectations, I am closely watching this program in the present and the future.

## The Young Scientist's Prize

Commendation for Science and Technology by the Minister of Education, Cultures, Sports, Science and Technology, FY2012

– Research of direct observation of quantum condensates and their motion control by using electron microscopy –

Dr. Yoshihiko Togawa  
Tenure-Track Associate Professor

On April 17, 2012, I attended the ceremony of the commendation for Science and Technology by the Minister of Education, Cultures, Sports, Science and Technology (MEXT), held at the MEXT Hall. “The Young Scientist’s Prize” is granted to young researchers under 40 years old in recognition of their outstanding research achievements that exhibit their ability of performing advanced research and development, such as exploratory and creative researches. This fiscal year, 90 promising young researchers from all over Japan have been awarded this prize. I would like to gratefully acknowledge the opportunity to be recommended for this prestigious award from Osaka Prefecture University (OPU). In the screening process, only published research papers and registered patents and utility models are under examination. In this respect, here, I would like to deeply thank my collaborators those who worked together in research studies related to this achievement, as well. Also, I am really glad to mention that Prof. Seiji Akita at OPU, who is one of the members of the acting committee of the Tenure-Track program and sincerely supports our activity, was granted “the Prize for Science and Technology (Development Category)” in honor of the achievement of “Development of Carbon-nanotube tips.”

It is already four years since I started working at OPU as a faculty member of the Tenure-Track program. I believe that our research activity has been proceeding very well mainly because my students work very hard and enjoy their researches. I hope that I can report good news to you soon again. I appreciate your further support and cooperation to our activities at OPU.



Fig.1: The awarded medal and Dr. Yoshihiko Togawa.

## The 6th NanoSquare Workshop

–5th year of the NanoSquare Program–

NanoSquare Office

The 6th NanoSquare Workshop was held on the Nakamozu Campus of Osaka Prefecture University on October 28, 2012. This open-to-the-public annual event, which uses English as the official language, constitutes a part of the Annual Assessment for TTFMs (Tenure-Track Faculty Members) conducting research at the NanoSquare Research Center. Eleven TTFMs gave presentations in fluent English on the progress they had made in their own cutting-edge research, and responded in Q&A sessions to large audiences drawn from both inside and outside the university. In particular, professors from universities overseas asked the speakers questions and provided constructive advice from extensive viewpoints, highly evaluating their dedication to research, their collaborative approaches, and their social contributions as well as their remarkable research achievements.

The NanoSquare program, entering its 5th year, has led to consistent accomplishments in the direction of fulfilling its mission, which is “fostering world-class advanced young scientists.” It would be a great pleasure if this NanoSquare program can offer young scientists great opportunities to obtain broader perspectives, in addition to hope and a sense of mission, so as to eventually expand to become a part of the contribution to local, national, and even the now borderless global communities.

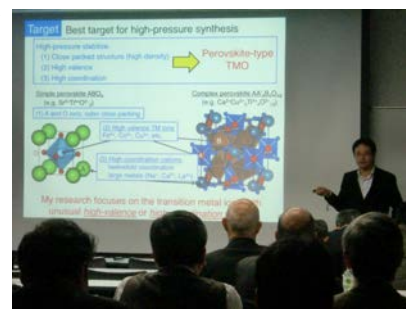


Fig.3: TTFM making presentation in fluent English.



Fig.4: Prof. V. Moshchalkov, external committee member from K. U. Leuven, Belgium.

## The 23rd N2RC Seminar Tenure-Track OPEN LAB-Shirasagi Festival

Program Acting Committee

Prof. Masaya Matsuoka

In the face of an increasing number of environmental issues such as the energy crisis, global warming and environmental pollution, it is highly desirable to develop new chemical processes for environmental protection and renewable energy generation. In order to address these concerns, catalysts, which promote various chemical reactions, have been attracted much attention. The 23rd N2RC Seminar was held on July 27<sup>th</sup>, 2012 with two lecturers, Associate Prof. Kohsuke Mori from Osaka University, and Prof. Jiří Čejka from the Academy of Sciences of the Czech republic, both of whom have been exploring advanced studies on catalysis.

In this seminar, the integration of active sites into the well-ordered porous structures of micro- or meso-porous materials was introduced as a novel concept to design highly functional catalysts. In particular, Associate Professor Mori presented hydrogen production from water under visible light irradiation, and Professor Čejka presented various organic syntheses over novel zeolites. After the presentations, meaningful discussions were conducted with many students. It has been convinced that the seminar was successfully carried out and will encourage future works of participants.



Fig.1: Prof. Čejka in his lecture.



Fig.2: Discussions with students (Prof. Kohsuke Mori).

Tenure-Track Faculty Member

Dr. Yan Xu

On November 2, undergraduate students from Osaka Prefecture University (OPU) and other universities as well as local residents joined the Open Laboratory held by tenure-track faculty members. They experienced short lectures from all our fourteen members. After that, they had comfortable talks with us at a tea party, and visited our research center and laboratories.

This event was a part of the Shirasagi Festival at OPU, aimed at increasing public understanding about our faculty system and to stimulate the students' interest in our cutting-edge research. While some participants said that the event was very interesting and meaningful, others even expressed their willingness to join our research center for their graduation researches, according to the findings of a post-event questionnaire.

On behalf of our faculty members, Dr. Iida, Dr. Kosuga and I planned and organized the event with the support of the other faculty colleagues and students. The messages from the participants were very encouraging, and we will continue our promotional activities so as to attract more and more students and members of the public.



Fig.3: The ambience of the Open Lab.



As one of the regional contributions by NanoSquare program, the 5th NanoSquare Cafe was held on June 22, 2012, where I presented a lecture entitled "Nano World Manipulated by Optical Force and Green- & Bio-Technologies". In the 20th century, high intensity laser was invented, and allowed human beings to manipulate microscopic objects by utilizing "optical force." By using optical tweezers based on such an "optical force," we can realize the trapping, the observation, and the dynamics control of polymer molecules, biological cells and nanoparticles. The lecture had two parts: At the first half, my talk started from lots of applications of "optical force" in various research fields, for example, the space development, the biological science, the natural energy utilization. After the brief interpretation of fundamental principles of the interaction between light and electrons exhibiting quantum wave-like properties in nanoparticles, I introduced examples of the cutting-edge research on the nano optical manipulation. At the second half, I explained the latest achievements of my own research group about the creation of novel photofunctional materials consisting of nanoparticles arranged by the "optical force" and

"fluctuations". As a new trial, particularly, the difference of tones depending on the size of wind instruments was taken for example also through my flute performance in order to give an intuitive illustration of the electronic wave in a nanoparticle. By such an attempt, the speaker entertained the audience with both the visual and the acoustic images of "Nano World Created by Light & Fluctuations". During the lecture, there were many active questions and requests of related documents, and all the staff strongly feels that the event was successfully completed.



Fig.1: Introduction of the world of "Light" & "Fluctuations" through the melody of flute.

## NanoSquare Event Calendar FY2012

### The 2nd NanoSquare Week

The 5th Honor Lecture	February 4, 2013	"Discovery of Carbon Nanotube" Lecturer: Dr. Sumio Iijima (Professor of Meijo University, Director of the Research Center for Advanced Carbon Materials, AIST)
The First NanoSquare International Conference of Nanoscience and Nanotechnology	February 4 to 5, 2013	Invited talks: Dr. Masaki Nakagawa (Tokyo Univ. of Agriculture and Technology), Dr. Toshiro Takabatake (Hiroshima Univ.), Mr. Naoki Saito (MEXT), Dr. Masao Toyoda (JST), Dr. Toshiaki Enoki (JST), Dr. Masatake Haruta (Tokyo Metropolitan Univ.), Dr. Hideo Hosono (Tokyo Institute of Technology), Dr. Victor Moshchalkov (KU, Leuven), Dr. Michel Che (Pierre et Marie Curie Univ.), Dr. Hitotomo Harima (Kobe Univ.), Dr. Setsuko Tajima (Osaka Univ.), Dr. Sumio Iijima (Meijo Univ.), Dr. Masakazu Anpo (OPU), Dr. Takekazu Ishida (OPU)
The 2nd NanoSquare External Panel	February 5, 2013	Presentations and Poster Sessions by 14 tenure-track faculty members

### Orientation to the TT laboratories for motivated students

13th	February 6, 2013	Open Lab at the Nanoscience and Nanotechnology Research Center of OPU Guidance for applicants to the Graduate School about their desired laboratory
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### NanoSquare Café

7th	March 18, 2013	Guest Speaker : Dr. Yasushi Takahashi (N2RC, Osaka Prefecture University)
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MEXT Program to Disseminate Tenure Tracking System

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The front picture shows the campus of Osaka Prefecture University beautifully covered with snow in wintertime.