

Center Director's Vision

I believe that at present the research activity of the Institute for Materials Research, Tohoku University is really one of the world top classes in the field of material science, as evident from the citation analysis of ESI; the top 3 among 536 institutes in the world. According to the citation analysis, Max-Planck is the number 1 and Chinese Academy is number 2 in material science, but they are huge organizations including several separated/independent institutes in different cities. I am very proud of the achievement of IMR, as the Deputy President (2006-2007) of Tohoku University and as a professor in Department of Chemistry.

Although the present activity on material research in our University is high, I think that it is needed to pursue research in the fusion area including chemistry, physical property, material science, electronic/informational engineering, and precision mechanical engineering, in order to accomplish the creation of entirely new materials with innovative functions in the next 10 years. It is essential to understand the chemical and physical properties of bulk materials at atomic and molecular level in order to create entirely new materials with innovative functions. Based on those fundamental understandings and analyses, we are able to create and design the new materials and substances and synthesize them; this research is carried out at the sector one (Creation of New Substances and Materials). Besides this fundamental research area, we need the sector two in which the construction and development of devices derived from the materials and substances are carried out (Device Construction). Since Tohoku University has rather strong background in practical science and in putting research results to practical use, we set the sector three for Material and System Architecture.

The core part of the Tohoku University WPI Research Center for Atom·Molecule·Materials, Advanced Institute for Materials Research (WPI-AIMR), is material science, but the fundamental and basic sciences in physics and physical property exist at the left wing of WPI-AIMR and the fundamental and basic sciences in chemistry exists in the right wing. Accordingly, I want to say that a key word for our WPI-AIMR is "*from atom and molecule to society through materials.*" I will do my best to make feasible the fusion of the left wing-the core part-the right wing, and I strongly hope that we will be able to create a new academic discipline by the fusion approach and to really provide some practically useful materials/substances/devices/mechanics in the next 10 years, contributing to the prosperity and welfare of human beings. Another fusion (or perhaps linking) between the first, second, and third sectors, mentioned above, is needed not only to facilitate the process from discovery to practical use but also to create a new discipline in material science. Consequently, I am going to push the fusion both lengthwise (among three sectors) and horizontally (among three basic

sciences).

Besides the scientific and research issues, I think it is needed to provide the PIs in WPI-AIMR not only enough facilities and space in laboratories but also enjoyable living environments at home, especially for people from abroad. Of course, additional things are needed to attract people from abroad and from domestic institutes in order to make joining this WPI-AIMR feasible. However, I believe that the two factors mentioned above, (1) world leading research activities in new and fused research area and (2) comfortable environments on research place and living zone, are essential to attract world top class researchers, to awaken them joining the WPI-AIMR, and to make the Center visible in the world.

My major is organic chemistry and the specialty is not in the core part of WPI-AIMR but rather at the right wing. I have strong background on molecule-based science and I am familiar, to some extent, with atom-based science. I was a Deputy-President of Tohoku University during April, 2006 – March, 2007, and did the job for evaluating all the Faculties and Institutes of TU. Accordingly, I believe that I will be able to look the whole structure and activity of WPI-AIMR with wide and fair point of view based on basic and applied science, to put forward the management smoothly and efficiently, and to drive WPI-AIMR to the real world top institute for material science with the aid of many smart and bright PIs.

Yoshinori Yamamoto

Director

WPI Advanced Institute for Materials Research

Tohoku University