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Academic Background:

1973年　Nagoya University, Faculty of Engineering, Applied Physics
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Work Experience:

1979 年 나고야대학 응용물리학과 조수
1990年 나고야대학 응용물리학과 조교수
1999年 나고야대학 응용물리학과 교수
2002年 나고야대학　EcoTopia Science Institute 教授 (겸무)

1983 - 1985, Arizona State University (U.S.) 이학부 연구원
1995 - 1996, Oak Ridge National Laboratory(U.S.) 객원연구원
2005 - 2012, Head of high-voltage electron microscope Laboratory
2009 - 2010, Visiting Professor of Helsinki Institute of Technology (Republic of Finland)
2012 - 현재, Director of EcoTopia Science Institute, Nagoya University

주요저서

1. Adavances in Imaging and Electron Physics, 2008
2. High-spatial resolution analysis of interfaces of semiconductor superlattice by using nm-sized electron probe, Control of semiconductor interfaces, 1994
3. Electron Microscopy of Advanced Material Characterization -Nano diffraction-, 1992
4. Handbook of Micro-beam Analysis -Scanning Transmission Electron Microscopy-, 1985
5. STEM of Nanomaterials: Basics of Imaging Analysis

Present Status and Future Prospects of
Advanced TEM/STEM for Study of Nanomaterials

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The present status of spherical aberration(Cs)-corrected TEM/STEM is reviewed from the viewpoint of study of nanomaterials[1]. Characteristic features of the TEM and STEM are explained by using mainly our data. The correction up to the third-order aberrations has been already established[2,3], and the next research interest is correction of fifth-order and chromatic aberrations in combination with the development of a monochromator and a high-energy resolution spectrometor. The latest data of electron energy loss spectroscopy (EELS) are approaching 10 meV energy resolution, which enables phonon spectroscopy in electron microscopes[4].

STEM is the general trend of future electron microscopy, which enables local analyses of elements and physical states (energy band structures) in samples[3]. One of future prospects of Cs-corrected TEM/STEM is the possibility of extending space around samples, which means creation of "Nanolaboratory" inside an objective lens[2]. The wider space should contribute to the ease of performing in-situ, dynamic, 3D and environmental electron microscopy and combination with other physical analyses, for example, by using laser light.

Another recent advancement of electron microscopy is use of new kinds of incident electron waves such as vortex waves[5], spin-polarized waves[6], and pulsed waves[7]. This trend means that electron microscopy and diffraction are truly connected with basic quantum mechanics and laser optics. We shall be able to have wide and various kinds of possibility of the research plan. The future prospects for electron microscopy are given in the last chapter of my textbook[3].

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