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Preface

The Advanced Microscopy and Theoretical Calculations (AMTC) symposium series is organized by the Nanostructures Research Laboratory (NSRL) of the Japan Fine Ceramics Center (JFCC) to provide regular opportunities to discuss state-of-the-art techniques and research involving advanced microscopy and theoretical calculations. The 1st International Symposium on Advanced Microscopy and Theoretical Calculations (AMTC1) took place two years ago, at the Nagoya Congress Center, Nagoya, Japan. During the two-day symposium, 29 oral presentations were given by invited speakers, over 100 posters were presented by researchers, and 330 people from 17 different countries attended. AMTC1 was thus a great success. The second symposium in the biannual series, The 2nd International Symposium on Advanced Microscopy and Theoretical Calculations (AMTC2), is being held from June 24 to 26, 2010. The symposium builds on the legacy of Expo 2005 Aichi, Japan, and is expected to surpass even the success of AMTC1.

The properties of materials strongly depend on their nano- and microstructures, with lattice imperfections such as interfaces, surfaces, dislocations, intrinsic point defects and impurities/dopants, as well as the interactions between them, playing a key role in determining the macroscopic properties of a material. Recent developments in advanced microscopy and computational techniques now make it possible to analyze structure-property relationships quantitatively on both the atomic and electronic levels. Such knowledge leads to the rational design of new materials that are not only excellent in terms of performance but are also superior in terms of environmental protection and sustainable development. AMTC2 aims to provide productive opportunities for participants from universities, industry and research institutes, including students, to learn about cutting-edge R&D, and to take part in the exchange of ideas and information. By bringing together scientists, technologists and engineers from around the globe it is hoped that the symposium will lead to future innovations in this field.

The symposium comprises 30 invited talks and about 100 poster presentations. These presentations cover a broad swathe of materials science and nanotechnology disciplines, and have been organized into the following sections: "Interfaces and Grain Boundaries", "Electron Holography, Lorentz Microscopy and Environmental TEM", "Advanced Microscopy", "Modeling and Simulations", and "AMTC2 Special Topic: Frontiers of Materials Science". This wide range of topics is expected to lead to further scientific and technological breakthroughs, which will ultimately be of benefit both to society and the environment, ensuring a sustainable future for our planet.

This symposium is also being held with support from the Grant-in-Aid for Scientific Research on Priority Areas "Nano Materials Science for Atomic-Scale Modification" from the Ministry of Education, Culture, Sports and Technology (MEXT). Finally we would also like to thank the Chubu Economic Federation for supporting this symposium.

June 24, 2010

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