



A Special Issue on Nanoscale Modeling and Simulation

This special issue of *Journal of Computational and Theoretical Nanoscience* consists of 2 review and 12 research original papers. The increasing power of today's computers forms the basis for an increasing significance of computer simulations in all fields, from quantum mechanics to biology, processes, devices, and applications in nanoscience. This special issue was intended to share very important results in advanced simulations techniques, multiscale modeling, as well as properties and applications to various materials and device problems from the leading research groups in Republic of Korea. A large number of manuscripts were received. After going through a very strict reviewing process, 2 review and 12 research papers were selected for publication in this special issue. One review paper on nanotube oscillators presents important progresses for their properties and applications in outstanding works by means of molecular dynamics simulations. Another review paper on traveling wave photodetectors presents recent advanced model using finite-difference time-domain (FDTD) method. The contributed papers

covers multiscale methods, such as quantum calculation, molecular dynamics, kinetic Monte Carlo, and continuum calculation, and various fields, such as protein, nanotubes, semiconductor processes and devices, subwavelength conducting aperture systems, and X-ray photoelectron spectroscopy. The papers presented in this special issue should be interesting to researchers dealing with computational and theoretical nanoscience.

Guest Editors

Professor Jeong-Won Kang
Chungju National University
Republic of Korea

Dr. Kwang-Ryeol Lee
Korea Institute of Science and Technology
Republic of Korea

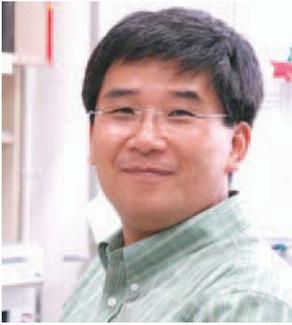
Professor Ho-Jung Hwang
Chung-Ang University
Republic of Korea

ABOUT THE GUEST EDITORS



Jeong-Won Kang received the B.S., M.S., and Ph.D. degrees from Chung-Ang University, Seoul, Korea, in 1995, 1997, and 2002, respectively. From 2003 to 2005, he was a visiting professor in Chung-Ang University, from February 2006 to February 2007, he was a research associate in University of California at Riverside, and from October 2007 to February 2008, he worked with a Senior Researcher with LG Siltron. In February 2008, he joined the Department of Computer Engineering, Chungju National University, Chungju, Republic of Korea, where he is currently an assistant Professor. He has authored over 110 peer reviewed papers in various international journals and two book chapters in Encyclopedia of Nanoscience and Nanotechnology published by American Scientific Publishers and Marcel Dekkers Inc. He received a Bronze Medal of Samsung Human Tech from Samsung Ltd. (2004) and Young Scientist Award from Korean Physical Society (2004). His main interests

are in nano electronic device, semiconductor technology, and process simulation. He is one of editorial board member in *Journal of Computational and Theoretical Nanoscience*.



Kwang-Ryeol Lee, Principal research scientist at the Korea Institute of Science and Technology, received his Ph.D. from Korea Advanced Institute of Science in 1988 by studying the coherence strain effect on discontinuous precipitation. Before joining KIST in 1991, he studied on the rapid solidification of Si-As by pulsed laser annealing in the Division of Applied Science at Harvard University as a postdoctoral research fellow. He started his career at KIST with the synthesis and application of diamond-like carbon films and published about 100 research papers and filed about 20 patents. From 2001, he extended his research to the computational materials science to overcome the limit of the experimental research. His main purpose of the computational research or simulation is to understand the thin film and surface phenomena in atomic scale.



Ho-Jung Hwang was born in Kyeongnam, Korea, in 1946. He received the B.S. degree in electronic engineering from the University of Hanyang, Seoul, Korea, in 1975, and the Dipl. Ing. and Dr. Ing. degrees in electrical engineering from the Technical University of Karlsruhe, Germany, and the Technical University of Munich, Germany, in 1979 and 1982, respectively. During the winter of 1990–1991 he was a Visiting Researcher at the Institute of Solid-State Technology, Munich, and at the Institute of Electronic Devices, Erlangen, Germany, where he worked on semiconductor process simulation. Since 1983 he is a Professor of Electrical and Electronic Engineering at Chung-Ang University, Seoul, Korea. He was the director of Institute of Technique and Science, and the dean of College of Engineering at Chung-Ang University in 2000–2002 and 2003–2005, respectively. He received an Honor Award (1990), Haedong Academic Award (2005) from the Institute of Electronics Engineers of Korea (IEEK) and Academic Awards in Natural Science and Technology at Chung-Ang University in 1987 and 2000. He was also awarded from the Minister of Industry and Materials in Korea for excellence in technical innovation in 2007. His main interests are in semiconductor technology, process/equipment simulation, nanotechnology, and nano simulation. He has co-authored over 200 publications. Dr. Hwang was an editor in chief and vice president of IEEK. He is also a member of the Materials Research Society (MRS).