Sensors and Materials

Special Issue on Unique Physical Behavior at the Nano to Atomic Scales

Call for Papers

"Phenomena hidden in bulk materials become apparent in nanomaterials". This is the size effect of material characteristics, which has always been a fascinating research topic. For example, in nanosized single-crystal silicon, dislocation motion becomes active even at room temperature, and metal nanoparticles exhibit a lower melting point than bulk and altered magnetic properties. These are unique phenomena that occur as materials become smaller in size, especially on the nanometer scale. Even with current experimental and computational technologies, however, many aspects remain unexplored. Size effect phenomena that become apparent in specific size ranges are not only fascinating research topics but also have the potential to spark new industries. In other words, size effect phenomena in materials will open up new directions for future research and development in the world.

This special issue focuses on size effects and new functions brought about by materials, structures, and spaces at the micro-, nano-, and atomic scales. Materials treated in this special issue are not limited to semiconductor device materials, but also include soft materials such as plastics and rubber, biomaterials, gases, and liquids. It covers a wide range of intriguing size effect phenomena observed in all materials or structures in the mechanical, thermal, electrical, chemical, physical, optical, biological, and medical fields. Furthermore, because superior experimental and computational techniques are essential for the study of size effects, this special issue will also cover state-of-the-art related technologies in both experiment and simulation. Papers on applications of size effect phenomena are also welcome. We look forward to receiving your interesting and relevant research papers, especially from active young researchers.

Guest editor: Professor Takahiro Namazu (Kyoto University of Advanced Science)
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Editorial Department of *Sensors and Materials*
MYU K.K.
1-23-3-303 Sendagi, Bunkyo-ku, Tokyo 113-0022, Japan
Tel: +81-3-3827-8549, Fax: +81-3-3827-8547
Email: myukk@myu-inc.jp