

Preface

It is our pleasure to welcome you to the proceedings of the 2013 2nd International Symposium on Quantum, Nano and Micro Technologies (ISQNM 2013), which will be held on December 1-2, 2013, Singapore. Our objective of the conference is to bring together the researchers from academia and industry as well as practitioners to share ideas, problems and solutions relating to the quantum, nano, micro Technologies and material science.

The word “quantum” comes from the Latin “quantus” for “how much”. “Quanta” short for “quanta of electricity” (electrons) was used in a 1902 article on the photoelectric effect by Philipp Lenard, who credited Hermann von Helmholtz for using the word in the area of electricity. However, the word quantum in general was well known before 1900. It was often used by physicians, such as in the term quantum satis. Albert Einstein suggested that radiation existed in spatially localized packets which he called “quanta of light”.

Nano materials is a field that takes a materials science-based approach to nanotechnology. It studies materials with morphological features on the nano scale, and especially those that have special properties stemming from their nano scale dimensions. Nano scale is usually defined as smaller than a one tenth of a micrometer in at least one dimension, though this term is sometimes used for even smaller materials. An important aspect of nanotechnology is the vastly increased ratio of surface area to volume present in many nano scale materials, which makes possible new quantum mechanical effects. However, it becomes pronounced when the nanometer size range is reached. A certain number of physical properties also alter with the change from macroscopic systems. A novel mechanical property of nano materials is a subject of nano mechanics research. Catalytic activities also reveal new behavior in the interaction with biomaterials.

The conference is sponsored by International Materials Science Society, and the proceedings are published by international journal Applied Mechanics and Materials. We would like to thank the organization staff, the members of the Program Committees and the reviewers for their hard work.

The conference was both stimulating and informative with an interesting array of keynote and invited speakers from all over the world. Delegates had a wide range of sessions to choose from. The program consisted of invited sessions, technical workshops and discussions with eminent speakers covering a wide range of topics. This rich program provided all attendees with the opportunity to meet and interact with one another. The selected, peer reviewed paper from ISQNM 2013 focus on five topics: (1) Quantum, Nano, Micro Materials and Technologies, (2) Material Science and Technology, (3) Mechanic Manufacturing System, (4) Information Technologies and Computational Procedures in Engineering Researches and Design, and (5) Related Topics. We expect that the conference and its publications will be a trigger for further related research and technology improvements in this importance subject. It is also our hope that the wide scope of the collection of articles in the book will give a panoramic view of some recent trends in the representation theory of Quantum, Nano and Micro Technologies.

We hope that all participants and other interested readers benefit scientifically from the proceedings and also find it stimulating in the process. We look forward to seeing all of you at the next ISQNM event.

Yuanzhi Wang

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