New Trends, Approaches and Applications in Nanoelectronics and Optoelectronics

Inspired initially by the work of Richard Feynman in 1959, and his famous talk “There is plenty of room at the bottom,” predicting that manipulating and controlling things on a small scale would have an enormous number of applications, nanoscience and nanotechnology moved during the 2000s from laboratory developments to daily life applications. The nanoworld, as understood today, is at the frontier between the level of atoms and molecules, governed by quantum physics, and the macroworld, where materials have bulk properties resulting from the assembly of billions of atoms. The general idea underlying the “nano” concept is that studying or rearranging matter at the molecular or atomic level will yield electrical, chemical, mechanical, or optical properties that are superior to those of the bulk material.

Over the last few decades, there has been a notably fast development in the miniaturization of mechanical microdevices, later known as microelectromechanical systems (MEMS), which combine electrical and mechanical components at a microscale level. The integration of microflow and optical components in MEMS microdevices, as well as the development of micropumps and microvalves, have promoted the interest of several research fields dealing with fluid flow and transport phenomena happening at microscale devices. Microfluidic systems have many advantages over macroscale by offering the ability to work with small sample volumes, providing proper manipulation and control of samples, decreasing reaction times, and allowing parallel operations in one single step. As a consequence, microdevices offer great potential to develop portable and point-of-care diagnostic devices. Moreover, the recent progress of nanotechnology is gaining popularity. It has expanded the areas of application of the microfluidic devices, including the manipulation and analysis of flows on the scale of DNA, proteins, and nanoparticles (nanoflows). The development of nanoelectronics and optoelectronics is an interdisciplinary subject that demands an integration of several research fields, such as biotechnology, medicine, chemistry, informatics, optics, electronics, mechanics, and micro/nanotechnologies.

This Special Issue intends to provide a timely chance to scientists, engineers, and professionals from academia, industries, and governmental laboratories to discuss and summarize new trends, approaches, and applications in nanoelectronics and optoelectronics. It aims to target scientists, engineers from universities, and industry to publish their current high-quality experimental, theoretical and modeling research articles, rapid communications, and state-of-the-art reviews. We require gathering relevant contributions addressed to introduce new ideas, projects, researches results, models, experiences, future trends, etc. Interdisciplinary applications are particularly welcome. We also encourage authors to contribute their codes and experimental data so they are available to the public, which would make our special issue more infusive and attractive. All submitted papers will be reviewed for originality, significance, relevance, and clarity of presentation.

Proposed topics of the special issue include but are not limited to the following:

- Electronic and optical properties of semiconductor, inorganic, organic, and hybrid nanostructures
- Electronic applications of superlattices, quantum structures, and other nanostructures
• Optoelectronic and photonic applications of novel materials and nanostructures
• Nanoelectronic circuits and device integration
• Nanofabrication, processing and characterization techniques
• Information processing and optical communications.

Manuscript Submission:
Manuscripts must be prepared according to Journal’s guidelines, available at http://www.aspbs.com/jno/jno_instructions.htm. All papers submitted to this issue will be subject to a strict peer review process to ensure high quality articles. Please make sure in the cover letter that the submitted paper has not been published previously and is not currently submitted for review to any other journal and will not be submitted elsewhere before a decision is made by this journal. Please notify well in advance all accepted manuscripts shall be paid manuscript processing fees 580 Dollars.

Key Dates:
Manuscript due: December 30, 2020
Authors’ notification: Within one month from submission
Publication date: Papers will be published regular upon acceptance.

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