Guest Editorial

Olena Fesenko^a

Institute of Physics, National Academy of Science of Ukraine, Kiev, Ukraine

Published online: 21 July 2020

© Società Italiana di Fisica and Springer-Verlag GmbH Germany, part of Springer Nature 2020

The Special Issue contains the articles which were presented at the International research and practice conference “Nanotechnology and Nanomaterials” (NANO-2018).

The NANO-2018 Conference was organized by the Institute of Physics of NAS of Ukraine with the participation of the Yuriy Fedkovych Chernivtsi National University (Ukraine), University of Tartu (Estonia), University of Turin (Italy), Pierre and Marie Curie University – Paris 6 (France) and Representative office of Polish Academy of Sciences in Kiev.

NANO-2018 was the fifth conference in the series of NANO-conferences initiated by the Institute of Physics of NAS of Ukraine in 2012 in the framework of FP7 Nanotwining project. From year to year, they attract more attention and participants. In 2012, the first meeting was held in the format of International Summer School for young scientists “Nanotechnology: from fundamental research to innovations.” The 2013 and 2014 conferences were organized in conjunction with the International Summer Schools for young scientists under the same title. In 2013, this event was attended by more than 300 scientists, in 2014–2016, 450 scientists took part, and in 2017, it gathered above 650 participants from Ukraine, Poland, Italy, Estonia, France, Austria, Germany, Greece, Turkey, USA, Romania, Moldova, Czech Republic, Taiwan, Lithuania, Egypt, Iran, India, Algeria, Indonesia and other countries. In 2017, Organizer Committee has received more than 700 application forms from about 25 countries of the world.

The NANO-2018 conference brought together leading scientists and young researchers from many countries of the world. This year its topics were as follows: Nanobiotechnology for health-care; Nanochemistry and biotechnology; Nanocomposites and nanomaterials;

^a e-mail: fesenko@iop.kiev.ua (corresponding author)

Nanoobjects microscopy; Nanooptics and photonics; Nanoplasmonics and surface enhanced spectroscopy; Nanoscale physics; Nanostructured surfaces; and Physico-chemical nanomaterials science.

This special section on nanotechnology gathered high-level articles at the forefront of research which are devoted to: the optical absorption by a nanosystem with dielectric quantum dots; the fabrication and characterization of crystalline $\text{Bi}_2\text{TeO}_5\text{--Bi}_4\text{Si}_3\text{O}_{12}\text{--SiO}_2$ nanocomposite; the existence of both size and “even–odd” effects for the lifetime of carbyne-based nanodevices consisting of two graphene sheets connected by a carbyne chain; the adsorption properties of the silica–titanium mixed oxide; the adsorption properties and application perspectives of BSA films as sensitive coatings for gas sensors; the properties of magnesium ferrite nanoparticles (MgFe_2O_4); the problem of band broadening of SPR, namely an alternative way for the solving of this problem by the use of bimetallic nanostructures on a sculptured template; the structural studies concerning formation of self-assembled indium deposited nanostructures on the (100) surface of In_4Se_3 layered semiconductor; and the possibility of constructing the general dynamic properties of a conduction electron injected into graphene in the rectangular lattice approximation.

I hope that this collection provides a quick overview on recent trends in this emerging field of research.