
# ABSTRACT BOOK

## International research and practice conference:

## NANOTECHNOLOGY AND NANOMATERIALS (NANO-2022)

25-27 August 2022
Lviv, Ukraine

# INTERNATIONAL RESEARCH AND PRACTICE CONFERENCE "NANOTECHNOLOGY AND NANOMATERIALS"

(The NANO-2022 Conference is dedicated to the International Year of Basic Sciences for Sustainable Development)

**25-27 of August 2022**

**Lviv, UKRAINE**

## Abstract book

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This book contains the abstracts of contributions presented at the International research and practice conference "Nanotechnology and Nanomaterials" (NANO-2022).

The NANO-2022 Conference was organized by the Institute of Physics of NAS of Ukraine with the participation of the University of Tartu (Estonia), the Lviv Polytechnic National University, University of Turin (Italy) and Pierre and Marie Curie University – Paris 6 (France).

NANO-2021 was the ninth 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 2014-2017, 450 scientists took part and in 2018 it gathered above 650 participants. In 2021 conference was attended by more than 700 scientists 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 2021 the Organizer Committee has received more than 800 application forms from about 25 countries of the world.

The NANO-2022 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; Nanoobjects microscopy; Nanooptics and photonics; Nanoplasmonics and surface enhanced spectroscopy; Nanoscale physics; Nanostructured surfaces; Physico-chemical nanomaterials science.

Website of the Nano-2022 conference: http://nano-conference.iop.kiev.ua

In order to support the formation of the communications between the scientific and innovation communities the EEN-Ukraine consortium together with EEN partners in Germany organized STARTUP2022 competition for selection 10 the best Ukrainian startups for participation in the Start-up BW Summit, Germany.

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# Nano-engineered cement-based composites: Perspectives of advanced functional materials – a review

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Over the years, nanomaterials were used to modify the fresh and hardened properties of cement-based composites. It was found that inclusion of tiny dosage of nanomaterials have substantial impact on the rheology and workability of fresh composites as well as significantly affects mechanical and durability performance of material. Besides modification of basic engineering properties it was found that incorporation of nanomaterials can endow the composites with various functional properties. Therefore, it is possible to produce so-called smart composites. This consists of self-sensing (e.g. sensing stress, strain, crack, damage, temperature, and smoke), self-heating and self-healing abilities.

This work is aimed to review the recent development in the field of nano-engineered cement-based composites. The impact of selected nanoparticles, including $Fe_2O_3$, $Fe_3O_4$, $TiO_2$ and carbon-based materials (carbon nanotubes, graphene oxide), on the physico-chemical properties of functional materials in cementitious composites are summarized. In addition, the effects of molecular hybrids (core-shell structures) is discussed. In the final part, technology potential, gaps and future perspectives are discussed.

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## Our publications

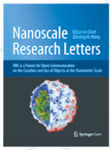
Abstracts Book of the 1st International Summer School (2012)
Abstracts Book of the 1st International Summer School and International Conference NANO-2013
Abstracts Book of the 2-nd International Summer School and International Conference NANO-2014
Abstracts Book of the 3-rd International Conference NANO-2015
Abstracts Book of the 4-th International Conference NANO-2016
Abstracts Book of the 5-th International Conference NANO-2017
Abstracts Book of the 6-th International Conference NANO-2018
Abstracts Book of the 7-th International Conference NANO-2019

O. Fesenko, L.Yatsenko and M. Brodin et al. (eds.), Nanomaterials, Imaging techniques, Surface Studies, and Applications, Springer Proceedings in Physics 146, DOI: 10.1007/978-1-4614-7675-7, ©Springer Science+Business, Media, New York 2013

O. Fesenko, L. Yatsenko (eds.), Nanocomposites, Nanophotonics, Nanobiotechnology, and Applications, Springer Proceedings in Physics 156, DOI: 10.1007/978-3-319-0661-0, ©Springer International Publishing, Switzerland 2014

O. Fesenko, L. Yatsenko, Nanoplasmonics, Nano-Optics, Nanocomposites, and Surface Studies 167, DOI: 10.1007/978-3-319-18543-9, ©Springer International Publishing, Switzerland 2015

O. Fesenko, L. Yatsenko, Nanophysics, Nanophotonics, Surface Studies, and Applications 183, DOI: 10.1007/978-3-319-30737-4, ©Springer International Publishing, Switzerland 2016





Participants of International Summer Schools and International NANO Conferences – published their articles in Special Issue of Springer Open Journal "Nanoscale Research Letters" (in 2013, 2014 and 2015) dedicated to NANO Conferences. Impact Factor of Journal – 2.779.

*www.springer.com/materials/nanotechnology/journal/11671*

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