Nanoelectronics – the highlight of the NANOCON´21 conference

The XIII. international conference NANOCON took place in Brno on October 20th – 22th 2021. In total **280 participants from 19 countries listened 84 lectures and could see 150 posters**. Their common theme was nanomaterials and the latest advances in their research and applications. In the Czech Republic, it is the largest event of its kind, and one of the largest in the Central European region. After a one-year break caused by the coronavirus pandemic, it could take place in the traditional format this year. The Czech Society for New Materials and Technology is co-organizer of this event.

Professor Yury Gogotsi, director of the Drexel Nanomaterials Institute at the Drexel University in Philadelphia (U.S.A.) and currently one of the most world renowned materials scientists, opened the conference with his overview and, to some extent, futuristic lecture. He gave an insight into the world of 2D carbides and nitrides. Thanks to the attractive properties of these nanomaterials (mainly high electronic conductivity and outstanding electromagnetic interference shielding), their promising use in telecommunications, energy or medical and electronic devices is expected.

Nanotechnologies and nanomaterials in electronics was the highlight topic of the NANOCON´21. The reason is obvious. Current society is increasingly dependent on mobile devices, massive quantities of data need to be stored and analyzed, the semiconductor industry is significant driver in the global economy, and high-performance computing supports human actions in science, technology, engineering, medicine, industry and in daily life.

The topic of nanoelectronics resonated in practically all thematic program sections of the NANOCON´21 and also in two plenary lectures. Professor Dieter H. Bimberg from the Technical University of Berlin and the Executive Director of the Chinese-German Center for Green Photonics at Changchun presented the results of his research relating to a novel quantum dot based electronic memories and their advantages, especially long storage times, short write, read and erase time. Professor Tomáš Jungwirth from the Institute of Physics of the CAS in Prague presented excellent discoveries of his team in the field of antiferromagnetic crystals enabling to store electronic data much faster than ever before.

However, the **thematic scope** of the conference lectures was traditionally much broader. In Brno researchers presented their R&D in the preparation, characterization of the properties of nanomaterials and their applications in various sectors, including medicine and the environment. Monitoring and potential toxicity of nanomaterials, as well as their impact on health and the environment were also discussed. Special attention in this direction raised the lecture of Prof. Tomáš Cajthaml from the Faculty of Science, Charles University in Prague, focused on toxicity of microplastics. He presented the results of studies confirming that fish living in the sea and other water sources intensively accumulate small plastic particles (of diameter 1 μ and less) in various organs which significantly burden their organism. And because they are mostly hydrophobic, they cannot be easily removed from the body.

The prize for **the best poster** has been awarded to Rodrigo Ferreira from the Institute of Physics of the CAS. The young scientist in his work presented the results of his study of optoelectronic properties of single-molecule emitters and their aggregates and indicated also the possibilities of their promising use for the development of quantum computers and molecular storage devices and sensors.

Two **Best Lectures for the Young scientists** (up to 33 years of age) has been awarded. The PhD student Hadi Hematian from the Faculty of Electrical Engineering of the Czech Technical University in Prague won the award for his talk relating to the use of zinc oxide as a semiconductor in biomedical and pharmaceutical applications. Jiří Doležal from the Faculty of Mathematics and Physics of Charles University in Prague received the prize for a lecture presenting a developed and easily applicable procedure for effective compensation of high-frequency lines and for determining the size of the transmission function in the GHz band. In the contest named after Dr. Tasilo Prnka – a major promoter of nanotechnology in the Czech Republic, a record number of 34 competitors participated.

The next, 14th NANOCON conference will take place on **19th – 21st October 2022**. It will accentuate the latest scientific and technological challenges **in nanomedicine**. More information can be found at www.nanocon.eu

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