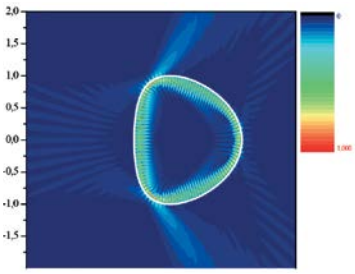
# Alexander Nosich receives the ICO Galileo Galilei Award

**Head of the Laboratory of Micro and Nano Optics, National Academy of Sciences of Ukraine.**



A microcavity laser developed at Prof. Nosich's laboratory.

Professor Alexander I Nosich was born in 1953 in Kharkiv, the second-largest city of Ukraine. He received his combined BSc and MSc, his PhD and his DSc in radio physics from the Kharkiv National University, a highly reputed university established in 1804.

In 1979, he joined the Institute of Radio Physics and Electronics of the National Academy of Sciences of Ukraine (IRE NASU) in Kharkiv, major Ukrainian research and development centre for science and applications of microwaves, millimetre waves and sub-millimetre waves. Currently, he is professor, principal scientist and head of the Laboratory of Micro and Nano Optics at IRE NASU, which he created in 2010.

Prof. Nosich has held numerous guest fellowships and professorships in the EU, Japan, Singapore, and Turkey. They include, among others, a NATO-CNR Guest Researcher Fellowship in the Politecnico di Torino, a Visiting Professor Fellowship of TUBTAK in the Bilkent University, Ankara, an EPSRC Senior Fellowship in the University of Nottingham, and a post as Head of International Research Chair at the European University of Brittany.

Prof. Nosich's field of expertise spans computational electromagnetics across a broad range of frequencies, from optical waves to terahertz waves to microwaves, and concentrates on fundamental topics in wave scattering, absorption, and emission. His research interests include the methods of singular integral equations, analytical regularization, propagation and scattering of electromagnetic waves in open waveguides, simulation of microcavity and nanocavity lasers, and characterization of nano-optical antennas and sensors.

He proposed a powerful approach to the Maxwell-equation analysis of lasers, viewing them as open resonators equipped with active regions filled in with a gain material. Firstly, he applied that approach to the accurate study of modal thresholds and emission directionalities of various two-dimensional microcavity lasers and photonic-molecule lasers. More recently, this analysis was extended to the modes of plasmon-assisted nanocavity lasers, which are based on noble-metal strips or wires embedded into quantum wires. He has also applied it to the comparison of thresholds of the localized-surface-plasmon modes and the so-called grating or lattice modes in the lasers built on the periodic arrays of both metal nanowires and quantum wires. His achievements in the modeling of microcavity and nanocavity lasers are well documented by numerous publications in international journals and enjoy several hundreds of independent citations.

Prof. Nosich was one of the initiators and technical committee chairman and co-chairman of the International Conference on Mathematical Methods in Electromagnetic Theory (MMET) held in Ukraine biennially since 1990. Thanks to his efforts, since the early 2000s MMET conferences feature sessions on computational micro and nano optics and photonics. In 1995, he organized the IEEE East Ukraine Chapter, the first one in the former USSR. Currently, he represents Ukraine in the European Association on Antennas and Propagation. In 2015, he was a convener of the special session on "Advanced computational methods and analysis of optical nanosensors, resonators, and other photonic circuit components" at the EuCAP-2015 conference in Lisbon.

Prof. Nosich with his students at the Laboratory of Micro and Nano Optics in Kharkiv, Ukraine.

These achievements have brought to Prof. Nosich a broad international recognition. He was elected IEEE Fellow in 2004, Senior Member of the Optical Society (OSA) in 2012, and awarded the title of Doctor Honoris Causa of the University of Rennes 1, Rennes, France, in 2015.

Prof. Nosich was awarded the Galileo Galilei Award 2017 "for his contribution from fundamental mathematical physics studies to the modeling of actual devices for photonics and optoelectronics under comparatively difficult circumstances". His outstanding contributions were achieved in unfavourable circumstances of Ukraine, which got independence in 1991, and made a decisive choice to join Europe in 2014. The conditions for doing research in Ukraine became hard after its independence in 1991, due to the lack of access to scientific publications, poor internet connection, and scarce funding, but they became tragic after Ukraine joined Europe, because of the aggression, occupation and annexation of a part of the country. Prof. Nosich faced not only economic hardships (by 2016, GDP of Ukraine had dropped by 2.2 times with respect to 2013 level), but safety and security problems for himself and for his students and co-workers.