ICFO



INSIGHT SEMINAR: Advancing Nanophotonics: From Tailorable Materials to Novel Phenomena

ALEXANDRA BOLTASSEVA

May 30, 2024
12:30 to 13:00
Auditorium

Bio:

Alexandra Boltasseva is a Ron and Dotty Garvin Tonjes Distinguished Professor of Electrical and Computer Engineering with courtesy appointment in Materials Engineering at Purdue University. She received her PhD in electrical engineering at Technical University of Denmark, DTU in 2004. Boltasseva specializes in nanophotonics, quantum photonics, and optical materials. She is the 2023 recipient of the R.W. Wood Prize (Optica, formerly Optical Society of America), 2022 Guggenheim Fellow, 2018 Blavatnik National Award for Young Scientists Finalist and received the 2013 Institute for Electrical and Electronics Engineers (IEEE) Photonics Society Young Investigator Award, 2013 Materials Research Society (MRS) Outstanding Young Investigator Award, the 2011 MIT Technology Review Top Young

Innovator (TR35), the 2009 Young Researcher Award in Advanced Optical Technologies from the University of Erlangen-Nuremberg, Germany, and the Young Elite-Researcher Award from the Danish Council for Independent Research (2008). She is a Fellow of the National Academy of Inventors (NAI), MRS, IEEE, Optica, and SPIE. She served on MRS Board of Directors and is former Editor-in-Chief for Optical Materials Express journal.

Abstract:

The recent advent of tailorable photonic materials such as plasmonic ceramics including transition metal nitrides (TMNs), MXenes, Weyl semimetals and transparent conducting oxides (TCOs) is currently driving the development of new concepts and devices for IT, communication, sustainable energy and quantum technologies. In addition to great tailorability of their optical properties, strong plasmonic behavior, optical nonlinearities, these materials offer pathways to uncovering new optical and quantum phenomena ranging from epsilon-near-zero behavior to transdimensional photonics and strongly correlated systems. In this talk, we explore novel applications of TMNs (titanium nitride, zirconium nitride) and TCOs for flat optics, all-optical switching, high-harmonic-based XUV generation as well as for demonstrating new physical effects in atomically thin, transdimensional plasmonic films related to strong light confinement and metal-to-insulator transition. Our work paves the way to novel phenomena and device design with ultrafast tunable and tailorable optical materials.

** This INSIGHT Seminar will be co-located with that of **VLADIMIR M. SHALAEV** taking pla
e in the ICFO Auditorium from 12-1

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Hosted by: Prof. Dr. Javier Garcia de Abajo