ICFO



# INSIGHT SEMINAR: Extreme Space-Time Optics & Quantum Meta-Photonics

## VLADIMIR M. SHALAEV

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

**Bio:**

Vladimir M. Shalaev, Scientific Director for Nanophotonics at Birck Nanotechnology Center and Distinguished Professor of Electrical and Computer Engineering at Purdue University, specializes in nanophotonics, plasmonics, optical metamaterials and quantum photonics. Prof. Shalaev has received several awards for his research, including the APS Frank Isakson Prize for Optical Effects in Solids, the Max Born Award of the Optical Society of America for his pioneering contributions to the field of optical metamaterials, the Willis E. Lamb Award for Laser Science and Quantum Optics, IEEE Photonics Society William Streifer Scientific Achievement Award, Rolf Landauer medal of the ETOPIM (Electrical, Transport and Optical Properties of Inhomogeneous Media) International Association, the UNESCO Medal for the

development of nanosciences and nanotechnologies, and the OSA and SPIE Goodman Book Writing Award. Prof. Shalaev is recognized as a Highly Cited Researcher in physics by the Web of Science Group for 7 consecutive years, in 2017-2023. He is a Fellow of the IEEE, APS, SPIE, MRS and Optica.

**Abstract:**
We first discuss all-optical modulation with single photons using electron avalanche, resulting in record-high nonlinearities. Then we show that transparent conducting oxides (TCOs) operating in the near-zero index (NZI) regime can provide strong single-cycle modulation, thus enabling novel photonic time crystals. Finally, we discuss scalable quantu photonics with single-photon emitters in silicon nitride that we recently discovered as well a the intriguing possibility to generate indistinguishable single photons by using plasmoni speedup that could enable important quantum photonics applications, including quantu communication and quantum computing

** This INSIGHT Seminar will be co-located with that of **ALEXANDRA BOLTASSEVA** takin place in the ICFO Auditorium from 12-13

**Hosted by:** Prof. Dr. Javier Garcia de Abajo