ICFO Colloquium Series: Shaping Light in Space and Time with Metamaterials

ANDREA ALU

October 02, 2026
10:00 to 11:00
ICFO Auditorium

PROFILE:

? Andrea Alu is a Distinguished Professor at the City University of New York (CUNY), t
e Founding Director of the Photonics Initiative at the CUNY Advanced Science Resear
h Center, and the Einstein Professor of Physics at the CUNY Graduate Center. He received h
s Laurea (2001) and PhD (2007) from the University of Roma Tre, Italy, and, after a postdoc
t the University of Pennsylvania, he joined the faculty of the University of Texas at Austin
n 2009, where he was the Temple Foundation Endowed Professor until 2018. His resear
h interests span over nanophotonics, metamaterials and wave physic
. Dr. Alu is a Fellow of the National Academy of Inventors (NAI), the Italian Academy
f Engineering, the American Association for the Advancement of Science (AAAS), the Institu

e of Electrical and Electronic Engineers (IEEE), the Materials Research Society (MRS), Optic , the International Society for Optics and Photonics (SPIE) and the American Physical Socie y (APS). He is a Senior Fellow of the Simons Society of Fellows and a Life Member of the N w York Academy of Sciences. He is a Highly Cited Researcher since 2017, a Simons Investigat r in Physics, the director of the Simons Collaboration on Extreme Wave Phenomena Based n Symmetries, and the Editor in Chief of Optical Materials Express.

He has received several scientific awards, including the NSF Alan T. Waterman award, the Blavatnik National Award for Physical Sciences and Engineering, the IEEE Kiyo Tomiyasu Award, the ICO Prize in Optics, the Optica Max Born Award, and the URSI Issac Koga Gold Medal.

ABSTRACT:

Metamaterials-artificial structures engineered at the nanoscale-have transformed our ability to control light waves. By designing these materials with specific patterns in space and time, we can unveil remarkable effects and phenomena that do not exist in nature. In this talk, I will discuss our progress in the quest towards extreme of control of light waves by structuring materials in space and time. I will focus on the central role of broken symmetries in this quest: how rotations, structural perturbations, and other material perturbations in space and time give us powerful tools to mold light propagation and scattering, as well as control its coherence. These concepts open the door to phenomena that connect physics, engineering and materials science.

Finally, I will discuss how these principles translate into emerging technologies-from imaging and sensing to more efficient thermal management, sources, computation and communication devices. The goal is to show how fundamental physics can lead to practical innovations and to highlight the exciting opportunities that metamaterials offer to the next generation of scientists and engineers.

** If you require an accommodation to participate in this event due to a disability, please contact the Events Team at events@icfo.eu as soon as possible.

Hosted by: Prof. Dr. Javier Garcia de Abajo