SEMINAR SERIES

PHOTONICS INITIATIVE

ADVANCED SCIENCE RESEARCH CENTER
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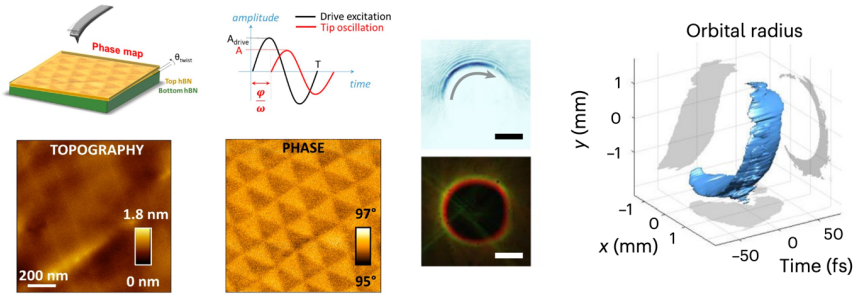
Vectorial Nano-imaging

Abstract – In this seminar, I'll present the different research activities of my research line *Vectorial Nano-imaging* at the Italian Institute of Technology. I will show how we uses Orbital Angular Momentum of light to structure beams in space and time, by also developing new sources that include optical metasurfaces inside the laser cavity. Relative to our scanning probe microscopy activity, I'll present the most recent results on twisted 2D materials that includes the observation of vdW forces modulation in twisted hexagonal boron nitride and the development of mechanical detection of optical near-field.



References:
[1] *Moiré Modulation of Van Der Waals Potential in Twisted Hexagonal Boron Nitride*. ACS Nano 16, 7589 (2022)
[2] *Radially and Azimuthally Pure Vortex Beams from Phase-Amplitude Metasurfaces*. ACS Photonics 10, 290 (2023)
[3] *Vortex laser arrays with topological charge control and self-healing of defects*. Nature Photonics 16, 359 (2022)
[4] *Shapeshifting Diffractive Optical Devices*. Laser and Photonics Reviews 16, 2100514
[5] *Broadband control of topological–spectral correlations in space–time beams*. Nature Photonics (2023) https://doi.org/10.1038/s41566-023-01223-y

Bio – Antonio Ambrosio holds a Master degree in Condensed Matter Physics from the University of Naples Federico II and a PhD degree in Applied Physics from the University of Pisa. From December 2007 to June 2016, Antonio was researcher at the Consiglio Nazionale delle Ricerche. In April 2013, Antonio became Visiting Research Scholar of the John A. Paulson School of Engineering and Applied Sciences of the Harvard University, collaborating with the group of Prof. Federico Capasso in building a nano-imaging spectroscopic facility that allowed imaging of the steered surface plasmon polaritons in one- and two-dimensional metamaterials. Between July 2016 and August 2019, Antonio was Principal Scientist at the Center for Nanoscale Systems at Harvard where he has continued his research activities in nano-photonics. From September 2019, Antonio is PI of the research line named Vectorial Nano-imaging at the Center for Nano Sciences and Technology (CNST) of the Italian Institute of Technology (IIT) in Milan. Antonios's research activity is dedicated to the development of metasurface-based optical nano-devices and new optical near-field imaging and spectroscopy techniques for 2D materials, polymers and nanostructured surfaces. Antonio is member of the Editorial Board of Scientific Reports and Optics Express. He is member of the Materials Research Society and SPIE, and Senior Member of The Optical Society of America.

ANTONIO AMBROSIO
Italian Institute of Technology (IIT)

Date:
Wednesday August 30, 2023

Time:
11:00am – 12:00pm

Location:
5th Fl. Data Visualization Room
85 Saint Nicholas Terrace
New York, NY 10031

Host:
Andrea Alù, Director, Photonics Initiative, ASRC, CUNY GC

This is an in-person seminar. If you opt to join via zoom use Zoom meeting ID 833 1137 5172, Passcode 358846

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