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Optical Metasurfaces: The future of Ultrathin Optics

Dr. Debdatta Ray
INSPIRE Faculty @ IISER Kolkata

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SEPTEMBER 20, 2023 @ 5PM
L413, 4TH FLOOR, LABORATORY COMPLEX

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ABSTRACT

Metasurfaces are the future of ultrathin optics and can be engineered to generate any desired optical output by varying the material and geometry of its constituents called “meta-atoms”. The talk would begin with a brief introduction about metasurfaces and their working principle. The various techniques by which these metasurfaces can be simulated and fabricated shall be discussed. The talk will also include some state-of-the-art applications by manipulating the meta-atoms by several unconventional means i.e. by using alloys or hybrid metal-dielectric as materials or random stealthy hyperuniform pattern as geometry. Some of such applications include plasmonic metalenses, fluorescence enhancement with reduced quenching and improvements in efficiency of solar cells. The talk would conclude with a brief overview on the significance of metasurfaces and how they can be integrated in our everyday life.

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ABOUT THE SPEAKER

Debdatta Ray is currently an INSPIRE Faculty Fellow in the Department of Physical Sciences at IISER Kolkata. Prior to this, she has held post-doctoral positions at IISER Kolkata as a National Post-Doctoral Fellow and at the University of Muenster, Germany with the Women in Research (WIRE) Fellowship. She obtained her PhD from the Swiss Federal Institute of Technology, Lausanne (EPFL, Switzerland) and M.S. (by Research) from IIT Madras. During her PhD, she has undertaken investigation and extensive nanofabrication of various metallic, dielectric and hybrid optical metasurfaces in world class cleanrooms. She is a recipient of the Swiss Government Excellence Scholarship and DAAD IIT Master Sandwich Scholarship during her doctoral and masters programmes respectively.

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