THE CHINESE UNIVERSITY OF HONG KONG

Department of Physics

COLLOQUIUM

Nanophotonic Metasurfaces Loaded by Two-Dimensional Nanomaterials

by

Dr. Guangwei HU (胡光維博士)
Department of Electrical and Computer Engineering
National University of Singapore

Date: *March 2, 2021 (Tuesday)*
Time: *1:30 - 2:30 p.m.*
Join ZOOM Meeting: *https://qrgo.page.link/aNiDk*

ALL INTERESTED ARE WELCOME
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Abstract

Optical Metasurfaces, developed since 2010s, are assemblies of subwavelength artificial structures forming flat devices that have unprecedent powers to manipulate electromagnetic waves for various applications. In parallel, since the experimental discovery of graphene in 2004, two-dimensional (2D) nanomaterials have recently been found to support exotic optoelectronic properties, including nonlinearity, polaritonics, tunabilities and many other properties. In this colloquium, I will show how to merge those two exciting material platforms to achieve advanced multifunctional nanophotonic metasurfaces. I will start from overview of nanophotonics to the state-of-art of functional metasurfaces made conventional plasmonic and dielectric materials, followed by the introduction of optoelectronic properties of 2D materials. With that, I will present two generic strategies to bridge those platforms: synthesizing and structuring. Two examples of advanced nonlinear [1] and polaritonic metasurfaces [2,3] from 2D materials will be provided. Our studies provide the general principle guiding to develop novel advanced nanophotonic meta-devices from emerging 2D materials and are promising for various applications.

1. G. Hu et al, Nature Photonics 13, 467–472 (2019)
2. G. Hu et al, Nano Letters 20, 3217-3224 (2020)
3. G. Hu et al, Nature 582, 209-213 (2020)

Enquiries: 3943 6303