**Light manipulation by natural/artificial two-dimensional materials**

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Understanding of light-matter interaction is now at the core of various research areas as it reveals novel ways of light manipulation. Recently, two-dimensional (2D) natural crystals such as graphene and hexagonal boron nitride have attracted great interest owing to their ability to capture photons in the form of surface polaritons (SPs) with electrical tunability and unprecedentedly long lifetime, while 2D artificial metasurfaces, structured sheets with deep sub-wavelength thickness, have made another distinctive research field by providing diverse opportunities of novel light manipulation.

In this talk, we discuss various topics of light manipulation enabled by these two facets of 2D materials, natural 2D crystals and artificial 2D metasurfaces. Specifically, we introduce recent studies on optical properties of SPs in 2D crystals [1-3], essential for further developments of light manipulation in deep sub-wavelength regimes. Also, we present engineering of novel optical responses provided by artificial 2D metasurfaces, and address several recent achievements including the fractional tunneling resonance that is the counterpart of the Fabry-Perot resonance [4, 5] and the universal impedance matching that allows omnidirectional and frequency-independent anti-reflection [6].

**References**

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