MACQUARIE University

# MQ Photonics Research Centre Seminar

**Wednesday, 20 October 2021, 2:00 pm (Sydney time)**
**(Zoom link: https://macquarie.zoom.us/j/85829287435)**

## Metasurfaces: new generation diffractive optical elements and their applications

**Jaehyuck Jang**

**Pohang University of Science and Technology, South Korea**

**Abstract:**

Metasurfaces, a two-dimensional array of subwavelength meta-atoms, have been actively studied due to their extraordinary capability to shape light. The geometric modification of meta-atoms, i.e. changing shape and arrangements can shape the optical properties of whole metasurfaces such as absorption, transmission, reflection, phase delay, resonant frequency, bandwidth, nonlinear coefficient, and chirality. These modulated optical properties open up opportunities for versatile applications such as holographic storage devices, high-resolution colour displays, optical security tagging, and ultra-thin lenses. In this talk, I will review the fundamentals of metasurfaces and their applications toward new generation display and diffractive optical elements. The state-of-art approaches toward tunable and dynamic metasurfaces will also be introduced. Lastly, I will briefly discuss trends and future directions of planar optics.

**Speaker biography:**

Jaehyuck Jang is a senior Ph.D. student in the Department of Chemical Engineering at Pohang University of Science and Technology (POSTECH) in South Korea under the supervision of Professor Junsuk Rho. His research interests include planar optics and its applications toward next-generation displays, high-Q optical resonators, and light-matter interactions between resonators and quantum emitters. In past years, his studies have been presented in international conferences held by SPIE, MRS, and OSK societies where he belongs as the student member. He won the best student presentation awards in OSJ-OSA-OSK joint symposia, Nano convergence, and ENGE conference.