

### Seminar On

#### IEEE AP-S Young Professional Ambassador Talk Series: Recent Advances in Display-Integrated Millimeter Wave Antennas

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**Director, Core RF/Power Component Research Center for Low-Orbit Next-Generation  
Satellites (LONGS)**

**Ulsan National Institute of Science and Technology (UNIST), Ulsan, South Korea**

**Date** : 6 July 2023 (Thursday)

**Time** : 11:00 am – 12:00 noon

**Onsite (with limited seats) is for City University of Hong Kong (CityU) staff and students only**

**Online (Zoom) is for the participants outside CityU**

**Venue** : Room 15-202, 15/F, Lau Ming Wai Academic Building,

**Registration:** <https://events.vtools.ieee.org/event/register/363759>

#### Abstract

As demands grow for high transmission data rates, low latency, and high reliability, there has been a continuous pursuit of wider bandwidths in wireless communications. This has attracted extensive research interests in millimeter-wave (mmWave) antennas in the fifth-generation (5G) mobile to take advantage of a high-speed transmission network and broader bandwidth than previous cellular technologies. To take those benefits of the mmWave spectrum, an approach of integrating optically-transparent antennas into a display panel, i.e., antenna-on-display (AoD), has been proposed recently. In this talk, we will explore technical challenges when integrating antennas as thin-metal mesh lines on top of the active region of the display area. Some design examples will be presented to overcome strict restrictions on the impedance matching bandwidth, realized gain, efficiency, and polarization without compromising the panel thickness. This talk will be delivered in the sense that both IEEE AP-S members and the general audience will benefit even without a background in electromagnetics.

#### Biography



**Gangil Byun** (S'12, M'15, SM'21) received his B.S. and M.S. degrees in electronic and electrical engineering from Hongik University, Seoul, Korea, in 2010 and 2012, respectively, and his Ph.D. degree in electronics and computer engineering from Hanyang University, Seoul, Korea in 2015.

After his graduation, he returned to Hongik University to work as a Research Professor and performed active research for two years. He joined the faculty of Ulsan National Institute of Science and Technology (UNIST), Ulsan, South Korea, in February 2018, where he is currently an Associate Professor in the department of electrical engineering (EE). He has been serving as a director of the Core RF/Power Component Research Center for Low-Orbit Next-Generation Satellites (LONGS) since 2022. His principal areas of research are in designing and analyzing small antenna arrays for adaptive beamforming applications, such as direction-of-arrival estimation, interference mitigation, and radar. He has actively contributed to improving overall beamforming performances by combining antenna engineering and signal processing

perspectives. His recent research interests also include Huygens' metasurface, satellite antennas, optically invisible antennas, electromagnetic sensors, and waveguide slot array antennas to bring advances in future wireless communication systems.

**\*\*\* ALL ARE WELCOME \*\*\***

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