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IEEE AP-S Young Professionals Lecture (co-sponsored by IEEE AP-S Tokyo Chapter)

“Dielectric Antennas for Wireless Systems at Millimeter-wave Frequencies and Beyond”

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場 所：理学部1号館3階340号室＋ZOOM での開催（事前登録制）

【Abstract】

An antenna mediates between guided-waves and free-space fields, most commonly via acceleration of charges in conductive materials. These accelerating charges will in-turn perturb the free-space electromagnetic fields to which they are coupled, causing radiation of electromagnetic waves. However, this picture implies that antennas must necessarily be made primarily of conductive metal and, although this is suitable for the microwave range, where metals are close to ideal conductors, Ohmic loss unfortunately increases with respect to frequency. To compensate for this, growing interest in reaching higher frequencies has spurred the fundamental re-imagination of antenna design, this time with a dielectric focus. As a result, a working understanding of the wireless systems of the present and future will demand a firm grasp of the core principles of dielectric radiators. This talk will provide an overview spanning from classical microwave-range works, through the mm-wave antennas that low-temperature cofired ceramics have made possible, to contemporary cutting-edge all-dielectric radiators for terahertz and light-waves, which are etched photolithographically from high-purity semiconductors.

【Biography】

Dr. Daniel Headland earned his Ph.D. in Electrical and Electronic Engineering from The University of Adelaide, Australia, in 2017. His doctoral research focused on beamforming of terahertz radiation, with a particular emphasis on the use of efficient silicon microstructures to construct nonuniform metasurfaces. He was awarded the University Doctoral Research Medal and received a Dean’s Commendation for Doctoral Thesis Excellence. From 2018 to 2021, he held a position at Osaka University under the Core Research for Evolutional Science and Technology (CREST) program of the Japan Science and Technology Agency, where he worked on substrateless, all-intrinsic-silicon micro-scale integration platforms. He later received a three-year CONEX-Plus Research Fellowship under the Marie Curie Actions framework at Universidad Carlos III de Madrid, Spain. He is a recipient of the prestigious Discovery Early Career Researcher Award (DECRA) Fellowship. As of late 2024, he is undertaking this research fellowship at his alma mater, The University of Adelaide. He is also serving as a 2025 IEEE AP-S Young Professional, and this presentation is part of the AP-S Young Professionals Ambassador Program.

使 用 言 語 ： 英語（English）
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