



THE CHINESE UNIVERSITY OF HONG KONG
Department of Electronic Engineering

Distinguished Visiting Professor Seminar series



**Emerging Transceiver Architectures and Technologies
for Future Wireless Systems**

Professor Ke WU
Industrial Research Chair, Dept. of Elec. Engineering,
École Polytechnique (University of Montreal)
Montreal, Canada

Date: 8 Aug 2023 (Tuesday)

Time: 2:30 p.m.

Place: Rm 222, Ho Sin Hang Engineering Building, CUHK

Abstract

Data communication, parametric sensing and power transmission are the three fundamental functions of wireless technology. They have so far been independently enabled by various RF and wireless transceivers. Recent transceiver architecture research has spurred the development of emerging system solutions featuring low-power, self-adaptation and scalable integration. In future intelligent systems, the fusion of multiple wireless functions will categorically create many invaluable and lasting benefits in transceiver design frameworks, such as architectural unification, simplification, miniaturization, and reconfiguration, as well as efficiency enhancement, function interplay and cost reduction. This presentation discusses several emerging advances and developments of multifunction transceivers and system integrations over MHz-through-THz. State-of-the-art linear and non-linear interferometric techniques are reviewed with reference to multi-band and multi-structure transceiver hardware development. Circuit-antenna unification, orthogonal mode control, and virtual transceiver matrix concepts are presented. Theoretical and experimental demonstrations including CMOS ICs are exemplified and contextualized in current wireless system developments, such as 5G/6G, IoT and beyond. Future pertinent research topics are also highlighted.

Biography

Dr. Ke Wu is the Industrial Research Chair in Future Wireless Technologies and Professor of Electrical Engineering with the Polytechnique Montréal (University of Montreal), where he is also the Director of the Poly-Grames Research Center. He was the Canada Research Chair in RF and millimeter-wave engineering, the NSERC-Huawei Endowed Chair, and the Founding Director of the Center for Radiofrequency Electronics Research of Quebec. He has authored/co-authored over 1400 referred technical papers, and numerous books/book chapters and filed more than 80 patents. Dr. Wu was the principal initiator and organizer of many conferences and events including the General Chair of the 2012 IEEE MTT-S International Microwave Symposium (IMS – the largest IEEE annual conference), the TPC Co-Chair of the 2020 IEEE International Symposium on Antennas and Propagation (APS). He was the 2016 President of the IEEE Microwave Theory and Technology Society (MTT-S). He also served as the two-terms inaugural representative of the North America in the General Assembly of the European Microwave Association (EuMA). He was the recipient of many awards and prizes including the 2019 IEEE MTT-S Microwave Prize, the 2021 EIC Julian C. Smith Medal, 2022 IEEE MTT-S Outstanding Educator Award, and 2022 IEEE AP-S John Kraus Antenna Award. He was an IEEE MTT-S Distinguished Microwave Lecturer. Dr. Ke Wu is a Fellow of the IEEE, the Canadian Academy of Engineering, and the Academy of Science of the Royal Society of Canada, and the German National Academy of Science and Engineering (acatech).

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

For enquiries: Prof. CHENG Kwok Keung (kkcheng@ee.cuhk.edu.hk), Tel: 3943 8269