



**THE CHINESE UNIVERSITY OF HONG KONG**  
**Department of Electronic Engineering**

**Distinguished Visiting Professor Seminar series**



**Towards Batteryless IoT Networking and Sensing  
System: Radiative Wireless Power Transfer and  
Harmonic Backscattering**

**Professor Ke WU**  
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**Montreal, Canada**

**Date: 18 Aug 2023 (Friday)**

**Time: 2:30 p.m.**

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

**Abstract**

One essential foundation of IoT technology is the development of numerous interrelated IoT sensing and communicating nodes distributed extensively in our environment. Conventional batteries/cords-based powering solutions are certainly not an acceptable long-term and sustainable solution, considering the incurred cost, feasibility, and most of all, environmental impact. A promising and “green” powering alternative solution for IoT networking and sensing devices is recycling omnipresent ambient RF energy. The concept of harnessing wireless energy for powering IoT systems requiring a higher power supply is also feasible through dedicated wireless power base-stations, which can be an effective supplement. To realize RF power scavenging and recycling, this talk focuses on two mainstream techniques: radiative or far-field wireless power transfer (WPT) and harmonic backscattering. As an exploratory study, a survey of ambient RF energy density in the core areas of Montreal is presented first. Then, design and optimization techniques regarding low-power far-field rectifiers and fully passive harmonic transponders are presented.

**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 \*\*\***

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