Distinguished Seminar on

Harvesting Ambient Electromagnetic Energy through Emerging Rectifier Technology

by

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Date : 26 November 2015 (Thursday)
Time : 02:30 pm – 03:30 pm
Venue : Room 15-202, 15/F, meeting room of State Key Laboratory of Millimeter Waves, 15/F, Academic 3, City University of Hong Kong

Abstract

The roadmap evolution and historical milestones of electromagnetic energy conversion and recycling techniques and related breakthroughs are reviewed with emphasis on low-density energy harvesting technologies. Ambient radiofrequency (RF) energy sources are examined in connection with omnipresent wireless system deployment. The effective use and recycling of such an ambient electromagnetic energy are the most relevant and critical issue for the current and future practicability of wireless energy harvesting. In this talk, a set of performance criteria and development considerations, required to meet the need of applications of ambient energy harvesting is derived. A technological outlook of the performances that can be expected from different device technologies is assessed. Promising devices and emerging solutions in the development of ambient energy harvesters are also presented and discussed with a special highlight of our proposed disruptive schemes, which include hybrid energy harvesting approaches and cooperative system design platforms.

Biography

Dr Ke Wu is Professor of electrical engineering, and Canada Research Chair in RF and millimeter-wave engineering at the Ecole Polytechnique (University of Montreal). He has been the Director of the Poly-Grames Research Center and was the Founding Director (2008-2014) of the Center for Radiofrequency Electronics Research of Quebec. He has authored/co-authored over 1000 referred papers, and a number of books/book chapters and more than 30 patents. Dr. Wu has held key positions in and has served on various panels and international committees including the chair of technical program committees, international steering committees and international conferences/symposia. In particular, he was the general chair of the 2012 IEEE MTT-S (Microwave Theory and Techniques Society) International Microwave Symposium. He has served on the editorial/review boards of many technical journals, transactions and letters as well as scientific encyclopedia including editors and guest editors. Dr. Wu is an elected IEEE MTT-S AdCom member and has served as the chair of many standing committees including Transnational Committee, Member and Geographic Activities (MGA) Committee and Technical Coordinating Committee (TCC). He is the 2015 IEEE MTT-S President-Elect and will become the 2016 IEEE MTT-S President. He also serves as the inaugural North-American representative in the General Assembly of the European Microwave Association (EuMA). He was the recipient of many awards and prizes including the inaugural IEEE MTT-S Outstanding Young Engineer Award, the 2004 Fessenden Medal of the IEEE Canada, the 2009 Thomas W. Eadie Medal from the Royal Society of Canada (The Academies of Arts, Humanities and Sciences of Canada), the Queen Elizabeth II Diamond Jubilee Medal, the 2013 Award of Merit of Federation of Chinese Canadian Professionals, the 2014 IEEE MTT-S Microwave Application Award, the 2014 Marie-Victorin Prize (Prix du Québec – the highest distinction of Québec in the Natural Sciences and Engineering), the 2015 Prix d'Excellence en Recherche et Innovation from Polytechnique Montreal (University of Montreal) and the 2015 IEEE Montreal Section Gold Medal of Achievement. He is a Fellow of the IEEE, a Fellow of the Canadian Academy of Engineering (CAE) and a Fellow of the Royal Society of Canada. He was an IEEE MTT-S Distinguished Microwave Lecturer from Jan. 2009 to Dec. 2011.

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

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