



# 学术报告

## ACADEMIC LECTURE

### Power amplifiers and Transmitters for

### Software Defined Radio Systems

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#### Abstract:

The next wave in the information revolution will consist of bringing intelligence to the information and communication technology (ICT) sector, allowing seamless and intelligent networking and communication between different users using different services and operators. This will lead to the convergence of communication technologies, aiming at the development and deployment of cooperative and ubiquitous networks that involve existing and future wireless and satellite communications systems. A critical element in enabling the convergence of different communication systems is the development of software defined radio (SDR) systems that can be used across different frequency bands and for multi-standard applications. This SDR has to be developed to support different frequency carriers and modulation schemes concurrently, in addition to being power- and spectrum-efficient, in order to be able handle high data rates, while being less energy-hungry and more environmentally friendly.

The design of power amplifiers as critical components in any SRD based communication terminal has to be considered closely together with the system architecture, in order to ensure optimal system level performances in terms of quality of signal and power efficiency. This implies the use of adequate transmitter architectures that convert the analog baseband information to architecture-dependent signals, such as in sigma-delta, Polar and LINC architectures. This talk lays out the principles behind SDR Radio systems and examines the design of software-enabled linear and highly efficient RF/DSP co-designed power amplifiers/transmitters for multi-standard and multi-band applications. Recent advances and practical realizations will also be presented and discussed.

#### Biography:

*Fadhel M. Ghannouchi* is Fellow of Engineering Institute of Canada ( ), Fellow of Institution of Engineering and Technology, and IEEE Fellow. Currently he is a professor, Alberta Innovates/Canada Research Chair and Director of the iRadio Laboratory ([www.iradio.ucalgary.ca](http://www.iradio.ucalgary.ca)) in the Department of Electrical and Computer Engineering at the University of Calgary, Alberta. He was with Ecole Polytechnique de Montreal until 2005, where he taught microwave theory and techniques and RF communications systems since 1984. His research interests are in the areas of RF and wireless communications, nonlinear modeling of microwave devices and communications systems, design of power- and spectrum-efficient microwave amplification systems and design of SDR systems for wireless and satellite communications applications. His research has led to over 500 refereed publications and 14 US patents (6 pending), 3 books and 3 spun-off companies.