

# IEEE Distinguish Lecture - Challenges and Trends in Magnetics

Venue: Theater CBA, The University of Hong Kong

Date: 27 May 2016 (Friday)

Time: 19:00-20:30 [Registration and refreshment start at 18:30]

## Abstract

This lecture describes the current state of magnetics in terms of research and design challenges as well as trends and applications. The momentum towards high density, high efficiency power supplies continues unabated. The key to reducing the size of power supplies is high frequency operation and the bottle-neck is the design of the magnetic components. Recent developments in wide band gap devices such as SiC and GaN have opened up the possibilities of higher frequency operation. Current research challenges include magnetic materials with low losses at high frequency, high frequency effects including skin and proximity effects, fringing in gapped inductors and transformers, leakage inductance and packaging. Planar magnetics offer the possibility on improved reliability through automated manufacturing process with repeatable parameters such as inductance and capacitance. Wireless Power Transfer (WPT) offer unlimited opportunities in a range of applications from the Internet of Things (IOT) to wireless charging of electric vehicles. Wearable electronics and energy harvesting depend hugely on magnetic design in the form of microgenerators.

Current trends and applications include planar magnetics, integrated magnetics, Power Supply on Chip (PwrSoC), wireless power transfer, solar generation, wide band gap devices and consumer electronics.

## Speaker

William Gerard Hurley is professor of Electrical Engineering at the National University of Ireland, Galway. He is a Fellow of the IEEE and the 2013 recipient of the IEEE PELS Middlebrook Award for Technical Achievement. Research interests include high frequency magnetics, power quality, and renewable energy systems. Prof. Hurley was appointed Distinguished Lecturer of the IEEE for 2014/15. He has given invited presentations on magnetics in Mexico, Japan, Singapore, Spain, Czech Republic, Hong Kong, China, Australia and USA. He has authored a textbook on magnetics and it was translated into Chinese.



Prof. Hurely received the B.E. degree in Electrical Engineering from the National University of Ireland, Cork in 1974, the M.S. degree in Electrical Engineering from the Massachusetts Institute of Technology, Cambridge MA, in 1976 and the PhD degree at the National University of Ireland, Galway in 1988.

All are welcome to attend this lecture. It is free of charge. As seats are limited, prior registration is recommended. The lecture is recommended for 1.5 CPD hours and certificate will be issued upon request.

Registration link: <http://www.ieee-hk-2pipi.org/Activity-promo>

For enquiry, please contact Dr. C.K. Lee by [cklee@eee.hku.hk](mailto:cklee@eee.hku.hk).

## Organizer:

IEEE (HK) Joint Chapter of Power & Energy Society, Industrial Application Society, Power Electronics Society and Industrial Electronics Society (PES/IAS/PELS/IES JC), with support from the Electrical and Electronic Engineering Department of The University of Hong Kong.

