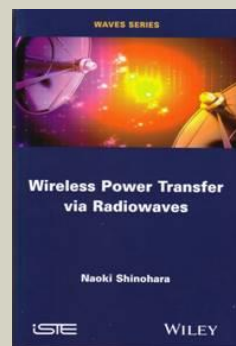


**DEPARTMENT OF ENGINEERING**  
**IEEE MACQUARIE UNIVERSITY STUDENT BRANCH**  
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\* **Friday, 3<sup>rd</sup> March, 2017**

**04.00 pm – 05.00 pm**

**Seminar Room 149, Level 1, Building E6B**

**Macquarie University, Sydney**

# **Current Research & Development of Wireless Power Transfer via Radio Waves and Applications**

Theory, technologies, applications, and current R&D status of the wireless power transfer (WPT) will be presented. The talk will cover both the far-field WPT via radio waves, especially beam-type and ubiquitous-type WPT, and energy harvesting from broadcasting waves. The research of the WPT was started from the far-field WPT via radio waves, in particular the microwaves in 1960s. In recent years this became a hot topic again due to the rapid growth of wireless devices. Theory and technologies of antenna and circuits will be presented in case of beam-type and ubiquitous-type WPT. The industrial applications and current R&D status of the WPT via radio waves will be also presented. Antenna technology for the WPT will be mentioned. In order to increase beam efficiency from a transmitting antenna to a receiving antenna, which is almost 100%, the antennas must put on Fresnel region. We cannot use Friis' transmission formula on Fresnel region. Special technology of the antenna for the WPT will be introduced.

## **Prof. Naoki Shinohara**

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Naoki Shinohara received the B.E. degree in electronic engineering, the M.E. and Ph.D (Eng.) degrees in electrical engineering from Kyoto University, Japan, in 1991, 1993 and 1996, respectively. He was a research associate in the Radio Atmospheric Science Center, Kyoto University from 1996. From 2010, he has been a professor in Research Institute for Sustainable Humanosphere, Kyoto University. He has been engaged in research on Solar Power Station/Satellite and Microwave Power Transmission system. He is IEEE Distinguished Microwave Lecturer, IEEE MTT-S Technical Committee 26 (Wireless Power Transfer and Conversion) vice chair, IEEE MTT-S Kansai Chapter TPC member, IEEE Wireless Power Transfer Conference advisory committee member, international journal of Wireless Power Transfer (Cambridge Press) executive editor, Radio Science for URSI Japanese committee C member, past technical committee chair on IEICE Wireless Power Transfer, Japan Society of Electromagnetic Wave Energy Applications vice chair, Wireless Power Transfer Consortium for Practical Applications (WiPoT) chair, and Wireless Power Management Consortium (WPMc) chair.

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