

# **2019 IEEE PELS Workshop on Emerging Technologies: Wireless Power Transfer (WoW 2019)**

**London, United Kingdom  
18 – 21 June 2019**



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## PROGRAM: WIRELESS POWER WEEK 2019

Tuesday 18 June

### Registration and Opening

- 08:00 Registration & Coffee
- 08:25 Welcome Talk  
*Paul Mitcheson, Hubregt Visser*

### Plenary Talk I

Kelvin Lecture Theatre  
*Chairs: Bart Smolders, Grant Covic*

- 08:55 Wireless Charging: Driving EV Adoption and the Autonomous Future.....N/A  
*Alex Gruzen*  
WiTricity, United States of America

### 09:40 Transit

WPTC Session I – Systems for Power and Data Transfer.....N/A  
Kelvin Lecture Theatre  
*Chairs: Bruno Clerckx, Luca Roselli*

- 09:45 Experimental Analysis of Harvested Energy and Throughput Trade-Off in a Realistic SWIPT System.....N/A  
*Junghoon Kim<sup>1</sup>, Bruno Clerckx<sup>1</sup>, Paul D. Mitcheson<sup>1</sup>*  
<sup>1</sup>Imperial College London, United Kingdom

- 10:00 Experimental Characterization of Narrowband Power Optimized Waveforms.....N/A  
*Takashi Ikeuchi<sup>1</sup>, Yoshihiro Kawahara<sup>1</sup>, Joshua R. Smith<sup>2</sup>*  
<sup>1</sup>University of Tokyo, Japan, <sup>2</sup>University of Washington, United States of America

- 10:15 Power Allocation Method Using Pilot Signal for Simultaneous Transmission of Power and Information.....N/A  
*Nam-I Kim<sup>1</sup>, Dae geun Yang<sup>1</sup>, Ju Yong Lee<sup>1</sup>, Dong-Ho Cho<sup>1</sup>*  
<sup>1</sup>KAIST, South Korea

- 10:30 A New Wireless Power and Data Transmission Circuit for Cochlear Implants.....N/A  
*Iman Abdali Mashhadi<sup>1</sup>, Behzad Poorali<sup>1</sup>, Majid Pahlevani<sup>1</sup>*  
<sup>1</sup>University of Calgary, Canada

- 10:45 Receiving ASK-OFDM in Low Power SWIPT Nodes without Local Oscillators.....N/A  
*Steven Claessens<sup>1</sup>, Ya Ting Chang<sup>1</sup>, Dominique Schreurs<sup>1</sup>, Sofie Pollin<sup>1</sup>*  
<sup>1</sup>University of Leuven, Belgium

- 11:00 A Wideband Efficient Rectifier Design for SWIPT.....N/A  
*Ya Ting Chang<sup>1</sup>, Steven Claessens<sup>1</sup>, Sofie Pollin<sup>1</sup>, Dominique Schreurs<sup>1</sup>*  
<sup>1</sup>University of Leuven, Belgium

### WoW Session I – Magnetic Designs

Turing Lecture Theatre

## PROGRAM: WIRELESS POWER WEEK 2019

Chairs: Jürgen Meins, Christopher Kwan

- 09:45 Optimising Ferrite-Less Pad Reflection Winding with a Multi-Objective Genetic Algorithm..... |  
*Matthew G.S. Pearce<sup>1</sup>, Michael J. O'Sullivan<sup>1</sup>, Claudio Carretero<sup>2</sup>, Grant A. Covic<sup>1</sup>, John T. Boys<sup>1</sup>* |<sup>1</sup>University of Auckland, New Zealand, <sup>2</sup>University of Zaragoza, Spain
- 10:00 Evaluation of Soft Magnetic Composites for Inductive Wireless Power Transfer .....7  
*Daniel Barth<sup>1</sup>, Giuseppe Cortese<sup>2</sup>, Thomas Leibfried<sup>1</sup>*  
<sup>1</sup>Karlsruhe Institute of Technology, Germany, <sup>2</sup>Daimler AG, Germany
- 10:15 Avoiding Null Power Point in DD coils..... | |  
*Manuele Bertoluzzo<sup>1</sup>, Giuseppe Buja<sup>1</sup>, Hemant Dashora<sup>1</sup>*  
<sup>1</sup>University of Padova, Italy
- 10:30 A Dead-Angle-Free Omnidirectional Wireless Power Transfer.....N/A  
*Bowen Zhang<sup>1</sup>, Zhen Zhang<sup>1</sup>, Hongliang Pang<sup>1</sup>, Cong Xie<sup>1</sup>, Xingyu Li<sup>1</sup>, Lin Yang<sup>1</sup>*  
<sup>1</sup>Tianjin University, China
- 10:45 Misalignment Influence on Resonance Shielding in Wireless Power Transfer for Electric Vehicles..... | 6  
*Myrel Alsayegh<sup>1</sup>, Markus Clemens<sup>1</sup>, Benedikt Schmuelling<sup>1</sup>*  
<sup>1</sup>University of Wuppertal, Germany
- 11:00 Reduction of the Shielding Effect on the Coupling Factor of an EV WPT System.....2 |  
*Karim Kadem<sup>1</sup>, Yann Le Bihan<sup>1</sup>, Mohamed Bensetti<sup>1</sup>, Éric Laboure<sup>1</sup>, Antoine Diet<sup>1</sup>, Mustapha Debbou<sup>2</sup>*  
<sup>1</sup>Sorbonne Université, France, <sup>2</sup>Vedecom, France

### Coffee Break

11:15 Coffee Break

### Plenary Talk 2

Kelvin Lecture Theatre

Chairs: Alessandra Costanzo, David Yates

11:40 Market & Future of Global Wireless Power Transfer Industry.....N/A  
*Alexander Gerfer*  
Würth Elektronik, Germany

### Lunch

12:25 Lunch

### Joint Invited Talk 1

Kelvin Lecture Theatre

Chairs: Ron Hui, Nuno Carvalho

13:45 Moving to a World without Wires.....N/A  
*Paul Wiener*  
GaN Systems, United States of America

14:10 Transit

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### WPTC Session 2 – Novel Rectifier Solutions

Kelvin Lecture Theatre

Chairs: Nuno Carvalho, Pedram Mousawi

- 14:15 Input Impedance Calculation of a Multi-Stage Rectifier Circuit.....N/A  
*Hubregt Visser<sup>1</sup>, Hans Pflug<sup>2</sup>, Shady Keyrouz<sup>3</sup>*  
<sup>1</sup>imec, Netherlands, <sup>2</sup>GTX Medical, Netherlands, <sup>3</sup>Antenna Company, Netherlands
- 14:30 GaN Schottky Barrier Diode for Sub-Terahertz Rectenna.....N/A  
*Sei Mizojiri<sup>1</sup>, Kengo Takagi<sup>1</sup>, Kohei Shimamura<sup>1</sup>, Shigeru Yokota<sup>1</sup>, Masafunari Fukunari<sup>2</sup>, Yoshinori Tatematsu<sup>2</sup>, Teruo Saito<sup>2</sup>*  
<sup>1</sup>University of Tsukuba, Japan, <sup>2</sup>University of Fukui, Japan
- 14:45 Design of High Voltage Output for CMOS Voltage Rectifier for Energy Harvesting Design.....N/A  
*Jefferson A. Hora<sup>1</sup>, Eryk Dutkiewicz<sup>1</sup>, Xi Zhu<sup>1</sup>*  
<sup>1</sup>University of Technology Sydney, Australia
- 15:00 Wide Dynamic Range Rectifier Circuit with Varactor Tuning Technique.....N/A  
*Ayako Suzuki<sup>1</sup>, Koshi Hamano<sup>1</sup>, Hayato Shimizu<sup>1</sup>, Hiroshi Okazaki<sup>2</sup>, Yasunori Suzuki<sup>2</sup>, Kunihiro Kawai<sup>2</sup>, Atushi Fukuda<sup>2</sup>, Kenjiro Nishikawa<sup>1</sup>*  
<sup>1</sup>Kagoshima University, Japan, <sup>2</sup>NTT Docomo, Inc., Japan
- 15:15 2.4 GHz CMOS Design RF-to-DC Energy harvesting with Charge Control System for WSN Application.....N/A  
*Jefferson A. Hora<sup>1</sup>, Eryk Dutkiewicz<sup>1</sup>, Xi Zhu<sup>1</sup>*  
<sup>1</sup>University of Technology Sydney, Australia

### WoW Session 2 – System Characterisation

Turing Lecture Theatre

Chairs: Ron Hui, Patrick Hu

- 14:15 Optimal Excitation of Multi-transmitter Wireless Power Transfer System without Receiver Sensors.....25  
*Prasad Jayathurathnage<sup>1</sup>, Fu Liu<sup>1</sup>*  
<sup>1</sup>Aalto University, Finland
- 14:30 Loss Shifted Design of Transcutaneous Energy Transfer Systems.....29  
*Alexander Enssle<sup>1</sup>, Lukas Elbracht<sup>1</sup>, Nejila Parspour<sup>1</sup>, Marco Zimmer<sup>1</sup>, Joerg Heinrich<sup>1</sup>* <sup>1</sup>University of Stuttgart, Germany
- 14:45 Measuring the Q-factor of IPT Magnetic Couplers.....34  
*Gaurav R. Kalra<sup>1</sup>, Matthew G. S. Pearce<sup>1</sup>, Seho Kim<sup>1</sup>, Duleepa J. Thrimawithana<sup>1</sup>, Grant A. Covic<sup>1</sup>*  
<sup>1</sup>University of Auckland, New Zealand
- 15:00 Impedance Measurement on Inductive Power Transfer Systems.....39  
*Marius Hassler<sup>1</sup>, Oguz Atasoy<sup>2</sup>, Morris Kesler<sup>2</sup>, Karl Twelker<sup>2</sup>, Tobias Achatz<sup>3</sup>, Markus Jetz<sup>3</sup>, Josef Krammer<sup>1</sup>*  
<sup>1</sup>BMW Group, Germany, <sup>2</sup>WiTricity Corporation, United States of America, <sup>3</sup>Zollner Elektronik AG, Germany
- 15:15 A Reflected Impedance Estimation Technique for Inductive Power Transfer.....45  
*Lingxin Lan<sup>1</sup>, Juan M. Arteaga<sup>1</sup>, David C. Yates<sup>1</sup>, Paul D. Mitcheson<sup>1</sup>*  
<sup>1</sup>Imperial College London, United Kingdom

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### Poster Session I and Coffee Break

15:30 – 17:00 Poster Session I – WPTC

Chair: Diego Masotti

#### WPTC-PI- Near-Field Links

Maxwell Library

- WPP1 Design of Coil Turn Ratios to Achieve Extensive Load Range and High Efficiency in Wireless Power Transfer System.....N/A  
*Heng-Ming Hsu<sup>1</sup>, Yu-Fu Liu<sup>1</sup>, Jian-Kai Liao<sup>1</sup>, Pang Yu Liu<sup>1</sup>*  
<sup>1</sup>National Chung Hsing University, Taiwan
- WPP2 Using Metallic Coil to Optimize the Heating Efficiency for Tumor Hyperthermia.....N/A  
*Guoxiong Chen<sup>1</sup>, Chenxi Wang<sup>1</sup>, Yuhua Cheng<sup>1</sup>, Gaofeng Wang<sup>1</sup>*  
<sup>1</sup>Hangzhou Dianzi University, China
- WPP3 Virtual Impedance Control for Efficient Power Transfer in Electromagnetic Levitation Melting System.....N/A  
*Moria Elkayam<sup>1</sup>, Yotam Frechter<sup>1</sup>, Idan Sassonker<sup>1</sup>, Alon Kuperman<sup>1</sup>*  
<sup>1</sup>Ben-Gurion University of the Negev, Israel
- WPP4 High Q-factor Coil with Transistorized Negative Impedance Converter for Mobile Applications.....N/A  
*Tae-Hyung Kim<sup>1</sup>, Gi-Ho Yun<sup>2</sup>, Jong-Gwan Yook<sup>1</sup>*  
<sup>1</sup>Yonsei University, South Korea, <sup>2</sup>Sungkyul University, South Korea
- WPP5 Global Optimization Design of Inductively Coupled Power Transfer System Parameter.....N/A  
*Qiang Bo<sup>1,2</sup>, Lifang Wang<sup>1,3</sup>, Tao Chengxuan<sup>1</sup>*  
<sup>1</sup>Institute of Electrical Engineering Chinese Academy of Sciences, China, <sup>2</sup>University of Chinese Academy of Sciences, China, <sup>3</sup>Beijing Co-Innovation Center for Electric Vehicles, China
- WPP6 Modeling of Magnetic Coupled Coil for Wireless Power Transfer in Conductive Medium.....N/A  
*Jongwook Kim<sup>1</sup>, Haerim Kim<sup>1</sup>, Dongwook Kim<sup>1</sup>, Yujun Shin<sup>1</sup>, Chanjun Park<sup>1</sup>, Seungyoung Ahn<sup>1</sup>*  
<sup>1</sup>KAIST, South Korea
- WPP7 A Design Procedure for CPT System with LCL Resonant Network.....N/A  
*Hongfei Xia<sup>1</sup>, Huanhuan Wu<sup>1</sup>, Yuhua Cheng<sup>1</sup>, Gaofeng Wang<sup>1</sup>*  
<sup>1</sup>Hangzhou Dianzi University, China
- WPP8 85-kHz band 450-W Inductive Power Transfer for Unmanned Aerial Vehicle Wireless Charging Port.....N/A  
*Shuichi Obayashi<sup>1</sup>, Yasuhiro Kanekiyo<sup>1</sup>, Kouju Nishizawa<sup>2</sup>, Hiroaki Kusada<sup>2</sup>*  
<sup>1</sup>Toshiba Corporation, Japan, <sup>2</sup>Tepco Research Institute, Japan
- WPP9 Design of Free-Positioning Wireless Power Transfer using A Half-Rectangular Prism Transmitting Coil.....N/A  
*Nam Ha-Van<sup>1</sup>, Hoang Le-Huu<sup>1</sup>, Chulhun Seo<sup>1</sup>*  
<sup>1</sup>Soongsil University, South Korea
- WPP10 Wireless Power Transfer System Using Sub-Wavelength Toroidal Magnetic Metamaterials.....N/A  
*Yuqian Wang<sup>1</sup>, Xu Chen<sup>1</sup>, Yewen Zhang<sup>1</sup>, Kai Fang<sup>1</sup>, Yong Sun<sup>1</sup>, Yunhui Li<sup>1</sup>, Hong Chen<sup>1</sup>*  
<sup>1</sup>Tongji University, China

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- WPP11 Design of Magnetic Shielding Structure for Wireless Charging Coupler.....N/A  
*Heqi Xu<sup>1</sup>, Houji Li<sup>1</sup>, Chunfang Wang<sup>1</sup>*  
<sup>1</sup>Qingdao University, China
- WPP12 Study on Series Printed-Circuit-Board Coil Matrix for Misalignment-Insensitive Wireless Charging.....N/A  
*Jianchao Li<sup>1</sup>, Liming Wang<sup>1</sup>, Fanghui Yin<sup>1</sup>*  
<sup>1</sup>Tsinghua University, China
- WPP13 An Efficiency Optimization Strategy in a Wireless Power Transfer Device Under Seawater.....N/A  
*Wei Gao<sup>1</sup>, Jingjing Jiang<sup>2</sup>, Jianxin Gao<sup>1</sup>, Da Li<sup>1</sup>*  
<sup>1</sup>Naval University of Engineering, China, <sup>2</sup>Central Hospital in Wuhan, China
- WPP14 Optimal Coil Design for Wireless powering of Biomedical Implants Considering Safety Constraints.....N/A  
*Erik Andersen<sup>1</sup>, Binh Duc Truong<sup>1</sup>, Shad Roundy<sup>1</sup>*  
<sup>1</sup>University of Utah, United States of America
- WPP15 Wireless Power Transfer System whose Input / Output Ratio is Determined Only by Self-Inductance.....N/A  
*Kenji Nara<sup>1</sup>, Naofumi Madoiwa<sup>2</sup>, Yasuyoshi Kaneko<sup>1</sup>*  
<sup>1</sup>Saitama University, Japan, <sup>2</sup>Tokyo Institute of Technology, Japan
- WPP16 Alternative Configuration of Open-Bifilar Coil for Self-Resonant Wireless Power Transfer System.....N/A  
*Caio M. de Miranda<sup>1</sup>, Sérgio F. Pichorim<sup>1</sup>*  
<sup>1</sup>Federal University of Technology, Brazil
- WPP17 AC Loss Behavior of Wireless Power Transfer Coils.....N/A  
*Christoph Utschick<sup>1</sup>, Christian Merz<sup>1</sup>, Cem Som<sup>1</sup>*  
<sup>1</sup>Würth Elektronik eiSos GmbH & Co. KG, Germany
- WPP18 Investigation of Magnetic Field Shielding by Mesh Aluminum Sheet in Wireless Power Transfer System.....N/A  
*Cancan Rong<sup>1</sup>, Xiong Tao<sup>1</sup>, Conghui Lu<sup>1</sup>, Minghai Liu<sup>1</sup>*  
<sup>1</sup>Huazhong University of Science and Technology, China
- WPP19 Efficiency Factor Calculation for Contactless Energy Transfer Systems.....N/A  
*Jörg Heinrich<sup>1</sup>, Philipp Präg<sup>1</sup>, Nejila Parspour<sup>1</sup>, David Maier<sup>1</sup>*  
<sup>1</sup>University of Stuttgart, Germany
- WPP20 Current Distribution Analysis for Automatic Resonator Design in Wireless Power Transfer.....N/A  
*Yoshiaki Narusue<sup>1</sup>, Misaki Fujishiro<sup>1</sup>, Yoshihiro Kawahara<sup>1</sup>, Hiroyuki Morikawa<sup>1</sup>* <sup>1</sup>University of Tokyo, Japan
- WPP21 Research on Dynamic Wireless Charging of Electric Vehicle Based on Double LCC Compensation Mode.....N/A  
*Xian Zhang<sup>1</sup>, Jie Wang<sup>1</sup>, Ming Xue<sup>1</sup>, Yang Li<sup>1</sup>, Qingxin Yang<sup>1</sup>* <sup>1</sup>Tianjin Polytechnic University, China
- WPP22 Research on Shield Structure of Inductively Coupled Power Transfer System.....N/A  
*Houji Li<sup>1</sup>, Heqi Xu<sup>1</sup>, Chunfang Wang<sup>1</sup>*  
<sup>1</sup>Qingdao University, China

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- WPP23 Maximum Efficiency Point Tracking in Inductive Links: Series versus Parallel Receiver's Compensation.....N/A  
*Pablo Pérez-Nicoli<sup>1</sup>, Fernando Silveira<sup>1</sup>*  
<sup>1</sup>Universidad de la República, Uruguay
- WPP24 Omni-directional Inductive Wireless Power Transfer with 3D MID inductors.....N/A  
*Kamotesov Sergkei<sup>1</sup>, Philippe Lombard<sup>2</sup>, Vincent Semet<sup>2</sup>, Bruno Allard<sup>2</sup>, Maël Moguedet<sup>1</sup>, Michel Cabrera<sup>2</sup>*  
<sup>1</sup>Smart Plastic Products (S2P), France, <sup>2</sup>Université de Lyon, France
- WPP25 Maximising Inductive Power Transmission using a Novel Analytical Coil Design Approach.....N/A  
*Maryam Heidarian<sup>1</sup>, Samuel J. Burgess<sup>1</sup>, Radhakrishna Prabhu<sup>1</sup>, Nazila Fough<sup>1</sup>*  
<sup>1</sup>Robert Gordon University, United Kingdom
- WPP26 Novel Calculation Model for Bunched Litz Wires.....N/A  
*Christian Roth<sup>1</sup>, Dieter Gerling<sup>1</sup>*  
<sup>1</sup>Universitaet der Bundeswehr Muenchen, Germany
- WPP27 Efficiency Improvement for Three-coil Cooperative Inductive Power Transfer Systems.....N/A  
*Quoc-Trinh Vo<sup>1</sup>, Quang-Thang Duong<sup>1</sup>, Minoru Okada<sup>1</sup>*  
<sup>1</sup>Nara Institute of Science and Technology, Japan
- WPP28 Multiple-Receiver Wireless Power Transfer System Using a Cubic Transmitter.....N/A  
*Hoang Le-Huu<sup>1</sup>, Nam Ha-Van<sup>1</sup>, Chulhun Seo<sup>1</sup>*  
<sup>1</sup>Soongsil University, South Korea
- WPP29 Capacitively Coupled Resonators for Misalignment-Tolerant Wireless Charging through Metallic Cases.....N/A  
*Fabiano Cezar Domingos<sup>1</sup>, Susanna Vital de Campos de Freitas<sup>1</sup>, Rashid Mirzavand<sup>1</sup>, Pedram Mousavi<sup>1</sup>*  
<sup>1</sup>University of Alberta, Canada
- WPP30 Omnidirectional Power Transfer Through the Inductive and Capacitive Coupling Region of .....N/A a Transmitter.....N/A  
*Yen Po Wang<sup>1</sup>, Reo Kometani<sup>1</sup>, Shin'ichi Warisawa<sup>1</sup>* <sup>1</sup>University of Tokyo, Japan
- WPP31 Parallel Resonant Inductive Wireless Power Transfer .....N/A  
*Hans W. Pflug<sup>1,2</sup>, Steven Beumer<sup>2</sup>, Koen Weijand, Tina Bartulović Čulibrk<sup>1</sup>, Jeroen Tol<sup>1</sup>, Hubregt J. Visser<sup>2,3</sup>*  
<sup>1</sup>GTX Medical BV, The Netherlands, <sup>2</sup>Eindhoven University of Technology, The Netherlands, <sup>3</sup>imec / Holst Centre, The Netherlands

### WPTC-P2 -Materials

Siemens Board Room

- WPP32 A Novel Dual Band Defected Ground Structure for Short Range Wireless Power Transfer Applications.....N/A  
*Shalin Verma<sup>1</sup>, Dinesh Rano<sup>1</sup>, Mohammad Hashmi<sup>1,2</sup>*  
<sup>1</sup>IIT Delhi, India, <sup>2</sup>Nazarbajev University, Kazakhstan
- WPP33 Wireless Power Transfer through Low-e Glass .....N/A  
*Shengming Shan<sup>1</sup>, Vincent Hsiao<sup>1</sup>, Ruey-Bing Hwang<sup>2</sup>*  
<sup>1</sup>SWR Technology Inc., United States of America, <sup>2</sup>National Chiao Tung University, Taiwan



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- WPP34 [Designment of Wireless Power Transmitting System with Magnetic Megahertz Metamaterials.....N/A](#)  
*Guo Li<sup>1</sup>, Lifang Lang<sup>1</sup>, Jie Ren<sup>1</sup>, Kai Fang<sup>1</sup>, Yong Sun<sup>1</sup>, Yewen Zhang<sup>1</sup>, Yunhui Li<sup>1</sup>, Hong Chen<sup>1</sup>*<sup>1</sup>Tongji University, China
- WPP35 [An Efficient Metamaterial Based Design of Wireless Power Transfer System .....N/A](#)  
*Pratim Dasmahapatra<sup>1</sup>, Tarakeswar Shaw<sup>1</sup>, Soumyadeep Kal<sup>1</sup>, Debasis Mitra<sup>1</sup>*<sup>1</sup>Indian Institute of Engineering Science and Technology, India
- WPP36 [Qi Compliant Wireless Charger with PCB Integrated Magnetic Material .....N/A](#)  
*Gerald Weis<sup>1</sup>, Ivan Salkovic<sup>1</sup>, Gerald Weidinger<sup>1</sup>, Mario Schober<sup>1</sup>, Johannes Stahr<sup>1</sup>, Ronald Sekavcnik<sup>1</sup>*<sup>1</sup>AT & S Austria Technologie & Systemtechnik Aktiengesellschaft, Austria
- [WPTC-P3 -Data and Energy Transmission](#)  
Siemens Board Room
- WPP37 [Multiple FSK Data and Power Transmission System using Magnetic Resonance Wireless Power Transfer.....N/A](#)  
*Masaki Ishii<sup>1</sup>, Kosuke Yamanaka<sup>1</sup>, Masahiro Sasaki<sup>1</sup>*<sup>1</sup>Shibaura Institute of Technology, Japan
- WPP38 [A Novel Simultaneous Wireless Information and Power Transfer System.....N/A](#)  
*Xin Liu<sup>1</sup>, Xijun Yang<sup>1</sup>, Dianguang Ma<sup>1</sup>, Nan Jin<sup>2</sup>, Xiaoyang Lai<sup>1</sup>, Houjun Tang<sup>1</sup>*<sup>1</sup>Shanghai Jia Tong University, China, <sup>2</sup>Zhengzhou University of Light Industry, China
- WPP39 [125 kHz Wireless Energy and 25 kbps Data Transfer for Wearable Device.....N/A](#)  
*Diyang Gao<sup>1</sup>, Rongpeng Zhai<sup>1</sup>, Peter Baltus<sup>1</sup>, Huib Visser<sup>1</sup>, Hao Gao<sup>1</sup>*<sup>1</sup>Eindhoven University of Technology, The Netherlands
- WPP40 [Data Communication over a Novel Capacitive Resonant Wireless Power Transmission System.....N/A](#)  
*Semion Belau<sup>1</sup>, Susanna Vital de Campos de Freitas<sup>1</sup>, Fabiano Cezar Domingos<sup>1</sup>, Rashid Mirzavand<sup>1</sup>, Pedram Mousavi<sup>1</sup>*<sup>1</sup>University of Alberta, Canada
- WPP41 [Impact of 5G Waveforms on Energy Harvesting Rectifier Performance.....N/A](#)  
*Oludotun Olukoya<sup>1</sup>, Boris Malcic<sup>2</sup>, Djuradj Budimir<sup>1</sup>, Djuradj Budimir<sup>3</sup>*<sup>1</sup>Westminster University, United Kingdom, <sup>2</sup>University of Banja Luka, Bosnia and Herzegovina, <sup>3</sup>University of Belgrade, Serbia
- WPP42 [Mixed-Time Scale Based Adaptive Mode Switching for Dual Mode SWIPT.....N/A](#)  
*Jong Jin Park<sup>1</sup>, Jong Ho Moon<sup>1</sup>, Kang-Yoon Lee<sup>1</sup>, Dong In Kim<sup>1</sup>*<sup>1</sup>Sungkyunkwan University, Korea

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15:15 – 17:00 Poster Session I – WoW

Chair: Christopher Kwan

### WoW-P1 - Optimisation/Economics

Maxwell Library

- WoP1 Parameter Optimization of Modern Tram Wireless Power Transfer Power Supply System.....49  
*Geng Yuyu<sup>1</sup>, Wang Yi<sup>1</sup>, Yang Zhongping<sup>1</sup>, Lin Fei<sup>1</sup>*  
<sup>1</sup>Beijing Jiaotong University, China
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<sup>1</sup>University of Auckland, New Zealand
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<sup>1</sup>Purdue University, United States of America

### WoW-P2 - Magnetic Design

Maxwell Library

- WoP4 Investigation of the Influence of Split Ferrite Tiles in an Inductive Charging System with FEM-Simulation.....65  
*Timo Lämmle<sup>1</sup>, Nejila Parspour<sup>2</sup>, Christian Fuchs<sup>2</sup>*  
<sup>1</sup>MAHLE International GmbH, Germany, <sup>2</sup>University of Stuttgart, Germany
- WoP5 Statistical Model of Foreign Object Detection for Wireless EV Charger.....71  
*Kaiwen Gan<sup>1</sup>, Huan Zhang<sup>1</sup>, Chen Yao<sup>1</sup>, Xiaoyang Lai<sup>1</sup>, Nan Jin<sup>2</sup>, Houjun Tang<sup>1</sup>*  
<sup>1</sup>Shanghai Jiao Tong University, China, <sup>2</sup>Zhengzhou University of Light Industry, China

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Maxwell Library

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*Michal Košík<sup>1</sup>, Jiří Lettl<sup>1</sup>*  
<sup>1</sup>Czech Technical University in Prague, Czech Republic
- WoP7 Quadrature Demodulator based Output Voltage and Load Estimation of a Resonant Inductive WPT Link.....81  
*O. Trachtenberg<sup>1</sup>, A. Shoihet<sup>1</sup>, E. Beer<sup>1</sup>, E. Fux<sup>2</sup>, N. Tiktin<sup>2</sup>, S. Kolesnik<sup>2</sup>, A. Kuperman<sup>2</sup>* <sup>1</sup>Nuclear Research Center of the Negev, Israel, <sup>2</sup>Ben-Gurion University of the Negev, Israel
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*Ali Zakerian<sup>1</sup>, Sadegh Vaez-Zadeh<sup>1</sup>, Amir Babaki<sup>1</sup>*  
<sup>1</sup>University of Tehran, Iran

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*Manuele Bertoluzzo<sup>1</sup>, Rupesh Jha<sup>2</sup>, Giuseppe Buja<sup>1</sup>*  
<sup>1</sup>University of Padova, Italy, <sup>2</sup>Zeal College of Engineering and Research, India
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*Xian Zhang<sup>1</sup>, Xuejing Ni<sup>1</sup>, Qingxin Yang<sup>1</sup>, Bin Wei<sup>2</sup>, Songcen Wang<sup>2</sup>*  
<sup>1</sup>Tianjin Polytechnic University, China, <sup>2</sup>China Electric Power Research Institute, China
- WoP11 Wireless Power At-A-Distance Technology – A Strategy for Nurturing Ecosystem Development.....99  
*Philip Swan<sup>1</sup>*  
<sup>1</sup>Ossia Inc, United States of America
- WoW-P4 – Industrial Design and Applications*  
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*Bingcheng Ji<sup>1</sup>, Katsuhiko Hata<sup>1</sup>, Takehiro Imura<sup>1</sup>, Yoichi Hori<sup>1</sup>, Shuhei Shimada<sup>2</sup>, Osamu Kawasaki<sup>2</sup>*  
<sup>1</sup>University of Tokyo, Japan, <sup>2</sup>Japan Aerospace Exploration Agency, Japan
- WoP13 Strategy for Design of Misalignment Tolerant Inductive Powering System for Medical Implants.....111  
*Arseny Danilov<sup>1</sup>, Eduard Mindubaev<sup>1</sup>, Rafael Aubakirov<sup>1</sup>, Konstantin Gurov<sup>1</sup>, Oleg Surkov<sup>1</sup>, Sergey Selishchev<sup>1</sup>*  
<sup>1</sup>JSC ZITC, Russia
- WoP14 A Wide-Range IPT System for Body Worn Sensors.....116  
*Stephen G. Burrow<sup>1</sup>, Lindsay R. Clare<sup>1</sup>*  
<sup>1</sup>University of Bristol, United Kingdom
- WoP15 Approaching the Power Limit of an Electrodynamics WPTS with Nearly Coupling-Independent Operation.....121  
*Binh Duc Truong<sup>1</sup>, Shad Roundy<sup>1</sup>*  
<sup>1</sup>University of Utah, United States of America
- WoP16 Wireless Motor Drives with a Single Inverter in Primary Side of Power Transfer Systems.....125  
*Amir Babaki<sup>1</sup>, Sadegh Vaez-Zadeh<sup>1</sup>, Mohammad Jahanpour-Dehkordi<sup>1</sup>, Ali Zakerian<sup>1</sup>*  
<sup>1</sup>University of Tehran, Iran
- WoP17 Design of a 30 kW-85 kHz Wireless Power Transfer System for Charging Electric Vehicles.....N/A  
*Leyla Arioua<sup>1</sup>, Hadi Alawieh<sup>1</sup>, Salim Guerroudj<sup>1</sup>*  
<sup>1</sup>VEDECOM institute, France

## PROGRAM: WIRELESS POWER WEEK 2019

Wednesday 19 June

### Registration

08:00 Registration & Coffee

### WPTC Session 3 – Wearable and Biomedical Systems

Kelvin Lecture Theatre

Chairs: Alessandra Costanzo, Alexandru Takacs

- 08:25 An Octave Bandwidth RF Harvesting Tee-Shirt.....N/A  
*José Antonio Estrada<sup>1</sup>, Eric Kwiatkowski<sup>1</sup>, Ana López-Yela<sup>2</sup>, Mónica Borgoños-García<sup>2</sup>, Daniel Segovia-Vargas<sup>2</sup>, Taylor Barton, and Zoya Popović<sup>1</sup>*  
<sup>1</sup>University of Colorado, United States of America, <sup>2</sup>Universidad Carlos III de Madrid, Spain
- 08:40 A Wearable Passive Microwave Fluid Sensor Wirelessly Activated.....N/A  
*Francesca Benassi<sup>1</sup>, Nicola Zincarelli<sup>1</sup>, Diego Masotti<sup>1</sup>, Alessandra Costanzo<sup>1</sup>*  
<sup>1</sup>University of Bologna, Italy
- 08:55 Wireless Power Receiver with Wide Dynamic Range for Biomedical Implants.....N/A  
*Hankyu Lee<sup>1</sup>, Seungchul Jung<sup>1</sup>, Yeunhee Huh<sup>1</sup>, Sang Joon Kim<sup>1</sup>*  
<sup>1</sup>Samsung Advanced Institute of Technology, South Korea
- 09:10 Millimeter-Wave Textile Antenna for On-Body RF Energy Harvesting in Future 5G Networks.....N/A  
*Mahmoud Wagih<sup>1</sup>, Alex S. Weddell<sup>1</sup>, Steve Beeby<sup>1</sup>*  
<sup>1</sup>University of Southampton, United Kingdom
- 09:25 Energy Harvesting of a NFC Flexible Patch for Medical Applications.....N/A  
*Madjda Bouklachi<sup>1</sup>, Marc Biancheri-Astier<sup>1</sup>, Antoine Diet<sup>1</sup>, Yann Le Bihan<sup>1</sup>*  
<sup>1</sup>Sorbonne Université, France
- 09:40 Feasibility Study of a Wireless Power Transfer System Applied to a Left Ventricular Assist Device.....N/A  
*T. Campi<sup>1</sup>, S. Cruciani<sup>1</sup>, F. Orlando<sup>1</sup>, F. Maradei<sup>2</sup>, M. Feliziani<sup>1</sup>*  
<sup>1</sup>University of L'Aquila, Italy

### WoW Session 3 – Multicoil Design

Turing Lecture Theatre

Chairs: David Yates, Jackman Lin

- 08:25 Investigation of a DD2Q Pad Structure for High Power Inductive Power Transfer.....I 29  
*Benny J. Varghese<sup>1</sup>, Abhilash Kamineni<sup>1</sup>, Regan A. Zane<sup>1</sup>*  
<sup>1</sup>Utah State University, United States of America
- 08:40 Analysis of Intermediate Resonant Couplers for High Displacement Inductive Power Transfer.....I 34  
*Ahmad Bilal<sup>1</sup>, Grant Covic<sup>1</sup>, John Boys<sup>1</sup>, Seho Kim<sup>1</sup>*  
<sup>1</sup>University of Auckland, New Zealand

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- 08:55 Magnetic Design of a Q-Coil for a 10 kW DDQ System for Inductive Power Transfer..... I 40  
*Denis Kraus<sup>1</sup>, Hans-Georg Herzog<sup>1</sup>*  
<sup>1</sup>Technical University of Munich, Germany
- 09:10 Reduced Switch Operation of the Tripolar for Interoperability in Inductive Power Transfer..... I 44  
*Kaiquan Sun<sup>1</sup>, Grant A. Covic<sup>1</sup>, Duleepa Thrimawithana<sup>1</sup>, Seho Kim<sup>1</sup>*  
<sup>1</sup>University of Auckland, New Zealand
- 09:25 A Three-Phase Inductive Power Transfer Coil with SAE J2954 WPT3 Magnetic Interoperability..... I 50.....  
*Thorsten Kurpat<sup>1</sup>, Lutz Eckstein<sup>1</sup>*  
<sup>1</sup>RWTH Aachen University, Germany
- 09:40 Power Transferability Analysis of I-SS-Buck Dynamic Wireless Charging System..... I 56  
*Shuangcheng Song<sup>1</sup>, Zhihao He<sup>1</sup>, Chao Cui<sup>1</sup>, Qianfan Zhang<sup>1</sup>*  
<sup>1</sup>Harbin Institute of Technology, China

09:55 Transit

### Plenary Talk 3

Kelvin Lecture Theatre

Chairs: Grant Covic, Alessandra Costanzo

- 10:00 Advances in Wireless Power Transfer Technology & Implanted Medical Devices..... N/A  
*Mirko de Melis*  
Medtronic, United States of America

### Coffee Break

10:45 Coffee Break

### WPTC Session 4 – Microwave Power Converters

Kelvin Lecture Theatre

Chairs: Djuradj Budimir, Kenjiro Nishikawa

- 11:15 Time Trajectory Rectifier Impedance Analysis..... N/A  
*Hans W. Pflug<sup>1</sup>, Hubregt J. Visser<sup>2</sup>*  
<sup>1</sup>GTX Medical BV, The Netherlands, <sup>2</sup>imec / Holst Centre, The Netherlands
- 11:30 Investigation of a GaN-Based Bidirectional Wireless Power Converter Using Resonant Inductive Coupling..... N/A  
*Haimeng Wu<sup>1</sup>, Xiang Wang<sup>1</sup>, Bowen Gu<sup>1</sup>, Volker Pickert<sup>1</sup>*  
<sup>1</sup>Newcastle University, United Kingdom
- 11:45 Comparisons of MOSFET and Relay Switches in Impedance Matching Networks for Wireless Power Transfer..... N/A  
*Cristina A. Alexandru<sup>1</sup>, Dabin Zhu<sup>1</sup>*  
<sup>1</sup>University of Exeter, United Kingdom
- 12:00 A Comparison of Tunnel Diode and Schottky Diode in Rectifier at 2.4 GHz for Low Input Power Region..... N/A  
*Veselin Manev<sup>1</sup>, Huib Visser<sup>1</sup>, Peter Baltus<sup>1</sup>, Hao Gao<sup>1</sup>*  
<sup>1</sup>Eindhoven University of Technology, The Netherlands

## PROGRAM: WIRELESS POWER WEEK 2019

- 12:15 High Sensitive 2.4 GHz Band Rectenna with Direct Matching Topology.....N/A  
*Shunya Tsuchimoto<sup>1</sup>, Kenji Itoh<sup>1</sup>, Keisuke Noguchi<sup>1</sup>, Jiro Ida<sup>1</sup>*  
<sup>1</sup>Kanazawa Institute of Technology, Japan

### WoW Session 4 – Auxiliary Systems and Emissions

Turing Lecture Theatre

Chairs: Ahn Seungyoung, Jae Lee

- 11:15 Effect of Fields Generated Through Wireless Power Transfer on Implantable Biomedical Devices..... I 60  
*Nunzio Pucci<sup>1</sup>, Paul D. Mitcheson<sup>1</sup>, Christopher H. Kwan<sup>1</sup>, David C. Yates<sup>1</sup>*  
<sup>1</sup>Imperial College London, United Kingdom
- 11:30 Conducted Emission in an 85 kHz, 50 kW WPT System with Opposite-Phase Transfer and Spread Spectrum..... I 65  
*Masatoshi Suzuki<sup>1</sup>, Kenichirou Ogawa<sup>1</sup>, Tetsu Shijo<sup>1</sup>, Yasuhiro Kanekiyo<sup>1</sup>, Kazuhiro Inoue<sup>1</sup>, Koji Ogura<sup>1</sup>, Shuichi Obayashi<sup>1</sup>, Masaaki Ishida<sup>1</sup>*  
<sup>1</sup>Toshiba Corporation, Japan
- 11:45 Omnidirectional Vehicle Sensing for Wireless Power Transfer Applications..... I 69  
*Charles A. Robinson<sup>1</sup>, Hao Lu<sup>1</sup>, C. W. Van Neste<sup>1</sup>*  
<sup>1</sup>Tennessee Technological University, United States of America
- 12:00 Wireless Charging in Electric Vehicles: EMI/EMC Risk Mitigation in Pacemakers by Active Coils..... I 73  
*S. Cruciani<sup>1</sup>, T. Campi<sup>1</sup>, F. Maradei<sup>2</sup>, M. Feliziani<sup>1</sup>*  
<sup>1</sup>University of L'Aquila, Italy, <sup>2</sup>Sapienza University of Rome, Italy
- 12:15 Eigenvector Lookup Position Detection Method for Wireless Power Transfer of Electric Vehicles..... I 77  
*Shihui Xu<sup>1</sup>, Huan Zhang<sup>1</sup>, Chen Yao<sup>1</sup>, Dianguang Ma<sup>1</sup>, Nan Jin<sup>2</sup>, Houjun Tang<sup>1</sup>*  
<sup>1</sup>Shanghai Jiao Tong University, China, <sup>2</sup>Zhengzhou University of Light Industry, China

### Lunch

- 12:30 Lunch

### WPTC Session 5 – Unconventional WPT Links

Kelvin Lecture Theatre

Chairs: Naoki Shinohara, Ke Wu

- 13:45 **Invited Talk**  
Millimeter Wave Wireless Power Transmission-Technologies and Applications.....N/A  
*Hooman Kazemi*  
Raytheon, United States of America
- 14:10 Harvesting for Scattering Modulated RF-Signals Receivable by Mobile Telephones.....N/A  
*Matthias Schütz<sup>1</sup>*  
<sup>1</sup>IDP Invent AG, Switzerland

## PROGRAM: WIRELESS POWER WEEK 2019

- 14:25 Study on Antennas for Wireless Power Transfer to In-Line Inspection Robots.....N/A  
*Isami Sato<sup>1</sup>, Naoki Shinohara<sup>1</sup>*  
<sup>1</sup>Kyoto University, Japan
- 14:40 A New Circularly Polarized Antenna Suppressing Surface Wave for Microwave Power Transmission.....N/A  
*Seishiro Kojima<sup>1</sup>, Naoki Shinohara<sup>1</sup>*  
<sup>1</sup>Kyoto University, Japan
- 14:55 An RF-Powered IoT Node for Environment Sensing.....N/A  
*John Nicot<sup>1</sup>, Ludivine Fadel<sup>1</sup>, Thierry Taris<sup>1</sup>*  
<sup>1</sup>University of Bordeaux, France
- 15:10 Compact Dual-Band Rectenna on a New Paper Substrate Based on Air-Filled Technology.....N/A  
*E. Vandelle<sup>1</sup>, G. Ardila<sup>1</sup>, S. Hemour<sup>2</sup>, K. Wu<sup>3</sup>, T.P. Vuong<sup>1</sup>*  
<sup>1</sup>Université Grenoble Alpes, France, <sup>2</sup>Université de Bordeaux, France, <sup>3</sup>Polytechnique Montréal, Canada

### WoW Session 5 – Industrial Design and Applications

Turing Lecture Theatre

Chairs: Richard McMahon, Abhilash Kamineni

- 13:45 **Invited Talk**  
Solution for simplified wireless Inductive Power Transfer.....N/A  
*Jürgen Meins*  
University of Braunschweig, Germany
- 14:10 Thermal Characterisation of a Double-D Pad..... I81  
*Seho Kim<sup>1</sup>, Maedeh Amirpour<sup>1</sup>, Grant Covic<sup>1</sup>, Simon Bickerton<sup>1</sup>*  
<sup>1</sup>University of Auckland, New Zealand
- 14:25 Design and Construction of a 100 W Wireless Charger for an E-Scooter at 6.78 MHz..... I86  
*Christopher H. Kwan<sup>1</sup>, Juan M. Arteaga<sup>1</sup>, David C. Yates<sup>1</sup>, Paul D. Mitcheson<sup>1</sup>*  
<sup>1</sup>Imperial College London, United Kingdom
- 14:40 Contactless Energy Transfer for Inductive Electrically Excited Synchronous Machines..... I91  
*David Maier<sup>1</sup>, Nejila Paspour<sup>1</sup>, Jonas Kurz<sup>1</sup>*  
<sup>1</sup>University of Stuttgart, Germany
- 14:55 Performance of Inductive Power Transfer-based Pavements of Electrified Roads..... I96  
*Ahmed Marghani<sup>1</sup>, Douglas Wilson<sup>1</sup>, Tam Larkin<sup>1</sup>*  
<sup>1</sup>University of Auckland, New Zealand
- 15:10 Inductive Power Delivery with Acoustic Distribution to Wireless Sensors.....202  
*David E. Boyle<sup>1</sup>, Steven W. Wright<sup>1</sup>, Michail E. Kiziroglou<sup>1</sup>, Akshayaa Pandiyan<sup>1</sup>, Eric M. Yeatman<sup>1</sup>*  
<sup>1</sup>Imperial College London, United Kingdom

### Coffee Break

15:25 Coffee Break

15:50 – 17:00 Panel Session – The future of WBG devices in power processing and wireless power

Kelvin Lecture Theatre

Chaired by: Compound Semiconductor Applications Catapult

## PROGRAM: WIRELESS POWER WEEK 2019

Thursday 20 June

### Registration

08:00 Registration & Coffee

### WPTC Session 6 – Antenna and Systems for WPT

Kelvin Lecture Theatre

Chairs: Bart Smolders, Pedram Mousavi

- 08:25 Energy Focusing Through Layout-Based Frequency-Diverse Arrays.....N/A  
*Diego Masotti<sup>1</sup>, Mazen Shanawani<sup>1</sup>, Alessandra Costanzo<sup>1</sup>*  
<sup>1</sup>University of Bologna, Italy
- 08:40 Implementation of a High-Efficient and Simple CPW Rectenna at the 2.45 GHz ISM Radio Band.....N/A  
*Mohamed Mansour<sup>1</sup>, Haruichi Kanaya<sup>1</sup>*  
<sup>1</sup>Kyushu University, Japan
- 08:55 An Efficient RF Power Transfer Scheme using Location-based Phase-controlled Array Antenna.....N/A  
*Eui Bum Lee<sup>1</sup>, Wonshil Kang<sup>1</sup>, Hyunchul Ku<sup>1</sup>*  
<sup>1</sup>Konkuk University, South Korea
- 09:10 Study on Multipath Retrodirective for Efficient and Safe Indoor Microwave Power Transmission.....N/A  
*Taichi Sasaki<sup>1</sup>, Naoki Shinohara<sup>1</sup>*  
<sup>1</sup>Kyoto University, Japan
- 09:25 Efficiency of Wireless Power transfer with a Multi-sine Source Optimized for the Propagation Channel.....N/A  
*Regis Rousseau<sup>1</sup>, Guillaume Villemaud<sup>1</sup>, Florin Hutu<sup>1</sup>*  
<sup>1</sup>University of Lyon, France
- 09:40 Beaming Efficiency of 1-D Frequency-Scanned Based Radiative WPT System for Wireless Sensor Networks.....N/A  
*Miguel Poveda-García<sup>1</sup>, José Luis Gómez-Tornero<sup>1</sup>*  
<sup>1</sup>Technical University of Cartagena, Spain, <sup>2</sup>University of Aveiro, Portugal

### WoW Session 6 – Dynamic IPT

Turing Lecture Theatre

Chairs: Regan Zane, Seho Kim

- 08:25 Charging Infrastructure Design for In-motion WPT Based on Sensorless Vehicle Detection System.....205  
*Katsuhiko Hata<sup>1</sup>, Takehiro Imura<sup>1</sup>, Hiroshi Fujimoto<sup>1</sup>, Yoichi Hori<sup>1</sup>, Daisuke Gunji<sup>2</sup>*  
<sup>1</sup>University of Tokyo, Japan, <sup>2</sup>NSK Ltd., Japan
- 08:40 Push-pull driven Low-cost Coupler Array for Dynamic IPT systems.....209  
*Vahid Zahiri Barsari<sup>1</sup>, Duleepa J Thrimawithana<sup>1</sup>, Grant A. Covic<sup>1</sup>*  
<sup>1</sup>University of Auckland, New Zealand



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- 08:88 Sensorless Automatic Stop Control of Electric Vehicle in Semi-dynamic Wireless Charging System.....214  
*Jirawat Sithinamsuwan<sup>1</sup>, Kensuke Hanajiri<sup>1</sup>, Katsuhiro Hata<sup>1</sup>, Takehiro Imura<sup>1</sup>, Hiroshi Fujimoto<sup>1</sup>, Yoichi Hori<sup>1</sup>*  
<sup>1</sup>University of Tokyo, Japan
- 09:10 Comparison of Single and Three phase Dynamic Charging Systems for Electric Vehicles.....220  
*Van-Binh Vu<sup>1</sup>, Mohamed Dahidah<sup>1</sup>, Volker Pickert<sup>1</sup>, Van-Tung Phan<sup>1</sup>*  
<sup>1</sup>Newcastle University, United Kingdom
- 09:25 One-Sided Magnetic Field Halbach Pad for EV Wireless Charging.....226  
*Mei Su<sup>1,2</sup>, Tao Ling<sup>1,2</sup>, Qi Zhu<sup>1,2</sup>, and Pengcheng Wang<sup>1,2</sup>*  
<sup>1</sup>Central South University, China, <sup>2</sup>Human Provincial Key Laboratory of Power Electronics Equipment and Grid, China
- 09:40 A Concept of Multiphase Dynamic Charging System with Constant Output Power for Electric Vehicles.....229  
*Van-Binh Vu<sup>1</sup>, Mohamed Dahidah<sup>1</sup>, Volker Pickert<sup>1</sup>, Van-Tung Phan<sup>1</sup>*  
<sup>1</sup>Newcastle University, United Kingdom

### Coffee Break

09:55 Coffee Break

### WPTC Session 7 – Capacitive and Inductive WPT

Kelvin Lecture Theatre

*Chairs: Pablo Pérez-Nicoli, Giuseppina Monti*

- 10:25 High Efficient Wireless Power Transfer System for AUV with Multiple Coils and Ferrite under Sea.....N/A  
*Ryosuke Hasaba<sup>1</sup>, Katsuya Okamoto<sup>1</sup>, Tatsuo Yagi<sup>1</sup>, Souichi Kawata<sup>1</sup>, Kazuhiro Eguchi<sup>1</sup>, Yoshio Koyanagi<sup>1</sup>*  
<sup>1</sup>Panasonic Corporation, Japan
- 10:40 Capacitive Resonant System to Charge Devices with Metallic Embodiments.....N/A  
*Susanna Vital de Campos de Freitas<sup>1</sup>, Fabiano Cezar Domingos<sup>1</sup>, Rashid Mirzavand<sup>1</sup>, Pedram Mousavi<sup>1</sup>*  
<sup>1</sup>University of Alberta, Canada
- 10:55 Optimizing the Power Output for a Capacitive Wireless Power Transfer System with N receivers.....N/A  
*Ben Minnaert<sup>1</sup>, Franco Mastri<sup>2</sup>, Alessandra Costanzo<sup>2</sup>, Mauro Mongiardo<sup>3</sup> and Nobby Stevens<sup>4</sup>*  
<sup>1</sup>Odisee University College of Applied Sciences, Belgium, <sup>2</sup>University of Bologna, Italy, <sup>3</sup>University of Perugia, Italy, <sup>4</sup>KU Leuven, Belgium
- 11:10 Multifactorial Rig for Study of Inductive Powering Systems with Arbitrary Orientation of the Coils.....N/A  
*Arseny A. Danilov<sup>1</sup>, Eduard A. Mindubaev<sup>1</sup>, Konstantin O. Gurov<sup>1</sup>*  
<sup>1</sup>JSC ZITC, Russia

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- 11:25 Determination of the Optimal Resonant Condition for Multi-receiver Wireless Power Transfer Systems.....N/A  
*Seung Beop Lee<sup>1</sup>, Mingi Kim<sup>2</sup>, In Gwun Jang<sup>2</sup>*  
<sup>1</sup>Chonbuk National University, South Korea, <sup>2</sup>KAIST, South Korea
- 11:40 A Wireless Charging Coil in Printed Circuit Board with Partially Split Conductors for Low Resistance.....N/A  
*Yujun Shin<sup>1</sup>, Jaehyoung Park<sup>1</sup>, Haerim Kim<sup>1</sup>, Bumjin Park<sup>1</sup>, Jongwook Kim<sup>1</sup>, Chanjun Park<sup>1</sup>, Seungyoung Ahn<sup>1</sup>*  
<sup>1</sup>KAIST, South Korea

### WoW Session 7 – High Frequency WPT

Turing Lecture Theatre

Chairs: Burak Ozpineci, Juan Arteaga

- 10:25 Quarter Wavelength Surface Structures for Improved Operation in Unipolar Capacitive Power Transfer.....234  
*Donald Chaney<sup>1</sup>, Charles A. Robinson<sup>1</sup>, C. W. Van Neste<sup>1</sup>*  
<sup>1</sup>Tennessee Technological University, United States of America
- 10:40 A Phase-controlled Stacked-transmitter Wireless Power Transfer System for Magnetic Field Beamforming.....238  
*Ning Kang<sup>1</sup>, Ming Liu<sup>2</sup>, Chengbin Ma<sup>1</sup>*  
<sup>1</sup>Shanghai Jiao Tong University, China, <sup>2</sup>Princeton University, United States of America
- 10:55 High Power Density Stacked-Coils Based Power Receiver for MHz Wireless Power Transfer.....244  
*Jibin Song<sup>1</sup>, Ming Liu<sup>2</sup>, Minfan Fu<sup>3</sup>, Chengbin Ma<sup>1</sup>*  
<sup>1</sup>Shanghai Jiao Tong University, China, <sup>2</sup>Princeton University, United States of America, <sup>3</sup>ShanghaiTech University, China
- 11:10 Design of a Switchable Driving Coil for Magnetic Resonance Wireless Power Transfer.....249  
*Yelzhas Zhaksylyk<sup>1</sup>, Ulrik Hanke<sup>1</sup>, Mehdi Azadmehr<sup>1</sup>*  
<sup>1</sup>University of South-Eastern Norway, Norway
- 11:25 E-Field Analysis of a 3D Capacitive Power Transfer Configuration with Single Source Excitation.....253  
*Qi Zhu<sup>1,2</sup>, Lixiang Jackie Zou<sup>3</sup>, Mei Su<sup>1,2</sup>, Aiguo Patrick Hu<sup>3</sup>*  
<sup>1</sup>Central South University, China, <sup>2</sup>Human Provincial Key laboratory of power Electronics Equipment and Grid, China, <sup>3</sup>University of Auckland, New Zealand
- 11:40 Compactly Assembled Transmitting and Receiving Modules with Shield for Capacitive Coupling Power Transfer System.....257  
*Aam Muharam<sup>1,3</sup>, Mitsuru Masuda<sup>2</sup>, Reiji Hattori<sup>1</sup>, Abdul Hapid<sup>3</sup>*  
<sup>1</sup>Kyushu University, Japan, <sup>2</sup>Furukawa Electric Co., Japan, <sup>3</sup>Indonesian Institute of Sciences, Indonesia

### Lunch

- 11:55 Lunch

## PROGRAM: WIRELESS POWER WEEK 2019

### WPTC Session 8 – Novel Transmitter Architectures

Kelvin Lecture Theatre

Chairs: Bart Smolders, Simon Hemour

- 13:20 **Invited Talk**  
WPT: from  $\mu\text{W}/\text{cm}^2$  harvesting to kW capacitive powering.....N/A  
*Zoya Popovic*  
University of Colorado, United States of America
- 13:45 2.45-GHz Wireless Power Transmitter with Dual-Polarization-Switching Cantenna for LED Accessories.....N/A  
*Kosuke Yoshida<sup>1</sup>, Norifumi Kashiya<sup>1</sup>, Miho Kanemoto<sup>1</sup>, Shogo Umemoto<sup>1</sup>, Hisashi Nishikawa<sup>1</sup>, Ami Tanaka<sup>1</sup>, Takakuni Douseki<sup>1</sup>*  
<sup>1</sup>Ritsumeikan University, Japan
- 14:00 Thermal Performance of Class-FF Converter Used for Wireless Power Transfer in Retinal Implants.....N/A  
*Iman Abdali Mashhadi<sup>1</sup>, Behzad Poorali<sup>1</sup>, Majid Pahlevani<sup>1</sup>*  
<sup>1</sup>University of Calgary, Canada
- 14:15 Development of an Automatic Bidirectional Wireless Charging System for Mobile Devices.....N/A  
*James Washak<sup>1</sup>, Cristina Alexandru<sup>1</sup>, Dabin Zhu<sup>1</sup>*  
<sup>1</sup>University of Exeter, United Kingdom
- 14:30 Implementation of Constant Current Performance of 13.56MHz Wireless Power Transfer System.....N/A  
*Heng-Ming Hsu<sup>1</sup>, Yan-Kai Huang<sup>1</sup>, Tung-Lin Wu<sup>1</sup>*  
<sup>1</sup>National Chung Hsing University, Taiwan
- 14:45 A Distributed, Phase-locked, Class-E, RF Generator with Automatic Zero-Voltage Switching.....N/A  
*Robert A. Moffatt<sup>1</sup>, Trevor Howarth<sup>1</sup>, Connor Gafner<sup>1</sup>, Jeffrey J. Yen<sup>1</sup>, Feng-Kai Chen<sup>1</sup>, Josh Yu<sup>1</sup>*  
<sup>1</sup>Etherdyne Technologies Inc., United States of America

### WoW Session 8 – Converter Design & Control

Turing Lecture Theatre

Chairs: Volker Pickert, Duleepa Thrimawithana

- 13:20 **Invited Talk**  
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*Burak Ozpineci*  
Oak Ridge National Laboratory, United States of America
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<sup>1</sup>Oregon Institute of Technology, United States of America

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<sup>1</sup>Delft University of Technology, The Netherlands
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<sup>1</sup>Key Laboratory of Power Electronics and Electric Drives Institute of Electrical Engineering Chinese Academy of Sciences, China, <sup>2</sup>University of Chinese Academy of Sciences, China, <sup>3</sup>Beijing Co-Innovation Center for Electric Vehicles
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<sup>1</sup>Oregon Institute of Technology, United States of America

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- WPP43 Improving Conversion Loss Performance of Fully Passive Harmonic Transponder at Low Temperature.....N/A  
*Xiaoqiang Gu<sup>1</sup>, Simon Hemour<sup>2</sup>, Ke Wu<sup>1</sup>*  
<sup>1</sup>Polytechnique Montreal, Canada, <sup>2</sup>University of Bordeaux, France
- WPP44 DIY Electromagnetic Phantoms for Biomedical Wireless Power Transfer Experiments.....N/A  
*Tom van Nunen<sup>1</sup>, Esmee Huismans<sup>1</sup>, Rob Mestrom<sup>1</sup>, Mark Bentum<sup>1</sup>, Hubregt Visser<sup>1</sup>*  
<sup>1</sup>Eindhoven University of Technology, The Netherlands
- WPP45 Voltage Multiplier Rectifier with Second Harmonic Resonance for Wireless Power Transfer System.....N/A  
*Juwan Kim<sup>1</sup>, Wonshil Kang<sup>1</sup>, Hyunchul Ku<sup>1</sup>*  
<sup>1</sup>Konkuk University, South Korea
- WPP46 Demonstration of Sub-Terahertz Coplanar Rectenna using 265 GHz Gyrotron.....N/A  
*Sei Mizojiri<sup>1</sup>, Kengo Takagi<sup>1</sup>, Kohei Shimamura<sup>1</sup>, Shigeru Yokota<sup>1</sup>, Masafumi Fukunari<sup>2</sup>, Yoshinori Tatematsu<sup>2</sup>, Teruo Saito<sup>2</sup>*  
<sup>1</sup>University of Tsukuba, Japan, <sup>2</sup>University of Fukui, Japan
- WPP47 The Logistics System by Rotary Wing Unmanned Aerial Vehicle with 28GHz Microwave Power Transmission.....N/A  
*Satoru Suganuma<sup>1</sup>, Duc Hung Nguyen<sup>2</sup>, Yuma Nishioka<sup>1</sup>, Kohei Shimamura<sup>1</sup>, Koichi Mori<sup>2</sup>, Shigeru Yokota<sup>1</sup>*  
<sup>1</sup>University of Tsukuba, Japan, <sup>2</sup>Nagoya University, Japan

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- WPP48 Design of Rectifiers for High Power Wireless Power Transmission System.....N/A  
*Ce Wang<sup>1</sup>, Bo Yang<sup>1</sup>, Naoki Shinohara<sup>1</sup>*  
<sup>1</sup>Kyoto University, Japan
- WPP49 A Rectenna Using Copper Foil on Glass to Reduce Cost of Space Solar Power.....N/A  
*Evan Shi<sup>1</sup>, Erik Centeno<sup>1</sup>, Rafael Figueroa<sup>1</sup>, Cheng Qi<sup>1</sup>, Gregory Durgin<sup>1</sup>*  
<sup>1</sup>Georgia Tech, United States of America
- WPP50 Photonic-Assisted Field-Probing Receiver for kW Peak-Power Wideband Radiative Wireless Transmitter.....N/A  
*Young-Pyo Hong<sup>1</sup>, Jung-Il Park<sup>1</sup>, No-Weon Kang<sup>1</sup>, Dong-Joon Lee<sup>1</sup>*  
<sup>1</sup>Korea Research Institute of Standards and Science, South Korea
- WPP51 An RF-Powered Self-Locating Flexible Building Environment Sensor System.....N/A  
*David Schwartz<sup>1</sup>, Shabnam Ladan<sup>1</sup>, Vijay Karthik Venkatasubramanian<sup>1</sup>, Joseph Lee<sup>1</sup>, Ping Mei<sup>1</sup>, Brent Krusor<sup>1</sup>, Clinton Smith<sup>1</sup>, Shakthi Gowri<sup>1</sup>*  
<sup>1</sup>Palo Alto Research Center, United States of America
- WPP52 We've Got the Power: Overcoming the Distance Enlargement Fraud with Wireless Power Transfer.....N/A  
*Leo Botler<sup>1</sup>, Konrad Diwold<sup>1</sup>, Kay Römer<sup>1</sup>*  
<sup>1</sup>Graz University of technology, Austria
- WPP53 An Improved Rectenna Design for Battery-free Wireless Sensors and Structural Health Monitoring.....N/A  
*A. Sidibe<sup>1</sup>, A. Tacaks<sup>1</sup>, A. Okba<sup>1</sup>, G. Loubet<sup>1</sup>*  
<sup>1</sup>Université de Toulouse, France
- WPP54 Chipless Backscatter for Vital e-Health Sensing.....N/A  
*Felisberto Pereira<sup>1</sup>, Ricardo Correia<sup>1</sup>, Nuno B. Carvalho<sup>1</sup>*  
<sup>1</sup>Universidade de Aveiro, Portugal
- WPP55 Pacemaker Recharge Through Inductive Resonant Wireless Power Transfer.....N/A  
*Giuseppina Monti<sup>1</sup>, Laura Corchia<sup>1</sup>, Luciano Tarricone<sup>1</sup>*  
<sup>1</sup>University of Salento, Italy
- WPP56 Implantable Rectenna System for Biomedical Wireless Applications.....N/A  
*Shuoliang Ding<sup>1</sup>, Stavros Koulouridis<sup>2</sup>, Lionel Pichon<sup>1</sup>*  
<sup>1</sup>Université Paris-Sud, France, <sup>2</sup>University of Patras, Greece
- WPP57 A Study on Dynamic Charging Using Off-Resonant Coil Array With Receiver-side Compensation.....N/A  
*Tatsuya Ohashi<sup>1</sup>, Quang-Thang Duong<sup>1</sup>, Minoru Okada<sup>1</sup>*  
<sup>1</sup>Nara Institute of Science and Technology, Japan
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*Jaafar Al Sinayyid<sup>1</sup>, Hakim Takhedmit<sup>1</sup>, Patrick Poulichet<sup>1</sup>, Marjorie Grzeskowiak<sup>2</sup>, Antoine Diet<sup>3</sup>, Galle Lissorgues<sup>1</sup>*  
<sup>1</sup>Université Paris-Est, France, <sup>2</sup>Deos Isae Supaero, France, <sup>3</sup>Université Paris-Sud, France
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*Antoine Diet<sup>1</sup>, Marc Biancheri-Astier<sup>1</sup>, Yann Le Bihan<sup>1</sup>, Pablo Pérez-Nicoli<sup>2</sup>, Madjda Bouklachi<sup>1</sup>, Olivier Meyer<sup>1</sup>, Fernando Silveiro<sup>2</sup>, Lionel Pichon<sup>1</sup>*  
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- WPP60 Research on Wireless Power Transfer in Modular Spacecraft.....N/A  
*Longlong Zhang<sup>1</sup>, Lei Wang<sup>1</sup>, Haidi Yu<sup>1</sup>, Yan Zong<sup>1</sup>, Yucai Zhang<sup>1</sup>, Xudong Ming<sup>1</sup>, Zhenyu Zhang<sup>1</sup>*  
<sup>1</sup>Shandong Institute of Space Electronics Technology, China
- WPP61 Charging Base Stations Deployment Algorithms for Wireless Rechargeable Sensor Networks.....N/A  
*Peng Wan<sup>1</sup>, Baoyu Wu<sup>1</sup>, Yuhua Cheng<sup>1</sup>, Gaofeng Wang<sup>1</sup>*  
<sup>1</sup>Hangzhou Dianzi University, China
- WPP62 Coupled Magnetic Field-Circuit Analysis of Inductive Power Transfer in High-Potential Transformers.....N/A  
*Alex Pokryvailo<sup>1</sup>, Hiren Dave<sup>1</sup>*  
<sup>1</sup>Spellman High Voltage Electronics Corp., United States of America
- WPP63 Charging Area Extensible Wireless power Transfer System with an Orthogonal Structure.....N/A  
*Chen Xu<sup>1</sup>, Yuan Zhuang<sup>1</sup>, Anqi Chen<sup>1</sup>, Yi Huang<sup>1</sup>, Jiafeng Zhou<sup>1</sup>*  
<sup>1</sup>University of Liverpool, United Kingdom
- WPP64 Innovative Technique for HPA Characteristics Extraction and Accurate Predistorsion Function Modeling.....N/A  
*Blaise Mulliez<sup>1</sup>, Emmanuel Moutaye<sup>1</sup>, H el ene Tap<sup>1</sup>*  
<sup>1</sup>Universit e de Toulouse, France
- WPP65 MSA with Stacked Metal Rings for Rectenna System using Narrow Beam.....N/A  
*Seiya Mizuno<sup>1</sup>, Ryosuke Kashimura<sup>1, 2</sup>, Tomohiro Seki<sup>1</sup>, Yasunori Suzuki<sup>3</sup>, Hiroshi Okazaki<sup>3</sup>*  
<sup>1</sup>Nihon University, Japan, <sup>2</sup>Japan Radio Co., Ltd., Japan, <sup>3</sup>NTT Docomo Inc., Japan
- WPP66 Free-Positioning Magnetic Resonance Wireless Power Transfer System for Biomedical Devices.....N/A  
*Kyungmin Na<sup>1</sup>, Jieun Kim<sup>1</sup>, Young-Jin Park<sup>1</sup>*  
<sup>1</sup>Korea Electrotechnology Research Institute, South Korea
- WPP67 Analysis of the Efficiency of Wireless Power Transfer to Multiple Receivers.....N/A  
*Wanberton Gabriel de Souza<sup>1</sup>, Luciano Coutinho Gomes<sup>1</sup>, Darizon Alves de Andrade<sup>1</sup>, Lucas Rocha Lobo Lannes<sup>1</sup>, Josemar Alves dos Santos Jr.<sup>1</sup>, Eust aquio Fernandes J unior<sup>1</sup>*  
<sup>1</sup>University Federal of Uberl andia, Brasil
- WPP68 Geometric Quantities Characterizing Wireless Power Transfer Between a Resonator and Resonant Dipoles.....N/A  
*Robert A. Moffatt<sup>1</sup>*  
<sup>1</sup>Etherdyne Technologies, Inc., United States of America
- WPP69 Rectenna for Bluetooth Low Energy Applications.....N/A  
*Boules A. Mouris<sup>1</sup>, Wael Elshennawy<sup>2</sup>, Panagiotis Petridis<sup>3</sup>, Yuan Ding<sup>3</sup>, Spyridon N. Daskalakis<sup>3</sup>*  
<sup>1</sup>KHT Royal Institute of Technology, Sweden, <sup>2</sup>Orange Business Services, Egypt, <sup>3</sup>Heriot-Watt University, United Kingdom
- WPP70 Temperature Induced Degradation of RF Energy Harvesters Efficiency: Experiments and Interpretation.....N/A  
*Massimo Merenda<sup>1</sup>, Riccardo Carotenuto<sup>1</sup>, Francesco G. Della Corte<sup>1</sup>*  
<sup>1</sup>Mediterranea University Reggio Calabria, Italy

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- WPP71 Analysis of Transmission Distance and Transmission Efficiency of Wireless Power Transfer System.....N/A  
*Rongge Yan<sup>1</sup>, Zexun Wu<sup>1</sup>, Xiaoting Guo<sup>1</sup>, Shaoqing Cao<sup>1</sup>*  
<sup>1</sup>Hebei University of Technology
- WPP72 Traveling-Wave Fed Two-Dimensional Phased-Array Antenna for Microwave-Power Transfer.....N/A  
*Naoki Hasegawa<sup>1</sup>, Yuki Takagi<sup>1</sup>, Yoshichika Ohta<sup>1</sup>*  
<sup>1</sup>Softbank Corp., Japan
- WPP73 Energy Harvesting Cooperative Wireless Systems: Probabilistic Modeling and Statistical Analysis.....N/A  
*M. Aparna<sup>1</sup>, Bitragunta Sainath<sup>1</sup>*  
<sup>1</sup>BITS Pilani, India
- WPP74 A Study of Improve Efficiency of Broad-Angle Rectenna Using Hybrid Coupler.....N/A  
*Yuki Tanaka<sup>1</sup>, Kazuki Kanai<sup>1</sup>, Ryosuke Hasaba<sup>1</sup>, Hiroshi Sato<sup>1</sup>, Yoshio Koyanagi<sup>1</sup>, Takuma Ikeda<sup>1</sup>, Hiroyuki Tani<sup>1</sup>, Shoichi Kajiwara<sup>1</sup> and Naoki Shinohara<sup>2</sup>* <sup>1</sup>Panasonic Corporation, Japan, <sup>2</sup>Kyoto University, Japan
- WPP75 Influences of Magnetic Couplings in Transmitter Array of MIMO Wireless Power Transfer System.....N/A  
*Kyungtae Kim<sup>1</sup>, Ji-Woong Choi<sup>1</sup>*  
<sup>1</sup>Daegu Gyeongbuk Institute of Science and Technology, South Korea
- WPP76 Development of Wireless Power Supply Implantable Device Based on LED.....N/A  
*Li Yamin<sup>1</sup>, Tang Jun<sup>1</sup>, Liu Kun<sup>1</sup>*  
<sup>1</sup>Chinese Academy of Sciences, China
- WPP77 Visualization of Energy Flow in Wireless Power Transfer Systems.....N/A  
*Hanwei Wang<sup>1</sup>, Cheng Zhang<sup>2</sup>, Shu Yuan Ron Hui<sup>3</sup>*  
<sup>1</sup>Tsinghua University, China, <sup>2</sup>University of Manchester, United Kingdom, <sup>3</sup>University of Hong Kong, China
- WPP78 Proposal of Simplified Transfer Function Model for Dynamic Rectified DC Voltage in DWPT.....N/A  
*Kodai Takeda<sup>1</sup>, Wataru Ohnishi<sup>1</sup>, Takefumi Koseki<sup>1</sup>*  
<sup>1</sup>University of Tokyo, Japan
- WPP79 Voltage Control and Current Distribution for Multiple-Coil Wireless Power Transfer System.....N/A  
*Weikun Cai<sup>1</sup>, Houjun Tang<sup>1</sup>, Dianguang Ma<sup>1</sup>, Xin Liu<sup>1</sup>*  
<sup>1</sup>Shanghai Jiao Tong University, China
- WPP80 A Self-Synchronous Rectifier for Application of W-level Input Power.....N/A  
*Ying Wang<sup>1</sup>, Gao Wei<sup>1</sup>, Fei You<sup>2</sup>, Xumin Yu<sup>3</sup>, Yazhou Dong<sup>3</sup>, Xiaojun Li<sup>3</sup>*  
<sup>1</sup>Northwestern Polytechnical University, China, <sup>2</sup>University of Electronic Science and Technology of China, China, <sup>3</sup>China Academy of Space Technology, China
- WPP81 Experimental Evaluation of Coupling Coils for Underwater Wireless Power Transfer.....N/A  
*Cândido Duarte<sup>1</sup>, Francisco Gonçalves<sup>1</sup>, Miguel Silva<sup>1</sup>, Vasco Correia<sup>1</sup>, Luis M. Pessoa<sup>1</sup>*  
<sup>1</sup>INESC TEC and FEUP, Portugal

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- WPP82 Hybrid Mode Wireless Power Transfer for Wireless Sensor Network.....N/A  
*Shi-Wei Dong<sup>1</sup>, Xiaojun Li<sup>1</sup>, Xumin Yu<sup>1</sup>, Yazhou Dong<sup>1</sup>, Hao Cui<sup>1</sup>, Tao Cui<sup>1</sup>, Ying Wang<sup>1</sup>, Shuo Liu<sup>1</sup>*  
<sup>1</sup>China Academy of Space, China
- WPP83 EMI Suppression of MEMS Honeycomb-Shaped Inductor on Oscillators for Wireless-Powered IC Design.....N/A  
*Hao-Jiun Wu<sup>1</sup>, Po-Ming Wang<sup>1</sup>, Tzuen-Hsi Huang<sup>1</sup>, Sheng-Fan Yang<sup>2</sup>*  
<sup>1</sup>National Cheng Kung University, Taiwan, <sup>2</sup>Global Unichip Corp., Taiwan
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- WPP84 A Comparative Study of Conventional Rectifier Topologies for Low Power RF Energy Harvesting.....N/A  
*Jérôme Tissier<sup>1</sup>, Mohsen Koohestani<sup>1</sup>, Mohamed Latrach<sup>1</sup>*  
<sup>1</sup>ESEO-IETR, France
- WPP85 Modified Log Periodic Spiral Antenna for Multi-Band RF Energy Harvesting Applications.....N/A  
*Kapil Gangwar<sup>1</sup>, Jérôme Tissier<sup>2</sup>*  
<sup>1</sup>Indian Institute of Technology, India, <sup>2</sup>ESEO-IETR, France
- WPP86 Theoretical Analysis of Single Shunt Rectifiers.....N/A  
*Takashi Hirakawa<sup>1</sup>, Naoki Shinohara<sup>1</sup>*  
<sup>1</sup>Kyoto University, Japan
- WPP87 Design of Buck Converter with Dead-time Control and Automatic Power-Down System for WSN Application.....N/A  
*Jefferson A. Hora<sup>1</sup>, Aileen Chris Arellano<sup>2</sup>, Eryk Dutkiewicz<sup>1</sup>, Xi Zhu<sup>1</sup>*  
<sup>1</sup>University of Technology Sydney, Australia, <sup>2</sup>MSU-Iligan Institute of Technology, Philippines
- WPP88 A 19.6 dB Input Power Range 403 MHz Rectifier Based on Quality Factor in Matching Technique.....N/A  
*NgocDuc Au<sup>1</sup>, Chulhun Seo<sup>1</sup>*  
<sup>1</sup>Soongsil University, South Korea
- WPP89 Voltage-Double RF Rectifier using Inductive Matching Network.....N/A  
*Muh-Dey Wei<sup>1</sup>, Renato Negra<sup>1</sup>*  
<sup>1</sup>RWTH Aachen University, Germany
- WPP90 10W Class High Power C-Band Rectifier Using GaN HEMT.....N/A  
*Satoshi Yoshida<sup>1</sup>, Kenjiro Nishikawa<sup>1</sup>, Shigeo Kawasaki<sup>2</sup>*  
<sup>1</sup>Kagoshima University, Japan, <sup>2</sup>Japan Aerospace Exploration Agency (JAXA), Japan
- WPP91 Automated Design Optimization for CMOS Rectifier Using Deep Neural Network (DNN).....N/A  
*Heng Wah Ho<sup>1</sup>, Wendy W.Y. Lau<sup>2</sup>*  
<sup>1</sup>GLOBALFOUNDRIES Singapore Pte. Ltd., Singapore, <sup>2</sup>Nanyang Technological University, Singapore
- WPP92 2x2 Circularly Polarized Antenna Array with Equal Phases for RF Energy Harvesting in IoT System.....N/A  
*Osama M. Dardeer<sup>1</sup>, Hala A. Elsadek<sup>2</sup>, Esmat A. Abdallah<sup>2</sup>, Hadia M. Elhennawy<sup>1</sup>*  
<sup>1</sup>Ain Shams University, Egypt, <sup>2</sup>Electronics Research Institute, Egypt



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*Nobuhiko Yasumaru<sup>1</sup>, Kanto Nakanishi<sup>1</sup>, Kenji Itoh<sup>1</sup>, Shunya Tsuchimoto<sup>1</sup>, Takuya Yamada<sup>1</sup>,  
Takayuki Mori<sup>1</sup>, Jiro Ida<sup>1</sup>*  
<sup>1</sup>Kanazawa Institute of Technology, Japan

15:05 – 17:00 Poster Session II – WoW

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<sup>1</sup>University of Tokyo, Japan, <sup>2</sup>Mitsubishi Electric Corporation, Japan

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<sup>1</sup>University of Stuttgart, Germany

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<sup>1</sup>NSK Ltd., Japan, <sup>2</sup>University of Tokyo, Japan

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<sup>1</sup>Auckland University, New Zealand

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<sup>1</sup>Central South University, China, <sup>2</sup>Human Provincial Key Laboratory of Power Electronics Equipment and Grid, China

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*Giuseppe Guidi<sup>1</sup>, Salvatore D'Arco<sup>1</sup>, Jon Are Suul<sup>1,2</sup>*

<sup>1</sup>SINTEF Energy Research, Norway, <sup>2</sup>Norwegian University of Science and Technology, Norway

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<sup>1</sup>Imperial College London, United Kingdom
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<sup>1</sup>Chongqing University, China, <sup>2</sup>China Electronic Power Research Institute, China
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<sup>1</sup>University of Auckland, New Zealand
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<sup>1</sup>Delft University of Technology, The Netherlands

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<sup>1</sup>Chongqing University, China
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<sup>1</sup>Shanghai Jiao Tong University, China
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<sup>1</sup>Ben-Gurion University of the Negev, Israel
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<sup>1</sup>Tsinghua University, China
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<sup>1</sup>Ben-Gurion University, Israel
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<sup>1</sup>Global Energy Interconnection Research Institute, China, <sup>2</sup>State Grid Corporation of China, China, <sup>3</sup>San Diego State University, United States of America

18:00 – 22:00      Banquet

“Tesla’s Secret London Laboratory”

## PROGRAM: WIRELESS POWER WEEK 2019

Friday 21 June

### Registration

08:00 Registration & Coffee

### WPTC & WoW Joint Session I – High Power and Ultrasonic WPT

Kelvin Lecture Theatre

Chairs: Grant Covic, Mario Ferreira

- 08:25 Development of a 10 kW Wireless Power Transfer System.....406  
*Alex Ridge<sup>1</sup>, Ku Ku Ahamad<sup>1</sup>, Richard McMahon<sup>1</sup>, John Miles<sup>2</sup>*  
<sup>1</sup>University of Warwick, United Kingdom, <sup>2</sup>University of Cambridge, United Kingdom
- 08:40 Thin, Light & Flexible Magnetic Materials for 7.7 kW Wireless Power Transfer System.....N/A  
*Zohaib Hameed<sup>1</sup>, Milo Oien-Rochat<sup>1</sup>, Charles Bruzzone<sup>1</sup>, Ian Cummings<sup>1</sup>, Jeff Keeney<sup>1</sup>, Michael Benson<sup>1</sup>*  
<sup>1</sup>3M Company, United States of America
- 08:55 High Efficiency Wireless Power Transfer System using a Two-stack Hybrid Metamaterial Slab.....N/A  
*Seongsoo Lee<sup>1</sup>, Yeonje Cho<sup>2</sup>, Seungtaek Jeong<sup>1</sup>, Seokwoo Hong<sup>1</sup>, Boogyo Sim<sup>1</sup>, Hongseok Kim<sup>3</sup>, Joungho Kim<sup>1</sup>*  
<sup>1</sup>Korea Advanced Institute of Science and Technology (KAIST), South Korea, <sup>2</sup>Samsung, South Korea, <sup>3</sup>Missouri University of Science and Technology (MST), United States of America
- 09:10 Resistive Matching using an AC Boost Converter for Efficient Ultrasonic Wireless Power Transfer.....N/A  
*Marc Bisschop<sup>1</sup>, Wouter A. Serdijn<sup>1</sup>*  
<sup>1</sup>Delft University of Technology, The Netherlands
- 09:25 Mutual Inductance Modeling of In-wheel Arc-shaped Coil for In-motion WPT.....N/A  
*Osamu Shimizu<sup>1</sup>, Takehiro Imura<sup>1</sup>, Hiroshi Fujimoto<sup>1</sup>, Daisuke Gunji<sup>2</sup>, Keizo Akutagawa<sup>3</sup>, Giuseppe Guidi<sup>4</sup>*  
<sup>1</sup>University of Tokyo, Japan, <sup>2</sup>NSK Ltd., Japan, <sup>3</sup>Bridgestone Corporation, Japan, <sup>4</sup>Sintef Energy, Norway
- 09:40 Transit

### Plenary Talk 4

Kelvin Lecture Theatre

Chairs: Udaya Madawala, Huib Visser

- 09:45 Large-area Wireless Charging Enabled by Metamaterials.....N/A  
*Irina Khromova*  
Metaboards, United Kingdom

### Coffee Break

10:30 Coffee Break

## PROGRAM: WIRELESS POWER WEEK 2019

### WPTC & WoW Joint Session 2 – Moving WPT Systems

Kelvin Lecture Theatre

Chairs: David Yates, Djuradj Budimir

- 11:00     **Joint Invited Talk 2**  
Wireless power market set to evolve beyond mobile phones – Market overview.....N/A  
*Dinesh Kithany*  
IHS Markit, United Kingdom
- 11:25     ID-MV Position Detection Method for Wireless Power Transfer System of Electric Vehicle.....N/A  
*Huan Zhang<sup>1</sup>, Shihui Xu<sup>1</sup>, Chen Yao<sup>1</sup>, Houjun Tang<sup>1</sup>*  
<sup>1</sup>Shanghai Jiao Tong University, China
- 11:40     Separated Circular Capacitive Couplers for Rotational Misalignment of Drones.....N/A  
*Chanjun Park<sup>1</sup>, Jaehyoung Park<sup>1</sup>, Yujun Shin<sup>1</sup>, Sungryul Huh<sup>1</sup>, Jongwook Kim<sup>1</sup>, Seungyoung Ahn<sup>1</sup>*  
<sup>1</sup>KAIST, South Korea
- 11:55     Coil Design for High Coupling Performance for Two-phase Receiver of Dynamic Wireless Charging System.....N/A  
*Zhiyuan Wang<sup>1</sup>, Jiantao Zhang<sup>1</sup>, Tianhao Huang<sup>1</sup>, Shumei Cui<sup>1</sup>*  
<sup>1</sup>Harbin Institute of Technology, China

12:10 – 12:45     WPW 2020 Announcement and Closing Ceremony

Kelvin Lecture Theatre