Special Sessions

SS1: Workforce Development and Careers in Power Electronics

Monday, October 2nd, 2:00PM – 4:05PM
Room 201

To ensure America has a great workforce in power electronics, the US Power Electronics Industry Collaborative (PEIC) is focused on industry enablement by attracting & grooming new engineering talent. This comes with reaching out to aspiring minds to help them to understand the many power electronics related challenges and opportunities facing industry, society and government. Do engineers entering the power electronics industry benefit from a deep and relatively narrow education and/or experience in power electronics or an adjacent field, or is it anticipated that hiring companies are placing greater emphasis on broader based skill sets and experiences tying together multiple disciplines of electrical, mechanical and thermal? The answer is that both ends of the spectrum are and will be needed. The intent of this Special Session is to bring together a cross section of the industry involved with applications such as electric vehicle, solar/wind power, energy storage, variable speed motors & solid-state lighting. Several PEIC members from the semiconductor industry, end equipment manufacturers, national laboratories, and universities involved in power electronics R&D will describe some of the key problems and opportunities they face and the types of new talent they seek to add to their organization

Presenter:
Dean Henderson, Infineon and PEIC

SS2: Industry Activities in Korea, Organized in Collaboration with KIPE

Tuesday, October 3rd, 8:30AM – 10:30AM
Room 232

Join us for the following presentations:

1) LG Electronics: Practical Design Consideration for Automotive Traction Inverter System with High Speed Switching Devices
2) Hyosung Heavy Industry: Hyosung's R&D of Power Electronics in New Business (2MW ESS PCS for Frequency Regulation, Permanent-islanded Microgrid System)
3) Korea Electrotechnology Research Institute: KERI Business and R&D Status (Advanced Power Grid, HVDC Technology, Electric Propulsion, and Testing & Certification Services for Electric Apparatus)
4) Research Institute of Industrial Science and Technology – POSCO (Pohang Steel Company): Electrode Control Technology Delivering Constant Power Control in FeSi Submerged Arc Furnaces

SS3: Electrical Power for Aviation Applications

Wednesday, October 4th, 8:30AM – 10:10AM
Room 232

In this subsection, presenters will talk about the progress the aerospace industry is making, the challenges the industry is facing and overcoming, and the trend the industry is experiencing in aerospace electrical power. Audience will gain a great insight of what energy conversion technologies are about in the aerospace electrical power industry.

Chair:
Mike Blair

Panel:
Mike Blair (GE Aviation), Kevin J. Yost (AFRL), Benjamin P. Rhoads (AFRL), Longya Xu (HPPE/Ohio State University) , Chris Gerada (PEMC/University of Nottingham), Jin Wang (HPPE/Ohio State University)

SS4: IOT and Twin for Aviation

Wednesday, October 4th, 10:30AM – 12:10PM
Room 232

Internet of things (IOT) and Digital Twins are having a great impact on the industries, so as for aerospace. The presenters will share their work, results, technologies, visions, and plans. Importantly, the audience will gain a great insight about what IOT and Digital Twins are about, and the associated key technologies, such as icloud computation, real time modeling and simulation, sensors for health monitoring, etc.

Chair:
Syed Hossain

Panel:
Syed Hossain (GE Aviation), Zhenhua Jiang (University of Dayton Research Institute)

SS5: Advanced Aircraft Electrification beyond MEA

Wednesday, October 4th, 2:00PM – 3:40PM
Room 232

Aerospace is experiencing its third major technological advancement. The biggest milestone of the first major advancement was the human historic first flight by Wright Brothers in 1903, and the biggest milestone of the second was the introduction of the turbojet in 1939. The third major advancement involves the electrification of aircraft including more electric aircraft (MEA), hybrid electrical propulsion (HEP), etc. The presenters will talk about this advancement and the associated technology aspects.

Chair:
Konrad Weeber

Panel:
Konrad Weeber (GE Global Research Center) , Di Zhang (GE Global Research Center), Patrick Wheeler (Nottingham University), Charles Lents (United Technology Research Center)

SS6: Wide Band Gap Devices for the Aviation Applications

Wednesday, October 4th, 4:00PM – 5:40PM
Room 232

Wide Band Gap (WBG) devices, such as SiC and GaN, are next generation semiconductor devices beyond Si, providing significantly higher efficiency, lower losses, higher power density, and better reliability. The maturities of such devices are substantially improving, and the mave of their impact has arrived. The presenters will share their progresses, the challenges, the visions, and the plans with the audience with aerospace energy conversion focused.

Chair:
Rick Eddins

Panel:
Rick Eddins (GE Aviation), Ryo Takeda (Keysight Technologies), Tatsuya Yanagi (Keysight Technologies), Hiroyuki Sakairi (Keysight Technologies), Naotaka Kuroda (Keysight Technologies), Ken Nakahara (Keysight Technologies), Arun Gowda (GE Global Research Center), Siegbet Haumann (Danfoss Silicon Power), Michael Tonnes (Danfoss Silicon Power), Gerald Trant (GE Global Research Center), Ljubisa Stevanovic (GE Global Research Center)

SS7: Power Electronics Meets Power Utilities & Systems

Wednesday, October 4th, 8:30AM – 10:10AM
Room 206

This special session will discuss the role of power electronics for Electrical Power Systems at a variety of scales. Each sub-session will have one speaker that discusses the power electronic devices used in each area of the power grid and one speaker that focuses on the application and systems perspective of these devices. The power grid areas range from individual generation, to micro-grids, to distribution systems, to transmission grids.

Chairs:
Ben Kroposki, National Renewable Energy Laboratory <Benjamin.kroposki@nrel.gov
Patrick Wheeler, University of Nottingham <Pat.Wheeler@nottingham.ac.uk>

8:30AM – 9:20AM

1) Power Electronics in Generation (Focus on new advanced in wind turbines and PV inverters)

   Power Converter Perspective - Fred Wang, University of Tennessee, fred.wang@utk.edu

   System's Perspective - Blake Lundstrom, National Renewable Energy Laboratory, blake.lundstrom@nrel.gov

9:20AM – 10:10AM

2) Power Electronics in Micro-grids (Focus on DC micro-grids, static switches, other DER)

   System's Perspective - Alexis Kwasinski, University of Pittsburgh, akwasins@pitt.edu

   Power Converter Perspective - Tomislav Dragicevic, University of Aalborg, tdr@et.aau.dk

SS8: Power Electronics Meets Power Utilities & Systems

Wednesday, October 4th, 10:30AM – 12:10PM
Room 206

This second session is a continuation of SS7: Power Electronics meets Power Utilities & Systems.

10:30AM – 11:20AM

3) Power Electronics in Distribution Systems (Focus on solid-state transformers and power routers)

   Power Converter Perspective, Maryam Saeedifard, Georgia Institute of Technology - maryam@ece.gatech.edu

   System's Perspective – Deepak Divan, Georgia Institute of Technology ddivan@gatech.edu

11:20AM – 12:10PM

4) Power Electronics in Transmission Systems (Focus on HVDC and FACTS advancements)

   System's Perspective – Brian Johnson, University of Idaho <b.k.johnson@ieee.org>

   Power Converter Perspective – Brandon Grainger, University of Pittsburgh, bmg10@pitt.edu and Greg Kish, University of Alberta, gkish@ualberta.ca

SS9: Power Electronics and Control for Low-Inertia Electrical Systems

Wednesday, October 4th, 2:00PM – 3:40PM
Room 206

A wide scale deployment of power-electronic-based power sources, transmission/distribution systems, and loads are being envisioned in the near future. Differing from traditional electric machines, the solid-state electronic power converters are rotational-inertia-less, and consequently pose challenges on the transient stability of electric power systems. Moreover, the wideband control dynamics of power converters also bring in new power quality challenges, e.g. unexpected interharmonics and resonances across a wide frequency range. Those stability and power quality issues will in turn impose more stringent requirements and harsh environments on the hardware design and reliability of power converters.

The purpose of this special session is to provide a platform for power electronics and power system engineers to share the latest research progress and upcoming technical challenges with the low-inertia electrical systems.

The session is composed by four invited presentations from ABB Corporate Research, American Electric Power, ENERCON, and Argonne National Lab.

Chair:
Xiongfei Wang, Department of Energy Technology, Aalborg University, Denmark

Co-chair:
Jing Xu, ABB Corporate Research, NC, USA

SS10: Magnetic Materials Standards in the Research Environment

Wednesday, October 4th, 4:00PM – 5.40PM
Room 232

Magnetic materials take a primary role in the design and manufacture of machines and devices used throughout the energy conversion community. This session will present recent developments in material specifications and test methods and and will discuss the role of international standards in establishing a common ground of understanding from which advances in materials, engineering design and manufacturing practices can spring.

Chair:
Steve Sprague, Proto Lam, LLC.

IAS & PELS Young Professionals Reception

Tuesday, October 3, 2017, 6:30 p.m onwards
Location: Bauer Farm Kitchen, 435 Elm Street

How about an opportunity to mingle, interact, learn from the best minds of IEEE and have some fun.

IEEE Industry Application Society - IAS and Power Electronics Society - PELS, give you this opportunity to learn from the life journey of the biggest leaders at ECCE along with an evening well spent talking to people from across the globe.

An evening filled with meeting new people, fun games, learning about the best practices in industry and academia, and having loads of fun with drinks and snacks. As it's IEEE Day, we will have some celebrations too. So make sure you don't miss this wonderful chance to make new friends.

Please register @ https://goo.gl/forms/uxNFMwF7bqcRD4Q32 , to mark your presence for this amazing evening in Cincinnati .

This event is only for Young Professionals and Students registered for ECCE and the IAS Annual Meeting.