

**Special Session 9**  
**Power Electronic Interface for Smart DC Microgrids**

**Session Chair:**

*Fujin Deng*, Southeast University, [fdeng@seu.edu.cn](mailto:fdeng@seu.edu.cn)

**Scope of the Session:**

The microgrid can be defined as power cluster of distributed generation, load, and energy storage device accumulated together in the vicinity to each other, which gives opportunity to utilize renewable energy sources for green and clean environment. Recently, the DC microgrid is attractive due to higher reliability and no reactive power - reduction in losses, higher efficiency, simpler connection with DC bus, no need of synchronization, no frequency aspect, and future DC homes – DC loads such as LED, TV, laptop, dryer and washer. Various renewable energy such as the solar power and wind power can be integrated into the DC microgrid, as well as various energy storages. The power electronic interface (PEI) plays an important role in the DC microgrid for the integration of the renewable power, energy storages and loads into the DC microgrid such as the DC/DC power electronics converters, the AC/DC power electronics converters and the DC/AC power electronic converters. In order to achieve more reliability, cost benefit and enhanced performance, it is very important to design, operate and control these PEIs in the DC microgrid with appropriate ways.

This special session will bring together researchers and developers from academia, industry and governmental sectors to share and exchange novel ideas, explore the smart DC microgrid, investigate novel designs, explore enabling technologies and share relevant experiences on design, construction, maintenance, operation and control.

Topics for the session include, but are not limited to:

- New topology and advanced control of AC/DC power electronic interface
- New topology and advanced control of DC/AC power electronic interface
- New topology and advanced control of DC/DC power electronic interface
- New topology and advanced control of single input and multiple output power electronic interface
- New topology and advanced control of multiple input and single output power electronic interface
- New topology and advanced control of multiple input and multiple output power electronic interface
- Fault diagnosis of power electronic interface
- Protection and faulty tolerance
- Reliability and lifetime prediction for power electronic interface
- Modeling and simulation of DC microgrid
- Advanced control of DC microgrid