

Special Session Title

Abstract

This Special Session is designed to foster in-depth discussions and provide valuable insights into global trends and challenges in semiconductor research, with a particular focus on Power Electronic Semiconductors.

This session will feature expert-led talks on the future of Power Electronic Semiconductors, delivered by renowned researchers. This will be followed by an interactive discussion using strategic foresight methodologies to explore the trajectory of power electronic semiconductors over the next 25 years. The session also aims to facilitate meaningful networking and collaboration between researchers and industry stakeholders.

Additionally, the workshop will contribute to a DSIT and UKRI-commissioned study on current and emerging semiconductor-related research within UK universities. It will further support the National Semiconductor Strategy, helping to shape long-term interventions that advance academic R&D in the semiconductor sector.

Special Session Topics

- **Energy and decarbonisation, Engineering, Advanced Materials (compound semiconductors for Net Zero)**
- **High voltage power electronics: Opportunities for wide and ultrawide bandgap compound semiconductors.**
- **Why the Drive for Renewable Energy is important for Semiconductor Innovation.**
- **Process technology for Wide and Ultra-wide Bandgap Power Semiconductor Devices.**

Author Bios and Pics



Prof Ivona Mitrovic (University of Liverpool)

Ivona Z. Mitrovic is a Professor in the School of Electrical Engineering, Electronics and Computer Science and Head of BioMEMS, Organic and Silicon Electronics research group at the University of Liverpool. She received the B.Eng. degree in microelectronics from the University of Niš, Niš, Serbia, in 1997, the M.Sc. degree in materials science from the University of Belgrade, Belgrade, Serbia, in 2002, and the Ph.D. degree in electronic engineering from the University of Liverpool, Liverpool, U.K., in 2007. She has established a substantial track record in the area of thin high-k dielectrics and played a pivotal leadership role in collaborative efforts to achieve ultimately scaled gate stack in the European PULLNANO and NANOSIL projects. She has coordinated several UKRI EPSRC funded projects on resonant tunneling nanostructures for terahertz energy harvesting, interface engineering in germanium-based devices, doped ZnO films for transparent electronics, and most recently on rare-earth oxides on compound semiconductors (GaN, SiC, Ga₂O₃). She is a steering group member of the UKRI eFutures network, a Senior Member of IEEE and a member of the European SINANO Network of Excellence in nanoelectronics. Professor Mitrovic has authored around 200 scientific papers in refereed journals and conference proceedings and has delivered over 30 talks at premier international conferences in Europe and the USA. She advocates for a sustainable, renewable energy transition and has hosted in 2022, (see <https://news.liverpool.ac.uk/2022/09/13/event-how-electronics-can-shape-a-more-sustainable-future/>) the UKRI conference “Electronics for Sustainable Societies”, attracting critical mass of national and international research leaders in this field.



Prof Martin Kuball (University of Bristol)

Professor Kuball is Royal Academy of Engineering Chair in Emerging Technologies at the University of Bristol, Fellow of IEEE, MRS, IET, SPIE and IoP. He leads the UKRI flagship Innovation and Knowledge Centre (IKC) REWIRE developing and commercializing high voltage power electronics. He is on the Board of Director of the US manufacturing forum CS MANTECH. He obtained his PhD at the Max-Planck Institute for Solid State Physics in Stuttgart, Germany and joined the University of Bristol from Brown University, USA. He has expertise in power and RF electronics, in particular, wide and ultrawide bandgap semiconductors, as well as lightning applications.



Prof Layi Alatise (University of Warwick)

Layi Alatise, PhD, CEng, FIET, SMIEEE, is Professor and Royal Society Industry Fellow in Electrical Engineering at the University of Warwick. He has led several EPSRC projects in Power Electronics and as well as Innovate UK projects with several industrial collaborators. He was a co-recipient of the 2021 best paper award in the IEEE Transactions in Industrial Electronics and 2023 best paper award at

CIREN. He has authored or co-authored more than 150 journal/conference publications and supervised 11 PhDs in Power Electronic devices.

Prof. Alatise was an Associate Editor of the IEEE Journal of Emerging and Selected Topics in Power Electronics, a Chartered Engineer, Fellow of the IET and a Senior member of the IEEE. He received the B.Eng. (first class Hons.) degree in Electrical/Electronic engineering and the Ph.D. degree in Microelectronics and Semiconductors from Newcastle University, U.K in 2005 and 2008, respectively. In 2004 and 2005, he joined ATMEL North Tyneside where he worked on the process integration of the 130-nm CMOS technology node. In June 2008, he joined the Innovation R&D Department, NXP Semiconductors, as Development Engineer where he designed, processed, and qualified discrete power trench MOSFETs for automotive applications and switched-mode power supplies. In November 2010, he joined the University of Warwick and has been a Professor in Electrical Engineering since 2019.



Prof Mike Jennings (Swansea University)

Prof Mike Jennings is an academic with a focus on wide bandgap electronic materials (silicon carbide, gallium oxide and gallium nitride) for energy-efficient applications.

Having worked in the field of silicon carbide power electronics and devices since 2003, his main interest is to research the manufacturability of this technology through an extensive network of industrial partners. Mike have undertaken numerous research projects within the field of ultra-wide bandgap gallium oxide for power electronic application. His areas of expertise include Power semiconductor device physics and design, Wide bandgap materials and devices, electrical characterisation of power semiconductor devices and reliability of power semiconductor devices