



NEWSLETTER



OCTOBER 2025

UNIVERSITY OF WISCONSIN-MADISON

It's ECCE Time!

Several WEMPEC students will be presenting in poster and oral sessions detailing their research, while Professors Sarlioglu, Jahns, Roy and Gupta will participate in tutorials and lectures.



TUTORIALS

*Shuyan Zhao (ABB, USA), **Jinia Roy**, Rm 203A, 10-21-2025*

DC/DC Converters for Renewable Applications Session

*Dushan Boroyevich (Virginia Tech), **Mahima Gupta**, Rm 201C, 10-22-2025*

Modulation & Control Strategies for High-Performance Power Electronic Systems

LECTURES

***Bulent Sarlioglu**, Jin Wang, Rm 202A*

Challenges and Mitigation of EMI, Partial Discharge in WBG-based Power Electronics

***Thomas M. Jahns**, Hamid A. Toliyat, James Swanke, Rm 201B*

Meeting Demands of Fault-Tolerant Machine Drives for Safety-Critical Applications

Oral Sessions

ORAL SESSION NO. 2 HYBRID RENEWABLE SOURCES – OCTOBER 20TH

Hyeonmeen **Baik** and Jinia **Roy**, UW Madison (with Isha Prabhu from GE Vernova). [Multi-Port Extended-Duty-Ratio Boost Converter for Hybrid Power Sources](#)

ORAL SESSION NO. 26 MAGNETIC GEARS, ACTUATORS & NON-CONVENTIONAL MACHINES – OCTOBER 21ST

Silvia Ioana **Iordache** and Daniel C. **Ludois**, UW Madison. [Evaluation of Metal Foam Electrodes for DC and AC Magnetohydrodynamic Propulsion and Pumps](#)

ORAL SESSION NO. 32 EMI DESIGN IN POWER ELECTRONICS – OCTOBER 22ND

Ujjwal **Kumar** and Mahima **Gupta**, UW Madison (with Abhijeet Prem from Portland State University). [A High-Efficiency Electromagnetic Noise Weakening Circuitry for Fast Switching Device Power Converters](#)

ORAL SESSION NO. 33 MATERIALS, LOSSES & THERMAL ISSUES IN ELECTRICAL MACHINES – OCTOBER 22ND

Gokhan **Cakal** and Bulent **Sarlioglu**, UW Madison. [Inverted-T In-Slot Heat Exchanger for Improved Cooling of Electric Motors](#)

ORAL SESSION NO. 36 GATE DRIVER CIRCUIT DESIGN – OCTOBER 22ND

Pourya **Javidi**, Hyeonmeen **Baik** and Jinia **Roy**, UW Madison. [A Synchronous Gate Driver System for Series-Connected SiC MOSFETs for High-Voltage Pulsed Power Supplies Based on Magnetic Pulse Compression](#)

ORAL SESSION NO. 37 MULTILEVEL INVERTERS FOR SUSTAINABLE ENERGY APPLICATIONS – OCTOBER 22ND

Scott **Lawton** and Jinia **Roy**, UW Madison. [High Performance Modular Multilevel Converter with High Power Density Novel Submodules](#)



**COME SEE WEMPEC AT
UNIVERSITY TABLETOP, NO. 5!!**



As an engineer with a WEMPEC Member company, you have access to the included publications and all other member-only content on the WEMPEC website: www.wempec.wisc.edu. If you have not already done so, please use the following link to register for access: <https://apps.wempec.wisc.edu/register>.

Oral Sessions (cont'd)

ORAL SESSION NO. 37 MULTILEVEL INVERTERS FOR SUSTAINABLE ENERGY APPLICATIONS – OCTOBER 22ND

Luke **Andersen** and Jinia **Roy**, UW Madison. [Multiobjective Optimization of a Single-Phase T-Type Inverter Using Bidirectional GaN Devices](#)

ORAL SESSION NO. 51 SOLID STATE TRANSFORMERS – OCTOBER 22ND

Patrick **Nowakowski**, Mahima **Gupta** and Daniel C. **Ludois**, UW Madison. [Capacitive Bridge Transformer: An Isolated, Current-Stiff Dual Active Bridge Architecture](#)

ORAL SESSION NO. 68 AIRCRAFT ELECTRIFICATION – OCTOBER 23RD

Xiaoyuan **Zhang**, Pengkun **Tian**, Ken **Chen**, Antonio T. **Parra**, Thomas M. **Jahns** and Bulent **Sarlioglu**, UW Madison. [Development and Testing of a Fault-Tolerant Modular Motor Drive using Current-Source Inverters](#)

ORAL SESSION NO. 82 RELIABILITY & PROTECTION OF POWER ELECTRONICS – OCTOBER 23RD

Pourya **Javidi** and Jinia **Roy**, UW Madison. [A Short-Circuit Failure Detection Strategy for Series-Connected SiC MOSFETs in Direct-Switched Pulsed Power Supplies](#)

DEMO

Immanuel Williams, Table 15

PCB Windings with Integrated Power Electronics for Radial-Flux Electric Machines

WEMPEC POSTER SESSIONS:

- **Ashwin Shejwalkar & Mahima Gupta**, WEMPEC, [“Load-Independent Modulation Method for Isolated DC/DC Bridge Converters”](#)
- **Seong Been Bae**, **Hyo Jeong Gong**, **Sung Hoon Cho**, **Bulent Sarlioglu** & **Seun Guy Min**, Justek, Inc, Korea, Soongsil University, Korea and WEMPEC, [“Optimal Cost-Effective Solutions Considering Power Factor in Fractional-Slot Concentrated Windings”](#)
- **Immanuel Williams**, **Maheep Bhatt**, **Bulent Sarlioglu** & **Thomas Jahns**, WEMPEC, [“Reduced-Order Modeling of PM Motors for PWM Loss Estimation in VSI, T-Type MVSI and CSI Drives”](#)
- **WaiYan Chan** & **Lei Zhou**, WEMPEC, [“Designing for Simplicity: A Novel Segmented-Stator Axial Flux Permanent Magnet Motor with Tape-Wound Cut Cores”](#)
- **Sangwhhee Lee**, **Feida Chen**, **Thomas Jahns** & **Bulent Sarlioglu**, ORNL and WEMPEC, [“PWM for Simultaneous Minimization of Switching Losses and CM Voltage in Current Source Inverters”](#)
- **Mohammad ErfaniMatin** & **Lei Zhou**, WEMPEC, [“Towards Quantitative Eccentricity Fault Modeling for Interior Permanent Magnet Motors”](#)
- **Laura Homiller** & **Lei Zhou**, WEMPEC, [“Speed Sensorless Control for a Bearingless Permanent Magnet Synchronous Machine”](#)