

First Northeast Power Electronics Symposium (NEPES 2024)

SCHEDULE THURSDAY | NOVEMBER 21, 2024

08:00 am – 09:00 am **Registration and Breakfast**

09:00 am – 09:10 am **Welcome Notes**

UConn – Prof. Ali Bazzi

Wolfspeed – Mr. Kevin Mead, Dr. Ugo Ghisla, Dr. Ty McNutt, and Dr. Ashish Kumar

09:10 am – 09:30 am **Silicon Carbide Basics**

Technology comparison: SiC vs Si vs GaN

09:30 am – 10:15 am **Simulation and Models**

Predict junction temperatures

Minimize voltage overshoots

Use virtual prototypes to inform hardware decisions and/or facilitate optimization

10:15 am – 10:30 am **Break**

10:30 am – 11:00 am **SiC die Technology Discussion**

11:00 am – 11:45 am **Future of Packaging**

Top side cooling

Overmolded modules

Sintering considerations

11:45 am – 12:15 pm **SiC Reliability**

Cosmic ray reliability

Neutron failure mechanism

12:15 pm – 01:00 pm **Lunch**

01:00 pm – 02:00 pm **Demonstrations**

SpeedVal Demo modular evaluation platform

300kW and 600 kW reference designs

02:00 pm – 03:00 pm **Thermal Considerations**

Fundamentals of thermal stack up

System level thermal characterizations

03:00 pm – 03:15 pm **Break**

03:15 pm – 04:15 pm **High Voltage Applications**

Review of IMW inverter for motor drive applications

04:15 pm – 05:15 pm **Best Design Practices**

Gate driver circuits

Proper layout

Paralleling components

05:15 pm – 05:30 pm **Break**

05:30 pm – 07:30 pm **IEEE PELS CT Chapter Roundtable: Applications and Reliability of WBG Devices in Space and Industrial Environments**

Dr. Ty McNutt, Wolfspeed

Dr. Joseph Kozak, Johns Hopkins APL

05:30 pm – 08:00 pm **Reception and Refreshments**

Wolfspeed Workshop

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SCHEDULE FRIDAY | NOVEMBER 22, 2024

08:00 am – 08:30 am	Registration and Breakfast	
08:30 am – 08:50 am	Welcome Notes	<i>Prof. Ali Bazzi</i> <i>Dean Ji-Cheng Zhao</i>
08:50 am – 09:20 am	Integrated Power Train Development for Aerospace Electrified Propulsion	<i>Dr. Xin Wu</i> ARPA-E
09:20 am – 09:50 am	Intelligent Power Module Designs Offering Onboard State of Health and Next Generation Thermal Management Suitable for Ga ₂ O ₃ Power Devices	<i>Dr. Faisal Khan</i> NREL
09:50 am – 10:05 am	Break	
10:05 am – 10:35 am	Trends in the Development of Electrical Drives, Motors and Control over the Last 50 Years	<i>Dr. Vladimir Blasko</i> Sikorsky-LM
10:35 am – 11:00 am	High-Performance Capacitor-Based Power Conversion for Electrified Aircraft	<i>Prof. Samantha Coday</i> MIT
11:00 am – 11:15 am	Break	
11:15 am – 11:40 pm	Research on Simplified Hybrid Power Conversion Systems with Integrated Energy Management and Scalable Design for Small Unmanned Aerial Vehicles	<i>Prof. Yeonho Jeong</i> University of Rhode Island
11:40 pm – 12:30 pm	Panel 1: Power Electronics Challenges in Marine and Aerospace Applications <i>Dr. Zubair A. Baig, Pratt & Whitney</i> <i>Mr. Jack Chapman, Electric Boat</i> <i>Dr. Vladimir Blasko, Sikorsky-LM</i> <i>Dr. Dan Martin, WolfSpeed</i>	<i>Dr. Parag Kshirsagar</i> RTRC
12:30 pm – 01:15 pm	Lunch	
01:15 pm – 01:40 pm	Fault-Tolerant and Self-Healing Power Electronics: An Overview	<i>Prof. Ali Bazzi</i> UConn
01:40 pm – 02:05 pm	Trends in Motor Drive Technology for Elevator Applications	<i>Mr. P. Nagarajan</i> Otis
02:05 pm – 02:30 pm	Software-Defined Power Electronics Applied to Transportation Electrification	<i>Prof. Matthias Preindl</i> Columbia University
02:30 pm – 02:45 pm	Break	
02:45 pm – 03:10 pm	Fast Speed Protection Brought by Solid State Circuit Breakers in Medium Voltage DC Power Systems	<i>Prof. Hua Zhang</i> Lehigh University
03:10 pm – 04:00 pm	Panel 2: Grid Power Electronics – Goals and Challenges <i>Dr. Fernando Fachini, Dominion Energy</i> <i>Mr. Gustavo Ortenzi, Avangrid</i> <i>Mr. Steffen Zeigler, Eversource Energy</i>	<i>Prof. Fang Luo</i> Stony Brook University
04:00 pm – 04:15 pm	Break	
04:15 pm – 04:40 pm	Dynamic Capacitive Wireless Charging of Electrified Vehicles	<i>Prof. Khurram Afridi</i> Cornell University
04:40 pm – 04:50 pm	Move to IPB Lobby	
04:50 pm – 06:00 pm	Reception and Poster/Demos Presentation	
06:00 pm – 07:30 pm	Power Electronics Lab Tour	