

## **IEEE Energy Conversion Congress & Expo (ECCE 2024) Is Coming To Phoenix**

by David G. Morrison, Editor, [How2Power.com](#)

Entering its 16th year, the [IEEE Energy Conversion Congress & Expo \(ECCE 2024\)](#) is coming to Phoenix, Ariz., October 20-24, with an extensive program packed with nearly 1200 papers, presented in oral and poster sessions, plus luminaries special sessions honoring John Kassakian and Hirofumi (Hiro) Akagi, and 16 special sessions including one in memory of Ned Mohan. ECCE 2024 also boasts a lineup of 27 tutorials. Following its record-breaking attendance last year, ECCE 2024 is looking forward to continued growth with approximately 2400 attendees anticipated in Phoenix, and a bustling expo with approximately 60 exhibitors and 15 corporate sponsors.

As usual, ECCE 2024 will host a plenary session on Monday, Oct. 21 with distinguished speakers such as Dushan Boroyevich, university distinguished professor and associate vice president for Research and Innovation in Energy Systems at Virginia Tech (CPES); Gaudy Bezos-O'Connor, project manager of NASA's aviation industry-led MW-class electrified powertrain flight demonstration project; Matthew Potter, head of engineering for electrification modules and advanced technology in the Intelligent Solutions Group at John Deere; and Olga Spahn, program director at the Advanced Research Projects Agency-Energy (ARPA-E).



*ECCE 2024 will be held at the Phoenix Convention Center, North Building, 100 North Third Street, Phoenix, AZ 85004*

Other interesting events in the ECCE program will include:

- The WIE Distinguished Leaders panel and luncheon on Monday Oct. 21st, 11:30 am to 12:45 pm
- The IEEE PELS and IAS Awards luncheon, which Thursday, Oct. 24, 12:20-2 pm. This luncheon offers a unique opportunity to see and hear from some of the industry's most accomplished contributors.

With about 5 weeks to go, ECCE's expo is slated to host 58 exhibitors and 15 corporate sponsors. Among this year's corporate sponsors are How2Power.com, John Deere and ABB (Gold sponsors) and Plexim, Nomis Power, JMAG, RTDS, Hioki, Comsol, NREL, Opal-RT Technologies, STMicroelectronics and Wolfspeed (Silver sponsors). The exhibition will be held Monday, Oct. 21 from 4:00 to 7:30 pm with a reception starting at 5:00 pm and Tuesday, Oct. 22 from 10:30 to 5:30 pm including lunch and a coffee/snack break. Admission to the exhibition is free but requires registering for an [expo hall pass](#). To see the full list of companies and universities in the expo, see the [current exhibitors & sponsors page](#).

The expo hall will be a busy place. In addition to the corporate exhibitors, the exhibition will host nine or more university exhibits plus a section for student project demos. Poster sessions are held in the exhibition hall as well.

In addition, on Tuesday, Oct. 22 from 8:30 to 11:30 am, ECCE will host its third annual career fair. This will be held in the expo hall where all exhibitors are eligible to participate as well as companies that have just signed up for the career fair. To help job-seeking attendees prepare for the career fair, conference organizers offer some simple [guidelines](#) to optimize the attendees' career fair experience.

Following last year's record breaking ECCE 2023 conference in Nashville, which attracted 2000 attendees, this year's conference anticipates even greater participation with a projected 2400 attendees. Contributing to the growth of this year's conference is its prime location. As general chair Rolando Burgos observes Phoenix is notable "as one of the top-10 fastest growing tech hubs in the United States," being home to some large power semiconductor companies, several [aerospace and defense](#) companies and other tech firms.

For those interested in sight seeing while in Phoenix, on Tuesday Oct. 22 ECCE has a tour scheduled to the Dolly Steamboat Scenic Nature Cruise on Canyon Lake. The conference also offers childcare services for parents attending ECCE.

**ECCE 2025 Schedule At A Glance**

Sunday	20-Oct	Monday	21-Oct	21-Oct	Tuesday	22-Oct	22-Oct	Wednesday	23-Oct	Thursday	24-Oct
7:30 am - 7:00 pm	Registration	7:30 am - 6:00 pm	Registration		7:30 am - 5:00 pm	Registration		7:30 am - 6:00 pm	Registration	7:30 am - 5:00 pm	Registration
8:00 am - 11:30 am	AM Tutorials	7:00 am - 8:00 am	Speakers Breakfast		7:00 am - 8:00 am	Speaker's Breakfast		7:00 am - 8:00 am	Speakers Breakfast	7:00 am - 8:00 am	Speakers Breakfast
9:30 am - 10:00 am	Coffee Break	8:00 am - 11:30 am	Plenary Session		8:30 am - 10:10 am	Oral Sessions/Special Sessions	8:30 am - 11:30 am Career Fair	8:30 am - 10:10 am	Oral Sessions/Special Sessions	8:30 am - 10:10 am	Oral Sessions/Special Sessions
11:30 am - 1:00 pm	Lunch On Own	11:30 am - 12:50 pm	Lunch on Own		10:10 am - 10:30 pm	Coffee Break	10:30 am - 5:00 pm EXPO Open	10:10 am - 10:40 am	Coffee Break	10:10 am - 10:40 am	Coffee Break
1:00 pm - 4:30 pm	PM Tutorials	11:30 am - 12:50 pm	WIE Luncheon		10:30 am - 12:10 pm	Poster Session (2)		10:40 am - 12:20 pm	Oral Sessions/Special Sessions	10:40 am - 12:20 pm	Oral Sessions/Special Sessions
2:30 pm - 3:00 pm	Coffee Break	12:50 pm - 2:30 pm	Oral Sessions/Special Sessions		12:00 pm - 2:30 pm	EXPO Hall Lunch		12:20 pm - 2:00 pm	Lunch On Your Own	12:20 pm - 2:00 pm	Awards Luncheon
4:30 pm - 5:00 pm	ECCE Newcomers Orientation	2:30 pm - 3:00 pm	Coffee Break		2:30 pm - 4:10 pm	Poster Session (3)		2:00 pm - 3:40 pm	Oral Sessions/Special Sessions	2:00 pm - 3:40 pm	Poster Session (4)
6:00 pm - 8:00 pm	Welcome Reception	3:00 pm - 4:40 pm	Oral Sessions/Special Sessions		4:00 pm - 5:00 pm	Last Hour of EXPO		3:40 pm - 4:10 pm	Coffee Break	3:40 pm - 4:10 pm	Coffee Break
		4:00 pm	EXPO Opens		5:30 pm - 7:00 pm	Luminaries Special Session		4:10 pm - 5:50 pm	Oral Sessions/Special Sessions	4:10 pm - 5:40 pm	Free 90 min Tutorials
		5:00 pm - 7:30 pm	EXPO Reception	5:30 pm - 7:10 pm Poster Session (1)	7:30 pm - 9:30 pm	IAS/PELSYP Event		6:00 pm - 8:00 pm	Networking Dinner	5:40 pm - 7:00 pm	Closing Reception
		6:00 pm - 8:00 pm	Organizing Committee Dinner								
		7:00 pm - 9:00 pm	PELS Mentorship Roundtables								

**Tutorials**

This year’s extensive tutorial lineup includes two tutorials on Thursday that are open to registered ECCE attendees at no additional cost. Tutorial presenters and their topics are listed in the tables below.

Sunday, October 20, 2024 – (8:00 AM to 11:30 AM)

Authors	Title
Victor Veliadis, Jin Wang, Tom Jahns	Bidirectional WBG Power Switches and the Applications they Enable
Anton Miric, Habib Mustain	Reliable and Efficient Packaging of SiC Power Devices for Automotive and Industrial Applications

Authors	Title
Petar Grbovic	Current Source PWM Converters – From Theory to Practice
Rafal Wojda, Marcio Magri Kimpara, Vandana Rallabandi	Design Of The Magnetic Components: Key Aspects, Approach, And Practice
Andreas Liske, Alexander Oerder, Johannes Stoss, Stephan Goehner	Methods to Identify & Control Highly Non-Linear Three-Phase Machines
Krishan Kant, Eric Severson, Minkyun Noh, Wolfgang Gruber	Bearingless Motors: Fundamentals and Current Status
Xiaonan Lu, Kevin J. Kircher	Direct Current (DC) Distribution Systems: Modeling, Control and Real-World Implementation
Sudip Mazumder, Ankit Mehta, Congbo Bao, Steven Schwaitzberg	Electrosurgery Power Electronics: A Revolution In The Making
Chris Mi	Electric Propulsion Systems for Electric Aircraft
Sheldon Williamson, Deepak Ronanki, Rick Szymczyk	Advanced Power Electronics for Health-Conscious Fast Charging and Wireless Charging for Future E-Mobility
Olena Rubanenko, Milan Belik	Digital Twin Of Renewable Energy Sources: Modernization And Renovation Of Overloaded Power Systems

Afternoon Session Tutorials (Industry)

October 20, 2024 – (1:00 PM to 4:30 PM)

Authors	Title
Eric R. Motto, Michael Rogers, Mark Steiner	Practical Considerations for the Application of High Power Si and SiC Modules
Günter Keller	Electromagnetic Compatibility of Switched-Mode Power Supplies

Authors	Title
Yan-Fei Liu, Don Tan	State-of-the-Art and Future Research Directions for 48V to 0.7V / 2,000A Power Conversion for future CPU, GPU, FPGA applications
Dheeraj Bobba, Mohanraj Muthusamy, Vedanadam Mudumbai Acharya	Design & Optimization of High Torque Density Permanent Magnet Synchronous Machines for Traction Applications
Ralph Kennel, Jose Rodriguez, Zhenbin Zhang	Model Predictive Control of Power Electronics – an Intuitive and Simple Concept for the Future
Marcio Magri Kimpara, Joao Onofre Pereira Pinto, Walter Issamu Suemitsu	Artificial Intelligence Applications For Switched Reluctance Motors Drives
Sabin Carpiuc	Harvesting the Solar Energy: Modeling, Control, and Simulation of Photovoltaic Systems
Wen Soong	Underground Mining Fleet Electrification: Challenges and Opportunities
Jin Wang, Bulent Sarlioglu, Patrick McClusky, Tom Jahns, John Kizito	Electric Propulsion: Challenges and Opportunities
Rim Chun Taek	Recent Advances in Wireless Power Transfer Technology for Electric Vehicles and Smart Devices
Bryan Lieblick, Arnab Acharya	Hardware-in-the-loop Systems For Power Electronics Engineers: From Theory To Applications
Hui "Helen" Li, JiangBiao He, Yu Zhang, Ranga Tallam	Reflective Surge Voltage Mitigation for Fast-Switching Motor-Drive Systems
Daniel-Ioan Stroe, Jussi Sihvo, Tomi Roinila	Battery States Monitoring And Estimation Using Impedance Identification Techniques
Brian Zahnstecher	Identifying & Analyzing Total Lifecycle Energy Footprints in Large & Small Systems

Afternoon Session Tutorials (FREE)

October 24, 2024 (Thursday) – (4:10 PM to 5:40 PM)

Author	Title
Zhicheng Guo, Alex Huang, Levy Costa, Marco Liserre	Latest Development And New Technology Trends In Solid State Transformer
Hui Yang, Yiming Shen	From PM to PM+X: The State of the Art in Variable Flux Permanent Magnet Machines for Wide-Speed-Range Applications

For more on these instructional sessions, see the [tutorials page](#).

### Plenary Session

This year's plenary session will be held on Monday, October 21 from 8:00 to 11:30 with the following notable keynote speakers:

- Dushan Boroyevich is university distinguished professor and associate vice president for Research and Innovation in Energy Systems at Virginia Tech (CPES).
- Ms. Bezos-O'Connor is project manager of NASA's aviation industry-led MW-class electrified powertrain flight demonstration project, which could transform the aerospace industry and result in a dramatic reduction of aircraft emissions and enable sustainable aviation.
- Matthew Potter is the head of engineering for electrification modules and advanced technology in the Intelligent Solutions Group at John Deere. His teams lead research, development, and deployment of power dense, ruggedized motor drives, power converters, and electric machines in support of vehicle programs throughout the Deere enterprise.
- Olga Spahn currently serves as a program director at the Advanced Research Projects Agency-Energy (ARPA-E). Her focus at ARPA-E is on grid resiliency, power management and distribution, aviation and instrumentation for harsh environments leveraging optical and semiconductor device technologies.



To read the abstracts on their talks, see the [plenary sessions page](#).

### Luminaries Special Sessions



On Tuesday, Oct. 22, from 5:00 to 7:00 pm, ECCE will host special sessions honoring John Kassakian, professor of electrical engineering, emeritus, The Massachusetts Institute of Technology, and Hirofumi (Hiro) Akagi, distinguished professor, Tokyo Institute of Technology, in rooms 129 AB and 124 AB of the convention center, respectively.

This unique opportunity offers a chance to learn from the honorees' experiences, celebrate their remarkable achievements, and engage in discussions about future trends in this dynamic domain. These two special sessions will be held concurrently on Tuesday evening, following the closure of the expo. The sessions will open with a light networking reception.

### **Special Sessions**

Special sessions are planned throughout the conference program. These 100- or 200-minute sessions are organized by industry experts in industry and academia and focus on specific trending topics. The format is often in a panel or individual presentation style with a moderator.

- Professor Ned Mohan Memorial Session
- Energy Transition and Energy Access – Common Challenges and Enabling Technologies
- Dynamic Modeling and Control of Inverter-Based Resources: A Bottom-Up Approach Spanning from Networked Microgrids to Bulk Transmission Interconnection
- Design Automation for Power Electronics – Design Methods, Challenges and Education
- Advancements in Modeling, Control, and Operation of Converter Dominated Power Systems
- Power-dense Electric Traction Drive Component Integration, Packaging, and Manufacturing Challenges for Commercial and Industrial Vehicles
- Net Zero Carbon Power Converters Design and Production: Where Are We Now?
- Aerospace Electrified Propulsion – Integrated Powertrain Development And Testing for Future Electrified Skies
- Empowering Sustainable Futures: The Critical Role of Power Electronics in Energy and Industry
- Power Hardware in the Loop: Unlocking the Future of Energy Conversion Research and Testing
- Sustainable Energy Systems as Primary Sources to Advance the Grid
- P2964 IEEE Standard for Datasheet Parameters and Tests for Integrated Gate Drivers
- Simulation-Driven Electric Propulsion: Shaping the Future of Transportation
- Advancing Load Modeling and Power Electronics Integration in Evolving Grid Environments: Challenges, Solutions, and Open-Source Approaches
- MVDC Status, Technologies and Challenges
- Nex Generation AI for Power Electronics: Explainable, Flexible, and Lightweight
- Advancements in Multilevel Converters for Electric Vehicles/ Grid-Tied Applications
- Breakthroughs in Medium-Voltage SiC Power Module: Design, Validation and Application
- Solid State Circuit Protection for LV/MV Application

For more information, see the [special sessions page](#).

### **Preliminary Technical Program**

For a preliminary look at this year's technical program, including access to a list of the 1169 papers scheduled for presentation at ECCE, see the [technical programs page](#). This page also provides access to the complete conference programs from past years.

For a list of registration rates and other details on how to register for ECCE 2024, see the [rates and registration page](#). For more information, on any aspects of the ECCE 2024 conference, see the [website](#), [contact the conference](#), or email [me](#).