ITEC+2025

IEEE Transportation Electrification
CONFERENCE AND EXPO
+ Electric Aircraft Technologies Symposium

JUNE 18–20
Anaheim
CALIFORNIA

SPONSORED BY:

IEEE

IAS IEEE INDUSTRY APPLICATIONS SOCIETY

IEEE PES Power & Energy Society®

pels IEEE POWER ELECTRONICS SOCIETY Powering a Sustainable Future

IEEE TRANSPORTATION ELECTRIFICATION COUNCIL

iTEC+ 2025

June 17 - 20 Anaheim, CA

SCHEDULE-AT-A-GLANCE

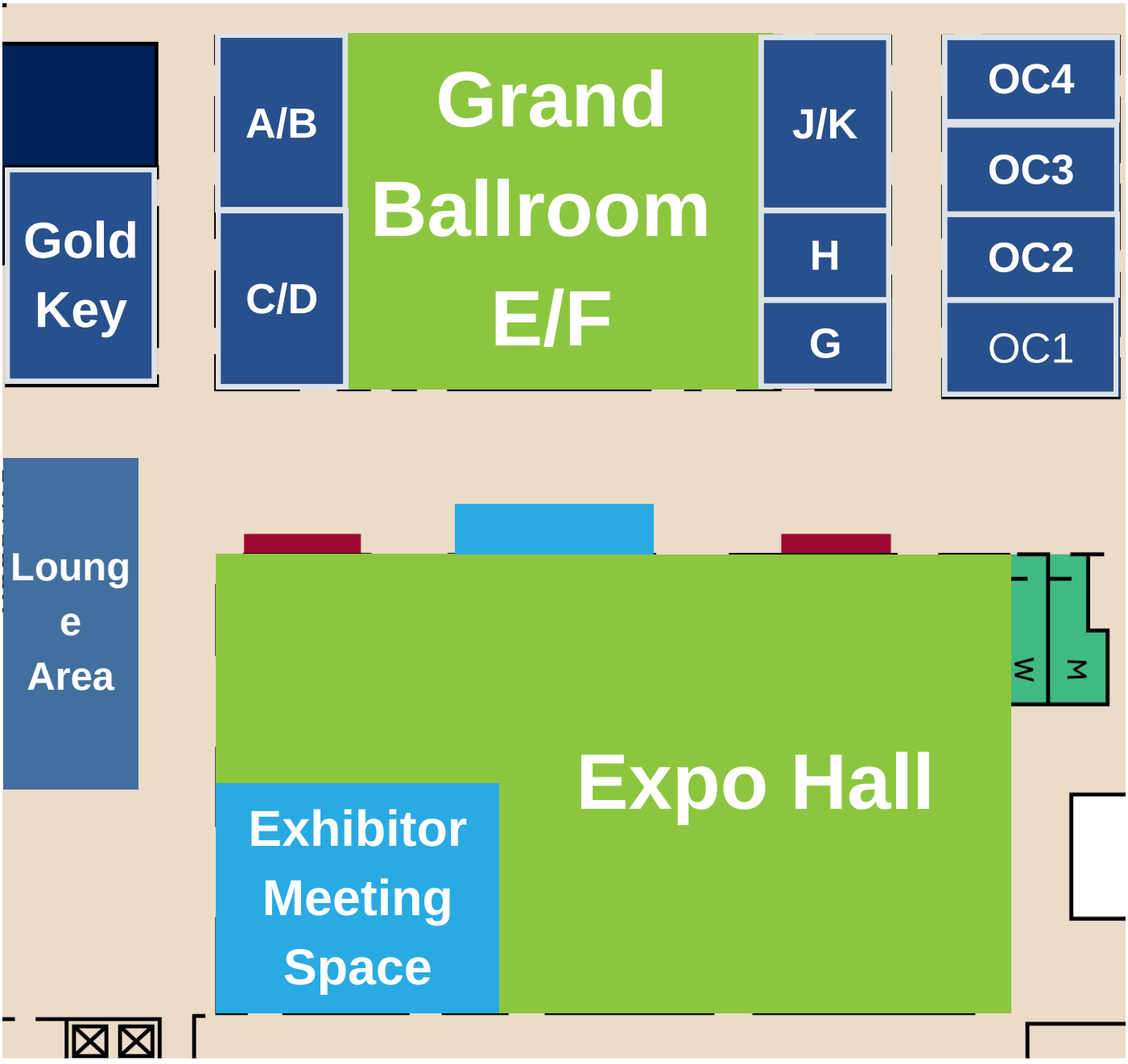
	Wednesday	Thursday	Friday
7:30 AM	Registration Open		
8:30 AM	Opening Remarks Keynotes 1 & 2	Awards Keynotes 6 & 7	Short Course 5 & 6 Oral Session 5-9
10:00 AM	Coffee Break		
10:30 AM	Keynotes 3-5	Keynotes 8 - 10	Tutorial 5 Short Course 5 & 6 Oral Session 10-13
12:00 PM	Lunch in Expo Poster Session 1	Lunch in Expo TC4 Luncheon Poster Session 3	Lunch (on own) WIE Luncheon
2:00 PM	Tutorial 1 Panels 1 & 2 Short Course 1 & 2 Oral Session 1 & 2	Tutorial 3 Panel 5 - 7 Short Course 3 & 4	1:40pm Oral Session 14-18
3:30 PM	Coffee Break		
4:00 PM	Tutorial 2 Panel 3 & 4 Short Course 1 & 2 Oral Sessions 3 & 4	Tutorial 4 Panel 7 (cont'd) & 8 Short Course 3 & 4	
6:00 PM	Expo Reception Poster Session 2	Industry Night Out YP Event	

More Information | https://itec-conf.com/ | info@itec-conf.com

iTEC+ 2025

June 17 - 20 Anaheim, CA

FLOORPLAN



iTEC+2025

June 17 - 20 Anaheim, CA

IMPORTANT CONFERENCE INFORMATION

Conference App

Download the ITEC+2025 App today! Build your schedule, set up networking appointments, even see the presentations of papers from authors not able to attend the conference. The possibilities are nearly endless!

Either search “ITEC+2025” in your app store or click the buttons!

GET IT ON Google Play

Download on the App Store

Conference WiFi

Looking to save your cellular data? Look no further than the exclusive WiFi available to ITEC+ attendees!

SSID: Marriott conference

Password: ITEC2025

iTEC+2025

June 17 - 20 Anaheim, CA

TABLE OF CONTENTS

The Table of Contents is fully interactive and linked with the rest of the program. Are you interested in a particular section? Click the title of the section, for example, “Keynotes”. You will be taken to the keynote section. Are you interested in a particular session? Click that specific session and be taken to that page. Once you are done and you want to find your way back to the Table of Contents, click the blue car in the bottom, right corner of each page to be brought back to this page.

Table of Contents - Cont'd

Tutorials

Panels

Industry Sessions

Oral Sessions

Poster Sessions

iTEC+ 2025

June 17 - 20 Anaheim, CA

WELCOME LETTER

Dear ITEC+ 2025 participants, colleagues, and friends,

On behalf of the organizing committee, it is my great pleasure to welcome you to the IEEE Transportation Electrification Conference and Expo—ITEC+ 2025—hosted this year in sunny Anaheim, California. This conference builds on the decade-long legacy of ITEC for 15 years with the support of IEEE. ITEC has established itself as the premier conference in transportation electrification with a global brand that focuses on the electrification of all types of vehicles and transportation systems. Each year, ITEC brings together leaders in industry, government, and academia to exchange knowledge, showcase innovations, and shape the evolving transportation landscape.

In 2022, for the first time ITEC teamed with EATS, which started in 2018 and has rapidly emerged as the leading event for technical developments in the emerging area of aircraft electrification. With the tremendous success made by ITEC+EATS 2022, we gather again this year and continue our shared journey toward a more sustainable, electrified future in transportation. This year's program features hundreds of peer-reviewed technical papers, 12 expert-led tutorials and short courses, 10 dynamic panels (including 2 industry panels, 1 AEPA-E project review panel, and 7 technical panels), and 11 keynote talks that spotlight the technologies and challenges transforming our field—from advanced charging systems to grid integration and heavy-duty electrification.

In addition to the technical program, we are proud to offer a lineup of special events, including the Women in Engineering Luncheon, PELS mentorship luncheon, student competitions, award ceremonies, and our signature Industry Night Out. These gatherings not only enrich the conference experience but also strengthen the connections that keep our community thriving. Moreover, our exhibit hall is once again filled with cutting-edge solutions from a diverse range of sponsors and exhibitors. I encourage you to explore, engage, and discover what's next in transportation electrification.

Finally, while we look forward to three impactful days here in Anaheim, we also look ahead. Each edition of ITEC builds on the last, growing in scope, ambition, and relevance. Your participation today helps shape not only this year's event—but also the future of ITEC+and the role we all play in accelerating global electrification.

Thank you for joining us. We hope that you enjoy the conference and have a great experience. Let's make ITEC+ 2025 one to remember and keep working together to build a better tomorrow for mankind.

Warm regards,
Liang Du
General Chair, ITEC+ 2025

iTEC+ 2025

June 17 - 20 Anaheim, CA

ORGANIZING COMMITTEE

General Chair
- Liang Du, Temple University

General Co-Chair (EATS)
- Herb Schlickenmaier, HS Advanced Concepts LLC

General Co-Chair
- Nanpeng Yu, University of California – Riverside

Program Chair
- Jennifer Bauman, McMaster University

Program Co-Chair (EATS)
- Vincent Schultz, NASA

Assistant Program Chairs
- Ilker Sahin, AVL
- Hang Dai, GE Aerospace

Finance Chair and Treasurer
- Fei Lu, Lehigh University

Publication Chairs
- Yan Li, Penn State University
- Jinan Zhang, Eaton
- Ilker Sahin, AVL

Student Activities Chair
- Weihan Li, RWTH Aachen University

Panel Chairs
- Hikmet Karakoç, SARES
- Krishna MPK Namburi, Nexteer Automotive
- Di Zhu, Ford

Keynote Chair
- Gokcin Cinar, University of Michigan

Short Courses/Tutorials Chairs
- Matilde D'Arpino, Ohio State University
- Nishanth Gadiyar, Oak Ridge National Lab
- Evgeni Ganev, EMPS Consulting LLC

Industry Liaisons
- Shobhit Gupta, GM
- Shreshta Rajakumar Deshpande, Southwest Research Institute

Women in Engineering (WIE) Activities Chair
- Sonia Martin, Stanford University

Awards Chairs
- Xiaofeng Yang, Beijing Jiaotong University
- Bo Jie, The University of Tokyo

Young Professionals Activities Chair
- Nishanth Gadiyar, Oak Ridge National Lab

STEERING COMMITTEE

- Ali Emadi (Chair), McMaster University
- Bogdan Borowy, Satcon Technology Corporation
- Rik DeDoncker, RWTH Aachen University
- Deepak Divan, Georgia Institute of Technology
- Babak Fahimi, University of Texas at Dallas
- Silva Hiti, Rivian
- Phil Krein, University of Illinois at Urbana-Champaign
- John M. Miller, Oak Ridge National Laboratory
- Jim Nagashima, Nagashima Advanced Technology Consulting
- Kaushik Rajashekara, University of Texas at Dallas
- Peter Steimer, ABB Switzerland Ltd.

iTEC+ 2025

June 17 - 20 Anaheim, CA

TRACK CHAIRS

Track 1: Power Electronics and Motor Drives
- Krishna MPK Namburi, Nexteer Automotive
- Qichen Yang, university of central florida
- Baiming Shao, AVL
- Liwei Zhou, University of Texas at Arlington

Track 2: Electric Machines and Actuators
- FNU Nishanth, Oak Ridge National Lab
- Sreedevi Krishnan, AnSys
- Gaoliang Fang, University of Prince Edward Island
- Sherry Du, Hitachi Astemo

Track 3: Battery, Fuel Cell, Hydrogen & Other Energy Storage
- Hengzhao Yang, Shanghai Tech
- Zheng Liu, University of Michigan – Dearborn
- Zhixue Zheng, University of Franche-Comté

Track 4: Superconducting & Cryogenic Systems & Components
- Mohamad Salameh, Rivian
- Theepan Balachandran, Hinetics, Inc.
- Mike Sumption, Ohio State University

Track 5: System Dynamics, Modeling, & Control
- Bahareh Zaghari, University of Southampton
- Justin Scheidler, NASA Glenn Research Center
- Sang Hyun Kim, Korea Aerospace University

Track 6: Mission Operation: Energy, Costs, Emissions, & Thermal Management
- Ratnak Sok, Waseda University
- Matthew Clarke, University of Illinois
- Jonathan Gladin, Research Engineer, Georgia Tech

Track 7: Connected & Autonomous Vehicles, Smart Mobility, & Vehicle Functional Security
- Bo Jie, The University of Tokyo
- Di Chen

Track 8: Powertrain Architectures: Design, Integration, Packing, &Optimization
- Pallavi Pragya, EMWorks Inc., Montreal, Canada
- Lulu Guo, Tongjij University

Track 9: Electrification of Heavy-Duty & Off-Road Vehicles
- Xiaofeng Yang, Beijing Jiaotong University
- Sumeet Singh, EMWorks Inc., Montreal, Canada

Track 10: Design & Optimization for Electrified Airplane, Sea, & Undersea Transportation
- Javad Khazaei, Lehigh University
- Bahareh Zaghari, University of Southampton
- Pengyu Fu, Ohio State University

Track 11: Rapid Prototyping, Real-Time Simulation, HIL & SIL, Verification & Testing
- Reza Kheirollahi, Tesla
- Apoorva Nandakumar, Tesla

Track 12: Smart & Micro Grids, EV-Interacting Grids
- Tianqi Hong, University of Georgia
- Mohamed Yasko, KU Leuven

Track 13: Battery Chargers: Onboard, Wireless, Fast, and Ultra-Fast
- Gautham Ram, TU Delft
- Gautam Rituraj, TU Delft
- Hua Zhang, Lehigh University

Track 14: Safety, Diagnostics, Reliability, Failure & Fault Mode Protection, & EMI
- Chanyeop Park, ASU
- Almeida Gregory, IRT Saint-Exupéry Institute

Track 15: Codes, Certifications, Standards, Policies, & Regulations; EcoCAR
- Xinyuan Jiang, Penn State University

Track 16: Previously Published Journal Papers
- Nil Patel, Concordia University

iTEC+2025

Meetings

SPONSORED BY:

IEEE

IAS IEEE INDUSTRY APPLICATIONS SOCIETY

IEEE PES Power & Energy Society®

pels IEEE POWER ELECTRONICS SOCIETY Powering a Sustainable Future

IEEE TRANSPORTATION ELECTRIFICATION COUNCIL

iTEC+ 2025

June 17 - 20 Anaheim, CA

COMMITTEE MEETINGS

Tuesday

IEEE TEC AdCom Meeting

Tuesday, June 17 | 12:00pm – 5:30pm | Location: Suite 304

Wednesday

IEEE Transactions on Transportation Electrification

Editorial Board and Steering Committee Meeting

Wednesday, June 18 | 2:00pm – 3:30pm | Location: Rooms OC4

IEEE PELS Technical Committee 4 Meeting

Wednesday, June 18 | 4:00pm – 5:30pm | Location: Rooms OC4

Thursday

EATS Committee Meeting

Thursday, June 19 | 1:00pm – 2:00pm | Location: OC4

ITEC Steering Committee Meeting

Thursday, June 19 | 4:00pm – 5:30pm | Location: OC4

iTEC+2025

Special Events

SPONSORED BY:

IEEE

IAS IEEE INDUSTRY APPLICATIONS SOCIETY

IEEE PES Power & Energy Society®

pels IEEE POWER ELECTRONICS SOCIETY Powering a Sustainable Future

IEEE TRANSPORTATION ELECTRIFICATION COUNCIL

iTEC+ 2025

June 17 - 20 Anaheim, CA

SPECIAL EVENTS

Welcome Reception

June 17 | 6:00pm – 8:00pm

Location: Platinum Ballroom Patio

Join us for an exciting start to ITEC+2025 at our Welcome Reception, sponsored by Empower a Billion Lives and the Transportation Electrification Council! This event is a wonderful chance to chat with leaders in the field of transportation electrification.

TC4 Luncheon

June 19 | 12:00pm – 2:00pm

Location: Gold Key

Sponsored by IEEE PELS, the ITEC+ 2025 Mentorship Luncheon welcomes PELS attendees at any career stage for roundtable discussions on career growth in academia and industry. Six tables will explore development, preparation, and transitions between the two paths. Lunch and refreshments are provided at no extra cost.

Expo Reception

June 18 | 6:00pm – 8:00pm

Location: Exhibit Hall

Mingle with industry professionals at our Expo Industry Reception. To top it off, enjoy a delicious walking meal on us. This is an event you won't want to miss!

Industry Night Out + Young Professionals Event

June 19 | 6:00pm – 8:00pm

Location: The Fifth Rooftop Restaurant

1650 S Harbor Blvd, Grand Legacy at the Park, Anaheim, CA 92802-2314

Looking for great food and even better networking opportunities? Look no further. Come join us for a night away from the rigors of the conference to relax and connect with other electrical engineers.

**Note: You must pre-register for this event. Tickets may still be available at the registration desk.*

Women in Engineering Luncheon

June 20 | 12:10pm – 1:40pm

Location: Gold Key

SPEAKER: Rashmi Krishnamurthy, *Program Manager and Senior Architect at Nvidia*

Come join the WIE Committee in celebrating women in engineering. She will be discussing women engineers leading global teams. A buffet lunch will be served.

Abstract:Join us for an inspiring conversation with Rashmi Dudda Krishnamurthy, Program Manager and Senior Architect at NVIDIA, as she reflects on her dynamic career journey in the automotive industry. With over two decades of experience leading cross-functional teams and advancing vehicle safety innovations, Rashmi will share pivotal moments, key lessons, and the personal challenges she has navigated as a woman in engineering. From technical breakthroughs to leadership growth, her story offers insight into building a meaningful, resilient career while staying true to one's passion for innovation and impact. Whether you're an early-career engineer or a seasoned professional, Rashmi's talk will provide valuable takeaways on perseverance, purpose, and the power of community.

iTEC+ 2025

Keynotes

SPONSORED BY:

IEEE

IAS IEEE INDUSTRY APPLICATIONS SOCIETY

pels IEEE POWER ELECTRONICS SOCIETY Powering a Sustainable Future

IEEE PES Power & Energy Society®

IEEE TRANSPORTATION ELECTRIFICATION COUNCIL

iTEC+ 2025

June 17 - 20 Anaheim, CA

KEYNOTE SPEAKER

Sanjeev Naik

Director of Energy & Propulsion System Research Laboratory
GM

iTEC+ 2025

ITEC is aimed at helping the industry in the transition from conventional vehicles to advanced electrified vehicles. The conference is focused on components, systems, standards, and grid interface technologies, related to efficient power conversion for all types of electrified transportation, including electric vehicles, hybrid electric vehicles, and plug-in hybrid electric vehicles (EVs, HEVs, and PHEVs) as well as heavy-duty, rail, and off-road vehicles and airplanes and ships.

Wednesday, June 18, 2025 9:00 AM
Room: Grand Ballroom E/F

SPEAKER BIO

"Dr. Sanjeev Naik is Director of Energy & Propulsion System Research at GM. He has held multiple management and technical leadership positions in vehicle electrification, propulsion systems, controls, and active safety. Dr. Naik is a recipient of GM's Boss Kettering Award, the Charles McCuen R&D Award, and the Chairman's Honors Award. His technical interests are in developing innovative electric mobility solutions.

He is an IEEE Senior Member, an SAE Member, and has several publications and over fifty patents. Sanjeev received his Bachelor's degree from IIT Bombay, India, M.S.E.E. from the University of Michigan, Ann Arbor, and Ph.D. from the University of Illinois, Urbana–Champaign, all in electrical engineering, and M.B.A. in corporate strategy from the University of Michigan, Ann Arbor.

iTEC+2025

June 17 - 20 Anaheim, CA

KEYNOTE SPEAKER

Hengchun Mao

President at Quanten Technologies

iTEC+2025

ITEC is aimed at helping the industry in the transition from conventional vehicles to advanced electrified vehicles. The conference is focused on components, systems, standards, and grid interface technologies, related to efficient power conversion for all types of electrified transportation, including electric vehicles, hybrid electric vehicles, and plug-in hybrid electric vehicles (EVs, HEVs, and PHEVs) as well as heavy-duty, rail, and off-road vehicles and airplanes and ships.

Wednesday, June 18, 2025, 9:30 AM
Room: Grand Ballroom E/F

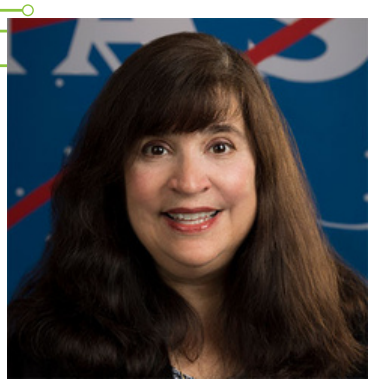
SPEAKER BIO

Dr. Hengchun Mao is the founder and CEO of Quantentech, a startup of high-performance motor and drive systems for EVs, eVTOLs and Robots. He received his Ph. D. degree from Virginia Tech in 1996, and has been working in power electronics and motor drive industries for over 30 years. He was a staff researcher of power systems in Bell Labs, the principal architect of Huawei's Digital Power department, and a business unit general manager at Diodes Semiconductor. He founded Quanten Technologies, NuVolta Technologies, and NetPower Technologies, respectively in the business of advanced EV drives, wireless charging technologies, and high efficiency power modules. In recent years, Dr. Mao has been focusing on advanced high performance multi-phase motor drive system with dynamically adjustable magnetic structure, with the aid of power electronics and advanced drive algorithm to adapt the magnetic configurations of the motor in real-time according to its load condition, achieving 50% power density improvement for hybrid and electric vehicle applications. He has authored over 100 US patent applications in these fields.

In recent years, multi-phase drive systems are attracting more attention due to their ability to achieve higher power and better reliability than three-phase drives. However, almost all of the multi-phase motors are designed and controlled as multi three-phase systems in parallel, practically limiting the performance improvement and thus application appeal of multi-phase technology. To fully release the potential of such technology, innovative "true" multi-phase design approach and control algorithm have to be developed. Dr. Mao will mainly present advancement of multi-phase motor and drive system development, and discuss how to significantly improve power and torque density of motors and create more reliable and cost-effective drive solutions than conventional three-phase technology. Target applications include electric and hybrid vehicles and eVTOLs.

iTEC+ 2025

June 17 - 20 Anaheim, CA



KEYNOTE SPEAKER

GAUDY BEZOS O'CONNOR

EPFD PROJECT MANAGER
NASA

iTEC+ 2025

ITEC is aimed at helping the industry in the transition from conventional vehicles to advanced electrified vehicles. The conference is focused on components, systems, standards, and grid interface technologies, related to efficient power conversion for all types of electrified transportation, including electric vehicles, hybrid electric vehicles, and plug-in hybrid electric vehicles (EVs, HEVs, and PHEVs) as well as heavy-duty, rail, and off-road vehicles and airplanes and ships.

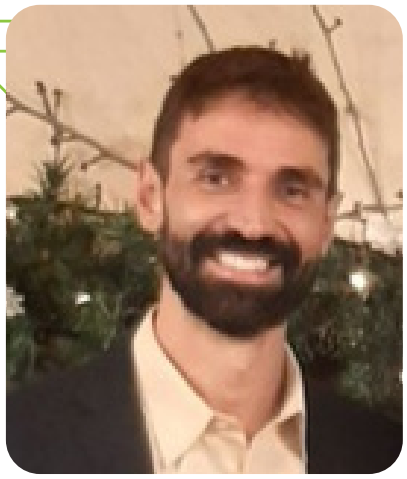
Wednesday, June 18, 2025 10:30 AM
Room: Grand Ballroom E/F

SPEAKER BIO

Ms. Bezos-O'Connor has over 4 decades of project management and R&D experience delivering high-risk, high-pay-off aerospace solutions for NASA in partnership with the FAA, the aerospace industry and academia. A highly collaborative leader, she brings a solid history of success in public-private partnerships and innovative project management strategies. For the past decade and a half, Ms. Bezos-O'Connor has been at the forefront of enabling sustainable aviation through NASA's Environmentally Responsible Aviation Project, and Advanced Air Transport Technology Project and the FAA CLEEN Program. Currently she is the Project Manager of NASA's aviation industry-led MW-class electrified powertrain flight demonstration (EPFD) project whose goal is to reduce EIS technology barriers and accelerate adoption of hybrid electric propulsion systems that enable a sustainable aviation future.

- Ms. Bezos-O'Connor, is an AIAA Associate Fellow and earned a B.S. in Aeronautical Engineering from Rensselaer Polytechnic Institute and a M.E. in Engineering Management from Old Dominion University.

iTEC+ 2025



KEYNOTE SPEAKER

Enrico Pietrantozzi

Director Software Engineering, EnerSys

iTEC+ 2025

ITEC is aimed at helping the industry in the transition from conventional vehicles to advanced electrified vehicles. The conference is focused on components, systems, standards, and grid interface technologies, related to efficient power conversion for all types of electrified transportation, including electric vehicles, hybrid electric vehicles, and plug-in hybrid electric vehicles (EVs, HEVs, and PHEVs) as well as heavy-duty, rail, and off-road vehicles and airplanes and ships.

Wednesday, June 18, 2025 11:00 AM
Room: Grand Ballroom E/F

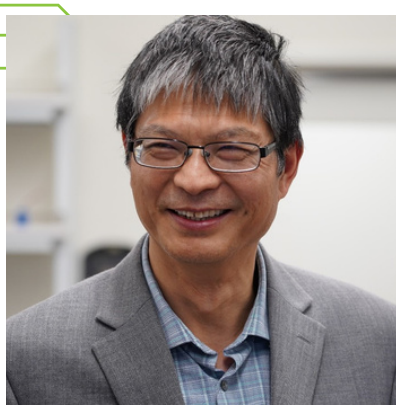
SPEAKER BIO

Enrico has 15 years of experience in Renewable Energy, Solar technology and EV charging solutions.

He started developing switching control system for power electronic in Assembly, today he is driving innovation with State of the Art AI/ML cloud based for Energy System. Energy Management and Sustainability are the core expertise across different business areas of experience.

iTEC+2025

June 17 - 20 Anaheim, CA



KEYNOTE SPEAKER

Chris Mi

Fellow IEEE & SAE
Distinguished Professor
Electrical and Computer Engineering
San Diego State University

iTEC+2025

ITEC is aimed at helping the industry in the transition from conventional vehicles to advanced electrified vehicles. The conference is focused on components, systems, standards, and grid interface technologies, related to efficient power conversion for all types of electrified transportation, including electric vehicles, hybrid electric vehicles, and plug-in hybrid electric vehicles (EVs, HEVs, and PHEVs) as well as heavy-duty, rail, and off-road vehicles and airplanes and ships.

Wednesday, June 18, 2025, 11:30 AM
Room: Grand Ballroom E/F

SPEAKER BIO

Dr. Mi is the Distinguished Professor of Electrical and Computer Engineering at San Diego State University. He is a Fellow of IEEE (Institute of Electrical and Electronics Engineers) and SAE (Society of Automotive Engineers). He is also the Director of the US Department of Energy-funded Graduate Automotive Technology Education (GATE) Center for Electric Drive Transportation at SDSU. He was previously a faculty member at the University of Michigan-Dearborn from 2001 to 2015, and an Electrical Engineer with General Electric from 2000 to 2001. He also served as the CTO of 1Power Solutions from 2008 to 2011, and CTO of EV Safe Charger, Inc. from 2021. Dr. Mi received his Ph. D from the University of Toronto, Canada, in 2001.

Dr. Mi has published five books, 200+ journal papers, 130 conference papers, and 20+ issued and pending patents. He served as Editor-in-Chief, Area Editor, Guest Editor, and Associate Editor of multiple IEEE Transactions and international journals, as well as the General Chair of over ten IEEE international conferences. Dr. Mi has won numerous awards, including the “Distinguished Teaching Award” and “Distinguished Research Award” from the University of Michigan-Dearborn, IEEE Region 4 “Outstanding Engineer Award,” IEEE Southeastern Michigan Section “Outstanding Professional Award,” and SAE “Environmental Excellence in Transportation (E2T) Award.” He is the recipient of three Best Paper Awards from IEEE Transactions on Power Electronics and the 2017 ECCE Student Demonstration Award. In 2019, he received the Inaugural IEEE Power Electronics Emerging Technology Award. In 2022, he received the Albert W. Johnson Research Lectureship and was named the Distinguished Professor, the highest honor given to an SDSU faculty member, and only one award is given each year. He received the 2023 IEEE PELS Vehicle and Transportation Systems Achievement Award, the IEEE Transactions on Industry Applications Best Paper Award, and the SDSU Innovator of the Year Award. In 2024, he received the prestigious Alumni Distinguished Faculty Award from SDSU.

iTEC+ 2025

June 17 - 20 Anaheim, CA

KEYNOTE SPEAKER

Xin Wu

Technology-to-Market Advisor
ARPA-E

iTEC+ 2025

ITEC is aimed at helping the industry in the transition from conventional vehicles to advanced electrified vehicles. The conference is focused on components, systems, standards, and grid interface technologies, related to efficient power conversion for all types of electrified transportation, including electric vehicles, hybrid electric vehicles, and plug-in hybrid electric vehicles (EVs, HEVs, and PHEVs) as well as heavy-duty, rail, and off-road vehicles and airplanes and ships.

Thursday, June 19, 2025, 09:00 AM
Room: Grand Ballroom E/F

SPEAKER BIO

Dr. Xin Wu is a Technology-to-Market Advisor at the Advanced Research Projects Agency – Energy (ARPA-E). With over 16 years of experience in power electronics, system integration, advanced sensors, real-time modeling, and health monitoring, Dr. Wu has a proven track record in cutting-edge technology development.

Before ARPA-E, Dr. Wu served as Discipline Chief for Integrated Electrical Systems at Pratt & Whitney, where she led technology strategies, collaborated with partners and government labs, and advanced system development for military and commercial programs. Previously, at Raytheon Technologies Research Center, she drove innovations in semiconductor applications, wireless power transfer, and embedded sensing systems. She began her career at Ansys Corporation in electromechanical system modeling.

Dr. Wu holds a Bachelor's in Electrical Engineering from Huazhong University of Science and Technology, China, and a Ph.D. in Electrical Engineering from the University of South Carolina.

iTEC+ 2025

June 17 - 20 Anaheim, CA

KEYNOTE SPEAKER

Scott Hotz

Founder & CEO
Simplify Tech LLC

iTEC+ 2025

ITEC is aimed at helping the industry in the transition from conventional vehicles to advanced electrified vehicles. The conference is focused on components, systems, standards, and grid interface technologies, related to efficient power conversion for all types of electrified transportation, including electric vehicles, hybrid electric vehicles, and plug-in hybrid electric vehicles (EVs, HEVs, and PHEVs) as well as heavy-duty, rail, and off-road vehicles and airplanes and ships.

Thursday, June 19, 2025, 09:30 AM
Room: Grand Ballroom E/F

SPEAKER BIO

Scott Hotz is a systems-level multidisciplinary engineering expert, entrepreneur and leader delivering energy optimization, efficiency improvements and emissions reductions. Mr. Hotz founded Simplify Tech LLC in Ann Arbor, Michigan to provide world-class multidisciplinary engineering services in support of research and development programs, and most importantly to commercialize technologies that change the world. Prior to forming Simplify Tech, Mr. Hotz spent 25 years at Southwest Research Institute where he was Director of the Control Systems Department supporting five (5) of SwRI's 11 technical divisions. He founded SwRI's Ann Arbor Technical Center in 2002, to support work at the EPA's National Vehicle & Fuel Emissions Laboratory, US Army GVSC and SwRI's many commercial clients in the Michigan region.
From 2016 to 2025 Mr. Hotz served as Principal Investigator for a $9MM ARPA-E (DOE) research grant. The NEXT-Generation Energy Technologies for Connected and Automated On-Road Vehicles "NEXTCAR" program leveraged connected-vehicle enabled "preview" of the route ahead to operate vehicles more efficiently, saving over 30% energy with no changes to the vehicle powertrain. Mr. Hotz earned his B.S. Electrical Engineering from the University of Toledo in 1999 and his MBA from the University of Michigan's Ross School of Business in 2012. Mr. Hotz is a Professional Engineer in the State of Michigan.

iTEC+ 2025

June 17 - 20 Anaheim, CA

KEYNOTE SPEAKER

Charlie Roberts

Executive Director
Southwest Research Institute

iTEC+ 2025

ITEC is aimed at helping the industry in the transition from conventional vehicles to advanced electrified vehicles. The conference is focused on components, systems, standards, and grid interface technologies, related to efficient power conversion for all types of electrified transportation, including electric vehicles, hybrid electric vehicles, and plug-in hybrid electric vehicles (EVs, HEVs, and PHEVs) as well as heavy-duty, rail, and off-road vehicles and airplanes and ships.

Thursday, June 19, 2025, 10:30 AM
Room: Grand Ballroom E/F

SPEAKER BIO

Dr. Charles E. Roberts, Jr., holds the position of Executive Director, Commercial Vehicle Systems, at Southwest Research Institute (SwRI) and is a Fellow of SAE. Dr. Roberts has over 35 technical publications and holds 35 U.S and International patents. Dr. Roberts' formal training is in the general area of Mechanical Engineering, with specialization in Engine Research, Combustion Systems and Combustion Chemistry.

Dr. Roberts manages the SwRI Commercial Vehicle emissions laboratories, which provide engine and emissions development and certification activities to heavy-duty and non-road vehicle companies worldwide. Dr. Roberts also oversees all heavy-duty and non-road powertrain systems advanced R&D activities, including internal research programs and advanced R&D for external clients.

iTEC+ 2025

June 17 - 20 Anaheim, CA

KEYNOTE SPEAKER

Erika Holtz

Engineering & Quality Manager
Harbour Air Group

iTEC+ 2025

ITEC is aimed at helping the industry in the transition from conventional vehicles to advanced electrified vehicles. The conference is focused on components, systems, standards, and grid interface technologies, related to efficient power conversion for all types of electrified transportation, including electric vehicles, hybrid electric vehicles, and plug-in hybrid electric vehicles (EVs, HEVs, and PHEVs) as well as heavy-duty, rail, and off-road vehicles and airplanes and ships.

Thursday, June 19, 2025, 11:30 AM
Room: Grand Ballroom E/F

SPEAKER BIO

Erika has been involved in aviation all her life, particularly in the Part 23 aircraft aftermarket repairs and modifications sector, as well as developing aviation quality management systems. Achieving her delegation status in 2010 as a Structural Delegate under the Design Approval Representative Program with Transport Canada, Erika became one of only ten structural DARs in the Pacific Region and started her own engineering company.

Erika has over 25 years of experience with modifications to general aircraft and 20 years spent managing quality systems. Currently, Erika is the Project Manager and Lead Engineer for the Harbour Air electrification of the DHC-2 Beaver project, and was chosen in 2023 as one of 8 “Women of Inspire” by Elevate Aviation. Last year Erika was added to the National Research Council of Canada Advisory Board for their Aero Research group, as well as named the Vice-Chair of the Initiative for Sustainable Aviation Technology™ (INSAT) Board of Directors. INSAT is a joint industry-government initiative to support the growth of one of Canada's most innovative and export-driven sectors – Aerospace.

iTEC+2025

Short Courses

SPONSORED BY:

IEEE

IAS IEEE INDUSTRY APPLICATIONS SOCIETY

IEEE PES Power & Energy Society®

pels IEEE POWER ELECTRONICS SOCIETY Powering a Sustainable Future

IEEE TRANSPORTATION ELECTRIFICATION COUNCIL

GaN Switching Devices for High-Efficiency Power Electronics Applications

Wednesday, June 18, 2025 2:00 PM - 5:30 PM

Room: OC1

SPEAKER

ZHIKAI TANG

GAN TECHNOLOGY LEAD

TEXAS INSTRUMENTS

Zhikai Tang is the GaN Technology Lead Engineer and Senior Member Technical Staff in the Kilby Labs at Texas Instruments (TI) focusing on GaN power technology research and development. Prior to TI, he was leading the next-generation power GaN product development as the Director, Device Engineering and Member of the Technical Staff at Efficient Power Conversion (EPC) from 2014 to 2022. In the technical community, Dr. Tang is currently serving on the technical program committees of IEEE IEDM and WiPDA, and is also a JEDEC JC-70 committee member and co-chair on Standards for GaN Device Test & Characterization Methods. He is an editor of multiple technical journals including IEEE Transactions on Electron Devices (T-ED), Japanese Journal of Applied Physics (JJAP) and Applied Physics Express (APEX). He is an IEEE Senior Member, EDS Compound Semiconductor Devices and Circuits Committee Member, and Member of the Japan Society of Applied Physics (JSAP). Dr. Tang has co-authored over 50 technical publications, more than 20 US patents and applications, and 1 book chapter in the field of GaN power device and IC technologies. He received the B.S. degree in Microelectronics from the University of Electronic Science and Technology of China and the Ph.D. degree in Electronic and Computer Engineering from the Hong Kong University of Science and Technology in 2010 and 2014, respectively.

ABSTRACT

Since the first demonstration of gallium nitride high electron mobility transistor (GaN HEMT) in a research lab in 1993, the GaN device field has witnessed tremendous performance and reliability improvement through enhanced device physics understanding and technology innovation for the past three decades. Today the GaN power switching device technology has become mature and competitive to be adopted in a multitude of critical power electronics applications in commercial, industrial, and automotive sectors that would have a great impact to a greener and sustainable future. In this short course, we will take a close look at what has enabled GaN as a major commercialized power device technology in mass production today with remarkably rapid market penetration and growth. This includes the excellent wide bandgap material properties of GaN, cost-effective substrates, unique device physics, novel device architectures and fab process techniques that are designed and developed for ubiquitous power management applications where simultaneous realization of high energy efficiency and high power density is indispensable. Key GaN-specific reliability aspects at both device and application levels focused upon during device technology development will also be presented and discussed.

Aerospace and Automotive Electrified Designs, Progression and Mutual Benefits

Wednesday, June 18, 2025 2:00 PM - 5:30 PM

Room: J/K

iTEC+ 2025

SPEAKER

Arif Salam
Chief Engineer Honeywell Aerospace Technologies

Evgeni Ganev
CEO EMPS Consulting LLC

About The Speaker:

Dr. Evgeni Ganev:

DDr. Evgeni Ganev is CEO of EMPS Consulting LLC, specializing in electrification for aerospace and automotive industries. With over 40 years of engineering experience—30 at Honeywell as Chief Engineer—he has contributed to major platforms including the F-22, F-35, ISS, B787, and A350. His expertise spans power generation, electric drives, and actuation systems. Dr. Ganev holds over 50 U.S. patents and has received numerous awards, including the SAE Charles Manly Award. He is an active member of AIAA, IEEE, SAE, and ASTM.

Arif Salam:

Arif Salam is Chief Engineer at Honeywell Aerospace Technologies, leading work on electric propulsion and actuation controllers. He is Principal Investigator for an ARPA-E ASCEND project and has 20 years at Honeywell with projects spanning NG Jammer, high-speed drives, and UAM systems. Arif holds degrees in electrical and systems engineering and has prior experience in industrial automation and advanced drive systems.

ABSTRACT

The steady introduction of electric vehicles for ground applications has recently reached an inflection point for the market. It is projected that in some regions like China and Europe EVs will dominate in the next few years. These developments are putting pressure on aerospace and at the same time paving the way for key technology improvements of batteries, electric machines, and high-power electronics.

As nascent aerospace electric vehicles begin to emerge in the form of trainer aircraft and eVTOLs, there are many challenges to overcome for wide adoption and initial entry into service. These challenges stem from two elements inherent in aerospace, namely, safety and weight. Safety concerns drive many stringent regulations and standards while weight concerns drive development of lightweight technologies that normally would be adequate for ground applications.

In this short course, the power train systems and components common to automotive and aerospace applications will be discussed in-depth. The main vehicle and power train architectures will be reviewed, and the major requirements for systems and components will be analyzed. Similarities and differences between the two segments will be highlighted, and some of the unique challenges will be discussed.

To overcome these challenges and obstacles, new methodologies are required for faster development and rapid entry into service. The major obstacles impeding fast entry into service will be identified and solutions will be proposed. Tools and topics such as Artificial Intelligence (AI), Autonomous Flights, Accelerated Testing using hardware in the loop, Design for Certification, and Design for Manufacturability that will greatly contribute to accelerated introduction will be discussed.

Other topics to be covered include performance priorities, results of comparative analysis, and benefits of electrification for automotive and aerospace industries.

This is a highly interactive short course that will benefit anyone interested in the electrification developments for aerospace and automotive industries.

Efficient Electrified Transportation: Harnessing Reduced Order Modelling

Thursday, June 19, 2025 2:00 PM - 5:30 PM

Room: OC2

iTEC+ 2025

SPEAKER

Joel Van Sickel

Principal Application Engineer

MathWorks

About The Speaker:

Joel Van Sickel:

Joel Van Sickel, Principal Application Engineer at MathWorks, specializes in Simscape Electrical, focusing on power electronics and real-time testing. He earned a Ph.D. in Electrical Engineering from Penn State in 2010 and previously worked as a hardware design engineer at Raytheon.

ABSTRACT

In the rapidly evolving field of electrified transportation, efficient and accurate modeling of system components is crucial for optimizing performance and integration. This tutorial explores reduced order modeling techniques for key components of electrified transportation systems, focusing on power converters, motors, and batteries. Participants will gain a comprehensive overview of how to employ system identification, artificial intelligence, and analytical/physics-based approaches to create effective and performant reduced order models.

The session begins with an overview of the various techniques available, discussing their strengths and weaknesses. Following this, three detailed examples will be presented, each highlighting a common use case. First, a classical system identification approach will be applied to a power converter to extract a time-varying state-space representation of the system. Next, an industry-standard approach to 2D motor modelling will be compared to a high-fidelity finite element motor model, capturing essential details such as saturation and spatial harmonics without the computational cost. Finally, the process of designing, training, and using a neural network for modeling a lithium-ion battery will be reviewed.

Participants will leave with a solid understanding of the existing modeling approaches available for electrified transportation systems. They will learn how to effectively apply these techniques to meet specific design and analysis needs, equipping them with the skills necessary to optimize system performance and integration.

Main considerations for inverter design with SiC MOSFET

Thursday, June 19, 2025 2:00 PM - 5:30 PM
Room: OC3

iTEC+2025

SPEAKER

Simon Kim

Principal Engineer Infineon

About The Speaker:

Simon Kim:
At Infineon Technology Korea, he is a Principal Engineer in the System Application Engineering team with 20 years of experience in power electronics and six years in robotics and automation. His expertise includes inverter design using SiC MOSFETs and gate drivers, focusing on UAM, HVAC, rail applications, MV drives, ESS, and electric ships.

ABSTRACT

The proposed session will be composed of three topics as the following.
As a start, there is the introduction for both SiC MOSFET and gate driver. SiC MOSFET's characteristics and trends are reviewed. Application review with SiC MOSFET. Selection of discrete or module (two more SiC MOSFET switch is inside) with power dimensioning. Gate driver type and selection guide.
As a main topic, there is the design guide between SiC MOSFET and gate driver IC. Key design consideration with gate driver IC as the followed topics: Low loss, gate clamping, Better EMI with slew rate gate driver IC, current protection by over current protection with shunt, DESAT protection and 2 level DESAT Protection. Used application is reviewed. Signal pattern consideration with related with gate-ringing. Power pattern consideration with stray inductance. Tunning by Gate resistor and snubber.
As a last topic, there is a short introduction of micro controller Selection of Micro controller for inverter. Without program coding. motor driving. Industrial and automotive micro controller. Simple introduction. And then, there is "Q&A session" and listen & discussion of voices from industrial and academic field.

Advanced Battery Management for Transportation Electrification: Challenges and Approaches

Friday, June 20, 2025 8:30 AM - 12:00 PM

Room: A/B

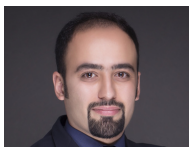
iTEC+2025

SPEAKER

Huazhen Fang

Associate Professor

University of Kansas



Amir Farakhor

Associate Professor

University of Kansas

About The Speaker:

Huazhen Fang:

Huazhen Fang is an Associate Professor of Mechanical Engineering at the University of Kansas. He received his Ph.D. from the University of California, San Diego in 2014, M.Sc. from the University of Saskatchewan, Canada in 2009, and B.Eng from Northwestern Polytechnic University, China in 2006. His research interests lie in advanced battery management. Additionally, he studies autonomy and control of complex spatio-temporal systems for aerospace applications. His work has been sponsored by NSF, DOE, ARL, among others. He received the NSF Faculty Early Career Award in 2019 and the University Scholarly Achievement Award at the University of Kansas in 2024. He currently serves as an Associate Editor for IEEE Transactions on Industrial Electronics and IEEE Control Systems Letters, among others.

ABSTRACT

Lithium-ion batteries (LiBs) serve as a cornerstone technology for advancing transportation electrification, powering electric vehicles, eVTOLs, and other mobility solutions. They offer exceptional energy density, efficiency, and lifespan, making them indispensable in meeting sustainability goals. However, their widespread adoption faces critical challenges, including performance degradation, thermal management, and safety risks. These pressing issues have spurred intense research and development efforts to harness the full potential of LiBs through advanced battery management.

This short course provides a comprehensive exploration of cutting-edge developments in battery management systems (BMS), equipping participants with both foundational knowledge and insights into emerging innovations. The curriculum encompasses three core areas: 1. Battery Modeling: Explore the convergence of electrochemical principles, equivalent circuit models, and machine learning techniques to create accurate and efficient models for diverse applications. 2. State Estimation, Fault Detection, and Control: Learn about model-based methods to monitor critical battery states (e.g., state of charge and state of health), detect faults, and optimize performance through advanced control strategies. 3. Large-Scale Battery System Design and Power Management: Delve into the challenges and solutions for designing safe, robust, and efficient systems that integrate battery packs with power electronics for large-scale applications.

Participants will gain an in-depth understanding of the latest methodologies and tools to enhance battery performance, improve safety, and enable seamless integration into advanced transportation systems. Whether you are an academic researcher, industry professional, or student, this course offers valuable perspectives on the future of battery management. By the end, attendees will be well-prepared to contribute to advancing electrification technologies and shaping the future of sustainable transportation.

iTEC+ 2025

Tutorials

SPONSORED BY:

IEEE

IAS IEEE INDUSTRY APPLICATIONS SOCIETY

pels IEEE POWER ELECTRONICS SOCIETY Powering a Sustainable Future

IEEE PES Power & Energy Society®

IEEE TRANSPORTATION ELECTRIFICATION COUNCIL

Multiphysics analysis and design of rotating machines-PMSM-considering different aspects: electromagnetic, thermal, control and mechanical constraints

Wednesday, June 18, 2025 2:00 PM - 3:30 PM

Room: C/D

iTEC+ 2025

SPEAKERS

Charishma Modem
Electromechanical Solution Engineer, Altair

Philippe Wendling
Vice President Business Development LFEM
Simulation & Design Support_GTT

About The Speakers:

Charishma Modem:
Charishma Modem earned her M.S. in Electrical and Computer Engineering from the University of Florida in 2024. She is currently an Electromechanical Solution Engineer at Altair Engineering, where she focuses on the multiphysics simulation and design of rotating electrical machines, considering electromagnetic, thermal, structural, and control aspects. Her prior work includes developing electromechanical models to estimate vehicle dynamics and energy consumption in electric mobility applications. Charishma supports technical evaluations, workflow development, and customer enablement. She brings a good foundation in control systems and system-level simulation to help drive efficient and sustainable electric machine design.

Philippe Wendling:
Philippe Wendling, a Senior Lifetime IEEE Member, earned his master's degree from École Centrale de Lille in 1979. As Vice President of GTT Electromagnetics Applications at Altair Engineering Inc., he focuses on modeling power systems and electromechanical conversion in Multiphysics environments. With expertise in finite element modeling of electromagnetic fields since the 1980s, he leads technical support and training. Philippe is an active participant and author at IEEE conferences, including CEFC, IAS, IEMDC, ECCE, and ITEC.

ABSTRACT

Manufacturers and designers of rotating machines are increasingly confronted with constraints (technical and environmental) in the design of electrical machines imposed by new standards, particularly environmental ones. Among the technical constraints: mass reduction, acoustic noise, quality and properties of the materials... etc. To meet these constraints, engineers are led to consider the environmental and technical aspects (electromagnetic, thermal, control and mechanical). Hence the need to consider multiphysics aspect (electromagnetic, thermal, control and mechanical) in the design of rotating machines. Multiphysics analysis and study is driving a multi-physics study of a motor concept: electromagnetic, thermal, control, structural constraints have to be considered and coupled defining an analysis scenario.

The multiphysics workflow analysis helps engineers to do an accurate analysis and design of rotating machines considering electromagnetic, thermal, control, structural aspects with different constraints.

Grid Integration of EV Charging Infrastructure: Smart Charge Management (SCM) and Vehicle to Everything (V2X)

Wednesday, June 18, 2025 4:00 PM - 5:30 PM
Room: C/D

iTEC+ 2025

SPEAKERS

Ahmed Mohamed
Technology Manager for EV Charging Infrastructure at Eaton Research Labs

Azrin Zulkefli
Engineering Specialist
Eaton Research Labs

About The Speakers:

Ahmed Mohamed:
Dr. Mohamed is a Technology Manager at Eaton Corporation, leading R&D for EV Charging Infrastructure. Previously, he was a Senior Researcher at the National Renewable Energy Laboratory (NREL) and an Adjunct Professor at the Colorado School of Mines.
He holds a Ph.D. in Electrical Engineering from Florida International University (FIU) and has nearly 15 years of experience in power electronics, EV charging, and DC distribution systems.
Dr. Mohamed has six U.S. patents/applications, five book chapters, and over 70 publications. A senior IEEE member, he serves as an associate editor for IEEE Transactions on Transportation Electrification and IET Power Electronics Journal. He was also Technical Chair and Publication Chair for the IEEE Greentech conferences in 2023 and 2021.
He received the Outstanding PhD Graduate Award from FIU in 2017.

Azrin Zulkefli:
Dr. Zulkefli, a Specialist Engineer at Eaton Corp., specializes in controls and optimization of dynamical systems. He earned his Ph.D. in Mechanical Engineering from the University of Minnesota in 2017.
His work, funded by the U.S. Federal Highway Administration and Minnesota DOT, focused on optimal powertrain controllers for hybrid electric vehicles and hardware-in-the-loop testing for fuel and emissions evaluation. He later served as a Postdoctoral Associate before joining Eaton in 2018.
At Eaton, he develops controllers for power grid systems, distributed energy resources (DERs), and EV charging infrastructure to improve energy efficiency and resiliency. He has authored publications and holds patents in vehicular and grid control technologies.

ABSTRACT

The rapid adoption of electric vehicles (EVs) presents both opportunities and challenges for the power grid. This tutorial, "Grid Integration of EV Charging Infrastructure: Smart Charge Management (SCM) and Vehicle to Everything (V2X)," explores integrating EV charging with the grid, focusing on SCM and V2X technologies.
Smart Charge Management (SCM) optimizes EV charging to reduce peak demand and enhance grid stability. This tutorial covers SCM strategies like time-of-use pricing and demand response programs, helping utilities manage increased EV load and improve energy efficiency.
Vehicle to Everything (V2X) technology allows EVs to act as mobile energy storage units, including Vehicle-to-Grid (V2G), Vehicle-to-Home (V2H), and Vehicle-to-Building (V2B) interactions. The tutorial addresses the technical and regulatory frameworks for V2X, benefits like grid resilience, and challenges such as bi-directional power flow and cybersecurity.
Lessons from two projects provide practical insights: an AC V2G/V2H demonstration for residential applications with vehicle OEMs, utilities, and aggregators, and a DC-coupled fast charging site for medium and heavy-duty commercial EV fleets. These projects highlight stakeholder coordination, technical feasibility, and operational benefits.
Participants will gain a comprehensive understanding of EV grid integration, equipped with knowledge and tools to implement SCM and V2X solutions, fostering a resilient and sustainable energy ecosystem.

High Power Density Electric Machine Design for Aerospace Propulsion

Thursday, June 19, 2025 2:00 PM - 3:30 PM

Room: OC1

iTEC+ 2025

SPEAKERS

Sara Roggia

Head of Protection and Control

MagniX

Bulent Sarlioglu

Professor

University of Wisconsin-Madison

About The Speakers:

Bulent Sarlioglu:

Bulent Sarlioglu is a Professor at the University of Wisconsin-Madison and Director of Technology at the Wisconsin Electric Machines and Power Electronics Consortium. Previously with Honeywell Aerospace, he contributed to electric motor drives for aircraft like the Airbus A380 and A350. An expert in electrical machines, drives, and power electronics, he holds 24 U.S. patents and has published over 280 technical papers. Dr. Sarlioglu is a recipient of the IEEE PES Cyril Veniott Award, NSF CAREER Award, and Grand Nagamori Award. He is a Fellow of the National Academy of Inventors (2021) and IEEE (2022).

Sara Roggia:

Sara Roggia (IEEE SM'20, M'16) earned her B.Sc. and M.Sc. in Electrical Engineering from Politecnico di Bari, Italy, and a Ph.D. in electrical machine design from the University of Nottingham, UK, as a Marie Curie Fellow in 2017. She has contributed to novel electrical machine technologies for more electric aircraft and has held roles at Motor Design Limited, SAFRAN, and magniX. Currently Head of Protection and Controls at magniX, her work focuses on protection and control algorithms for inverters. Sara holds five patents and has authored over 18 scientific publications.

ABSTRACT

The electrification of aircraft is rapidly advancing, driven by significant efforts to develop electric propulsion systems. This burgeoning field is underpinned by innovations and technological advancements aimed at achieving fully electric architectures utilizing energy sources like batteries and fuel cells for aircraft propulsion. Electric machines and power electronics play a pivotal role in delivering the high performance and fault-tolerant capabilities essential for aviation applications. Achieving high power density and fault redundancy is critical in aerospace systems, necessitating advancements in materials such as high-density permanent magnets, improved steel alloys for electric machines, and wide-bandgap devices for power electronics. Additive manufacturing further supports these goals by enabling designs with greater specific power and higher efficiency, which are crucial for aerospace electrification and the potential realization of net-zero carbon emissions in air transportation.

This tutorial will begin with an overview of the current state-of-the-art in commercial and electric aircraft, followed by a discussion of future trends in electric propulsion, including All-Electric Propulsion (AEP), Hybrid Electric Propulsion (HEP), and Turboelectric Propulsion (TEP). Prof. Sarlioglu will highlight the latest advancements in electrical systems for flying vehicles and airplanes, exploring various propulsion architectures such as series and hybrid systems while addressing the challenges and opportunities in the application of electric machines and power electronics. The tutorial will delve into enabling technologies and key machine design considerations specific to aerospace applications. Different electric machine topologies will be examined, including Permanent Magnet Synchronous Machines (PMSM), Induction Machines (IndM), Switched Reluctance Machines (SRM), Synchronous Reluctance Machines (SynRM), and Axial Flux Machines (AFM). Their respective advantages and disadvantages will be analyzed in terms of efficiency, speed range, reliability, compactness, cost, and manufacturability. Additionally, topics on integrated motor drives and fault-tolerant drive systems will be explored in depth.

Medium Voltage Converters in Transportation Electrification

Thursday, June 19, 2025 4:00 PM - 5:30 PM

Room: C/D

iTEC+2025

SPEAKER

Pourya Shamsi

CTO, Infinity Miles Inc

ABSTRACT

This tutorial will cover an introduction to medium voltage converters, power switches used in these converters, reliability considerations, utilization of these converters in marine, railway, evtol, and EV applications, and challenges and future trends associated with medium voltage converters in transportation electrification.

About The Speaker:

Pourya Shamsi:

Pourya Shamsi is the CTO of Infinity Miles Inc and Route 66 Controls LLC and is also an associate professor of electrical engineering at Missouri University of Science and Technology. His expertise includes power electronics, medium voltage converters, drives, and control. He is a member of IEEE as well as several UL committees.

ELECTRIFIED AIRCRAFT PROPULSION APPROACHES FOR MODELING AND ELECTRICAL HARDWARE-IN-THE-LOOP TESTING

Friday, June 20, 2025 10:30 AM - 12:00 PM

Room: C/D

iTEC+ 2025

SPEAKERS

Joseph Connolly

Deputy Project Manager of Technology

Electrified Powertrain Flight Demonstration Project - NASA Glenn Research Center

Joseph Haglage

Hybrid Thermally Efficient Core Project

Chief Engineer

NASA Glenn Research Center

About The Speakers:

Joseph Connolly:

Joseph Connolly is the Deputy for Electrified Aircraft Propulsion (EAP) Integration at the NASA Glenn Research Center. In this position Joseph works to support EAP technology development across aeronautics projects. Joseph also serves as the Deputy Project Manager of Technology for the Electrified Powertrain Flight Demonstration Project and a technical lead for the Hybrid Electric Thermally Efficient Core Project. Joseph earned his B.S. in Aerospace Engineering from the Ohio State University, his M.S. in Control Systems from Case Western Reserve University, and his PhD in Aerospace Engineering from the Ohio State University.

Joe Haglage:

ABSTRACT

This tutorial session outlines capabilities made available by the National Aeronautics and Space Administration for testing electrified aircraft propulsion (EAP) hardware and software prior to using turbomachinery. Removing these components from the experimentation process until necessary significantly reduces the development and testing costs and safety risks. Three facilities, the NASA Electric Aircraft Testbed (NEAT) and the Hybrid Propulsion Emulation Rig (HyPER) are unique facilities that provide the following capabilities: (i) the verification of megawatt scale electrical and electromechanical system components at altitude, (ii) the verification of EAP control systems on sub-scale representative electromechanical architectures. The importance, operation, and specifications of each facility is described with detail. Provided examples of past testing showcase the abilities of each facility. Simple and complex methods for replicating the steady state and dynamical mechanical loading on the electrical power system are discussed.

iTEC+2026

Call for Short Course and Tutorial Proposals

All conference registrants are welcome to attend the short courses and tutorials, which are in parallel with technical sessions, at no additional charge.

INFORMATION

Short courses are expected to be 180 minutes in duration and tutorials are expected to be 90 minutes in duration. Short courses and tutorials will be scheduled in the afternoons of Wednesday (June 10, 2026), Thursday (June 11, 2026) and on Friday Morning (June 12, 2026).

Proposals should include

- Short course / Tutorial Title
- A one paragraph bio for each instructor (max 150 words)
- Proposed short course / tutorial summary for evaluation. If accepted, a full short course / tutorial description will be required. Max 300 words.
- Name, affiliation, and e-mail contact for each of the proposed instructors
- If you have a preferred time slot(s) for the short course or tutorial, please indicate it: (a) Wednesday (June 10, 2026) afternoon, (b) Thursday (June 11, 2026) afternoon or (c) Friday (June 12, 2026) morning.

iTEC+2026

The presenter/s of accepted short courses/tutorials may choose between an honorarium or a free full registration (which includes up to 2 paper submissions). If chosen, the honorarium is $1,000 for each accepted short course and $500 for each accepted tutorial. If there is more than one presenter per short course/tutorial, the honorarium/registration discount will be split among the presenters.
Potential topic areas include but are not limited to:

- Power Electronics and Motor Drives
- Electric Machines and Actuators
- Superconducting and Cryogenic Systems and Components
- System Dynamics, Modeling, and Control
- Mission Operation: Energy, Cost, Emissions, and Thermal Management
- Powertrain Architecture: Design, Thermal Management, Packing, and Optimization
- Battery, Fuel Cell and Energy Storage Systems
- Electric, Hybrid Electric, Plug-in Hybrid Electric Vehicle System Architectures and Control
- Connected and Autonomous Vehicles, Smart Mobility, and Vehicle Functional Security
- Smart and Micro Grids, EV-Interacting Smart Grid and Electrical Infrastructure
- Electrification of Heavy-Duty and Off-Road Vehicles
- Design and Optimization for Electrified Airplane, Space, Sea, and Undersea Transportation
- Rapid Prototyping, Real-Time Simulation, HIL and SIL for Transportation Electrification
- Battery Chargers: Onboard, Wireless, Fast, and Ultra-Fast
- Safety, Diagnostics, Reliability, Failure and Fault Mode Protection, and EMI
- Published IEEE PELS Transaction Papers in 2024 and 2025 (Poster Only)

If you are interested in giving a short course/tutorial at ITEC+EATS 2026, please submit your proposal through the QR Code or click this link: Interest Form

If you have any questions, feel free to contact the Conference at info@itec-conf.com. The deadline for the submission is December 15, 2025.

iTEC+ 2025

Panels

SPONSORED BY:

IEEE

IAS IEEE INDUSTRY APPLICATIONS SOCIETY

IEEE PES Power & Energy Society®

pels IEEE POWER ELECTRONICS SOCIETY Powering a Sustainable Future

IEEE TRANSPORTATION ELECTRIFICATION COUNCIL

INDUSTRY PANELS

ENHANCING EFFICIENCY: THE ROLE OF CONTROLS AND OPTIMIZATION IN ELECTRIC VEHICLE PERFORMANCE

June 18: 2:00pm - 3:30pm
Location: Room A/B

Moderator: Shobhit Gupta - General Motors

Panelists:

- Chunhao Lee - Tech Fellow for General Motors
- Hareesh Parepalli - Technical Lead at Lucid Motors
- Dr. Caleb Secrest - Global Senior Manager, Electrification Controls at BorgWarner

Abstract:
The electrification of powertrains represents a pivotal step toward sustainable mobility, yet achieving their full potential demands the integration of advanced controls, optimization techniques, and cutting-edge artificial intelligence (AI) and machine learning (ML). This panel convenes leading experts to explore how AI/ML-driven strategies are transforming the design, operation, and performance of next-generation electrified powertrains. Key topics include intelligent energy management systems, real-time adaptive control algorithms, predictive thermal optimization, and data-driven approaches to enhance efficiency, extend range, and improve reliability. Panelists will also tackle critical challenges such as battery degradation, thermal management, and seamless system integration under dynamic driving conditions. Join us to uncover how the synergy of AI/ML, controls, and optimization is shaping the future of electrified transportation, delivering smarter, cleaner, and more efficient mobility solutions.

INDUSTRY PANELS

MEDIUM AND HEAVY DUTY VEHICLE ELECTRIFICATION: BUILDING A SUSTAINABLE ECOSYSTEM

June 18: 4:00pm- 5:30pm
Location: Room A/B

Moderator: Zuzhao Ye

Panelists:

- Vasileios Papapostolou, South Coast Air Quality Management District
- Brent Buffington, Southern California Edison
- Nanpeng Yu, University of California, Riverside
- Jacob Richard, CALSTART
- Chaitanya Inamdar, Kenworth Truck Company , Paccar, Inc,

Abstract:

Electrifying medium- and heavy-duty vehicles is critical for reducing emissions, improving air quality, and building a more sustainable transportation sector. However, the transition faces significant challenges, including high upfront costs, limited charging infrastructure, and power grid constraints. Fleets remain hesitant due to operational uncertainties, creating a "chicken-and-egg" dilemma for investing in charging networks and power grid upgrades, which must be strategically sited and scaled to ensure cost-effectiveness. This panel will explore strategies for overcoming these barriers through coordinated infrastructure development, fleet electrification planning, regulatory incentives, and innovative business models. Experts will discuss how to align industry stakeholders, utilities, and policymakers to accelerate adoption while demonstrating the long-term economic benefits of electrification.

INDUSTRY PANELS

NASA AND AIRCRAFT ELECTRIFICATION: PROGRESS AND CHALLENGES

June 18: 2:00pm- 3:30pm
Location: Grand Ballroom E/F

Moderator: Gaudy Bezos-O'Connor, NASA EPFD

Panelists:

- Ben Loxton, MagniX
- Christine Andrews, GE
- Ed Lovelace, Ampaire
- Jeff Engler, Wright Electric

Abstract:
Reducing technology risks is essential for demonstrating the potential of Electrified Aircraft Propulsion (EAP). The NASA Electrified Powertrain Flight Demonstration (EPFD) project has partnered with two industry collaborators to advance the technology of integrated Megawatt-class powertrain systems and to advance the technology and assess the regulatory and standards gaps in their technology. During the early phases of the EPFD project, we collaborated with a diverse cross-section of the EAP community to understand the challenges associated with EAP from the industry's perspective. This panel brings together a variety of stakeholders in the EAP community to share lessons learned and identify challenges that lie ahead.

INDUSTRY PANELS

SO, YOU THINK YOU CAN FLY: WHAT IT TAKES TO CERTIFY ELECTRIC AIRCRAFT - FIRESIDFE CHAT
&
A MULTI-YEAR REVIEW OF ELECTRIC AIRCRAFT RESEARCH AND THE POLICY SHAPING ITS PATH

June 18: 4:00pm- 5:30pm
Location: Grand Ballroom E/F
Moderator: Herb Schlickenmaier

Panelists:

- Vince Schultz, NASA EPFD Regulations & Standards Lead
- Herb Schlickenmaier, Regulations & Standards SME
- Ed Lovelace, Chair, SAE E-40, Ampaire
- Erika Holtz, Engineering and Quality Manager, Harbour Air Group
- Celeste Rubio-Medina, UCSD
- Deepta Bharadwaj, UCSD

Abstract:
Technology risk reduction is essential for demonstrating the potential of Electrified Aircraft Propulsion (EAP). The industry is leading EAP by developing a diverse community of innovative vehicles. A variety of novel EAP technologies exists for each of these vehicles. The industry aims to certify these aircraft through regulatory authorities like the US Federal Aviation Administration (FAA). The international standards community is grappling with critical challenges regarding the certification of EAP. Regulatory authorities have chosen to collaborate and leverage the expertise of the standards community to address these challenges and seek solutions. ASTM has key committees within its ASTM F44 General Aviation Committee and F39 Aircraft Systems Committee. SAE has established the E-40 Electric Propulsion and AE-10 High Voltage committees. This panel will address the lessons and challenges ahead in certification to enable entry into service of these EAP technologies.

In addition to the certification discussion, we will hear from a SemperSky student intern team on the students' Multi-Year Review of Electric Aircraft Research and the Policy Shaping Its Path.

INDUSTRY PANELS

ADVANCING AVIATION ELECTRIFICATION: PATHWAYS TO A SUSTAINABLE FUTURE

June 19 2:00pm - 3:30pm
Location: Grand Ballroom E/F

Moderator: Fengyu Wang - Endowed Chair Professor for Utilities Management

Panelists:

- Dr. Liang Sun - *Associate Professor at Baylor University*
- Dr. Nick Gunady - CEO at Aerovy
- Dr. Di Shi - Associate Professor at New Mexico State University
- Dr. Jeffery Saunders - Technical Fellow at Aurora Flight Sciences Corporation
- Dr. Andy Woodworth - NASA

Abstract:

This panel will bring together industry leaders, policymakers, and researchers to provide a holistic overview of the opportunities and challenges associated with aviation electrification. The discussions aim to 1) drive collaboration among stakeholders to address key barriers to electrified aviation. 2) showcase cutting-edge research and technologies shaping the future of eVTOL. 3) offer actionable insights into creating sustainable and equitable electrification pathways.

INDUSTRY PANELS

SAFE AND ADVANCED LOW-CARBON RAIL TRANSPORTATION ELECTRIFICATION TECHNOLOGIES

June 19 2:00pm - 3:30pm
Location: C/D

Moderator: Xiaofeng Yang - Associate Professor, Beijing Jiaotong University

Panelists:

- Dr. Tiefu Zhao - The University of North Carolina at Charlotte
- Dr. Xiaofeng Yang - Beijing Jiaotong University, China
- Dr. Zhongping Yang - Beijing Jiaotong University, China
- Dr. Mohammad Saif - Mott MacDonald
- Mohamed Hegazi, PhD - Subject Matter Expert, DB E.C.O. North America Inc.

Abstract:

With the rapid development of global rail transportation, the world is actively promoting rail energy transformation. The demand of safe and advanced low-carbon rail transportation electrification technologies is essential to guarantee the operation of rail transit. In recent years, emerging technologies such as high-efficiency power supply, energy conversion, safe challenges, condition monitoring, lifecycle health management, renewable energy integration and AI technologies have emerged continuously. The deep integration of these technologies will support safer and low-carbon rail transportation electrification system. Therefore, this panel invited relevant experts to discuss safe and advanced low -carbon rail transit electrification technologies. All scholars from industry and academia who are interested in this field are welcome to join this panel. Let's explore related technologies in depth and promote technological progress.

INDUSTRY PANELS

OVERVIEW OF THE RANGE EXTENDERS FOR ELECTRIC AVIATION WITH LOW CARBON AND HIGH EFFICIENCY (REEACH) PROGRAM

June 19: 2:00pm - 3:30pm
Location: Room A/B

Moderator: Xin Wu, Vivien Lecoustre

Panelists:

- Milos Ilak, *Dynamics, Control, and Autonomy Team Lead*, RTX Technology Research Center
- John Hong, *Senior Engineer*, GE Aerospace Research
- Christopher Cadou, *Keystone Professor and Director of Undergraduate Studies in Aerospace Engineering*, University of Maryland, College Park
- Xiao-Dong Zhou, *Professor in Chemical and Biomolecular Engineering, Mechanical Engineering, and Materials Science and Engineering*, University of Connecticut, Storrs
- Subir Roychoudhury, *Vice President of Research & Engineering*, Precision Combustion Inc.

OVERVIEW OF THE ASCEND (AVIATION-CLASS SYNERGISTICALLY COOLED ELECTRIC-MOTORS WITH INTEGRATED DRIVES) PROGRAM

June 19: 4:00pm - 5:30pm
Location: Room A/B

Moderator: Xin Wu

Panelists:

- Amy Jankovsky, Advanced Air Transport Technology Project, Aircraft Electrification Subproject Manager, NASA Glenn Research Center
- Colin Tschida, Chief Technology Officer, Wright Electric
- Sara Roggia, Head of magniDrive Product, magniX
- Thanatheepan Balachandran, Director of Engineering, Hinetics Inc. Inc.

Abstract:

This special two-session panel will present an overview and update on two active ARPA-E programs focused on aviation electrification: Range Extenders for Electric Aviation with Low Carbon and High Efficiency (REEACH) and Aviation-class Synergistically Cooled Electric-motors with iNtegrated Drives (ASCEND). The panel will highlight the latest advances in high-efficiency, lightweight onboard electric power generation and integrated electric powertrain development, recognizing these as key enabling technologies for realizing commercial electric aviation. Launched in 2021, these two programs aim to accelerate the development of commercial-class electric aviation energy technology solutions through significant improvements in power and energy density as well as performance for air-worthy electric power generation system at MW-scale and integrated electric powertrains. Entering their final year, the programs have spurred innovation in materials, machine designs, power electronics topologies, cooling technologies, controls, and optimization techniques to achieve high power density, performance, and efficiency metrics. The participants for this two-session panel will include key personnel and representatives from some of the ARPAE REEACH and ASCEND teams.

INDUSTRY PANELS

ADVANCED BATTERY TECHNOLOGY FOR TRANSPORTATION ELECTRIFICATION

June 19: 4:00pm - 5:30pm
Location: Grand Ballroom E/F

Moderator: Weihan Li, RWTH Aachen University

Panelists:

- Ilker Sahin, Chief Engineer, Electrification, AVL Mobility Technologies
- Prof. Yuzhang Li, Assistant Professor, UCLA
- Dr. Valentin Sulzer, Co-founder & CEO, Ionworks
- Prof. Weihan Li, RWTH Aachen University

Abstract:

As battery technology plays a key role in the global shift toward sustainable energy, staying up-to-date on these advancements is crucial for improving the efficiency, reliability, and lifespan of energy storage systems. This session will dive into the technical aspects of battery modeling, diagnostics, and aging prediction, with a focus on both automotive and stationary applications. Our expert speakers will explore new methods for simulating battery behavior, introduce cutting-edge diagnostic tools for real-time issue detection, and highlight advanced techniques for predicting battery lifespan. By combining physics-based and data-driven approaches, we'll demonstrate how these innovations are transforming battery development, management, and optimization to allow for more accurate predictions, adaptive diagnostics, and smarter optimizations.

iTEC+ 2025

Industry Sessions

SPONSORED BY:

IEEE

IAS IEEE INDUSTRY APPLICATIONS SOCIETY

IEEE PES Power & Energy Society®

pels IEEE POWER ELECTRONICS SOCIETY Powering a Sustainable Future

IEEE TRANSPORTATION ELECTRIFICATION COUNCIL

Selecting the Right Test Solution for Aerospace Compliance Standards

Thursday, June 19, 2025 4:00 PM - 5:30 PM
Room: OC1

iTEC+ 2025

SPEAKERS

George Liu
Applications Engineering Manager
Pacific Power Source

PACIFIC POWER SOURCE

ABSTRACT

As aircraft systems become increasingly electrified, simulating real-world power conditions with precision is critical for effective testing and certification. Both commercial and military platforms require advanced AC and DC power sources and electronic loads to meet evolving power architectures and stringent aerospace standards. This presentation explores the latest trends in onboard power systems— such as variable-frequency (wild frequency) AC and high-voltage DC—and how they impact test strategy. Attendees will gain insights into the latest trends, challenges, and best practices in AC/DC power testing for aerospace applications. We'll also share key considerations for selecting power sources and loads that can reliably simulate and absorb power under dynamic conditions, while ensuring compliance with standards like MIL-STD-704, DO-160, and aircraft-specific test requirements.

About The Speaker:

George Liu:
George Liu has over 15 years of electrical engineering experience, with a strong foundation in test equipment across AC and DC systems. His expertise stems from hands-on experience testing a wide range of power applications including power conversion, grid, renewable energy, batteries, and energy storage systems. In his role, George manages a team of applications engineers and works closely across product line management, engineering, customer support, and manufacturing to drive high-quality, innovative products, and value to our customers. Previously, George held senior field application positions at NI, NH Research, and Bureau Veritas.

Power Loss Analysis and Efficiency Mapping for EV Motors

Thursday, June 19, 2025 2:00 PM - 3:30 PM
Room: J/K

iTEC+ 2025

SPEAKERS

Hidekazu Masuda
Mobility Market Specialist
Hioki

HIOKI
HIOKI USA CORPORATION

About The Speaker:

Hidekazu Masuda:
Hidekazu Masuda is a Mobility Market Specialist at Hioki, based in Michigan. He leads global marketing for EV applications, connecting advanced customer needs with Hioki's product roadmap. He began as a development engineer for high-bandwidth current probes and holds a U.S. patent in current sensing. After supporting European customers as an application engineer in Germany, he now collaborates with global teams to solve EV measurement challenges. His work helps engineers improve motor efficiency and energy use, advancing sustainable mobility.

ABSTRACT

Electric vehicle (EV) motors require high efficiency across a wide range of speeds and torques. To support performance improvement, it is critical to understand overall efficiency and the sources of power loss. This presentation introduces a method to separate motor losses and generate efficiency maps using the Hioki PW8001 Power Analyzer.

Focusing on Permanent Magnet Synchronous Motors (PMSMs), we demonstrate how to calculate mechanical output and losses by measuring voltage, current, torque, and speed. Losses are separated into copper losses (arising from winding resistance) and iron losses (caused by magnetic hysteresis and eddy currents). Leveraging the PW8001's high-accuracy, wideband measurement capabilities, both fundamental and harmonic components are captured with precision, enabling accurate loss separation.

The analyzer's User Defined Function (UDF) feature supports custom equations for automated, real-time loss calculations. The resulting efficiency and loss maps plotted across speed and torque domains offer valuable insights to support motor design optimization and R&D decision-making.

Critical challenges such as wideband power measurement and low power factors are addressed by PW8001's phase correction and sensor matching functions.

We welcome attendees to visit our exhibition booth #122 for a live demonstration of this solution in action. Discover how precision power measurement is driving advancements in EV motor efficiency and sustainable design.

Insulation Materials for EMobility Applications – A Discussion on Material Selection and Process Considerations

Thursday, June 19, 2025 4:00 PM - 5:30 PM
Room: J/K

iTEC+ 2025

SPEAKERS

Michael Ricker
Technical Manager
EMobility

Stephen Tuckwell
VP Wire Enamel
EMobility

ELANTAS

ABSTRACT

- Wire Enamel
- Chemistry Considerations
- Current Trend in Emobility Applications
- Impregnation Resins
- Technical Considerations
- Challenges with requirements in the current industry and our approach
- Process Development
- Thermal Potting and Adhesives
- Technical Considerations
- Challenges with requirements in the current industry and our approach

About The Speakers:

Michael Ricker:

Michael holds a Chemical Engineering degree from RIT and has over 10 years of experience in R&D and process improvement. He has spent the last 5 years in the electrical insulation industry and currently serves as Technical Manager for Emobility at ELANTAS North America, supporting Tier 1 and OEM projects.

Stephen Tuckwell:

Stephen is a 46-year veteran of the liquid electrical insulation industry, serving the motor, generator, and transformer markets. He is an active member of multiple trade associations and currently serves as Chair of NEMA 6IM and Standards Chair for IEEE DEIS.

iTEC+ 2025

Oral Sessions

SPONSORED BY:

IEEE

IAS IEEE INDUSTRY APPLICATIONS SOCIETY

IEEE PES Power & Energy Society®

pels IEEE POWER ELECTRONICS SOCIETY Powering a Sustainable Future

IEEE TRANSPORTATION ELECTRIFICATION COUNCIL

Oral Session Schedule

Wednesday, June 18, 2025 | 2:00PM - 3:40PM

OS 1: Fuel Cells and Hydrogen

Location: Room OC2

Session Chairs: *Erdem Asa, Oak Ridge National Lab & Muhammad Tahir Mehmood Khan Niazi, Florida State University*

14:00 | **Conceptual Study on DC-DC Converter Topologies in Battery-Fuel Cell Electric Aircraft Propulsion [4092]**
Jeff Kugener{1}, Mohan Maddula{2}, Stefanie de Graaf{1}, Stefan Kazula{1} {1}German Aerospace Center, Germany; {2}Liebherr Electronics and Drives GmbH, Germany

14:20 | **Redundant Multi-Source Multi-3-Phase Fuel Cell Propulsion Architecture for Electric Aviation [4138]**
Lukas Baum, Torben Göbel, Andreas Stadler, Florian Grumm, Detlef Schulz Helmut-Schmidt-Universität/Universität der Bundeswehr Hamburg, Germany

14:40 | **Impact of Hybrid, Electric, and Hydrogen Propulsion in U.S. Commercial Aviation Fleet [4137]**
Francesco Salucci, Nirmit Prabhakar, Dominik Karbowski Argonne National Laboratory, United States

15:00 | **PEM Fuel Cell Fault Diagnosis in Automotive Applications Under Aging Conditions: A Physics-Informed Deep Learning Method [4308]**
Chiara Pettorossi{2}, Vincent Heiries{1}, Raphaël Morvillier{1}, Sébastien Rosini{2}, Mathias Gerard{2} {1}CEA-Leti, France; {2}CEA-Liten, France

15:20 | **Modeling and Simulation of Fuel Cell Powered and Turboelectric Generator Assisted Electric Aircrafts [4064]**
Jim P. Zheng{3}, Jingye Guo{3}, Petru Andrei{2}, Jonathan C. Gladin{1} {1}Aerospace Systems Design Laboratory, Georgia Institute of Technology, United States; {2}Florida A&M University-Florida State University, United States; {3}State University of New York at Buffalo, United States

Wednesday, June 18, 2025 | 2:00PM - 3:40PM

OS2: Machine Learning for Electrified Transportation

Location: Room OC3

Session Chairs: *Ye Cheng, General Motors & Nuh Erdogan, Nottingham Trent University*

14:00 | **Learning-Assisted Aggregate Flexibility Characterization for EV Charging Stations Considering Scheduling Deviation Uncertainty [4273]**
Shengyi Wang{2}, Omar Abu-Znad{2}, Liang Du{2}, Shreyas Sao{1} {1}Great Valley High School, United States; {2}Temple University, United States

14:20 | **Physics-Informed Machine Learning Enhanced Battery Pack Optimization [4097]**
Zheng Liu, Yuan Jiang, Yumeng Li, Pingfeng Wang University of Illinois Urbana-Champaign, United States

14:40 | **A Dynamic Pricing Method to Manage the Impact of EV Charging on the Grid Using RL [4195]**
Harish Suryanarayana{1}, Parashar Parikh{1}, Aniket Joshi{1}, Manoj Kumar Cebol Sundarrajan{2} {1}ABB Inc., United States; {2}Idaho National Laboratory, United States

15:00 | **Machine Learning Based Approach for Electric Machine NVH Modelling [4285]**
Fabien Chauvicourt, Raluca Raia Siemens Digital Industries Software, Belgium; Siemens Digital Industries Software, Romania

15:20 | **Towards Decentralized Coordination of the Charging Demand of Connected Electric Vehicles: Game Theory vs. Reinforcement Learning [4026]**
Eiman ElGhanam, Mohamed S. Hassan, Ahmed Osman American University of Sharjah, U.A.E.

Oral Session Schedule

Wednesday, June 18, 2025 | 4:00PM - 5:40PM

OS3: Thermal Management

Location: Room OC2

Session Chairs: *Shan Zuo, University of Connecticut & Rafal Wojda, Oak Ridge National Lab*

16:00 | **Thermal Behavior Prediction of the Silicon Carbide Power Devices Based on Time Series Decomposition [4387]**
Bangli Du{1}, Kazim Efe Özel{2}, Yu Zuo{1}, Wilmar Martinez{1} {1}Katholieke Universiteit Leuven - EnergyVille, Belgium; {2}Katholieke Universiteit Leuven - University of Hasselt, Belgium

16:20 | **Modeling and Aircraft-Level Assessment of Thermal Management System for Battery Hybrid Electric Commercial Transport [4147]**
Ezgi Balkas, James Kenny Jr., Chrysoula Pastra, Yu Cai, Dimitri N. Mavris Georgia Institute of Technology, United States

16:40 | **Optimized Jet Impingement Cooling for High-Power SiC Modules in Electric Vehicles Using Genetic Algorithm [4238]**
Manar Emira{1}, Linke Zhou{1}, Joshua Budisa{1}, Sreejith Chakkalakkal{1}, Wesam Taha{2}, Shrutika Sawardekar{2}, Ali Emadi{1} {1}McMaster University, Canada; {2}Schaeffler AG, Canada

17:00 | **Design of Heat Exchangers with Cooling Fins in Fuel Cell-Powered Electric Aircraft: Genetic Optimization Approach with CFD Validation [4075]**
Sahil Bhapkar, Chetan Sain, Stefan Kazula German Aerospace Center, Germany

17:20 | **Designing Thermal Management in Electric Aircraft Using Air-Cooled Systems [4182]**
Sooyoung Kim, Gyeongho Gong, Donghyun Park, Seongim Choi Gwangju Institute of Science and Technology, Korea

Wednesday, June 18, 2025 | 4:00PM - 5:40PM

OS4: Hybrid & Electric Powertrains

Location: Room OC3

Session Chairs: *Krishna MPK Namburi, Nexteer Automotive & Elyse Hill, NASA*

16:00 | **Reconfigurable Battery Architectures for Electric Aircraft [4353]**
Stephan Diecke{1}, Nina Sorokina{2}, Wolfgang Bliemetsrieder{2}, Manuel Kuder{2} {1}Ingenieurbüro Stephan Diecke, Germany; {2}Universität der Bundeswehr München, Germany

16:20 | **Subscale Emulation of Full-Scale Hybrid Electric Aircraft Powertrains [4194]**
Aaron VanLandingham, David Hall, Hershcel Pangborn Pennsylvania State University, United States

16:40 | **Development of a Series Hybrid Electric Propulsion System for AAM and Turbo-Electric Mode Test [4065]**
Jaesung Huh{2}, Bo Hwa Lee{2}, Poo Min Park{2}, Chun-Taek Kim{2}, Seong Oh Kwon{3}, Seon-Woong Hwang{1} {1}Hyowon Power Tec, Korea; {2}Korea Aerospace Research Institute, Korea; {3}KSEP, Korea

17:00 | **Hybrid Electric Aircraft with Unlike Engine Degradation Using Model Predictive Control [4033]**
Halle Buescher{1}, Elyse Hill{2} {1}NASA Glenn Research Center, United States; {2}NASA Langley Research Center, United States

17:20 | **Development and Optimization of Energy Management Strategies for Hybrid Heavy Duty Vehicle: From Model to Hardware in the Loop Validation [4247]**
Hugo Lambert, David Hernández-Torres Université Grenoble Alpes, CEA-Liten, France

Oral Session Schedule

Friday, June 20, 2025 | 8:30AM - 10:10AM

OS5: Power Electronics

Location: Room OC1

Session Chairs: *Jorge Rodas, Universidad Nacional de Asunción, Paraguay & Mattia Ricco, University of Bologna*

8:30 | **Soft Switching Control of Isolated Resonant Switched Capacitor Converter with Consideration of Parasitic Capacitance [4278]**
Yan Liu{1}, Xiaofeng Yang{1}, Wentao Mu{1}, Lixia Xie{1}, Longxiang Wang{1}, Trillion Q. Zheng{1}, Seiki Igarashi{2} {1}Beijing Jiaotong University, China; {2}Fuji Electric Co., Ltd., Japan

8:50 | **C Rate Based Control of Hybrid Cell Battery Pack System by Dual Active Bridge DC DC Converter in Electric Vehicles [4078]**
Moningi Srivalli, Siddhartha Mukhopadhyay, Deepak Pullaguram Indian Institute of Technology Kharagpur, India

9:10 | **Asymmetric Enhanced Wye-Zigzag Transformer for Soft Switching Expansion of Three Phase Dual Active Bridge Operation [4349]**
Mohamed Mansour, Indranil Bhattacharya Tennessee Technological University, United States

9:30 | **Totem Pole Converters with Robust Proportional-Resonant Control Mechanism for Two-Wheeler EV Charging [4021]**
Gajendra Singh Chawda, Wencong Su, Mengqi Wang University of Michigan–Dearborn, United States

9:50 | **Efficiency Comparison of DAB Module for LVDC-Connected EV Fast Charging Systems [4347]**
Mohamed Aboubacar Yasko, Diego Bernal, Wilmar Martinez, Johan Driesen Katholieke Universiteit Leuven - EnergyVille, Belgium

Friday, June 20, 2025 | 8:30AM - 10:10AM

OS6: Battery Modeling and Parameter Estimation

Location: Room OC2

Session Chairs: *Athar Hanif, Ohio State University & Hareesh Parepalli, Lucid Motors*

8:30 | **Multi-Objective Parameter Identification Method for Electrochemical Model of Lithium-Ion Battery [4083]**
Minsu Kim{1}, Yunji Lee{1}, Taeho Kwon{2}, Gijang Ahn{2}, Donkyu Baek{1} {1}Chungbuk National University, Korea; {2}SAMSUNG SDI Co., Ltd., Korea

8:50 | **Fiber Bragg Grating -Based State of Charge Sensitive Feature Extraction and Estimation for Lithium Ion Batteries [4365]**
Na Zhang, Maoshu Xu, Sheng Wang, Shuhan Liu, Kangli Wang, Kai Jiang Huazhong University of Science and Technology, China

9:10 | **Influence of Open Circuit Voltage Measurement on Battery Voltage Modeling [4317]**
Sobhika Narayanan, Qi Yao, Phillip J. Kollmeyer, Ali Emadi McMaster University, Canada

9:30 | **Optical-Sensor-Based State-of-Charge Estimation for Lithium Iron Phosphate Batteries [4243]**
Pornrawee Thonapalin{1}, Nhat Nguyen{1}, Ningyue Mao{2}, Xuan Zhou{2}, Xiaofan Cui{1} {1}University of California, Los Angeles, United States; {2}University of Michigan–Dearborn, United States

Oral Session Schedule

Friday, June 20, 2025 | 8:30AM - 10:10AM

OS7: Electric Machines

Location: Room OC3

Session Chairs: *Tayfun Gundogdu, Istanbul Technical University & Brian Malone, NASA*

8:30 | **Teardown Analysis and FEA Motor Model of Chevrolet Bolt EV Drivetrain [4331]**
Harsh Dipakkumar Patel, Batuhan Sırrı Yilmaz, Phillip J. Kollmeyer, Berker Bilgin, Ali Emadi
McMaster University, Canada

8:50 | **Hybrid FEA and Meta-Modeling for De Optimization of a PM Stator-Excited Motor with a Reluctance Rotor [4241]**
Oluwaseun Badewa, Dan M. Ionel SPARK Laboratory, University of Kentucky, United States

9:10 | **Achieving Balanced Magnetic Flux Distribution in Post-Fault Operation with Multi-Layer Winding Configuration [4345]**
Junhyuk Im, Woongkul Lee Purdue University, United States

9:30 | **Mitigation of PM Eddy Current Losses Using Offset Windings in Coreless AFPM Machines [4377]**
Matin Vatani{3}, Diego A. Lopez Guerrero{3}, John F. Eastham{2}, Dan M. Ionel{1} {1}SPARK Laboratory, University of Kentucky, United States; {2}University of Bath, United Kingdom; {3}University of Kentucky, United States

9:50 | **Cryogenic Thermal System for Coreless Axial Flux PM Machine with Litz Wire Winding for Electric Aircraft Propulsion [4375]**
Matin Vatani{4}, Chaianan Sailabada{2}, Philippe Masson{1}, Juan C. Ordóñez{2}, Dan M. Ionel{3} {1}Advanced Magnet Lab, United States; {2}Florida State University, United States; {3}SPARK Laboratory, University of Kentucky, United States; {4}University of Kentucky, United States

Friday, June 20, 2025 | 8:30AM - 10:10AM

OS8: Electrified Aircraft

Location: Room OC4

Session Chairs: *Dahlia Pham, NASA & Halle Buescher, NASA*

8:30 | **Performance Scaling of Multi-Class Parallel Hybrid-Electric Regional Turboprop Airliner Concepts [4031]**
Dahlia Dang-Thy Vu Pham{1}, Akshay M. Naik{1}, Carl J. Recine{1}, James Joseph{1}, Noah S. Listgarten{1}, Carlos Anthony D. Natividad{1}, Jimin Park{1}, Jacob M. Wishart{2} {1}NASA Ames Research Center, United States; {2}U.S. Department of Transportation / John A. Volpe National Transportation Systems Center, United States

8:50 | **Mission-Level Assessment of Environmental Control System Electrification on Hybrid-Electric Turboprop Regional Aircraft [4029]**
Sijian Tan, Yu Cai, Jiacheng Xie, Dimitri N. Mavris Georgia Institute of Technology, United States

9:10 | **High-Impedance and Low-Impedance Fault Protection Requirements and Verification Testing for Electric Aircraft Power Systems [4060]**
Trey D. Rupp{1}, Brian P. Malone{1}, David J. Sadey{1}, Nicolas A. Carbone{2}, Arthur G. Birchenough{3}, Mark D. Schmiedlin{3} {1}NASA Glenn Research Center, United States; {2}National Aeronautics and Space Administration, United States; {3}National Aeronautics and Space Administration / HX5, LLC, United States

9:30 | **Power Density Analysis of Dual Multilevel Inverters for Hybrid-Electric Aircraft Propulsion Systems [4126]**
Keiji Wada{1}, Katsuya Shingu{1}, Ryo Shirai{1}, Ryosuke Ota{1}, Yutaro Tawara{2}, Hidemine Obara{2} {1}Tokyo Metropolitan University, Japan; {2}Yokohama National University, Japan

9:50 | **Framework for Technical Performance Uncertainty in Hybrid-Electric Aircraft Development [4149]**
Jimin Park{1}, Noah S. Listgarten{1}, Halle Buescher{2}, Dahlia Dang-Thy Vu Pham{1} {1}NASA Ames Research Center, United States; {2}NASA Glenn Research Center, United States

Oral Session Schedule

Friday, June 20, 2025 | 8:30AM - 10:10AM

OS9: Fast and On-Board Charging

Location: Room J/K

Session Chairs: *Satish M. Mahajan, Tennessee Tech University & Keshav Bagri, Lucid Motors*

8:30 | **Physics-Embedded Dictionary-Based Model Predictive Control for Electrical Vehicle Charging Systems [4093]**
Hanyang He, Yan Li, Minghui Zhu Pennsylvania State University, United States

8:50 | **Stochastic Modeling of EV On-Board Chargers for V2G Services [4305]**
Xiang Shi, I Safak Bayram University of Strathclyde, United Kingdom

9:10 | **Improving Resiliency in Planning MW-Scale Medium and Heavy Duty EV Charging Stations Considering TSCOTS Optimization [4107]**
Moises Ponce{2}, Michael Starke{1}, Joao Pinto{1}, James Ostrowski{2}, Namwon Kim{1} {1}Oak Ridge National Laboratory, United States; {2}University of Tennessee, Knoxville, United States

9:30 | **Analyzing Suitability of Pulsing Techniques for Fast-Charging of Commercial NMC811/Graphite Li-Ion Batteries [4279]**
Mohammad Qasem{2}, Yazan Yassin{2}, Mariana Haddadin{2}, Stoyan Stoyanov{1}, Said Al-Hallaj{1}, Mahesh Krishnamurthy{2} {1}Beam Global, United States; {2}Southern Methodist University, United States

9:50 | **Integrated On-Board Charger for Dual Motor Based Electric Vehicle Power Train [4366]**
S. Mukherjee, Vandana Rallabandi, Shajjad Chowdhury, Omer C. Onar Oak Ridge National Laboratory, United States

Friday, June 20, 2025 | 8:30AM - 10:10PM

OS10: Power Electronics: Inverters

Location: Room J/K

Session Chairs: *Sebastian Neira Castillo, University of Edinburgh & Jorge Rodas, Universidad Nacional de Asunción, Paraguay*

8:30 | **Dynamically Reconfigurable Three-Phase Inverter [4191]**
Zong-Han Lin, Youssef Fahmy, Matthias Preindl Columbia University, United States

8:50 | **Inverse Segmented Motor Drive Using Dual ANPC Inverters for Common-Mode Voltage and Neutral-Point Current Cancellation [4384]**
Sangwhee Lee, Vandana Rallabandi, Gui-Jia Su, Shajjad Chowdhury, Burak Ozpineci Oak Ridge National Laboratory, United States

9:10 | **Verification of PD Suppression by Multi-Level Inverter for Electric Aircraft [4022]**
Akihiko Iwata Osaka Sangyo University, Japan

9:30 | **Hybrid Si/SiC NPL.H Three-Level Inverter for Cost-Effective Electric Propulsion System [4190]**
Ali Halawa{2}, Jinyeong Moon{1}, Woongkul Lee{2} {1}Florida State University, United States; {2}Purdue University, United States

9:50 | **Minimising Torque Ripple and Harmonic Distortion in Open-Circuit Five-Phase Induction Motors Fed by NPC Inverters Using Predictive Current Control [4319]**
Christian Medina Morel{2}, Paola Maidana{2}, Rodrigo Romero{2}, Alejandro Duarte{2}, Jorge Rodas{2}, Osvaldo Gonzalez{2}, Federico Barrero{1} {1}Universidad de Sevilla, Spain; {2}Universidad Nacional de Asunción, Paraguay

Oral Session Schedule

Friday, June 20, 2025 | 10:30AM - 12:10PM

OS11: Battery State of Health and Aging

Location: Room OC2

Session Chairs: *I. Safak Bayram, University of Strathclyde & Wenlin Zhang, McMaster University*

10:30 | **Field-Validated Battery Capacity Estimation Using an Iterative Filter-Based Approach [4335]**
Wenlin Zhang, Ryan Ahmed, Saeid Habibi McMaster University, Canada

10:50 | **Feasibility Analysis of Utilizing Second-Life eVTOL Batteries in Off-Grid EV Charging Stations [4271]**
Mariana Haddadin{2}, Mohammad Qasem{2}, Yazan Yassin{2}, Said Al-Hallaj{1}, Mahesh Krishnamurthy{2} {1}Beam Global, United States; {2}Southern Methodist University, United States

11:10 | **Experimental Characterization of Electric Aircraft Battery Degradation Using Accelerated and Evolving Load Profiles [4110]**
Cade Boggan, Matthew Clarke University of Illinois Urbana-Champaign, United States

11:30 | **Capturing Temporal and Spatial Patterns in Battery SOH Prediction with a Dynamic T-GNN Model [4340]**
Meriam Chelbi, Isaiah Oyewole, Abdallah Chehade University of Michigan–Dearborn, United States

11:50 | **Quantum Restricted Boltzmann Machines-Based Feature Selection for Electric Vehicle Battery Health Monitoring [4395]**
Ameya Khot{1}, Alve Akash{2}, Taesic Kim{2} {1}Texas A&M University-Kingsville, United States; {2}University of Missouri, United States

Friday, June 20, 2025 | 10:30AM - 12:10PM

OS12: Motor Drives

Location: Room OC3

Session Chairs: *Riccardo Mandrioli, The University of Bologna & Emily Belovich, NASA*

10:30 | **Design and Analysis of Current-Source Inverter Based Integrated-Motor Drive for EV Traction Applications [4397]**
Feida Chen, Sangwhee Lee, Wenda Feng, Ken Chen, Justin Paddock, Thomas Jahns, Bulent Sarlioglu University of Wisconsin-Madison, United States

10:50 | **Online Compensation Strategy for Current Sensor Scaling Errors in Induction Motor Drive Systems [4291]**
Hojoong Kim{2}, Hyeonseong Kim{2}, Donghyuk Kim{2}, Seungyong Lee{1}, Kibok Lee{2} {1}Hyundai Mobis Co., Ltd., Korea; {2}Korea University, Korea

11:10 | **Resonant Motor Drive for Electrified Aircraft: Algorithms and Controls [4020]**
Emily Belovich, Marc Carbone, Matthew Granger, Susanah Kowalewski NASA Glenn Research Center, United States

11:30 | **Envelope-Based Fault Detection and Identification in Three-Phase Motor Drive Systems [4246]**
Qian Yang{3}, Shailesh Joshi{1}, Raymond Viviano{1}, Yohei Iwahashi{1}, Anna Corbitt{2}, Chris Farnell{2}, Justin Jackson{2}, Alan Mantooth{2}, Krishna R. Pattipati{3} {1}Toyota Research Institute of North America, United States; {2}University of Arkansas, United States; {3}University of Connecticut, United States

Oral Session Schedule

Friday, June 20, 2025 | 10:30AM - 12:10PM

OS13: Wireless Charging

Location: Room OC4
Session Chairs: *Rafal Wojda, Oak Ridge National Lab & Xiuhu Sun, University of North Carolina at Charlotte*

10:30 | **Design and Thermal Analysis of WPT System with LCC-LCC Compensation Network Based on Real-World 50kW Charging Profiles [4309]**
Hassan Pervaiz, Mohamed Aboubacar Yasko, Wilmar Martinez Katholieke Universiteit Leuven - EnergyVille, Belgium

10:50 | **Integrated Multiport Conductive and Wireless Architecture for Electric Vehicle Charging [4342]**
S. Mukherjee, Vandana Rallabandi Oak Ridge National Laboratory, United States

11:10 | **Fabrication and Characterization of Roadway-Embedded DWPT Transmitter Coils [4187]**
Isaac Abram, Nicholas Frooninckx, Vatan Mehar, Aaron Brovont, Dionysios Aliprantis, Steven Pekarek, Robert Swanson Purdue University, United States

11:30 | **Analysis and Comparison of Compensation Networks for Multi-Megahertz Inductive Power Transfer [4388]**
Victor Gao, Aobo Yang, Sida Chen, Lei Gu University of Pennsylvania, United States

11:50 | **Comparative Analysis of Ferrite Blocks and Magnetic Concrete in Wireless Power Transfer Systems [4372]**
Xiuhu Sun, Shen-En Chen, Tiefu Zhao University of North Carolina at Charlotte, United States

Friday, June 20, 2025 | 10:30PM - 12:10PM

OS14: Electrification of Heavy-Duty & Off-Road Vehicles

Location: Room OC1
Session Chairs: *Zheng Liu, University of Michigan & Manoj Kumar Cebol Sundarrajan, Idaho National Laboratory*

10:30 | **Real-Time Prioritized Allocation and Smart Charging for Medium- and Heavy-Duty Commercial Electric Vehicle Fleets [4240]**
Waqas Ur Rehman, Niroj Gurung, Daniel Sanchez, Ahmed A. S. Mohamed, Vijay Bhavaraju, Sid Suryanarayanan Eaton Research Laboratories, Eaton Corporation, United States

10:50 | **Electrifying Airport GSE: Monte Carlo Grid Impacts [4321]**
Ranjan Kumar Bose, Praveen Kumar, Ingrid Busch, Wan Li, Michael O. Rogers Oak Ridge National Laboratory, United States

11:10 | **Robustness and Sensitivity of Aging Models for Batteries and Electric Machines in Heavy-Duty Electrified Powertrains [4119]**
Md Ragib Rownak{2}, Athar Hanif{2}, Qadeer Ahmed{2}, Muhammad Qaisar Fahim{1}, Hamza Anwar{1}, Hui Li{1}, Dat D Le{1}, Matthew Nelson{1} {1}Cummins Inc., United States; {2}Ohio State University, United States

11:30 | **Electric System for Efficient Hybridization of Off-Highway Vehicles [4361]**
Jim Gant, Jackson Wills, Zihao Chen, Perry Li, Eric Severson University of Minnesota, United States

11:50 | **School Districts' Benefits with Electric School Bus V2B Enhancements [4066]**
Moses Vidyasagar Sag Sadaraboina, Mohd Azrin Mohd Zulkefli, Uma Maheswari Gajjarapu, Ahmed A. S. Mohamed, Niroj Gurung, Abhinandan Tripathi, Vijay Bhavaraju Eaton Research Laboratories, Eaton Corporation, United States; Eaton Research Laboratories, Eaton Corporation, India

Oral Session Schedule

Friday, June 20, 2025 | 1:40PM - 3:00PM

OS15: Superconducting & Cryogenic Systems

Location: Room OC1

Session Chairs: *Justin Scheidler, NASA & Aaron Anderson, NASA*

13:40 | **Design Approaches for Enhancing Critical Torque Ratios in Cryogenic Induction Motors [4039]**
Tayfun Gundogdu Istanbul Technical University, Turkey

14:00 | **Graded Heat Exchangers for Cryogenic Thermal Management of Power Devices of Liquid Hydrogen-Electric Aircraft [4301]**
M. Tahir Khan Niazi, Chul Han Kim, Peter Cheetham, Sastry V. Pamidi Florida State University, United States

14:20 | **Cryogenic Bus Bar Design for IZEA Aircraft Power Distribution System [4303]**
M. Tahir Khan Niazi, Chul Han Kim, Peter Cheetham Florida State University, United States

14:40 | **Assessment on PMSC Machines (Permanent Magnet Rotor and Superconducting Stator) to Ship Propulsion Application [4015]**
Uijong Bong{1}, Kiruba Haran{2} {1}Hinetics, Inc., United States; {2}University of Illinois Urbana-Champaign, United States

15:00 | **Motor Configuration Trade Study for a New Technical Challenge to Develop a 5 MW Cryogenic Motor and Drive [4100]**
Justin Scheidler, Thomas Tallerico, Aaron Anderson, Peter Kascak NASA Glenn Research Center, United States

Friday, June 20, 2025 | 1:40PM - 3:00PM

OS16: Electric Motor Control

Location: Room OC2

Session Chairs: *Yiming Shen, Nanyang Technological University, Singapore & Arbi Gharakhani Siraki, Honeywell*

13:40 | **Extending the Convergence Region of Saliency-Based Rotor Position Estimation for Heavily Saturated PMSMs [4054]**
Richard Spießberger, Andreas Lang, Manfred Schrödl Technische Universität Wien, Austria

14:00 | **Efficiency Improvement Through Dynamic Torque Modulation Motor Control in Electric Vehicle [4222]**
Ye Cheng, Norman Bucknor, Madhu Raghavan General Motors Company, United States

14:20 | **Fault Control Strategy for Torque Ripple Reduction in Single-Phase Open Fault of OW-PMSM Fed by a Dual Inverter with a Common DC Bus [4158]**
Donghyuk Kim, Hyeonseong Kim, Kibok Lee Korea University, Korea

14:40 | **Performance Investigation of Rotor Position Estimation Based on HF Voltage Injection for IPMSM with Different Injected Signal Frequencies [4008]**
Qian Li, Günter Schröder, Junchi Feng Universität Siegen, Germany

15:00 | **Optimal Current Command Determination Under Unity Power Factor Operation of Biaxial Excitation Synchronous Machines [4230]**
Krishna MPK Namburi{2}, Prerit Pramod{1}, Ion Boldea{4}, Iqbal Husain{3} {1}MicroVision Inc, United States; {2}Nexteer Automotive, United States; {3}North Carolina State University, United States; {4}Politehnica University Timisoara, Romania

Oral Session Schedule

Friday, June 20, 2025 | 1:40PM - 3:00PM

OS17: Impacts of Electric Vehicle Charging

Location: Room OC3

Session Chairs: *Nuh Erdogan, Nottingham Trent University & Hualong Liu, North Carolina State University*

13:40 | **A Stochastic Programming Model for Depot Charging Capacity Assessment of Electric Commercial Fleets Considering Operational Variabilities [4326]**
Margarita Loupa, Sara Ahmed, Miltiadis Alamaniotis, Nikolaos Gatsis University of Texas at San Antonio, United States

14:00 | **An Agent-Based Modeling Approach for Spatiotemporal Optimization of Electric Vehicle Fast-Charging Station Demand [4333]**
Steven Schmidt, Manoj Kumar Cebol Sundarrajan, Kang-Ching Chu Idaho National Laboratory, United States

14:20 | **Grid-Aware Electric Fleet Charging Management for Heavy-Duty Vehicle [4086]**
Joon Moon, Athar Hanif, Qadeer Ahmed Ohio State University, United States

14:40 | **Aggregator Zone Selection for EV Smart Controls Based-on ML Clustering of Grid Strength, Distance, and Charging Homogeneity [4260]**
Rosemary Alden, Sam Lowe II, Dan M. Ionel SPARK Laboratory, University of Kentucky, United States

15:00 | **Optimal Scheduling for Microgrids with Large-Scale Integration of Electric Vehicle Charging Using Info-Gap Decision Theory [4113]**
Hualong Liu, Wenyuan Tang North Carolina State University, United States

Friday, June 20, 2025 | 1:40PM - 3:00PM

OS18: Reliability, Testing, & Certification

Location: Room OC4

Session Chairs: *Trey Rupp, NASA & Renzo Fabián Espinoza, KEMA Labs*

13:40 | **NASA AREAL Testbed High Voltage UE Power Quality Testing [4225]**
David J. Sadey{1}, Keith Hunker{2}, Xavier Collazo Fernandez{2}, Patrick Hanlon{2}, Casey Theman{2}, Linda Taylor{2}, Paul Nowak{2}, Brian P. Malone{1} {1}NASA Glenn Research Center, United States; {2}National Aeronautics and Space Administration, United States

14:00 | **What It Takes to Certify Electric Aircraft [4268]**
Herbert Schlickenmaier{1}, Vincent Schultz{2} {1}HS Advanced Concepts LLC, United States; {2}NASA Langley Research Center, United States

14:20 | **A System-Agnostic Process to Design DC Series Arc Fault Detectors [4059]**
Brian P. Malone{2}, George Thomas{2}, Trey D. Rupp{2}, Bryce Lanese{1}, David J. Sadey{2} {1}Cleveland State University, United States; {2}NASA Glenn Research Center, United States

15:00 | **Advancing Connected Vehicle Capabilities with Scalable and Flexible Anything-in-the-Loop Testing Framework [4272]**
Jihun Han, Miriam Di Russo, Debashis Das, Qian Peng, Jongryeol Jeong, Michael Pamminger, Priyash Misra, Dominik Karbowski, Kevin Stutenberg, Trevor Crain Argonne National Laboratory, United States

iTEC+ 2025

Poster Sessions

SPONSORED BY:

IEEE

IAS IEEE INDUSTRY APPLICATIONS SOCIETY

IEEE PES Power & Energy Society®

pels IEEE POWER ELECTRONICS SOCIETY Powering a Sustainable Future

IEEE TRANSPORTATION ELECTRIFICATION COUNCIL

Poster Session 1

Wednesday, June 18 | 12:00pm – 2:00pm | Location: Expo Hall
Listings with ** next to their ID number will have a presentation on the app

Battery Chargers: Onboard, Wireless, Fast, & Ultra-Fast

1 | A New Design Consideration for Bidirectional Resonant Converters [4122]
Erdem Asa{2}, Vivek A. Sujan{2}, Omer C. Onar{2}, Leandro Della Flora{1} {1}Beta Technologies, United States; {2}Oak Ridge National Laboratory, United States

2 | Impacts of Reliability-Oriented Phase Shedding in Modular DAB EV Charging [4056]
Jiayi Geng{2}, Riccardo Mandrioli{2}, Ariya Sangwongwanich{1}, Mattia Ricco{2} {1}Aalborg University, Italy; {2}Alma Mater Studiorum – Università di Bologna, Italy

3 | High-Frequency Characteristics for Wireless Charging Systems for EV [4178]
Xiaodong Yang, Shuye Shang, Ka Wai Eric Cheng University of California, Merced, United States

4 | Intercell Power Transformer for Power Balancing of Polyphase Wireless Power Transfer Systems [4392]
Rafal Wojda, Vandana Rallabandi, S. Mukherjee, Mostak Mohammad, Omer C. Onar Oak Ridge National Laboratory, United States

Battery, Fuel Cell, Hydrogen & Other Energy Storage

5 | A Novel Compact Thermal Management Model for Temperature Fluctuation Evaluation of Liquid Metal Battery Module [4036]
Yi Zhang, Haomiao Li, Min Zhou, Kai Jiang Huazhong University of Science and Technology, China

6 | Electrochemical Expert-Free Battery Remaining Capacity Estimation via Impedance Spectroscopy and CNN-Attention-BiLSTM Deep Learning Frameworks [4057]
Maoshu Xu, Kexin Cheng, Qionglin Shi, Zhuohao Li, Kai Jiang, Kangli Wang Huazhong University of Science and Technology, China

7 | Lightweight Feature-Based Attention Network for Li-Ion Battery SOC Estimation [4180]
Ahmed Abdulmaksoud, Ryan Ahmed McMaster University, Canada

8 | Real-Time Operation and Protection for AC Vehicle to Home (V2H) System Using Smart Circuit Breakers [4197]
Daniel Sanchez, Ahmed A. S. Mohamed, Vijay Bhavaraju, Kurt Rinehart, Pooja Gangawane Eaton Research Laboratories, Eaton Corporation, United States

9 | An Optimization Model for Two-Way EV Battery-Swapping: Balancing Revenue and User Satisfaction [4200]
Rami Zaino, Ahmed M. Benaya, Mohamed S. Hassan, Ahmed Osman American University of Sharjah, U.A.E.

10 | Analysis and Evaluation of Methods to Reduce Test Duration and Effort for Second-Life Batteries [4224]
Kheireddine Tekaya{2}, Benedikt Schmuelling{2}, Heiko Fechtner{2}, Maniteja Boya{2}, Jan-Cristophe Krabbe{1}, Mathias Nippraschk{3}, Zitao Wang{3} {1}Athenata GmbH, Germany; {2}Bergische Universität Wuppertal, Germany; {3}BLC GmbH, Germany

Poster Session 1

Wednesday, June 18 | 12:00pm – 2:00pm | Location: Expo Hall

Battery, Fuel Cell, Hydrogen & Other Energy Storage

11 | Data-Driven SOH Estimation via Voltage Temporal and Capacity Peak Features for Batteries [4295]

Qinghua Li{2}, Zhongbao Wei{2}, Hany M. Hasanien{1} {1}Ain Shams University, Egypt; {2}Beijing Institute of Technology, China

12 | Adaptive Cold Start of PEM Fuel Cell by Tracking the Maximum Power Point [4296]

Ruoyang Song{1}, Zhongbao Wei{1}, Deshuai Sun{2}, Weihong Zang{2}, Yulin Luo{2} {1}Beijing Institute of Technology, China; {2}China North Vehicle Research Institute, China

13 | Air Supply System Control of PEMFC with SMD-PID Strategy Under Variable Altitude [4300]

Yimo Fan{1}, Zhongbao Wei{1}, Deshuai Sun{2}, Weihong Zang{2}, Yulin Luo{2} {1}Beijing Institute of Technology, China; {2}China North Vehicle Research Institute, China

14 | Standardized Computational Complexity Evaluation for Battery State-of-Charge Estimation Algorithms [4334]

Atjen von Liebenstein{1}, Tijs Donkers{1}, Phillip J. Kollmeyer{2} {1}Eindhoven University of Technology, Netherlands; {2}McMaster University, Canada

Connected & Autonomous Vehicles, Smart Mobility, & Vehicle Functional Security

15 | Symbiotic Radio V2V THz Communications for Connected and Autonomous Electric Vehicles [4167]

Ahmed M. Benaya, Eiman ElGhanam, Mohamed S. Hassan, Ahmed Osman American University of Sharjah, U.A.E.

Design & Optimization for Electrified Airplane, Sea, & Undersea Transportation

16 | Symmetrical Cockcroft-Walton Voltage Multipliers with Multiple Intermediate Loads for Ionic Propulsion in Atmosphere [4004]

Sara Baldisserri, Riccardo Mandrioli, Gabriele Neretti, Mattia Ricco, Andrea Cristofolini Alma Mater Studiorum – Università di Bologna, Italy

17 | Can We Predict the Partial Discharge Inception Voltage in Electrical Asset Components Operating at Variable Pressure? an Innovative Answer [4006]

Sukesh Babu Myneni, Gian-Carlo Montanari Florida State University, United States

18 | Low Pressure and High Temperature Partial Discharge Mitigation Using Electrets [4124]

Pradip Chandra Saha, Omar Faruqe, Asif Muhamma Juberi, Chanyeop Park Arizona State University, United States

19 | Square-Wave-Fed Cockcroft-Walton Voltage Multipliers for Ionic Propulsion in Atmosphere [4139]

Sara Baldisserri, Riccardo Mandrioli, Gabriele Neretti, Mattia Ricco, Andrea Cristofolini Alma Mater Studiorum – Università di Bologna, Italy

Poster Session 1

Wednesday, June 18 | 12:00pm – 2:00pm | Location: Expo Hall

Design & Optimization for Electrified Airplane, Sea, & Undersea Transportation

Electric Machines & Actuators

21 | The Role of Magnet Segmentation in a High-Speed IPMSM: Torque and Loss Reduction [4037]
Ioannis Thomidis, Walaa Chliouet Benaboud, Rik W. De Doncker RWTH Aachen University, Germany

22 | Assessment of General Aviation Electrified Aircraft Powertrain Based on Simulation and Experiment [4080]
Victor J. Bahrs{1}, Mohsen Broumand{2}, Katharina Kolo{1}, Osvaldo Arenas{2}, Stefanie de Graaf{1} {1}German Aerospace Center, Germany; {2}National Research Council Canada, Canada

23 | Numerical Multi-Phase Thermal Analysis to Determine End-Winding Heat Transfer Coefficient of an Interior Permanent Magnet Motor [4131]
Hams Hefny, Reemon Z. Haddad, Dhafar Al-Ani, Ali Emadi, Berker Bilgin McMaster University, Canada

24 | Design of an Exterior-Rotor Switched Reluctance Motor for a Washing Machine Application [4242]
Amrutha K. Haridas, Kamal Vaghasiya, Berker Bilgin McMaster University, Canada

Electrification of Heavy-Duty & Off-Road Vehicles

25 | Investigation of Partial Power Processing DC/DC Converters for Class 8 Fuel Cell Hybrid Electric Trucks [4145]
Orges Ali, Jennifer Bauman McMaster University, Canada

Mission Operation: Energy, Costs, Emissions, & Thermal Management

26 | Evaluating the Fuel Consumption for Series Hybrid Agricultural Tractor Under Different Operating Scenarios [4226]
Hend Abououf{2}, Athar Hanif{2}, Qadeer Ahmed{2}, Nitish Chandramouli{1}, Jon A. Dickson{1} {1}Cummins Inc., United States; {2}Ohio State University, United States

27 | Machine Learning-Based Approach for Modeling Power Consumption of Electric Vehicles [4236]
Masoud Mohammadi{3}, Dillon Seward{3}, Poria Fajri{3}, Reza Sabzehgar{2}, Arash Asrari{1} {1}Purdue University Northwest, United States; {2}San Diego State University, United States; {3}University of Nevada, Reno, United States

28 | A Multi-Fidelity Design Framework for Battery Thermal Management Systems: From Conceptual Level to Detailed CFD Analysis [4332]
Ezgi Balkas{3}, Jonathan Jilesen{2}, Egemen Aydin{3}, Jonathan C. Gladin{1}, Gregory M. Laskowski{2}, Dimitri N. Mavris{3} {1}Aerospace Systems Design Laboratory, Georgia Institute of Technology, United States; {2}Dassault Systemes, United States; {3}Georgia Institute of Technology, United States

Poster Session 1

Wednesday, June 18 | 12:00pm – 2:00pm | Location: Expo Hall

Power Electronics & Motor Drives

29 | Performance Evaluation of SiC MOSFET-Based Inverter for Individual Blade Control in Electrical Aircraft [4027]
Simon Kim{4}, Yonggyun Park Park{1}, Donghyun Lee{2}, Jeongseok Choi{1}, Minho Seo{1}, Byunggil Kwak{1}, Myeonghyo Kim{1}, Kwok Wai Ma{3} {1}Hanwha Areospace, Korea; {2}Hanwha Systems, Korea; {3}Infineon Technologies Asia Pacific Pte Ltd, Singapore; {4}Infineon Technologies Korea, Korea

30 | Enhanced Efficiency Inverter with Winding Changeover Circuit for Ultra High-Speed SPMSMs in Fuel-Cell Electric Vehicles [415 5]
Jeonghun Suh{2}, Kun Shin{2}, Hyeonseong Kim{2}, Junhyeok Song{2}, Kibok Lee{2}, Young-Yoon Ko{1}, Hyun-Jun Lee{1}, Jongmyeong Kim{1} {1}Hyundai Motor Company, Korea; {2}Korea University, Korea

31 | Unified Converter Platform Design for Light Industrial Application Using Si IGBT [4163]
Simon Kim{5}, Kyunghoon Lee{2}, Weidong Chu{3}, Hyun Won Jeong{1}, Gwangmin Ko{2}, Donghyun Lee{2}, Diego Raffo{3}, Kwok Wai Ma{4} {1}Hanwha Ocean, Korea; {2}Hanwha Systems, Korea; {3}Infineon Technologies America, United States; {4}Infineon Technologies Asia Pacific Pte Ltd, Singapore; {5}Infineon Technologies Korea, Korea

32 | An MPCC-Based Adaptive Strategy for Minimizing Losses in EV Traction Systems Under Variable Speed Demands [4164]
Ying He, Mateja Novak, Huai Wang Aalborg University, Denmark

33 | A Novel Phase Shift Combination Control Strategy for Isolated Resonant Switched-Capacitor Converter [4214]
Wentao Mu{2}, Xiaofeng Yang{2}, Yan Liu{2}, Lixia Xie{2}, Longxiang Wang{2}, Seiki Igarashi{3}, Shouxiang Li{1} {1}Beijing Institute of Technology, China; {2}Beijing Jiaotong University, China; {3}Fuji Electric Co., Ltd., Japan

34 | Modeling of Active Return Traction Power System for Mitigating Stray Current [4220]
Xiangxuan Sun{1}, Xiaofeng Yang{1}, Runda Zhao{1}, Zhenshuai Wang{1}, Trillion Q. Zheng{1}, Zhongping Yang{1}, Lu Chen{2} {1}Beijing Jiaotong University, China; {2}State Grid Shanghai Electric Power Research Institute, China

35 | ANN-Based Fault-Tolerant Control of Open-End Winding Induction Motors for Electric Vehicles [4231]
Kaif Ahmed Lodi, Abdul R. Beig, Khaled Ali Al Jaafari Khalifa University, U.A.E.

Rapid Prototyping, Real-Time Simulation, HIL & SIL, Verification & Testing

36 | Comparison of Control Signal Oversampling Techniques for Real-Time Capable Simulation Models [4168]
Thorben Hoffstadt, Olga Roeser, Axel Kiffe dSPACE GmbH, Germany

Poster Session 1

Wednesday, June 18 | 12:00pm – 2:00pm | Location: Expo Hall

Safety, Diagnostics, Reliability, Failure & Fault Mode Protection, & EMI

37 | Why We Should Not Rely Upon the Paschen Law to Estimate Partial Discharge Inception in Electrical Insulation Systems and What We Should Use Instead [4016]

Gian-Carlo Montanari{1}, Sukesh Babu Myneni{1}, Praveen Koya{2}, Amit Kohli{2} {1}Florida State University, United States; {2}Rugged Monitoring Québec Inc., Canada

38 | Mitigating PWM-Induced Partial Discharge Through Optimized Skin Effect Control [4046]

Suaib Al Sufi{3}, Kangbeen Lee{2}, Woongkul Lee{2}, Chanyeop Park{1} {1}Arizona State University, United States; {2}Michigan State University, United States; {3}University of Wisconsin-Milwaukee, United States

39 | EMI Noise Mitigation for Multiple Inverters of Hybrid Electric Aircraft Propulsion Systems [4159]

Ryo Shirai, Keiji Wada Tokyo Metropolitan University, Japan

40 | FMEA-Graph-Based Approach for the Identification of Critical Cascading Failure Events in Li-Ion Battery Packs [4181]

Emanuele Gravante, Matilde D'Arpino Ohio State University, United States

41 | Thermal Loss Estimation in IPMSMs Under Fault Conditions Using UIO and MPC-Based Methods for Fault-Tolerant Control [4339]

Duc Pham, Xinyi Yu, Lukas Braun, Rik W. De Doncker RWTH Aachen University, Germany

Smart & Micro Grids, EV-Interacting Grids

43 | Smart Charging of Electric Vehicle Fleets with Solar Power and Energy Storage [4103]

Christian Viteri, Kartik Sastry, Michael Leamy, David Taylor Georgia Institute of Technology, United States

44 | A Mixed-Integer Second-Order Cone Programming Approach for the Optimal Scheduling of Active Distribution Networks with High Penetration of Distributed Energy Resources Including Electric Vehicles [4112]

Hualong Liu, Wenyuan Tang North Carolina State University, United States

45 | Increasing Grid Stability: Impact of Charging Characteristics on an Easy-to-Use Priority-Driven EV Load Reduction Approach [4188]

Maik Plenz, Andreas Stadler, Yuzhuo Fu, Detlef Schulz Helmut-Schmidt-Universität/Universität der Bundeswehr Hamburg, Germany

46 | Evaluating Sentiment Analysis Models for Enhancing Electric Vehicle Charging Infrastructure Planning [4199]

Shouai Wang, Kaustubh Kulkarni, Sanchari Deb Newcastle University, United Kingdom

Poster Session 1

Wednesday, June 18 | 12:00pm – 2:00pm | Location: Expo Hall

Smart & Micro Grids, EV-Interacting Grids

46 | Transformer Aging Under Harmonic Emissions from Electric Vehicle Smart Charging [4307]
Murat Senol, I Safak Bayram, Xiang Shi
University of Strathclyde, United Kingdom

47 | A Study on the V2G-Based Frequency Fluctuations Suppression Considering the Uncertainty of EVs Charging Loads [4359]
Bo Jie{2}, Sidun Fang{1}, Tao Niu{1}, Jumpei Baba{2}, Akiko Kumada{2}
{1}Chongqing University, China; {2}University of Tokyo, Japan

48 | Evaluating the Impact of Managed EV Charging for Reliable Operation of Bulk Power Systems with High Non-Dispatchable Generation [4371]
Manoj Kumar Cebol Sundarrajan, Steven Schmidt, Kang-Ching Chu, Lionel Toba
Idaho National Laboratory, United States

System Dynamics, Modeling, & Control

49 | Hybrid Parabolic Assumption-Hill Climbing GMPPT Algorithm for On-Vehicle Solar Panels Under Partial Shading Conditions [4189]
Zahra Sadeghi, Jennifer Bauman McMaster University, Canada

50 | Linear Regression-Based Relative Efficiency Analysis Using Empirical Charging Data [4198]
Andreas Stadler, Maik Plenz, Amra Jahic, Detlef Schulz Helmut-Schmidt-Universität/Universität der Bundeswehr Hamburg, Germany

51 | Onboard Estimation of State of Charge for Li-Ion Cells Using Fractional Order Model with Hysteresis [4368]
Afsal Umar, Jyotirmaya Sahoo, Siddhartha Mukhopadhyay, Amit Patra Indian Institute of Technology Kharagpur, India

Late

52 | Stability Analysis of Parallel Connected Bidirectional WPT System [4396]
Erdem Asa, Vivek A. Sujan, Omer C. Onar
Oak Ridge National Laboratory, United States

53 | Self-Supervised Learning and Federated Learning for First-Life Batteries [4310]
Mohanad Ismail, Carlos Vidal, Ryan Ahmed
McMaster University, Canada

54 | Comparative Analysis of Active Liquid Cooling Strategies for High-Power Lithium-Ion Battery Modules [4311]
Mahir Abdul Nasar, Romulo Navega Vieira, Lewis Gross, Phillip J. Kollmeyer, Ryan Ahmed, Saeid Habibi McMaster University, Canada

Poster Session 2

Wednesday, June 18 | 6:00pm – 8:00pm | Location: Expo Reception
Listings with ** next to their ID number will have a presentation on the app

Session Chairs: *Nuh Erdogan, Nottingham Trent University & Hualong Liu, North Carolina State University*

Battery Chargers: Onboard, Wireless, Fast, & Ultra-Fast

1 | Three and Two Phase Rotating Field Inductive Couplers for Wireless Power Transfer with One Phase Per Layer Windings [4259]
Donovin Lewis{2}, Lucas Gastineau{2}, Omer C. Onar{1}, Dan M. Ionel{2} {1}Oak Ridge National Laboratory, United States; {2}SPARK Laboratory, University of Kentucky, United States

**** | A Complementary Asymmetrical Triangular Coil Set for Wireless Power Transfer Applications [4346]**
Joel Adubofuor, Jerry Kan, Sheldon Williamson Ontario Tech University, Canada - paper moved Poster Session 3

3 | MV Grid Integrated Multiport Configuration for EV Fast Charging Station [4352]
Prashant Kumar, Ali Arzani, Satish Mahajan Tennessee Technological University, United States

4 | Harmonics-Aware Smart Charging of Electric Vehicles [4380]
I Safak Bayram{2}, Murat Senol{2}, Raka Jovanovic{1}, Xiang Shi{2} {1}Hamad Bin Khalifa University, Qatar; {2}University of Strathclyde, United Kingdom

Battery, Fuel Cell, Hydrogen & Other Energy Storage

5 | A Novel Three-Phase Isolated LLC and Non-Isolated LCL-T Resonant Converter for Fuel Cell Applications [4123]
Erdem Asa, Vivek A. Sujan, Omer C. Onar Oak Ridge National Laboratory, United States

6 | State of Charge Estimation of Lithium-Ion Batteries Using an Extended Kalman Filter with Optimized OCV Modeling [4184]
Samuel Arigo, Matilde D'Arpino Ohio State University, United States

7 | State of Charge Estimation Using Extended Kalman Filter and Genetic Algorithms with Integrated Memory Analysis [4210]
Primo Wang, Romulo Navega Vieira, Lewis Gross, Phillip J. Kollmeyer, Ryan Ahmed, Saeid Habibi McMaster University, United States; McMaster University, Canada

8 | A Multi-Fault Diagnosis Framework for Electric Vehicle Batteries [4249]
Jiaqi Zhao{2}, Song Feng{1}, Caiying Xu{2}, Yifei Xu{2}, Wenjin Yang{2}, Hengzhao Yang{2} {1}China Automotive Engineering Research Institute Co., Ltd., China; {2}ShanghaiTech University, China

9 | Thermal Modeling of NMC811 Prismatic Battery for Fast Charging Profiles in EV Applications [4336]
John Guirguis, Farzaneh Ebrahimi, Saeid Habibi, Ryan Ahmed McMaster University, Canada

10 | iTransformer Based Voltage Estimation of Lithium-Ion Batteries [4348]
Biswanath Dehury, Bridget Marfo, Jarin Tasnin Mou, Esi Otoo, Ahmed Abdulmaksoud, Ryan Ahmed, Phillip J. Kollmeyer McMaster University, Canada

Poster Session 2

Wednesday, June 18 | 6:00pm – 8:00pm | Location: Expo Reception

Codes, Certifications, Standards, Policies, & Regulations; EcoCAR

11 | Development and Simulation of V2I Communications and Controls [4058]
TJared Diethorn, Jared Behr, David Burley, Brian Woerner, Andrew Nix West Virginia University, United States

12 | Evaluation of Powertrain Architectures for McMaster EcoCAR EV Considering Traditional Electric Machines and Switched Reluctance Machines [4157]
Lucas Rajotte, Vincent Lombardi, Haojun Zhao, George Fares, Ali Emadi McMaster University, Canada

13 | Optimized Acceleration and Braking for Dual Motor All-Wheel-Drive Electric Vehicles [4274]
Kallen Cunningham, Paul Barsa, David Taylor Georgia Institute of Technology, United States

14 | Design of an Adaptive Cruise Controller with Integral Action and Feedforward Compensation [4275]
Paul Barsa, Kallen Cunningham, David Taylor Georgia Institute of Technology, United States

15 | Design of Half Shafts for McMaster EcoCAR EV Considering Driveline Articulation Simulations [4306]
Vincent Lombardi, Emma Martino, Ali Emadi McMaster University, Canada

16 | Optimized Torque Path Control for Energy Efficiency in Electric Vehicles [4314]
Pranay Ketineni, Satvik Sudhir, Brandon Verley, Shawn Midlam-Mohler Ohio State University, United States

17 | Co-Operative Adaptive Cruise Control Design for the McMaster EcoCAR Cadillac Lyriq [4330]
Connor Ricotta, Sathurshan Arulmohan, Samuel Khzym, Winnie Trandinh, Ali Emadi McMaster University, Canada

18 | Effects of V2V Adoption Rates on DDPG-Based Cooperative Adaptive Cruise Control for Electric Vehicles [4370]
Sahuj Mehta, Nik Collins, Benjamin Fitzpatrick, Christian Darr, Conner Hall, David Leech, Paul Puzinauskas, Hwan-Sik Yoon University of Alabama, United States

Connected & Autonomous Vehicles, Smart Mobility, & Vehicle Functional Security

19 | iTransformer Neural Network Based Traffic Aware Motion Prediction for Autonomous Highway Driving [4085]
Oorja Dorkar{2}, Anurag Jha{2}, Atriya Biswas{1}, Ali Emadi{2} {1}Indian Institute of Technology Madras, India; {2}McMaster University, Canada

20 | Reinforcement Learning Based Integrated Energy and Thermal Management System for Electric Vehicles Considering Battery Aging and Cabin Comfort [4280]
Anurag Jha{2}, Oorja Dorkar{2}, Atriya Biswas{1}, Ali Emadi{2} {1}Indian Institute of Technology Madras, India; {2}McMaster University, Canada

Poster Session 2

Wednesday, June 18 | 6:00pm – 8:00pm | Location: Expo Reception

Design & Optimization for Electrified Airplane, Sea, & Undersea Transportation

21 | Uncertainty Analysis for Hybrid Electric Propulsion in NASA EPFD Vehicles [4068]

Tavish Pattanayak, Jaylon Uzodinma, Raphael Gautier, Turab Zaidi, Dimitri N. Mavris Georgia Institute of Technology, United States

22 | A SiC MOSFET-Based Electric Propulsion Inverter Design Consideration for Dynamic Imbalance in Failure [4072]

Simon Kim{3}, Heekwang Lee{1}, Hyunseok Hong{1}, Myungsoo Kim{1}, Gabriel Cretu{2}, Emanuel Eni{2} {1}Hyundai Motor Company, Korea; {2}Infineon Technologies Germany, Germany; {3}Infineon Technologies Korea, Korea

23 | A Comparative Study of Power Stage Layouts for Three-Level ANPC Inverters with Half-Bridge SiC Power Modules [4105]

Di Wang{2}, Linke Zhou{2}, Jiaming An{2}, Samuel Hemming{2}, Yulei Wang{2}, Giorgio Pietrini{2}, Piranavan Suntharalingam{1}, Armen Baronian{1}, Ali Emadi{2} {1}Eaton Aerospace LLC / Eaton Corporation, United States; {2}McMaster University, Canada

24 | Bi-Level Energy Management and Design Optimization for Hybrid Marine Power System Applications [4166]

David Hernández-Torres{3}, Zhenmin Tao{1}, Franck Sellier{2} {1}Flanders Make, Belgium; {2}Siemens Digital Industries Software, France; {3}Université Grenoble Alpes, CEA-Liten, France

25 | Performance Analysis of Mild Hybrid Electric Propulsion in Open Rotor Propulsion Architecture [4269]

Egemen Aydin{2}, Jonathan C. Gladin{1}, James Kenny Jr.{2}, Dimitri N. Mavris{2} {1}Aerospace Systems Design Laboratory, Georgia Institute of Technology, United States; {2}Georgia Institute of Technology, United States

Electric Machines & Actuators

26 | Nonlinear Integral Sliding Mode Control for Electromechanical Brake System with Friction and Disturbance Compensation [4067]

Congcong Li{2}, Lu Xiong{2}, Guirong Zhuo{2}, Quan Zhou{2}, Le Qiao{2}, Yulin Cheng{2}, Qiang Shu{1} {1}Shanghai Tongyu Automotive Technology Co., Ltd., China; {2}Tongji University, China

27 | **Innovative Design and Optimization of Flux Switching Machines for Transportation Electrification Using a Multi-Level Response Surface Approach [4073]**

Chiweta Abunike{2}, Aliakbar Jamshidi Far{2}, Ogbonnaya Okoro{1}, Sumeet Aphale{2} {1}Michael Okpara University of Agriculture Umudike, Nigeria; {2}University of Aberdeen, United Kingdom

28 | Torque Harmonics Mitigation in Wound Field Synchronous Generators with Asymmetric Rotors for More Electric Aircraft [4302]

Hyunwoo Kim, Woongkul Lee Purdue University, United States

Poster Session 2

Wednesday, June 18 | 6:00pm – 8:00pm | Location: Expo Reception

Electrification of Heavy-Duty & Off-Road Vehicles

1 | Optimal Torque Allocation for Energy Efficient Operation of Dual E-Axle Based Powertrain for Heavy Duty Electric Vehicles [4028]

Ahmad Hussain Safder, Athar Hanif, Qadeer Ahmed Ohio State University, United States

Power Electronics & Motor Drives

29 | Minimisation of NVH of a Permanent Magnet Synchronous Machine with the Aid of Lookup Tables and Neural Networks in Stationary and Dynamic Operating Points [4032]

Tim Becker, Patrick Deumann, Lukas Braun, Rik W. De Doncker RWTH Aachen University, Germany

30 | A Simplified DC Voltage and Current Ripple Estimation Method for Three-Level ANPC Inverters with Space Vector Modulation [4106]

Di Wang{2}, Jiaming An{2}, Giorgio Pietrini{2}, Linke Zhou{2}, Yulei Wang{2}, Samuel Hemming{2}, Piranavan Suntharalingam{1}, Mikhail Goykhman{1}, Ali Emadi{2} {1}Eaton Aerospace LLC / Eaton Corporation, United States; {2}McMaster University, Canada

31 | Active Rectification Modeling of High-Speed Permanent Magnet-Assisted Synchronous Reluctance Generator for Aircraft Power Generation [4127]

Samuel Spaltenstein{3}, Julia Zhang{3}, Steven Englebretson{1}, Darren Tremelling{1}, Shengyi Liu{2} {1}ABB Inc., United States; {2}Boeing Company, United States; {3}Ohio State University, United States

32 | Conducted EMI Signature Analysis and Verification of SiC-Based Three-Level ANPC Inverter System [4185]

Yulei Wang{2}, Di Wang{2}, Jiaming An{2}, Linke Zhou{2}, Samuel Hemming{2}, Giorgio Pietrini{2}, Piranavan Suntharalingam{1}, Mikhail Goykhman{1}, Ali Emadi{2} {1}Eaton Aerospace LLC / Eaton Corporation, United States; {2}McMaster University, Canada

33 | Optimal Modulation Methodology for Efficient Operation of Single-Stage Indirect Matrix Converter [4270]

Avinash Dornala, Woongkul Lee Purdue University, United States

34 | Partial Discharge Investigation of Medium Voltage PCBs for a 20-kV PWM Pulse Generator [4283]

Yizhou Cong{2}, Shuwei He{2}, Pengyu Fu{2}, Robert Guenther{1}, Jin Wang{2} {1}GPEM LLC., United States; {2}Ohio State University, United States

35 | Thermal Performance Evaluation and Design Optimization of a Battery Disconnect Unit for High-Power Electric Vehicle Applications [4344]

Kavish Wadehra, Lewis Gross, Romulo Navega Vieira, Phillip J. Kollmeyer, Ryan Ahmed, Saeid Habibi McMaster University, Canada

36 | Body Diode Soft Reverse Recovery Control with Active Miller Clamping for Improved SiC MOSFET Dynamic Characteristics [4362]

Karen Reyes Pacheco, Junghoon Kim, Woongkul Lee Purdue University, United States

Poster Session 2

Wednesday, June 18 | 6:00pm – 8:00pm | Location: Expo Reception

Power Electronics & Motor Drives

37 | A New Approach to Account for the Risk of Partial Discharge Inception in the Design of Insulation Systems Fed by Power Electronics Waveforms [4048]

Gian-Carlo Montanari, Sukesh Babu Myneni, Muhammad Shafiq, Zhaowen Chen Florida State University, United States

Rapid Prototyping, Real-Time Simulation, HIL & SIL, Verification & Testing

38 | Development of a Scaled Setup for Experimental Study of the Effect of Lateral Dynamics on Energy Consumption in Electric Vehicles [4104]

Simran Kumari, Anand Ronald Kumutham, Siddhartha Mukhopadhyay, Ashish Ranjan Hota Indian Institute of Technology Kharagpur, India

39 | A Novel Cost Effective and Highly Dynamic Power Hardware in the Loop (PHIL) System for Automotive Traction Inverter Testing [4354]

Xuanlin Pan{1}, Michael Schubert{1}, Marcel Reisner{1}, Rik W. De Doncker{2} {1}Leadrive Technology Germany GmbH, Germany; {2}RWTH Aachen University, Germany

Safety, Diagnostics, Reliability, Failure & Fault Mode Protection, & EMI

40 | Open-Switch Fault-Tolerant Scheme for Four-Level π-Type Inverter Fed Propulsion Drive for Marine Transportation [4132]

Sunny Sonandkar{1}, Thanga Raj Chelliah{1}, Zhengyu Lin{2}, Raghu Selvaraj{1} {1}Indian Institute of Technology Roorkee, India; {2}Loughborough University, United Kingdom

41 | Modular Solid State Power Controller (SSPC) for High Voltage Aerospace Applications [4267]

Mohamed Omar{3}, John Ramoul{2}, Kyle Kozielski{3}, Yizhi Zhang{3}, Giorgio Pietrini{3}, Piranavan Suntharalingam{1}, Mikhail Goykhman{1}, Armen Baronian{1}, Ali Emadi{3} {1}Eaton Aerospace LLC / Eaton Corporation, United States; {2}Eaton Corporation, United Kingdom; {3}McMaster University, Canada

42 | DC Fault Diagnosis and Suppression Method of Dual Active Bridge Converters Based on Junction Temperature Reliability Feedback [4386]

Bangli Du{1}, Yu Zuo{1}, Kazim Efe Özel{2}, Wilmar Martinez{1} {1}Katholieke Universiteit Leuven - EnergyVille, Belgium; {2}Katholieke Universiteit Leuven - University of Hasselt, Belgium

Smart & Micro Grids, EV-Interacting Grids

43 | Resilience-Oriented Optimization with Electric Vehicles and Vehicle-to-Grid in Power Distribution-Transportation Network Under Post-Disaster Stage [4156]

Yuhang Chen, Jiayao Bao, Xinbao Ma, Zaijun Wu Southeast University, China

44 | A Bi-Level Programming Approach for Optimal Hybrid AC/DC Microgrid Designs Considering Converter Losses [4192]

Hualong Liu, Wenyuan Tang North Carolina State University, United States

Poster Session 2

Wednesday, June 18 | 6:00pm – 8:00pm | Location: Expo Reception

Smart & Micro Grids, EV-Interacting Grids

45 | Accelerating Quantum Optimization with Graph Learning for Optimal PMU Placement [4218]

Primo Wang, Romulo Navega Vieira, Lewis Gross, Phillip J. Kollmeyer, Ryan Ahmed, Saeid Habibi McMaster University, United States; McMaster University, Canada

46 | Enhancing State Estimation Accuracy in Smart Grids with Low-Rank Tensor Ring-Based Electric Vehicle Data Completion [4251]

Jiacheng Ge, Zaijun Wu Southeast University, China

47 | Adaptive Deep Neural Network Architecture for Data-Driven Model Based Identification of Non-Linear Dynamics of Microgrids [4284]

Apoorva Nandakumar{2}, Yuqi Jiang{1}, Yan Li{1}, Liang Du{3} {1}Pennsylvania State University, United States; {2}Quanta Technology, LLC., United States; {3}Temple University, United States

48 | A Digital Twin Framework for Electric Vehicle Grid Integration: A Multi-Campus Case Study Integrating Smart Wireless and Renewable Energy Systems [4350]

Nuh Erdogan{2}, Mehdi Zeinali{1}, Umit Cali{3}, Charalampos Tsimenidis{2} {1}Manchester Metropolitan University, United Kingdom; {2}Nottingham Trent University, United Kingdom; {3}University of York, United Kingdom

System Dynamics, Modeling, & Control

49 | Multi-Objective Design Optimization of EV Inverter for Efficiency, Volume, and Reliability [4135]

Lee Gill{1}, Jason Neely{1}, Luke Yates{1}, Robert Kaplar{1}, Alan Michaels{2} {1}Sandia National Laboratories, United States; {2}Virginia Polytechnic Institute and State University, United States

50 | Distributionally Resilient and Safe Control of Low-Voltage AC Microgrids [4369]

Mohamadamin Rajabinezhad, Nesa Shams, Yichao Wang, Shan Zuo University of Connecticut, United States

51 | Quantum Computing for Analyzing Microgrid Systems with Uncertainties [4374]

Joseph Maxwell Lange{1}, Jianing Chen{1}, Yan Li{1}, Liang Du{2} {1}Pennsylvania State University, United States; {2}Temple University, United States

52 | **Machine-Learning-Assisted Real-Time Inter-Turn Short-Circuit Fault Detection in Six-Phase Induction Machines [4248]**

Hamdihun A. Dawed, Khaled Ali Al Jaafari, Abdul R. Beig, U Zeyar Aung Khalifa University, U.A.E.

Poster Session 3

Thursday, June 19 | 12:00pm – 2:00pm | Location: Expo Hall

Listings with ** next to their ID number will have a presentation on the app

Session Chairs: *Nuh Erdogan, Nottingham Trent University & Hualong Liu, North Carolina State University*

Battery Chargers: Onboard, Wireless, Fast, & Ultra-Fast

1 | Charge-Discharge Cooperative Control Strategy for Hybrid Energy Storage System Based on MPC [4393]

Na Zhi, Xiaobin Mi, Siyuan Li, Hang Zhang, Peng Tian Xi'an University of Technology, China

Battery, Fuel Cell, Hydrogen & Other Energy Storage

2 | Incorporating Cell Clamping and the Impact on Lithium-Ion Pouch Cell Performance [4023]

Xujian Zhang{2}, James Marco{2}, Giles Prentice{1}, David Ainsworth{1} {1}BP Technology Centre, United Kingdom; {2}University of Warwick, United Kingdom

3 | Automated Machine Learning for Estimating the State of Health of Lithium Ion Batteries [4038]

Sebastian Pohlmann, Andreas Wiedenmann, Dominic Karnehm, Manuel Kuder, Antje Neve, Thomas Weyh Universität der Bundeswehr München, Germany

4 | Enhanced Battery Capacity Estimation in Data-Limited Scenarios Through Swarm Learning [4041]

Jiawei Zhang{2}, Yu Zhang{2}, Wei Xu{2}, Yifei Zhang{2}, Weiran Jiang{1}, Qi Jiao{1}, Yao Ren{1}, Ziyou Song{2} {1}Farasis Energy USA, Inc., United States; {2}National University of Singapore, Singapore

5 | Observability and Estimability for State and Parameter Estimation in Li-Ion Battery Systems Under Different Parameter Configurations [4063]

Ruixin Zheng{2}, Kyoung Hyun Kwak{2}, Je-Heon Han{1}, Youngki Kim{2} {1}Tech University of Korea, Korea; {2}University of Michigan–Dearborn, United States

6 | Reduced-Order Thermal Modelling of Battery Modules Under Passive Air Cooling [4081]

Sankhadeep Bhattacharyya, Truong Dinh, Andrew McGordon University of Warwick, United Kingdom

7 | In-Situ Monitoring of Li-Ion Batteries Formation and Cycling Behaviour Through Optical Approach [4082]

Ningyue Mao{3}, Haofeng Su{3}, Xiaofan Cui{2}, Ming Han{1}, Xuan Zhou{3} {1}Michigan State University, United States; {2}University of California, Los Angeles, United States; {3}University of Michigan–Dearborn, United States

8 | Life Cycle Assessment of Direct Recycling for Cathode Active Materials [4099]

Zheng Liu, Kai-Wei Lan, Jarom Sederholm, Paul Braun, Nicola Perry, Yumeng Li, Pingfeng Wang University of Illinois Urbana-Champaign, United States

9 | Design of Ducted Heat Exchanger for Proton Exchange Membrane Fuel Cell on Electric Aircraft [4102]

Jingye Guo{3}, Jim P. Zheng{3}, Jonathan C. Gladin{1}, Juan C. Ordóñez{2} {1}Aerospace Systems Design Laboratory, Georgia Institute of Technology, United States; {2}Florida State University, United States; {3}State University of New York at Buffalo, United States

Poster Session 3

Thursday, June 19 | 12:00pm – 2:00pm | Location: Expo Hall

Battery, Fuel Cell, Hydrogen & Other Energy Storage

10 | **A Two-Stage Optimization Framework for Battery Swapping Stations Interacted with Electric Vehicles and Power Grids [4252]**

Qiuyu Li{3}, Jingying Xie{2}, Fanqi Min{1}, Fei Zheng{1}, Leijun Shao{1}, Hengzhao Yang{3} {1}Shanghai Aerospace Power Technology Co., Ltd., China; {2}Shanghai Institute of Space Power-Sources, China; {3}ShanghaiTech University, China

11 | **Pulsed Preheating of High-Power and High-Energy Lithium-Ion Cells in Extreme Cold Temperature [4286]**

Yazan Yassin{2}, Mariana Haddadin{2}, Mohammad Qasem{2}, Stoyan Stoyanov{1}, Said Al-Hallaj{1}, Mahesh Krishnamurthy{2} {1}Beam Global, United States; {2}Southern Methodist University, United States

12 | **Data-Driven Prognostic Health Monitoring of Key Components in Hydrogen Fuel Cells [4379]**

Zhenyu Zhao{2}, Karen Swider-Lyons{1}, Dustan Skidmore{1}, Liang Du{2} {1}Plug Power Inc., United States; {2}Temple University, United States

13 | **BattBee: A Novel Equivalent Circuit Model to Capture Thermal Runaway Induced by Internal Short Circuits [4389]**

Sangwon Kang, Huazhen Fang University of Kansas, United States

Connected & Autonomous Vehicles, Smart Mobility, & Vehicle Functional Security

14 | **Predictive Maintenance and Health Estimation of E-Bikes Using Nearest Neighbor Classification [4017]**

Shivam Chaturvedi{2}, Mutasim Salman{1}, Wencong Su{2} {1}Systems Research and Consulting LLC., United States; {2}University of Michigan–Dearborn, United States

Design & Optimization for Electrified Airplane, Sea, & Undersea Transportation

15 | **Multi-Paralleled GaN-Based Motor Drive Optimization for eVTOL Applications [4040]**

Shahid Aziz Khan{2}, Feng Zhou{1}, Duc Dung Le{2}, Mengqi Wang{2}, Shivam Chaturvedi{2} {1}Toyota Research Institute of North America, United States; {2}University of Michigan–Dearborn, United States

16 | **Energy and Power Management Optimization for Sequential Daily Operations in Regional Hybrid-Electric Aircraft [4043]**

Emma Cassidy{2}, Yipeng Liu{2}, Gokcin Cinar{2}, Max Z. Li{2}, Kathryn Kirsch{1} {1}RTX Technology Research Center, United States; {2}University of Michigan, United States

17 | **Full Airline Network Fleet Assignment Model with Hybrid Electric Aircraft Uptake [4047]**

Emma Cassidy{2}, Yipeng Liu{2}, Gokcin Cinar{2}, Max Z. Li{2}, Kathryn Kirsch{1} {1}RTX Technology Research Center, United States; {2}University of Michigan, United States

Poster Session 3

Thursday, June 19 | 12:00pm – 2:00pm | Location: Expo Hall

Design & Optimization for Electrified Airplane, Sea, & Undersea Transportation

18 | Design Space Exploration and Performance Analysis of Low Temperature PEM Fuel Cell Propulsion Aircraft [4111]

Yi-Chih Wang{2}, Swapnil Sarjerao Jagtap{2}, Blake Moffitt{1}, Jennifer Hallbach{1}, Gokcin Cinar{2} {1}Sikorsky Aircraft, United States; {2}University of Michigan, United States

19 | Partial Discharge Mitigation in Motor Windings Under High-Voltage and Low Pressure [4208]

Suaib Al Sufi{2}, Omar Faruqe{1}, Chanyeop Park{1} {1}Arizona State University, United States; {2}University of Wisconsin-Milwaukee, United States

20 | Design and Implementation of a GaN-Based, Cascaded Isolated DC-DC Converter for Satellite Applications [4257]

Sahana Krishnan, Francesca Giardine, Jiarui Zou, Rose A. Abramson, Robert C. N. Pilawa-Podgurski University of California, Berkeley, United States

Electric Machines & Actuators

21 | A Comprehensive Sensitivity Analysis of Thermal Aspects for a Water-Cooled Traction Motor [4130]

Yaohui Gai, Richard McMahon University of Warwick, United Kingdom

22 | Impact of Phase Current Sequencing in Machine Learning Models for Induction Motor Fault Detection [4235]

Robert Wright{2}, Poria Fajri{2}, Xingang Fu{2}, Ehsan Naderi{1} {1}Arkansas State University, United States; {2}University of Nevada, Reno, United States

23 | Maximum Efficiency Per Torque Control for IPMSM with DC-Current-Injection-Based Torque Observer and Online Searching [4255]

Jingwei Lin, Yilin Ma, Huan Yang, Rongxiang Zhao Zhejiang University, China

Electrification of Heavy-Duty & Off-Road Vehicles

24 | MPC Based Optimal Energy Management of Electrical Vehicles with Hybrid Energy Storage on Fixed Routine [4076]

Hanlin Lei, Benjamin Chong, Kang Li University of Leeds, United Kingdom

25 | Robust-Oriented Optimization of Flux Switching Machines as Reliable Solutions for Heavy-Duty Machinery Considering Manufacturing Tolerances [4090]**

Chiweta Abunike{2}, Aliakbar Jamshidi Far{2}, Ogbonnaya Okoro{1}, Sumeet Aphale{2} {1}Michael Okpara University of Agriculture Umudike, Nigeria; {2}University of Aberdeen, United Kingdom

26 | Comparative Analysis of Buck-Boost Topologies Integrated with 3ph-DAB for Wide-Range DC-DC Conversion in Electric Vehicles [4313]

Shubham Dhiman{2}, Dustin Oelmann{1}, Yuheung Wu{1}, Richard Wainwright{1}, Evan Eberle{1}, Sagar Kumar Rastogi{1}, Brij N Singh{1}, Subhashish Bhattacharya{2} {1}John Deere, Inc., United States; {2}North Carolina State University, United States

Poster Session 3

Thursday, June 19 | 12:00pm – 2:00pm | Location: Expo Hall

Electrification of Heavy-Duty & Off-Road Vehicles

27 | Impact of Medium and Heavy-Duty Electric Vehicle Electrification on Distribution System Stability [4357]

Ali Hassan{2}, Wanshi Hong{1}, Bin Wang{1}, Wencong Su{2} {1}Lawrence Berkeley National Laboratory, United States; {2}University of Michigan–Dearborn, United States

Power Electronics & Motor Drives

28 | On the Edge of Passive Cooling for Power Converters: Review and Future Trends [4062]

Zhengwei Dong, Liwei Zhou University of Texas at Arlington, United States

29 | Non-Linear Control of a Six-Phase Floating Interleaved Boost Converter with Coupled Inductors for Fuel Cell Hybrid Power Supply in Heavy-Duty Applications [4091]

Niema El Haddaji{1}, Abdesslem Djerdir{3}, Serge Pierfederici{2}, Daniel Hissel{1} {1}Université de Franche-Comté, CNRS, Institut FEMTO-ST, FCLAB, France; {2}Université de Lorraine, CNRS, LEMTA, Vandœuvre-Lès-Nancy, France; {3}University of Technology of Belfort-Montbéliard, CNRS, Institut FEMTO-ST, FCLAB, France

30 | On the Edge of Passive Cooling for Power Converters: Application and Strategies [4109]

Zhengwei Dong, Liwei Zhou University of Texas at Arlington, United States

31 | SuperBox: A 4-in-1 Power Electronics Solution for Dual-Motor Electric Vehicles [4128]

Wesam Taha, Yicheng Wang, Aniket Anand, Hossain Mohammadi Schaeffler AG, Canada

32 | Deep Learning Assisted -2P2Z Control for Boost DC/DC Converter [4150]

Pengyuan Chen{1}, Tianyu Chen{2} {1}University of Texas at Dallas, United States; {2}Wuhan University of Science and Technology, China

33 | Transformerless CHB-Based Converter for Clustered DC Microgrids [4171]

Sobhan Mohamadian{2}, Amir Ghasemian{1}, Concettina Buccella{2}, Carlo Cecati{2} {1}Politecnico di Bari, Italy; {2}Università degli Studi dell'Aquila, Italy

34 | Analog Comparator Modeling and Selection for High-Speed Constant On-Time Controlled DC-DC Converters [4223]

Guanyu Qian, Xiaofan Cui University of California, Los Angeles, United States

35 | A Minimized Conduction Loss Multiport SSCB Design with Post-Fault Optimization [4364]

Yannal Nawafleh, Xiaoqing Song University of Arkansas, United States

36 | High-Performance Spoke-Type PMSM Rotor for High-Torque, Low-Speed Applications [4203]

Fatemeh Ghalavand, Thirumarai Ch Ilamparithi University of Victoria, Canada

Powertrain Architectures: Design, Integration, Packing, & Optimization

37 | Investigation of Electric Bus Fleet Charging Infrastructure: Modeling Ultra-Fast Charger Deployment and On-Board Solar Generation [4221]

Lucas Nahidmobarakeh, Zahra Sadeghi, Jennifer Bauman McMaster University, Canada

Poster Session 3

Thursday, June 19 | 12:00pm – 2:00pm | Location: Expo Hall

Powertrain Architectures: Design, Integration, Packing, & Optimization

38 | Drivetrain Efficiency Investigation of Fuel-Cell-Powered Vehicles Using a Triple Active Bridge, FOC and Six-Step Operation [4360]

Daniel Camilo Rodriguez Pinto, Marius Kampshoff, Paul Kowalewski, Ioannis Thomidis, Rik W. De Doncker RWTH Aachen University, Germany

Rapid Prototyping, Real-Time Simulation, HIL & SIL, Verification & Testing

39 | A Flux Map-Based Approach for Experimental Characterization of an IPM 2-in-1 Drive Unit for Electric Vehicles [4324]

Eduardo Akira Shiguemoto{1}, Fabricio Machado{1}, Gaetano Dilevrano{2}, Igor Del-Vecchio{1}, Phillip J. Kollmeyer{1}, Gianmario Pellegrino{2}, Ali Emadi{1} {1}McMaster University, Canada; {2}Politecnico di Torino, Italy

40 | Simulation and Experimental Validation of Cross-Switched Reconfigurable Battery [4325]

Nina Sorokina{2}, Dominic Karnehm{2}, Wolfgang Bliemetsrieder{2}, Andreas Wiedenmann{2}, Thomas Weyh{2}, Manuel Kuder{1} {1}PULSETRAIN GmbH, Germany; {2}Universität der Bundeswehr München, Germany

Safety, Diagnostics, Reliability, Failure & Fault Mode Protection, & EMI

41 | Early Warning of Thermal Runaway for Lithium-Ion Battery Enabled by Embedded Optical Sensing [4233]

Jiayong Pan, Zhongbao Wei Beijing Institute of Technology, China

42 | Physics-Informed Neural Networks for Insulation Power Loss Estimation of Aircraft Wiring Under PWM Voltage [4055]

Pengyu Fu{3}, Yizhou Cong{3}, Nihanth Adina{3}, Jin Wang{3}, Daniel Schweickart{1}, Dennis Grosjean{2}, Tyler Bixel{4} {1}Air Force Research Laboratory, United States; {2}Innovative Scientific Solutions, Inc., United States; {3}Ohio State University, United States; {4}UES Inc., United States

45 | Development of a Hybrid Digital Twin for Electric Engines in Aircraft Propulsion Systems [4087]

Mohsen Broumand{2}, Victor J. Bahrs{1}, Stefanie de Graaf{1}, Michael R. Osborn{2}, Osvaldo Arenas{2} {1}German Aerospace Center, Germany; {2}National Research Council Canada, Canada

46 | Reliability Study of Die Attachments in SiC Power Modules with Thermal Balancing Control [4128]

Linke Zhou{2}, Jiaming An{2}, Yulei Wang{2}, Di Wang{2}, Giorgio Pietrini{2}, Piranavan Suntharalingam{1}, Mikhail Goykhman{1}, Armen Baronian{1}, Ali Emadi{2} {1}Eaton Aerospace LLC / Eaton Corporation, United States; {2}McMaster University, Canada

47 | Lithium-Ion Battery Anomaly Detection Based on Big Data Platform of Large-Scale Energy Storage System [4232]

Jian Hu, Zhongbao Wei, Xiangfeng Meng, Sheng Kang Beijing Institute of Technology, China

Poster Session 3

Thursday, June 19 | 12:00pm – 2:00pm | Location: Expo Hall

Smart & Micro Grids, EV-Interacting Grids

48 | Expectations and Performance of Ubiquitous Electric Vehicle Charging Alternatives [4172]

Philip Krein{2}, Raya Mahony{1}, Ryan Liem{2} {1}Johns Hopkins University Applied Physics Laboratory, United States; {2}University of Illinois Urbana-Champaign, United States

49 | Grid Voltage Phase Angle Detection Through di/dt Analysis and Curve Fitting for EV-Grid Synchronization [4204]

Hector Akuta, Yuan Li, Jinli Zhu University of Pittsburgh, United States

50 | Dynamic Bi-Level Coordination of Heterogeneous EV Charging Demands and System Operations Under Uncertainties [4237]

Mingyu Zhai{2}, Omar Abu-Znad{2}, Liang Du{2}, Yan Li{1} {1}Pennsylvania State University, United States; {2}Temple University, United States

52 | Market Participation Strategies for Fast-Charging Stations to Enhance Individual Profitability and Grid Reliability [4239]

Omar Abu-Znad{1}, Mingyu Zhai{1}, Liang Du{1}, Rui Fan{2} {1}Temple University, United States; {2}University of Denver, United States

53 | Disaggregation of EV Charging Profiles via Spatio-Temporal Graph Convolutional Networks [4244]

Mozhi Chen{1}, Zhenyu Zhao{2}, Liang Du{1}, Yuzhou Chen{3} {1}Temple University, United States; {2}University of Birmingham, United Kingdom; {3}University of California, Riverside, United States

54 | Cluster-Based Volt/Var Optimization on a Utility Distribution Feeder with Forecasted EV Penetration [4341]

Steven Poore{4}, Grant Fischer{4}, Rosemary Alden{3}, Evan Jones{1}, Aron Patrick{2}, Dan M. Ionel{3} {1}Ener.AI, United States; {2}PPL Corporation, United States; {3}SPARK Laboratory, University of Kentucky, United States; {4}University of Kentucky, United States

55 | A Multiport Converter for Seamless PV-Grid Integration in EV Charging Systems [4355]

Prashant Kumar, Ali Arzani, Satish Mahajan Tennessee Technological University, United States

System Dynamics, Modeling, & Control

56 | Mode-Selecting Nonlinear Model Predictive Control for Enhanced Thermal Management in Electric Refrigerated Vans [4084]

Sankhadeep Bhattacharyya, Kaibo Li, Truong Dinh University of Warwick, United Kingdom

57 | Low-Frequency Oscillation Analysis with Grid-Forming Converters [4151]

Xiuyu Zhan{2}, Shanti Karki{1}, Hui Yuan{2}, Di Wu{1} {1}North Dakota State University, United States; {2}Zhejiang University, China

58 | Analysis and Mitigation of Bifurcation in Cascaded DC-DC Converters Under Asynchronous Mode of Operation [4327]

Mohammad Hasan Ghaderi{2}, Mohammad Rastegar{2}, Majid Ghasemi Korrani{2}, Nasim Rashidirad{1}, Babak Fahimi{2}, Poras Balsara{2} {1}Hydro-Quebec Research Institute, United States; {2}University of Texas at Dallas, United States

Poster Session 3

Thursday, June 19 | 12:00pm – 2:00pm | Location: Expo Hall

Late/Travel issues

42 | Design and Analysis of a Bi-Directional Solid-State Battery Protection System for Solid-State Transformer Based Grid Supporting EV Charging Systems [4216]

Kushan Lulbadda, Ruvini De Seram, V S R Varaprasad Oruganti, Tarlochan Sidhu, Sheldon Williamson Ontario Tech University, Canada

56 | A Complementary Asymmetrical Triangular Coil Set for Wireless Power Transfer Applications [4346]

Joel Adubofuor, Jerry Kan, Sheldon Williamson Ontario Tech University, Canada

55 | Integrating Time-Domain and Frequency-Domain Analyses for Advanced Lithium-Ion Battery Characterization [4177]

Latha Anekal, Sheldon Williamson Ontario Tech University, Canada

ITEC+2026

Coiltech® North America
June 10-11, 2026 - Novi, MI

SAVE THE DATE

June 10–12, 2026 | Novi, Michigan

A Powerful Collaboration in Electrification and Manufacturing

ITEC 2026 and Coiltech US Join Forces in Novi, Michigan

A Powerful Partnership

ITEC+2026 and Coiltech US join forces in Novi to create a leading platform for transportation electrification and electromagnetic manufacturing. This co-location offers attendees:

- Joint access to both conferences and exhibits
- Cross-industry collaboration
- Prime location in the U.S. automotive corridor

What is ITEC+2026 ?

ITEC is North America's premier electrified transportation event, powered by IEEE PELS, IAS, PES, and TEC. With over 800 attendees, ITEC features:

- 16 technical tracks
- 300+ peer-reviewed presentations
- Exceptional keynotes, panels, tutorials, and short courses
- Real-time engagement and networking

LEARN MORE

Mark Your Calendars

- Joint access to Coiltech's industry exhibition
- Exposure to cross-sector collaboration in electrification
- Ideal location in the heart of the U.S. automotive corridor

ITEC+2026

Coiltech® North America
June 10-11, 2026 - Novi, MI

SAVE THE DATE

Co-located in Novi, MI | June 2026

A Powerful Collaboration in Electrification and Manufacturing

Call for Papers Opens August 2025 (Deadline November 2025)

Share your work in one of ITEC's robust technical tracks:

- Power Electronics and Motor Drives
- Electric Machines and Actuators
- Battery, Fuel Cell, Hydrogen, and Other Energy Storage
- Superconducting and Cryogenic Systems and Components
- System Dynamics, Modeling, and Control
- Mission Operation: Energy, Cost, Emissions, and Thermal Management
- Connected and Autonomous Vehicles, Smart Mobility, and Vehicle Functional Security
- Powertrain Architectures: Design, Integration, Packing, and Optimization
- Electrification of Heavy Duty and Off-Road Vehicles
- Design and Optimization for Electrified Airplane, Space, Sea, and Undersea Transportation
- Rapid Prototyping, Real-Time Simulation, HIL and SIL, Verification, Validation and Testing
- Smart and Micro Grids, EV-Interacting Grids
- Battery Chargers: Onboard, Wireless, Fast, and Ultra-Fast
- Safety, Diagnostics, Reliability, Failure and Fault Mode Protection, and EMI
- Codes, Certification, Standards, Policies, and Regulations and EcoCAR
- Published IEEE PELS Transaction Papers in 2025 and 2026 (Poster Only)

LEARN MORE

Mark Your Calendars

- Joint access to Coiltech's industry exhibition
- Exposure to cross-sector collaboration in electrification
- Ideal location in the heart of the U.S. automotive corridor

iTEC+ 2025

Exhibit

SPONSORED BY:

IEEE

IAS IEEE INDUSTRY APPLICATIONS SOCIETY

IEEE PES Power & Energy Society®

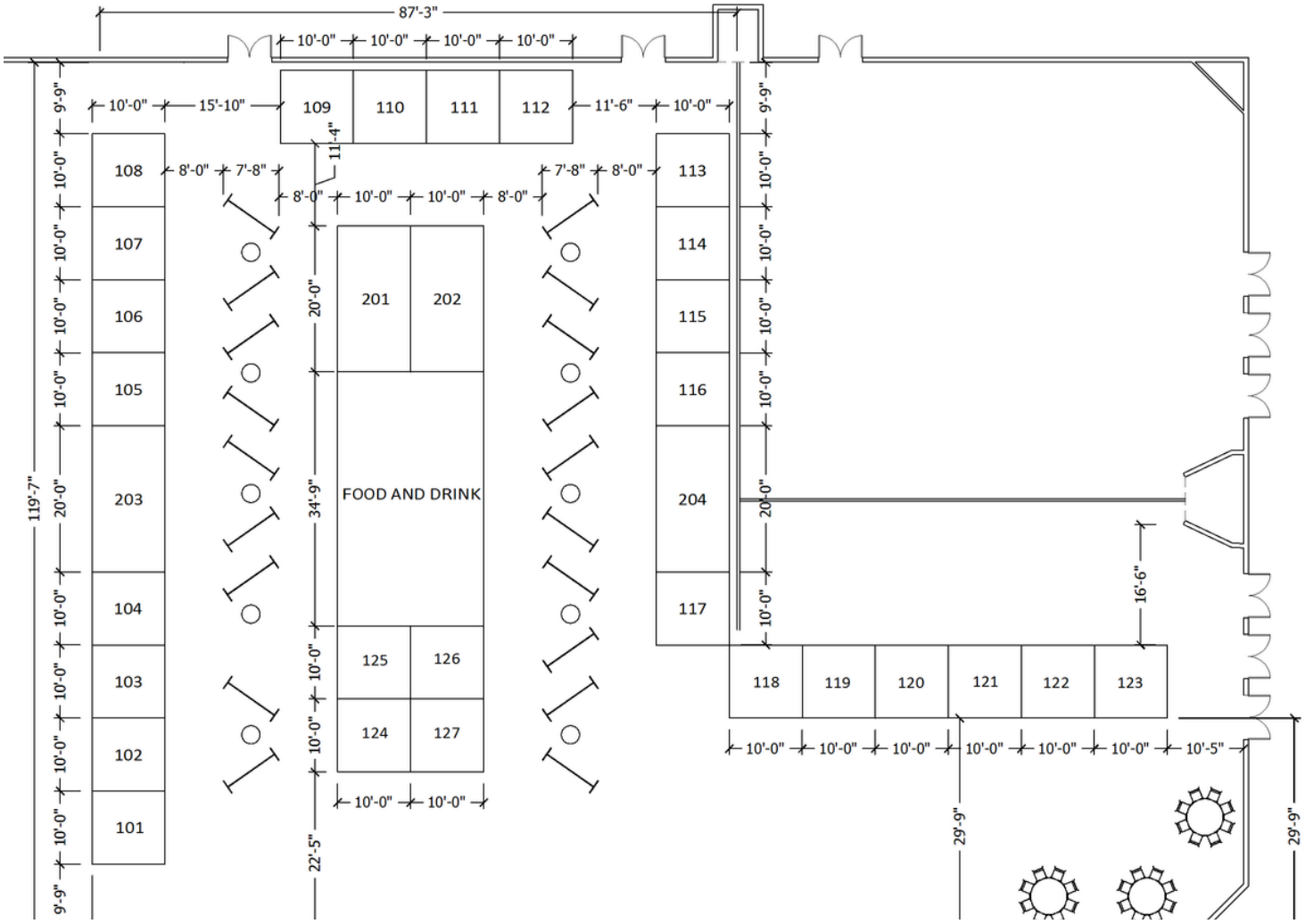
pels IEEE POWER ELECTRONICS SOCIETY Powering a Sustainable Future

IEEE TRANSPORTATION ELECTRIFICATION COUNCIL

iTEC+ 2025

June 17 - 20 Anaheim, CA

EXHIBIT FLOOR PLAN



Exhibitor Directory

Booth 101 - TDK Lambda Americas, Inc
Booth 102 - Impedyme, Inc
Booth 103 - University of Kentucky
Booth 104 - Quanten Technologies
Booth 105 - Advanced Test Equipment Rentals
Booth 106 - Hinetics, Inc
Booth 107 - OPAL-RT Technologies
Booth 108 - Neware
Booth 109 - Chroma
Booth 110 - Rohde and Schwarz, Inc
Booth 111 - Mathworks
Booth 116 - Imperix, Ltd
Booth 117 - South Coast AQMD
Booth 118 - University of Arkansas
Booth 119 - DEWETRON, Inc
Booth 120 - IEEE PELS & TEC
Booth 121 - D&V Electronics
Booth 122 - Hioki
Booth 123 - Route 66 Controls LLC
Booth 124 - Elantis
Booth 125 - dSPACE
Booth 112 - Pacific Power Source
Booth 127 - CoilTech - QUICKfairs

iTEC+ 2025

June 17 - 20 Anaheim, CA

EXHIBITORS

TDK

Booth # 101 **https://www.us.lambda.tdk.com**

TDK-Lambda Americas is a leading manufacturer of high-reliability programmable power solutions, including DC power supplies, AC sources, high-voltage capacitor chargers, and electronic loads. Their product lines include the GENESYS™, GENESYS+™, ALE, and SFL series.

IMPEDYME

Booth # 102 **https://impedyme.com/**

Impedyme delivers all-in-one Combined HIL and PHIL (CHP) solutions designed to serve industries including EV, eVTOL, aerospace, marine, and renewable energy. Their mission is to make advanced CHP technologies accessible and scalable, empowering global innovators to accelerate sustainable energy and transportation advancements.

Stanley and Karen Pigman College of Engineering — SPARK Laboratory — PEIK Power and Energy Institute of Kentucky

Booth # 103

The SPARK Laboratory at the University of Kentucky covers research in grid reliability and resilience, energy technology, electric machines and drives, electric power systems, and transportation.

https://sparklab.engr.uky.edu/
OR
https://engr.uky.edu/research/centers-institutes-and-consortia/power

QUANTEN

Booth # 104

Quanten Technologies is a Texas-based e-mobility innovator specializing in advanced electric drive systems for electric and hybrid vehicles. Their cutting-edge solutions, such as the Dynamically Reconfigurable Induction Machine (DRIM) and Efficient Asynchronous Machine (DREAMS) systems, are designed to enhance performance, efficiency, and scalability across a wide range of vehicle applications.

https://quantentech.com/

ATEC Advanced Test Equipment Corp.

Rentals • Sales • Calibration • Service

Booth # 105 **https://www.atecorp.com/**

ATEC provides cutting-edge and legacy test equipment for a wide range of industries, including automotive, aerospace, defense, and EMC. As an A2LA ISO 17025 accredited calibration company, ATEC supports both standard and specialized applications.

HINETICS

Booth # 106 **https://hinetics.com/**

Hinetics, a spin-off from the University of Illinois founded in 2017, develops advanced high-frequency, high-field electromagnetic machines for sustainable energy applications. Backed by NASA-supported research, the company operates from the Research Park at the University of Illinois at Urbana-Champaign.

iTEC+ 2025

June 17 - 20 Anaheim, CA

EXHIBITORS

OPAL-RT TECHNOLOGIES

Booth # 107 **https://www.opal-rt.com/**

Real-time simulation is enabling the world's visionaries to make innovative ideas a reality. OPAL-RT empowers engineers and researchers with accessible, cutting-edge, real-time simulation technology to accelerate the development of better products and more reliable energy transmission.

NEWARE

Booth # 108 **https://newarelab.com/**

NEWARE supports global battery and EV manufacturers, research institutions, and enterprises with high-performance battery testing, formation systems, environmental chambers, and automation equipment—backed by a global service network and AI-powered lab management tools.

Chroma

Booth # 109 **https://www.chromausa.com/**

Chroma Systems Solutions provides precision test equipment and turnkey systems for industries like EVs, aerospace, semiconductors, and renewable energy, specializing in power conversion, battery testing, and automation.

ROHDE&SCHWARZ

Booth # 110 **https://www.rohde-schwarz.com/**

Rohde & Schwarz is a global leader in test and measurement solutions, offering high-precision instruments like spectrum analyzers and signal generators for industries including wireless, aerospace, automotive, and cybersecurity.

MathWorks®

Booth # 111 **https://www.mathworks.com/**

MathWorks is the leading developer of mathematical computing software, offering MATLAB for algorithm development, data analysis, and visualization, and Simulink for model-based design and simulation of dynamic systems. Engineers and scientists worldwide rely on these tools to accelerate innovation across industries such as automotive, aerospace, robotics, and energy.

imperix

Booth # 116 **https://imperix.com/**

Imperix is a Swiss company offering modular hardware and software for rapid control prototyping in power electronics. Their solutions streamline the development of power converters, motor drives, and smart grid systems for both academic and industrial use.

iTEC+ 2025

June 17 - 20 Anaheim, CA

EXHIBITORS

Booth # 117

https://www.aqmd.gov/home

South Coast AQMD is the regulatory agency responsible for improving air quality across large areas of Southern California, including Los Angeles, Orange, Riverside, and San Bernardino counties. Its mission is to clean the air and protect public health through innovative strategies and programs.

Booth # 119

https://www.dewetron.com/

DEWETRON

DEWETRON is an Austrian manufacturer of precision test and measurement systems, specializing in modular, high-speed data acquisition solutions for industries such as automotive, aerospace, energy, and research. Their versatile hardware and OXYGEN software enable synchronized, multi-domain data collection and analysis, supporting applications from power analysis to structural testing.

Booth # 121

https://www.dvelectronics.com/

D&V Electronics is a global leader in designing and manufacturing advanced testing solutions for electric and hybrid vehicle components, including motors, inverters, batteries, and e-axles. Their modular systems support performance, endurance, and production testing, serving OEMs, Tier 1 suppliers, and research institutions across the automotive and aerospace industries.

Booth # 118 **https://grapes.uapower.group/**

GRAPES is a university-industry consortium advancing power electronics for grid modernization and renewable integration.

Booth # 120 **https://www.ieee-pels.org/** **https://tec.ieee.org/**

The IEEE Transportation Electrification Council and Power Electronics Society work together to advance technologies in power conversion and electrified transportation, including electric vehicles, aircraft, ships, and supporting infrastructure.

Booth # 122 **https://www.hioki.com/us-en**

Hioki USA delivers advanced electrical test and measurement instruments—including power analyzers, battery testers, and data loggers—to support industries such as automotive, energy, and electronics. With a focus on precision, safety, and innovation, Hioki empowers engineers and technicians to enhance performance, ensure compliance, and drive technological advancement.

iTEC+ 2025

June 17 - 20 Anaheim, CA

EXHIBITORS

Booth # 123

https://route66controls.com/

Route 66 Controls LLC specializes in designing, prototyping, and testing advanced power electronics systems—including inverters, converters, and motor drives—for industrial, automotive, and renewable energy applications. With rapid R&D services and full IP and manufacturing rights transfer, they leverage a collaborative network of engineers and academic experts to deliver production-ready solutions.

Booth # 124 **https://www.elantas.com/**

Elantas is a global leader in insulating and protective materials for electrical and electronics applications, including wire enamels, resins, varnishes, and coatings.

Booth # 125 **https://www.dspace.com/**

dSPACE is a global leader in simulation and validation solutions for developing and testing embedded control systems. Their tools support rapid prototyping, hardware-in-the-loop simulation, and code generation across automotive, aerospace, and industrial applications—advancing autonomous, electric, and connected vehicle technologies.

Booth # 126 **https://pacificpower.com/**

Pacific Power Source designs advanced AC and DC power test equipment for industries like aerospace, EVs, and renewable energy. Their programmable power sources and grid simulators support R&D, compliance testing, and PHIL applications.

Coiltech® North America

June 10-11, 2026 - Novi, MI

Booth # 127 **https://www.coiltech.us/**

Coiltech North America is a leading trade show for the coil winding industry, showcasing materials, machinery, and technologies for electric motors, transformers, and generators. It offers a focused platform for networking and innovation in energy-efficient solutions.

iTEC+ 2025

June 17 - 20 Anaheim, CA

A special

'Thank You'

to our Media Partners!

Please click the icons below to visit our amazing media sponsors!

HOW2POWER.COM

EVs are here. Try to keep up.
CHARGED
ELECTRIC VEHICLES MAGAZINE

CALSTART

E-MOBILITY ENGINEERING

Transport advancement

THE TRANSPORT DATA

THE AUTOMOTIVE DATA

E-MOBILITY ENGINEERING

PRINT | DIGITAL | SOCIAL

Pick up a copy at the show!

CONNECTING EV ENGINEERS: POWERING THE FUTURE OF MOBILITY