

IEEE Power Electronics Society

Technical Committee on Vehicle and Transportation Systems

Alireza Khaligh

**Chair, PELS Technical Committee on
Vehicle and Transportation Systems**

ECCE 2017, Cincinnati, OH, USA

October 2017

PELS Technical Committee on Vehicle and Transportation Systems

- **Chair: Dr. Alireza Khaligh**
- **Vice-Chairs: Dr. Mahesh Krishnamurthy
Dr. Bulent Sarlioglu**
- **Finance Chair: Dr. Bilgin Berker**
- **Awards Chair: Dr. Omer Onar**
- **Secretary: Dr. Fariborz Musavi**
- **TEC Representative: Dr. Sheldon Williamson**

Outline

- **ITEC Global Series**
 - **ITEC 2017 Highlights**
 - **ITEC 2018**
 - **ITEC Asia & Pacific 2017**
 - **ITEC India 2017**
- **IEEE Transactions on Transportation Electrification**
- **TC 4 (Technical Committee on Vehicle and Transportation Systems) Website**

ITEC Global Series

- **ITEC North America (60% PELS, 20% IAS, 20% PES)**
 - ITEC'12: June 18-20, 2012, Dearborn, MI, USA
 - ITEC'13: June 16-19, 2013, Dearborn, MI, USA
 - ITEC'14: June 15-18, 2014, Dearborn, MI, USA
 - ITEC'15: June 14-17, 2015, Dearborn, MI, USA
 - ITEC'16: June 27-29, 2016, Dearborn, MI, USA
 - ITEC'17: June 22-24, 2017, Navy Pier, Chicago, IL, USA
 - ITEC'18: June 13-15, 2018, Long Beach, CA, USA
- **ITEC Asia & Pacific (36% IAS, 12% PELS, 12% PES, 40% Others) – Led by IAS**
 - Aug. 31 – Sept. 3, 2014, Beijing, China
 - June 1-4, 2016, Busan, Korea
 - August 2-5, 2017, Harbin, China
- **ITEC India & Middle East – Led by IAS in Partnership with SAEINDIA**
 - Aug. 27 – 29, 2015, Chennai, India
 - Dec. 13– 15, 2017, Pune, India
- **ESARS-ITEC Europe**
 - November 2-4, 2016, Toulouse, France

ITEC 2017: June 22-24, 2017, Navy Pier, Chicago, IL

- **General Chair: Omer C. Onar, Oak Ridge National Laboratory**
- **General Co-Chairs:**
 - **Tom Stricker, Toyota Motor North America, Inc.**
 - **Nick Nagel, Triumph Aerospace, USA**
 - **Gary Parker, Cummins Inc, USA**
 - **Kent Wanner, John Deere, USA**
- **Program Co-Chairs:**
 - **Ryan Ahmed, General Motors, USA**
 - **Xiaodong Shi, Mercedes-Benz R&D, USA**
- **Panels Chair: Beijing Wang, Fiat Chrysler Automobiles, USA**

ITEC 2017: June 22-24, 2017, Chicago, IL

- 186 papers submissions
- **296** paid registrations
- **+ 75** keynote speakers/short-course and tutorial organizers/panel organizers-moderators-panelists/exhibitors
- ~20 student volunteers
- PELS TC4 provided travel support to 10 students
- **~215k revenue**

ITEC 2017: Keynote Speakers

Michael Tamor

Henry Ford Technical Fellow on Energy and Sustainability,
Ford Motor Company



Steve Tarnowsky

Director, Global Transmission & Electrification,
Advanced & New Product Engineering,
General Motors



Silva Hiti

Senior Director,
Powertrain Engineering,
Faraday Future



Nicholas Nagel

Director of R&D,
Triumph Aerospace



Jiaqi Liang

Director of Power Electronics,
Hyperloop-One



Mengyang Zhang

VP of Engineering,
Skysource Nanjing Powertrain
Technology,
CTO, Naniing Golden Dragon Bus Co.



Professor Adel Nasiri

Director, Center for Sustainable
Electrical Energy Systems
University of Wisconsin, Milwaukee



Jeffrey Casady

Business Development and Program
Manager,
Wolfspeed/CREE



Larry Spaziani

Vice President,
GaN Systems



Richard Hampo

Director, Power Electronics and
Controls,
Lear Corporation



Kent Wanner

Technical Manager,
Electronic Design,
John Deere Electronics Solutions



ITEC 2017: 5 Short Course Presentations

- **“Traction Drive Inverter Design,”** Lihua Chen and Yan Zhou, HEV inverter Core Engineering Technical Experts, Ford Motor Company, Jin Wang, Ohio State University, and Mark J. Scott, Miami University.
- **“Modern Heuristics Algorithms for Automotive Applications,”** Dhafar Al-Ani, CoE Lead, PhD, P. Eng., Electrified Powertrain Propulsion Systems, FCA US LLC.
- **“Thermal Management Solutions in Power Electronics,”** Dr. Ahmed Zaghlol, General Manager, Americas Cooling Products, Electrical Power, Mersen Canada Toronto, Inc.
- **“Power Semiconductors for Traction Inverters in Vehicles: From Discretes to Power Modules, from Silicon to Wide Bandgap Devices,”** Dr. Andre Christmann and Dr. David Levett, Infineon Technologies Americas Corp.
- **“Tool Support for Model Based Software Engineering in MATLAB/Simulink for Domain Experts,”** Mark Lawford, Monika Bialy, and Bennett Mackenzie, McMaster University.

All courses are approved for IEEE CEU Credits

ITEC 2017: 5 Tutorials

- **“Fundamentals for More Electric Aircraft Design,”** Tim O’Connell, PC Krause & Associates, Inc.
- **“Power Line Communications for Vehicular and Smart Grid Applications,”** Andrea M. Tonello, Prof. Dr. Ing., Institute of Networked and Embedded Systems, Alpen-Adria-Universitat Klagenfurt.
- **“Permanent Magnets Fundamentals, Trends, and Recent Advancements,”** David Farnia, Arnold Magnetic Technologies.
- **“Fundamentals of Battery Electrochemistry and Control of Electric Vehicle Batteries,”** Vishal Mahajan, Samsung and Ryan Ahmed, McMaster University.
- **“Building Fast and Accurate Powertrain Models for HEV System and Control Development,”** Kevin Oshiro, Application Engineer, Motor and Power Control, MathWorks Inc.

ITEC 2017: 7 Industry Panel Sessions

- **“More Electric Aircraft Applications,” Organizer: Tim O’Connell, PC Krause & Associates, Inc.**
- **“Wireless Charging of EVs,” Organizer: Veda Prakash Galigekere, PEEM Group, ORNL.**
- **“Polyphase Electric Machine Applications for Traction Drive Systems,” Omid Beik, McMaster University.**
- **“Connected and Autonomous Vehicles and Self-Driving,” Haochi Li and Feilong Liu (Autonomous Driving Sub-System Lead), General Motors.**
- **“Electric Motor Whine, NVH – Challenges and Solutions,” Beijing Wang and Anand Sathyan, FCA.**
- **“What Software Engineering Fundamentals do Engineers Need to Know for Model Based Development for Embedded Code?,” Lucian Patcas, Mark Lawford, MacAUTO.**
- **“High Voltage Components and ePT Architectures for PHEV, HEV, and EV Applications,” Dhafar Al-Ani, Electrified Powertrain Propulsion Systems, FCA US LLC.**

ITEC 2018: June 13-15, 2018, Long Beach, CA

- **General Chair: Bulent Sarlioglu, University of Wisconsin-Madison**
- **General Co-Chairs:**
 - **Tom Stricker, Toyota Motor North America, Inc.**
 - **Nick Nagel, Triumph Aerospace, USA**
 - **Gary Parker, Cummins Inc, USA**
 - **Kent Wanner, John Deere, USA**
- **Program Co-Chairs:**
 - **Sanjaka Wirasingha, Valeo**
 - **Ryan Ahmed, General Motors**
- **Panels Chair: Beijing Wang, Fiat Chrysler Automobiles, USA**

ITEC India 2017

- Led by IAS in Partnership with SAE-INDIA
 - Dec. 13– 15, 2017, Pune, India
- No. of papers submitted **308**
- No. of track chairs **48**
- No. of reviewers **410**
- No. of accepted/presented papers **122 (40%)**

2017 FEPPCON IX Workshop

- **Emerging Markets to be considered**
- **Interdisciplinary Approach to Integration & Control**
 - **Multi-physics optimization including thermal, electrical and mechanical design**
 - **Integration, EMI and system reliability**
 - **Integrated Power Electronics Interfaces:**
 - **Integrated Thermal Management**
 - **Integrated Packaging**
 - **Cybersecurity**
 - **High speed computational capability for high switching frequencies**

IEEE Transactions on Transportation Electrification (TTE)

- Led by PELS (45% Financial Co-Sponsor)
- IEEE Power Electronics Society (PELS) – 45%
- IEEE Industry Applications Society (IAS) – 30%
- IEEE Power & Energy Society (PES) – 15%
- IEEE Vehicular Technology Society (VTS) – 10%
- IEEE Industrial Electronics Society (IES) – Technical Co-Sponsor
- IEEE Reliability Society (RS) – Technical Co-Sponsor

IEEE Power Electronics Society CALL FOR WEBINAR SPEAKERS

IEEE Power Electronics Society is pleased to announce **PELS** Webinar Library, which is open to all **PELS** members as a membership benefit. The **PELS** Webinars can be viewed live with free registration. After the event is over, the link to the video of the webinar will be available through the **PELS** Webinar Library: <http://www.ieee-pels.org/products/pels-webinars>. This library will allow you access to tutorials from power electronics experts from all over the world at your convenience, anywhere you are on the computer or mobile device of your choice.

The webinars' scope will include all fields of interest of the IEEE **PELS** which include the development and application of power electronics technology, which encompass the effective use of electronic components, the application of circuit theory and design techniques, and the development of analytical tools toward efficient electronic conversion, control, and conditioning of electric power. Specific topics include (but not limited to)

- AC-DC converters
- DC-DC converters
- Power Electronics for Utility Interface
- Inverters
- Semiconductor Devices
- Passive Components
- Modeling, Simulation, and Control
- Packaging
- Thermal Management

Open for Submissions:

PELS Webinars are open for webinar submissions to anyone from the power electronics industry who are interested in sharing their experiences with the rest of the IEEE **PELS** community. Each Webinar is for 20 minutes followed by a 10 minutes Q&A.

To submit a proposal, please submit the names, the contact information, and short bios of the presenters, the title and a half a page abstract of the proposed subject to the Digital Media Editorial Committee enjeti@tamu.edu and b.boresen@ieee.org. Please note that the webinars are designed to have a 20-minute presentation and 10-minute Q&A session.

IEEE Power Electronics Society CALL FOR WEBINAR SPEAKERS

- Ranbir Singh (GeneSiC Semiconductors): Wide Band gap devices
- John Shen (Illinois Tech): Wide Band gap devices
- Tim Burress (Oak Ridge National Labs): State of the art in vehicle benchmarking and EV powertrains
- Neal Clements (John Deere): EMI/EMC in transportation systems
- Said Al Hallaj (AllCell Technologies): Energy Storage and Battery Management Systems

PELS Technical Committee on Vehicle and Transportation Systems

Vice Chair: Dr. Mahesh Krishnamurthy

TC Website:

<http://www.ieee-pels.org/tech-activities/tc-4-vehicle-and-transportation-systems>

The screenshot shows the website's navigation bar with links: About, Awards, Chapters, Conferences, Education, Distinguished Lecturers, Membership, Products, Publications, Standards, and Tech. Activities. Below the navigation bar is a breadcrumb trail: / Home / Tech. Activities / TC 4: Vehicle and Transportation Systems. On the left is a sidebar menu with items: TC 1: Power & Control Core Technologies, TC 2: Power Conversion Systems And Components, TC 3: Motor Drives and Actuators, TC 4: Vehicle and Transportation Systems (selected), Leadership, Programs & Services, and Activities, Announcements & Milestones. The main content area features the heading 'TC 4: Vehicle and Transportation Systems' followed by a paragraph describing the committee's scope, a paragraph about its role as the home technical committee for transportation electrification, and a 'Mission Statement' section. To the right of the main content is a 'Sponsor' section featuring a poster for 'pcim EUROPE Nuremberg, Germany, 16 – 18 May 2017'. At the bottom left is the PELS logo with the tagline 'Powering a Sustainable Future'. At the bottom right is the IEEE logo with the tagline 'IEEE Powering Technology for Humanity'.

Sponsor



PELS Technical Committee on Vehicle and Transportation Systems

Awards Chair: Dr. Omer Onar

- **TC4 provided 10 travel grants to participants of the 2017 IEEE Transportation Electrification Conference and Expo. (ITEC).**
- **TC4 will provide travel grants to participants of the 2018 IEEE Transportation Electrification Conference and Expo. (ITEC): <http://itec-conf.com/for-authors/>**

PELS Technical Committee on Vehicle and Transportation Systems

2018 Budget

PELS TC4 Budget Template (for 2018)

Budget Category	Amount
Education Activities (fellowships, student travel, formula hybrid competition)	\$15,000
Standards Activities (e.g., travel to meetings)	\$0
General, TC Administrative, Meeting Rooms & Travel	\$5,000
TC website re-design & maintenance	\$0
TC mailing data base management	\$0
Awards	\$3,000
TC sponsored conference	\$0
TT new initiatives in next year (for 2018)	\$0
Others	\$0
Total	\$23,000