

## Organisational Information

Sign up at: [www.ecpe.org/events](http://www.ecpe.org/events)

### Registration Deadline:

- **26 June 2019**

### Participation Fee:

- **€ 595,-\*** for industry
  - **€ 445,-\*** for universities/institutes
  - **€ 150,-\*** for students/PhD students  
(limited spaces; copy of students ID required; dinner € 50,-\* extra)
- \* plus VAT

- The regular participation fee includes dinner, lunches, coffee/soft drinks and a flash drive with presentations. The reduced (PhD) students fee includes all the above except for dinner (can be booked for an extra fee of € 50,-\*).
- A printed version of the workshop handout is available on request (€ 50,-\*).
- Upon receipt of registration confirmation via email you are signed-up for the event. The invoice will be sent via letter post.
- Three participants from each ECPE member company free of charge. Allocation in sequence of registration.
- Further information (hotel list and maps) will be provided after registration and can be found on the ECPE web page.
- Cancellation policy: Full amount will be refunded in case of cancellation upon to 2 weeks prior to the event. After this date and in case of no-show 50 % of the fee is non-refundable (replacement is possible).

## Organisational Information

**Organiser** ECPE e.V.  
90443 Nuremberg, Germany  
[www.ecpe.org](http://www.ecpe.org)

**Chairmen** Prof. Eckhard Wolfgang  
ECPE e.V.  
Prof. Volker Pickert  
Newcastle University  
Dr. Wolfgang Wondrak  
Daimler

**Organisation** Lena Somschor, ECPE e.V.  
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**Venue** Filderhalle  
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Source: Filderhalle Leinfelden-Echterdingen GmbH



European Center for  
Power Electronics e.V.

## Programme

### ECPE Workshop

## Availability of Power Electronics by Fault-Tolerant Designs in Automotive and Aircraft

**3 - 4 July 2019**

Filderhalle  
Leinfelden-Echterdingen  
Germany



in cooperation with



Auto Drive  
DAIMLER



## ECPE Workshop

### Availability of Power Electronics by Fault-Tolerant Designs in Automotive and Aircraft

3 - 4 July 2019  
Leinfelden-Echterdingen, Germany

The automotive and aerospace industries demand power electronics systems with high-availability in order to guarantee full operational function over a long in-service time. Attaining high-availability becomes a challenge in particular for power-dense converters due to inevitable multi-physical interactions that impact adversely on the operational time. Fault tolerant design is a discipline that increases availability of a system. Fault tolerant power electronics converters detect and isolate faults and switch to safe operation.

Switching to safe operations are in particular important to autonomous electric cars and electric aircrafts/drones. Autonomy in cars is expressed in six levels starting from no automation to full autonomy. Where at lower autonomy levels redundancy may be considered at higher autonomy fault-tolerant design seem to be the solution.

The Workshop aims to discuss the state-of-the-art of fault-tolerant design including discussions on safety and reliability by describing requirements for autonomous cars and electric aircrafts followed by describing reliability issues of components and systems.

This workshop will also include results from the ongoing EU Project AutoDrive which aims for advancing fail-aware, fail-safe, and fail-operational electronic components, systems, and architectures for fully automated driving and automated flying to make future mobility safer, affordable and end-user acceptable. Results of the project will be discussed.

Two Panel sessions on Challenges of Autonomous Cars and Electric Aircraft will stimulate know-how exchange between different disciplines involved.

The workshop is chaired by:  
**Prof. Eckhard Wolfgang (ECPE e.V.)**  
**Prof. Volker Pickert (Newcastle University)**  
**Dr. Wolfgang Wondrak (Daimler AG)**

All presentations and discussions will be in English.

## Programme

Wednesday, 3 July 2019

08:30 Start of Registration / Welcome Coffee

09:00 Welcome, Opening

Ted Hopper, Member of the Board, ECPE e.V.  
Eckhard Wolfgang, ECPE e.V.

### Introduction

09:20 **Overview: Fault Tolerant Systems** | Volker Pickert, Barrie Mecrow, Newcastle University (UK)

10:00 **Overview: Requirements for Fully Automated Cars** | Christian Thulfaut, Robert Bosch (D)

10:40 Coffee Break

### Reliability

11:00 **Fault Tolerance and Reliability**  
Huai Wang, University of Aalborg (DK)

11:30 **Applied Robustness Validation**  
Ulrich Abelein, Infineon Technologies (D)

12:00 **Prognostics and Health Management in Autonomous Vehicles** | Horst Lewitschnig, Infineon Technologies Austria (A)

12:30 **Condition Monitoring for Power Module - App. to Lifetime Extension and Fault Tolerance**  
Stefan Mollov, Mitsubishi Electric (F)

13:00 Lunch

### Reliability

14:15 **Reliable City Car**  
Ricardo Groppo, Ideas & Motion (I)

14:45 **Safe Operational Drive: 6 Phases, 800V**  
Jorge Perez, ZF (D)

15:15 **Safe Turn-off of Bordnet**  
Michael Buchta, Kromberg & Schubert (D)

15:45 **Reliability Tests of Complex Systems**  
Mihai Nica, AVL (A)

16:15 **Reliability Research at CALCE**  
Patrick McCluskey, University of Maryland (US)

16:45 Coffee Break

### Panel Discussion

17:00 **Opportunities and Challenges in Power Electronics Targeting Autonomous Cars**  
Moderator: Wolfgang Wondrak, Daimler (D)

18:30 End of 1st Workshop Day

19:30 Dinner at 'Parkhotel Stuttgart Messe-Airport'

## Programme

Thursday, 4 July 2019

8:30 Start of 2nd Workshop Day

### Introduction

8:30 **Hybrid-electric Propulsion Systems for Aircraft**  
Claus Müller, Siemens (D)

### Electric Drives

9:10 **Multi-phase, Fault Tolerant Power Converters for Aircraft Motor Drive Applications**  
Pat Wheeler, The University of Nottingham (UK)

9:40 **In-Wheel-Motor as a Powertrain of a Fault-Tolerant Modular Vehicle**  
Dimitrios Sarafianos, Protean Electric (UK)

10:10 **Fault Tolerant Motor Drive Systems for High Lift Application**  
Maamar Benarous, UTC Aerospace Systems (UK)

10:40 Coffee Break

### Converters

11:00 **Back-up Inverter-leg with an Original and Automatic Safe-connection**  
Frédéric Richardeau, CNRS-University of Toulouse (F)

11:30 **SiC PE System with High Level of Mechatronic Integration for Automotive & Aircraft Appl.**  
Maximilian Hofmann, Fraunhofer IISB (D)

12:00 **Fault-tolerant Design of Power Modules**  
Kai Kriegel, Siemens (D)

12:30 **Fault-tolerant Driver Circuits**  
Martin Pfof, TU Dortmund (D)

13:00 Lunch

### Panel Discussion

14:00 **Opportunities and Challenges for Electric Aircraft**  
Moderator: Volker Pickert, Newcastle University (UK)

16:00 End of Workshop