

# EPE 2021 ECCE Europe

September 6-10, 2021  
Ghent, Belgium

The 23<sup>rd</sup>  
European  
Conference on  
Power Electronics  
and Applications



<http://www.epe2021.com>

## Call for Papers

- **18 November 2020:** Receipt of synopses
- **3 March 2021:** Notification of provisional acceptance
- **3 June 2021:** Receipt of full typescript for final review



## Organization and Venue

The Power Electronics community will gather in **Ghent**, Belgium, from 6 to 10 September 2021, to exchange views on research progress and technological developments in the various topics described hereunder. On Monday 6 September a number of tutorials will be organised, and on Friday 10 September several technical visits are planned.

The 23<sup>rd</sup> Conference on Power Electronics and Applications (and Exhibition), EPE'21 ECCE (Energy Conversion Congress and Expo) Europe is co-sponsored by the EPE Association and IEEE PELS. It will take place at the Gent ICC – International Convention Center in Ghent, Belgium.

## Aims of the Conference

The EPE ECCE Europe conference is the largest in its field, attracting experts from numerous countries every year to join in the discussions. With the objective to exchange and meet fellow professionals and academics, the EPE ECCE Europe conference brings together researchers, engineers, etc. working at the forefront of power electronics technologies. For this type of event, where the future role of power electronics in this ecological and technological revolution will be explored, the EPE ECCE Europe conference is one of the privileged places. EPE ECCE Europe Ghent 2021 will provide the opportunity to discuss a number of subjects, not only during the lecture and poster sessions of the conference but also at the exhibition, industrial forums and tutorials.

## Topics

Electrification of mobile and non-mobile systems is progressing fast. Novel battery systems are being developed not only for drones, passenger cars and heavy-duty vehicle applications, but also for stationary storage applications. They need intelligent Battery Management Systems and control units as well as appropriate charging devices. For vehicle applications, high-power charging stations are being developed to reduce charging time. Bi-directional V2X charging systems allow for better grid management and, when combined with smart charging, for an increased share of renewables in the electricity mix. Power electronics interfaces, with their emerging wide bandgap (WBG) technologies (such as SiC and GaN), are a key element in these developments towards high energy-efficient systems. The reliability aspect is crucial in these and many other applications. Considering the reliability aspect in the design phase of battery systems, drivetrains, charging systems with both AC and DC networks, etc., will improve the lifespan of those systems and provide more robustness with less maintenance.

On top of the tutorials, lecture and dialogue sessions and technical visits, the organising committees will propose several discussion sessions within the industrial forums as well as special sessions of power electronics related trends. The conference will specifically focus on the following challenging topics:

Tuesday, the 7<sup>th</sup> of September 2021: **Battery Systems**  
(BMS, Balancing Circuits, Control Units,...)

Wednesday, the 8<sup>th</sup> of September 2021:  
**Transportation Electrification**  
(Charging Systems, V2X, Energy Management,...)

Thursday, the 9<sup>th</sup> of September 2021:  
**Reliability of Power Electronic Systems and Components**  
(Failure Mechanisms, Predictive Algorithms,...)

The conference topics are as follows:

### I POWER ELECTRONICS COMPONENTS AND CONVERTERS

#### Topic 1: DEVICES, COMPONENTS, PACKAGING AND SYSTEM INTEGRATION

- 1.a. Passive Components
- 1.b. Active Devices and Components (Si)
- 1.c. Active Devices and Components (Wide Bandgap and other new materials)
- 1.d. Components and Devices for Specific Applications, including for Pulsed Power

- 1.e. System Integration, Packaging & Thermal Management
- 1.f. Reliability & Life-Time

#### Topic 2: POWER CONVERTERS TOPOLOGIES

- 2.a. Modular Multilevel Converters
- 2.b. Solid State Transformers
- 2.c. Grid Connected Converters
- 2.d. Resonant Converters
- 2.e. HF Power Converters
- 2.f. Wide-Band Gap Power Electronics

#### Topic 3: CONVERTER MODELLING, DESIGN AND LOW-LEVEL CONTROL

- 3.a. Converter Design and Optimisation
- 3.b. Converter Modelling and Low-level Control, including Gate-Drives
- 3.c. EMI/EMC in Power Electronics including HF Phenomena

#### Topic 4: MEASUREMENT, SUPERVISION AND CONTROL FOR POWER CONVERTERS

- 4.a. Standard and Advanced Modulation Techniques
- 4.b. Standard and Advanced Current / Voltage / Synchronization Control Techniques
- 4.c. Estimation, Identification and Optimisation Methods
- 4.d. Measurement Techniques, Sensors and State Observers
- 4.e. Condition Monitoring and Life-Time Prediction

### II POWER ELECTRONICS APPLICATIONS

#### Topic 5: ELECTRICAL MACHINES AND DRIVE SYSTEMS

- 5.a. Electrical Machines and Actuators
- 5.b. Adjustable-Speed Drives and Converter-Machine Interactions
- 5.c. Design, Optimisation and Control of Electric Drives
- 5.d. Condition Monitoring and Life-Time Prediction

#### Topic 6: RENEWABLE ENERGY POWER SYSTEMS

- 6.a. Wind-Energy Systems
- 6.b. Solar-Energy Systems
- 6.c. Other Renewable-Energy Systems
- 6.d. Energy Harvesting
- 6.e. Energy Storage Systems for Renewable Energy

#### Topic 7: GRIDS, SMART GRIDS, AC & DC

- 7.a. Power Electronics in Transmission and Distribution Systems
- 7.b. HVDC & FACTS
- 7.c. Micro-Grids
- 7.d. Smart Grids
- 7.e. Mobile Power Stations
- 7.f. Power Quality Issues and Power Factor Correction Techniques
- 7.g. DC Grids including Fault Coordination and Protection
- 7.h. Hybrid Circuit Breakers
- 7.i. Real-Time Simulation and Hardware in the Loop

#### Topic 8: E-MOBILITY

- 8.a. Electric Drive Trains for On- and Off-Road Vehicles
- 8.b. Electric Drive Trains for Rail Vehicles
- 8.c. Electric Drive Trains for Aerospace and Space Applications
- 8.d. Electric Drive Trains for Marine Applications (Offshore, Subsea and Ships)
- 8.e. On-Board Power Converters
- 8.f. Batteries: Management Systems (BMS), Monitoring and Life-Time Prediction
- 8.g. Vehicle Battery Chargers: Contact and Contactless
- 8.h. Fuel Cells: Converters, Control, Diagnostics and System Integration
- 8.i. Smart Charging and Vehicle to Grid Interaction

#### Topic 9: POWER SUPPLIES AND INDUSTRY-SPECIFIC APPLICATIONS

- 9.a. Low Voltage DC Power Supplies
- 9.b. High Voltage DC Power Supplies
- 9.c. Distributed Power Supplies
- 9.d. Uninterruptible Power Supplies (UPS)
- 9.e. Lighting: Solid-State Lighting and Electronic ballasts
- 9.f. Contactless (Wireless) Power Supply
- 9.g. Industry-Specific Applications (Cement, Steel, Paper, Textile, Mining, etc...)
- 9.h. Applications in Physics Research and Related Areas

## Topic 10: DATA ANALYSIS, ARTIFICIAL INTELLIGENCE AND COMMUNICATION

- 10.a. Data Analysis applied to Power Electronics and Drive Systems
- 10.b. Application of Artificial Intelligence to Power Electronics and Drive Systems
- 10.c. Communication for Power Electronics and Drive Systems
- 10.d. Wireless Control
- 10.e. Diagnostics

### Presentation of Papers

Contributions to EPE'21 ECCE Europe must be presented either as a lecture presentation or as a dialogue presentation. A manuscript must be submitted in English in both cases for inclusion in the Conference Proceedings (electronic version only). Papers for lecture sessions will be strictly limited and selected on the basis of wide audience appeal, ease of understanding and potential stimulation of broad ranging discussion. No lecture session will be organized during the dialogue session timeslots

### Content of Synopses

The synopses should consist of a 3 to 5 page anonymous summary, including an abstract with no more than 50 words; topic number and indication of the preference for dialogue or lecture presentation (to be clearly mentioned), key diagrams and a references list. The synopses will be submitted using the host of the conference on the Internet. A link to the site will be available from <http://www.epe2021.com/>, as well as from <http://www.epe-association.org>. Detailed information and guidelines can be downloaded from the conference website to help you prepare the needed material for submitting a synopsis. The site will soon be open for upload.

Authors of papers provisionally selected for presentation will receive a notification and can download the instructions for preparing the dialogue papers and/or the lecture papers from the website. Final selection will be based on the full paper. The paper will only be included in the Conference Proceedings after receipt of one full registration fee per paper in due terms. Student registration fee is only valid for student participants, not for authors. One single author may not present more than two (2) papers. The publication date of the accepted conference papers will be two weeks before the conference.

A selection of outstanding conference papers will be published afterwards in the EPE Journal, which is an ISI registered journal.

The conference proceedings will be submitted to the IEEE Xplore® digital library.

All presented papers will be listed in the Web of Science (formerly Web of Knowledge), INSPEC database for Engineering. Selected papers published in the EPE Journal will be automatically included in the Web of Science – Core Collection and get a WOS-Accession number. The Organising Committee works toward ensuring that all conference papers are listed in the Core Collection as well. It is already the case since the 2014 edition.

### Tutorials – Call for Proposals

Several tutorials will be held prior to the conference. Authors willing to propose a tutorial at EPE'21 ECCE Europe are invited to send a proposal to Dr. David OLIVA URIBE at the scientific secretariat (EPE Association, c/o VUB-IrW-ETEC, Pleinlaan 2, B-1050 Brussels, Belgium, e-mail: [David.Oliva.Uribe@vub.be](mailto:David.Oliva.Uribe@vub.be)) before **11 January, 2021**. The proposal will consist of a three-page summary including tutorial title, name and affiliation of the lecturer(s), tutorial objectives and audience, topical outline and provisional schedule of the tutorial.

The tutorials will be organized on **Monday 6 September 2021**.

Tutorial proposals related to all conference topics are welcome.

### EPE'21 ECCE Europe provides the best experience

EPE'21 ECCE Europe is committed to providing solutions to the delegates so that they have the best experience of participating in the conference, whether in-person or remotely. Many delegates enjoy virtual participation in conferences while others prefer in-person exchange and networking opportunities. EPE'21 ECCE

Europe will endeavour to provide the best experience possible, as well as promote the reduction of the CO<sup>2</sup> footprint in travelling to the conference.

### Deadlines

Intending authors should note the following deadlines:

- Receipt of synopses: **18 November 2020**
- Notification of provisional acceptance: **3 March 2021**
- Receipt of full typescript for final review: **3 June 2021**

### Working Language

The working language of the conference is English, which will be used for all printed material, presentations and discussions.

### Programme and Registration

The provisional programme and registration form will be available from the Internet site early summer 2021.

Additional information will be available on:

<http://www.epe2021.com>

### Venue

The conference will take place at the Gent ICC – International Convention Center. The conference venue is at walking distance from the main railway station and the city center of Ghent. "Gent Sint-Pieters", the city's main railway station, is about 1 hour from the Airport in Brussels. The conference venue offers facilities and services of international quality meeting standards. Wi-Fi access will be free for attendees, everywhere in the congress center.

### Exhibition

As with previous editions, an industrial (and scientific) exhibition will be part of the event.

Detailed information is available at [www.epe2021.com](http://www.epe2021.com)

You can also contact us via e-mail to [Carol.Appelmans@vub.be](mailto:Carol.Appelmans@vub.be)

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The overall management of the Congress is conducted by the Coordination Committee to ensure consistency in strategy, scope and content of the Conferences from year to year. The committee issues a Call for future locations of the Conferences, and forwards its recommendations to the EPE Executive Council as well as to the IEEE-PELS Administrative Committee for final approval.

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#### **IEEE-PELS representative members:**

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