

## Registration (Fax Reply)

To: ECPE e.V.  
Att.: Ingrid Bollens

Fax: +49 (0)911 / 81 02 88 – 28

Register before **10 March 2009**

### Participation fee:

- .. €530,-\*
- .. €395,-\* for university members

The fee includes dinner, lunch, coffee/soft drinks and a CD with the seminar presentations. A printed version of the seminar handouts is available on request (€42,- \*).

- .. €120,-\* for students (shortened seminar package)

With the confirmation of seminar registration you will receive the invoice. (\* plus 19 % VAT).

In case of cancellation after 10 March 2009 or non-attendance 50 % of the participation fee are payable.

Three participants from each ECPE member company free of charge. Allocation in sequence of registration.

Sender:

\_\_\_\_\_

title, given name, name

\_\_\_\_\_

company, department

\_\_\_\_\_

full address

\_\_\_\_\_

phone, fax

\_\_\_\_\_

e-mail

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date, signature

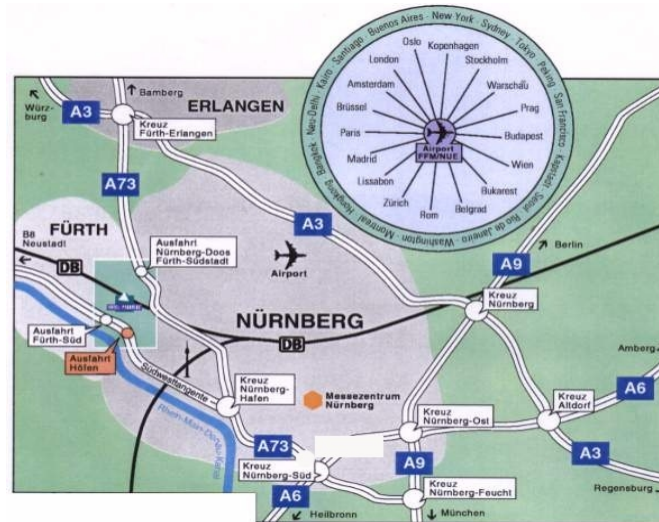
## Organisational information

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

Chair of seminar: Dr. Martin Maerz,  
Fraunhofer Institute IISB  
Thomas Harder, ECPE e.V.

Organisation: Ingrid Bollens, ECPE e.V.  
+49 (0)911 / 81 02 88 – 10  
[ingrid.bollens@ecpe.org](mailto:ingrid.bollens@ecpe.org)

Place of seminar: Hotel Pyramide  
Europa-Allee 1  
90763 Fuerth, Germany



Further information (hotel list and maps) will be provided after registration.



**ECPE European Center for  
Power Electronics e.V.**

# ECPE Seminar Innovative Materials for Power Electronics

- Electrical Engineering meets Material Science

**17 – 18 March 2009**

**at Hotel Pyramide  
Fuerth/Nuremberg  
Germany**

**in cooperation with**



**EUROPEAN  
POWER  
ELECTRONICS  
AND  
DRIVES**



**Fraunhofer** Institut  
Integrierte Systeme und  
Bauelementetechnologi

## Introduction

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### ECPE Seminar

## Innovative Materials for Power Electronics

- Electrical Engineering meets Material Science

17 – 18 March 2009

Fuerth/Nuremberg, Germany

Advanced materials are the key to many innovations in power electronics e.g. in packaging and inter-connection technologies, in thermal management as well as in active and passive component technology.

Therefore, we decided to select this important cross-functional topic for our ECPE Seminar held in the frame of the ECPE Annual Event 2009.

In power electronics the different materials in use are often stressed to their load limits. High power density is requiring excellent thermal conductivity, normally in combination with electrical insulation. The high voltages are challenging the dielectric properties, high currents ask for excellent electrical conductivity. Many different materials are needed in a power electronic system to meet all these often conflicting requirements. This leads to additional stresses resulting from the thermo-mechanics under electrical and thermal load cycles.

On the other side, materials and their manufacturability strongly influence the costs of components and assemblies in power electronics.

Dr. Martin Maerz (Fraunhofer IISB in Erlangen/Nuremberg) will chair the seminar together with Mr. Thomas Harder (ECPE). All presentations and discussions will be in English.

## Programme

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### Tuesday, 17 March 2009

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- 9:30 am **Start of registration**  
10:00 **Welcome Address and Introduction**  
T. Harder, ECPE  
10:15 **Innovative Materials – Key Enablers for High-Performance Power Electronics**  
M. Maerz, Fraunhofer IISB

### Joining and Substrate Materials

- 10:45 **Reliable Soldering for High Temperature and Temperature-Cycling Load**  
M. Rittner, Robert Bosch  
11:15 **Ag Sintering – A Highly Reliable Bonding Technology**  
C. Goebel, Semikron  
11:45 **Perspectives of Sintering with Nano-scale Ag Particles**  
M. Knoerr, Fraunhofer IISB  
12:00 **Case Study I: Ribbon Bonding in Power Electronics**  
E. Milke, W.C. Heraeus  
12:20 **Case Study II: Large Wire Bonding Using Fibre Reinforced Wire Materials**  
J. Dalin, Univ. Freiburg

### 12:40 **Lunch**

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- 13:45 **Direct Aluminum Bonded (DAB) Substrates**  
H. Knoll, IXYS Semiconductor  
14:00 **High Temperature PCB Substrates (200-250°C) based on Thermoplastic Polymers**  
T. Apeldorn, TU Hamburg Harburg  
14:30 **Thermally Optimised Adhesives**  
M. Hof, Polytec

### 15:00 **Coffee Break**

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### New Materials for Power Electronics Cooling

- 15:30 **Thermal Properties and Reliability of Advanced Metal-Diamond Composites**  
S. Knippscheer, Plansee  
16:00 **Carbon Material – An Overview of Materials and Applications**  
D. Schneider, SGL Carbon Group  
16:30 **Carbon Nano Tubes in Power Electronics**  
S. Forero, FutureCarbon

## Programme

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- 17:00 **Materials Roadmap in Power Electronics**  
E. Wolfgang, ECPE  
17:30 **End of 1<sup>st</sup> day programme**  
19:00 **Dinner at Hotel Pyramide**

### Wednesday, 18 March 2009

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### Advanced Polymer Systems

- 8:30 a.m. **Thermal Conductive Polymers**  
9:00 **Case Study III: Polymer Heatsinks**  
M. Maerz, Fraunhofer IISB  
9:30 **Soft-Magnetic Polymers**  
S. Egelkraut, Univ. Erlangen

### 10:00 **Coffee Break**

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### Passive Components

- 10:30 **Dielectric and Insulating Materials in Power Electronics**  
S. Guillemet, Univ. Toulouse  
11:00 **Ceramic Functional Materials for Magnetics**  
R. Lucke, FIT-Ceramics

### Power Semiconductor Devices & Technologies

- 11:30 **Process Chain for Soldering Semiconductor Front Sides - from Development to Mass Production**  
S. Landau, Infineon Technologies

### 12:00 **Lunch**

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- 13:15 **GaN – Perspectives for New Power Semiconductor Devices**  
M. Schlechtweg, Fraunhofer IAF  
13:45 **SiC – Perspectives for New Power Semiconductor Devices**  
P. Friedrichs, SiCED  
14:15 **Final Discussion**  
15:00 **End of seminar**