



Joint IAS/PELS/IES  
German Chapter



Founded on December 18, 1997  
[www.ewh.ieee.org/r8/germany/ias-pels/](http://www.ewh.ieee.org/r8/germany/ias-pels/)

IEEE-PELS Best Chapter Award for 2001  
IEEE-IAS's 2002 Outstanding Large Joint Chapter  
IEEE Region 8 The Chapter of the Year 2003  
IEEE PELS Continuous Outstanding Performance Award 2004



ÉCOLE POLYTECHNIQUE  
FÉDÉRALE DE LAUSANNE



Final Program Rel. 15<sup>th</sup> April  
MEGA-MEETING-LAUSANNE

*IEEE Region 8 Chapters Leadership Workshop  
and  
Joint Chapter Meeting  
of the  
IEEE IAS/PELS/IES German Chapter  
IEEE PELS Swiss Chapter  
IEEE PES Swiss Chapter  
IEEE PES German Chapter*

*June 1-4<sup>th</sup> 2005, Lausanne, Switzerland*



## HOSTS



IEEE  
Region 8  
&  
Swiss Section,  
Germany  
Section



Laboratoire d'électronique  
industrielle

**EPFL**  
*École Polytechnique Fédérale de Lausanne  
STI / Institut des Sciences de l'Énergie  
Laboratoire d'Électronique Industrielle*



**CERN**  
*Centre Européen de Recherches Nucléaires  
1211 Genève Meyrin*

**VENUE:** *Swiss Federal Institute of Technology – Lausanne  
École Polytechnique Fédérale de Lausanne  
Politecnico Federale – Losanna  
Eidgenössische Technische Hochschule - Lausanne*

EPFL – Ecublens  
ELD 132  
CH-1015 Lausanne, Switzerland

Final\_Program. Rel. April 15,2005

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**General Chairmen :** **Prof. Alfred Rufer**, [alfred.rufer@epfl.ch](mailto:alfred.rufer@epfl.ch)  
Swiss Federal Institute of Technology (EPFL), Lausanne, Switzerland  
Director of the Industrial Electronics Laboratory (LEI)

**Dr.-Ing. Peter Magyar**, [peter.magyar@ieee.org](mailto:peter.magyar@ieee.org)  
Hella Kga Hueck & Co., GE-ADE, Lippstadt, Germany  
IEEE IAS Region 8 Chapters Area /West/ Chair

**Chairmen:** **Dr. Frederick Bordry**, [frederick.bordry@cern.ch](mailto:frederick.bordry@cern.ch)  
Dept AB-PO CERN, 1211 Genève 23

**Mr. Moshe Harpaz**, [mharpaz@ieee.org](mailto:mharpaz@ieee.org)  
Moshe Harpaz Electrical Engineering Ltd., ISRAEL  
IEEE IAS Region 8 Chapters Area /East/ Chair

**Prof. Johann W. Kolar** [kolar@lem.ee.ethz.ch](mailto:kolar@lem.ee.ethz.ch)  
Swiss Federal Institute of Technology (ETH), Zurich, Switzerland  
Chairman of the IEEE PELS Swiss Chapter

**Prof. Andreas Lindemann**, [a.lindemann@ieee.org](mailto:a.lindemann@ieee.org)  
Otto-von-Guericke-Universität, Magdeburg, Germany  
Chairman of the IEEE IAS/PELS/IES German Chapter

**Dr.-Ing. Andreas Luxa**, [andreas.luxa@siemens.com](mailto:andreas.luxa@siemens.com)  
Siemens AG, PT D H T, Berlin, Germany  
Chairman of the IEEE PES German Chapter

**Representative of the IEEE Region 8 Committee**  
TBD

**Local Organizer:** **Mme. Fabienne Vionnet Monterde**, [fabienne.vionnet@epfl.ch](mailto:fabienne.vionnet@epfl.ch)  
Swiss Federal Institute of Technology Lausanne  
EPFL – Ecublens  
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CH-1015 Lausanne, Switzerland  
Tel: +41 21 693 26 28  
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## REGISTRATION AND HOTEL INFORMATION

Registration for the meeting will be open from 1<sup>st</sup> March to 30<sup>th</sup> April for 50 participants. You are kindly asked to use the enclosed Registration Form and send it to [fabienne.vionnet@epfl.ch](mailto:fabienne.vionnet@epfl.ch). If you wish to participate on the workshop too, you are pleased to make registration by 4<sup>th</sup> April and send an additionally mail copy to [peter.magyar@ieee.org](mailto:peter.magyar@ieee.org).

Hotel reservation should be made individually. Please refer to the Hotel Reservation Form available as a separate document. To localize the hotels, please visit <http://www.iti.fr/>.

In following hotels are rooms for special rate (reference "IEEE") available

**Hôtel Continental**  
Place de la Gare 2  
1003 Lausanne  
tél. +4121 321 88 00  
fax +4121 321 88 01  
[reservation@hotelcontinental.ch](mailto:reservation@hotelcontinental.ch)

**Hôtel Royal-Savoy**  
av. d'Ouchy 40  
1006 Lausanne  
+4121 614 88 88  
+4121 614 88 78  
[royal-savoy@bluewin.ch](mailto:royal-savoy@bluewin.ch)  
[royal-savoy@cdmgroup.ch](mailto:royal-savoy@cdmgroup.ch)

**Hôtel Agora**  
av. Rond-Point 9  
1006 Lausanne  
+4121 617 12 11  
+4121 616 26 05  
[agora@hotel.ch](mailto:agora@hotel.ch)  
[agora@fassbind-hotels.ch](mailto:agora@fassbind-hotels.ch)

30 singles at CHF 130.-

20 singles at CHF 199.-

20 singles at CHF 143.-

# PROGRAMME

(1<sup>st</sup> and 2<sup>nd</sup> Day)

## CHAPTERS LEADERSHIP WORKSHOP

**Chairman:** Peter Magyar  
IEEE IAS Region 8 Chapters Area /West/ Chair

1<sup>st</sup> June, evening

***Dinner Reception***

2<sup>nd</sup> June, 8:00

***Welcome and Opening Address***

**Peter Magyar**

IEEE IAS Region 8 Chapters Area /West/ Chair

***Presentations about IEEE Activities***

Chaired by: **Mr. Moshe Harpaz**

IEEE IAS Region 8 Chapters Area /East/ Chair

Moshe Harpaz Electrical Engineering Ltd., Israel

**Regions' Presentations**

8:10

***Presentation of the IEEE Region 8***

**Prof. Dr. Baldomir Zajc**, *Director*

University of Ljubljana, Slovenia

8:30

***Presentation of the IEEE Swiss Section***

TBD

TBD

8:50

***Presentation of the IEEE Germany Section***

**Univ.-Prof. em. Dr.-Ing. Adolf Schwab**, *IEEE Fellow, Chairman*

University of Technology, Karlsruhe, Germany

9:10

***Presentation of an IEEE Life Fellow***

**Univ.-Prof. em. Dr.-Ing. Werner Leonhard**, *IEEE Life Fellow*

University of Technology, Braunschweig, Germany

9:30

***How do Chapters in other Regions work?***

***IEEE New York Section PES/IAS Long Island Chapter***

**Ms. Balvinder Blah**, *Student Activity Chair*

El. Engineer, Supervisor, Consolidated Edison Company of NY, U.S.A

9:45

**Break**

**Societies' Presentations**

10:00

***Presentation of the IEEE Industry Applications Society***

**Mr. H. Landis Floyd II**, *IEEE Fellow, President*

DuPont Co., Wilmington, DE, U.S.A

10:20

***Presentation of the IEEE Industrial Electronics Society***

**Dr. Charles W. Einolf**, *IEEE Fellow, President Elect*

Consultant, Mitchellville, Maryland, U.S.A

10:40

***Presentation of the IEEE Power Electronics Society***

**Univ.-Prof. Dr.ir. Rik W. DeDoncker**, *IEEE Fellow, President*

RWTH University of Technology, Aachen, Germany

11:00

***Presentation of the IEEE Power Engineering Society***

**Mr. John D. McDonald**, *IEEE Fellow, President Elect*

Senior Principal Consultant & Director, Asset Automat.&Systems, USA

11:20

***Presentation of the IEEE IAS Chapters and Membership***

***Department, Leadership Training Committee***

**Mr. Caio A. Ferreira**, *IEEE Fellow, Chairman*

Founder & C.E.O., Mechatronics System LLC, U.S.A.

11:40

***Round Table Discussion***

***Chapters and the matrix structure of IEEE***

Chaired by **P.Magyar**, *IEEE IAS Region 8 Chapters Area /West/ Chair*

12:00 – 12:45

***Lunch break***

2<sup>nd</sup> June, afternoon**Chapter Chair Presentations**

Chaired by: **Representative of the IEEE R8 Committee Chapter Coordination**  
*TBD*

- 12:45            **IEEE Joint IAS / PELS / IES German Chapter**  
**Prof. Dr.-Ing. Andreas Lindemann, Chairman**  
Otto-von-Guericke-Universität Magdeburg, Germany
- 13:00            **IEEE Hungary Section IAS Chapter**  
**Dr. Tamás Ruzsányi, Chairman**  
Ganz Transelektro, Traction Electric Ltd, Budapest
- 13:15            **IEEE Israel Section Joint IAS / IES Chapter**  
**Mr. Moshe Harpaz, Chairman**  
Moshe Harpaz Electrical Engineering Ltd., Israel
- 13:30            **IEEE Macedonia Section Joint IAS / IES / PELS Chapter**  
**Prof. Dr. Goce L. Arsov, Chairman**  
SS "Cyril and Metodius" University, Skopje, Macedonia
- 13:45            **IEEE Joint IAS / PELS Chapter, Middle and South Italy**  
**Prof. Dr. Alfio Consoli, Life Fellow IEEE, Chairman**  
University of Catania, Catania, Italy
- 14:00            **IEEE IAS Spanish Chapter**  
**Prof. Dr. Juan M. Martin-Sánchez, Chairman**  
UNED/ETSI Industriales, Madrid, Spain
- 14:15            **IEEE Joint PELS / IAS Chapter in Russia (North-West)**  
**Prof. Dr. Sc. Valery I. Chrisanov, Chairman**  
St. Petersburg University of Telecommunications, Russian Federation
- 14:30            **Break**
- 14:45            **IEEE Spanish Joint PELS / IES Chapter**  
**Prof. Dr. Enrique J. Dede, Chairman**  
University of Valencia, Spain
- 15:00            **IEEE PELS Swiss Chapter**  
**Prof. Dr.-Ing. Johann W. Kolar, Chairman**  
Swiss Federal University of Technology (ETH) Zurich, Switzerland
- 15:15            **IEEE PES German Chapter**  
**Dr.-Ing. Andreas Luxa, Chairman**  
Siemens AG, PTD H T, Berlin, Germany
- 15:30            **IEEE Hungary Section PES Chapter**  
**Prof. Dr. Sc. László Jermendy, Chairman**  
Managing Director, Multiprak Consulting, Inc., Budapest, Hungary
- 15:45            **IEEE Russian (Central-East Zone) PES Chapter**  
**Dr. Sc. Lidia Kovernikova, Vice Chairman**  
Energy Systems Institute, Irkutsk, Russian Federation
- 16:00            **IEEE PES Swiss Chapter**  
**Prof. Dr.-Ing. Dirk Westermann, Chairman**  
University of Technology, Ilmenau, Germany
- 16:15            **Motion and voting about venue and host of the R8 Chapters Leadership Workshop 2006**  
**Closing Address**

## EPFL & IEEE SEMINAR

Chairman:

**Prof. Andreas Lindemann**  
Otto-von-Guericke-Universität, Magdeburg, Germany

2<sup>nd</sup> June 16:30

### ***“The Future Energy Challenge – An Exemplary Contribution”***

**Mr. Christoph Weissbacher, Student**  
University of Technology RWTH, Aachen, Germany  
Member of the Team FH Köln / RWTH Aachen for the IEEE Future Energy Challenge 2005, [www.fec.rwth-aachen.de](http://www.fec.rwth-aachen.de)

The simulated system is a single phase inverter meant to be used in a photovoltaic application of 1 kW, for both 220 Volt / 50 Hz and 110 Volt / 60 Hz. It provides both stand-alone and grid operation. The objective of this work was to find control parameters for voltage (stand-alone) and current (grid) control and to verify them with PSIM. These parameters will be implemented digitally in a microcontroller routine. The system consists of a boost converter, a series resonant converter and an inverter. The load is the VDE standard grid model.

2<sup>nd</sup> June 16:55

### ***“PSIM virtual machinery of a cruise ship for dynamic performance studies”***

**Seminar Lecture**  
**Mr. Ronan Besrest, Ingenieur**  
CAPSIM, 13650 Meyragues, France  
[www.capsimulation.com](http://www.capsimulation.com)

This lecture presents the design and the results of a virtual machinery tool developed with PSIM software dedicated to transient analysis of All Electric Ship power networks. This work has been made for and with a major French ship manufacturer.

The electrical network is AC and composed with several generators of different types (turbine-alternator, diesel-alternator) which supply altogether 57.4 MW for propulsion motors and hotel consumers. The use of mixed technologies for generators leads to specific problems of:

- stability of the machinery especially on transient conditions, (parallel operation, mixed control loops),
- active and reactive electrical loads sharing (turbine/diesel compatibility),
- global power management system strategies.

The virtual machinery is dedicated to the analysis and to the resolution of those problems.

The main objective of the virtual machinery is to be an industrial applicative tool for predicting the behaviour of the AC network on normal working transients (load variations, loads sharing...) or during fault conditions (short-circuit, generator trip...). Industrial means that it has to be robust for all stimuli on the network, easy to use and modify, and with a reasonable calculation time on a classical PC platform.

The tool has also to represent, thanks to a proper numerical model integration, different types of phenomena (electrical, mechanical, thermo-dynamical, regulations) that interact each other.

The power multi-disciplinary constraint has been managed by the use of a suitable modelization tool (PSIM from Powersim Technology). Unitary models have been created considering the appropriate details level with optimised representations for robustness in a global network use and for calculation time.

The parameters access problem has been solved by partnership with industrials (ex: General Electric for gas turbines) and bench tests existing data analysis. A modular integration approach of the whole virtual network has been defined for simple exploitation and evolution.

The ship machinery dynamic performance study was based on the numerical tool exploitation. Various scenarios have been defined and the virtual tool gave good results for:

- Frequency variations during transient conditions,
- What happens in case of a fault of a generator,
- Load sharing between generators,
- The influence of the swell,
- Response to Crash stop demand,

with reasonable calculation time and numerical robustness.

Simulations have pointed out network behaviours that were not quantified. Worse case tests could have been realized before the real machinery start. Solutions have been deduced from the results analysis concerning regulation tuning, re-configuration in fault conditions, or power management system strategies.

The dynamic performance study has shown the great interest of such a tool in the energy propulsion domain, especially:

- To anticipate problems in the network dimensioning and control strategies for new architectures,
- As assistance on test phases to solve problems in real time on a laptop computer.

2<sup>nd</sup> June 17:20**Break****Chairmen:****Dr.-Ing. Andreas Luxa**

Siemens AG, PTD H T, Berlin, Germany

**Prof. Johann W. Kolar**

Swiss Federal Institute of Technology (ETH), Zurich, Switzerland

2<sup>nd</sup> June 17:30-18:30**“Hybrid Fuel Cell Systems for Transportation and Stationary Power Generation”  
Guest Lecture****Dr. K.S. Rajashekara**, Fellow IEEE*Chief Scientist*

Propulsion Fuel Cell &amp; Energy Systems, Energetix Center, Delphi Corporation, Kokomo, IN, U.S.A.

**Summary:**

A hybrid power system consists of a combination of two or more power generation technologies to best make use of their operating characteristics and to obtain efficiencies higher than that could be obtained from a single power source. Since fuel cells directly convert fuel and an oxidant into electricity through an electrochemical process, they produce very low emissions and have higher operating efficiencies. Hence combining fuel cells with other sources, the efficiency of the combined system can be further increased or extend the duration of the available power to the load as a back-up power. In this seminar, different types of fuel cell hybrid systems for transportation and stationary power generation applications will be presented.

An analysis of the combined cycle operation of a SOFC- Microturbine will be discussed. A strategy for combining the Thermophotovoltaic power generation unit and Solid Oxide Fuel Cell (SOFC) to obtain the hybrid power system that would have higher efficiency will also be presented.

- Challenges-Energy and Environment
- Types and operation of fuel cells
- PEM and SOFC- Comparison
- Hybrid Fuel Cell Power Systems
  - SOFC – Gas Turbine hybrid system
  - SOFC – Thermophotovoltaic hybrid system
  - PEM fuel cell – Wind hybrid system
  - PEM fuel cell – Solar hybrid system
- Hybrid Fuel Cell APU for Airplanes and Trains.
- Convergence of Technologies and Opportunities
  - Energy System
  - Transportation
- Conclusions

**Dr. Kaushik Rajashekara** ("RAJA") received Ph.D. in 1983 from Indian Institute of Science, India. From 1977 to 1984, he worked as an Asst. Professor in Indian Institute of Science, India. In 1978 and in 1984, he worked in ABB, Switzerland on various power conversion projects. In 1982, he was a visiting Scientist in Technical University of Dresden, Germany. In 1985-86, he was a visiting associate Professor in University of Quebec, Trois-Rivieres, Canada. He joined General Motors in 1989 and presently, he is the Chief Scientist in Delphi corporation for Propulsion, Fuel Cell, and Energy Systems. Presently, he is working on the development of fuel cell based systems for automotive, stationary power, and aerospace applications. Dr. Rajashekara has published more than 70 papers in the areas of power electronics, energy conversion, electric, hybrid, and fuel cell vehicles. He has eighteen patents. He has been a guest lecturer at several universities in USA, Asia, and Europe.

**SOCIAL EVENT**2<sup>nd</sup> June 19:00**EPFL Apero****Welcome Address****Prof. Alfred Ruf**, General Chairmann

**(3<sup>rd</sup> Day)**

## THE LAUSANNE TECHNICAL MEETING AND CERN GENEVA VISIT PROGRAM

**Chairman:** **Prof. Alfred Rufer**  
Swiss Federal Institute of Technology, Lausanne, Switzerland  
Director of the Industrial Electronics Laboratory (LEI)

3<sup>rd</sup> June morning

- 08:29 **Welcome Address**  
Prof. A. Rufer  
*General Chairman of the Meeting*
- 08:30 **Presentation of EPFL's New Organization, Schools, Institutes,**  
Prof. Michel Declercq, Fellow IEEE, *Dean of the School of Engineering*
- 08:45 **Presentation of the ISE, Institute for Energy Sciences**  
Prof. Daniel Favrat, *Head of the ISE*
- 09:00 **Modern Design of High Power Generators: The Numeric Approach**  
Prof. Jean-Jacques Simond, *Director of the Electric Machines Lab (LME)*
- 09:30 **An Example of Multi-Disciplinary Research: Hybrid Storage**  
Prof. A. Rufer, *Director of the Industrial Electronics Lab (LEI)*
- 10:00 **Coffee** break
- 10:15 **High Power Semiconductors Development and Manufacturing**  
Dr. Eric Carroll, *ABB Power Semiconductors, Lenzburg, Switzerland*
- 10:45 **Research of ECPE - European Center for Power Electronics e.V:**  
Power supplies with ultra-high power density  
Prof. Dr.-Ing. J. W. Kolar, *Swiss Federal Institute of Technology (ETH), Zurich, Switzerland*
- 11:15 **Laboratory Visit** at LEI, EPFL
- 12:15 **Lunch** break
- 13:00 Meeting point at the Bus Stop
- 13:15 **Departure** to Geneva Meyrin
- 14:00 Arrival at Geneva Meyrin
- Chairman:** **Dr. Frederick Bordry**  
Dept AB-PO CERN, 1211 Genève 23
- Visit of the Facilities of the European Organization for Nuclear Research (CERN)**  
**New Power Electronic Supplies for the Magnets of the Large Hadron Collider**  
Dr. Frederick Bordry, *CERN*
- 17:00 approx. **End of the CERN visit**, the bus departs to Geneva Airport and back to Lausanne
- 18:00 approx. Arrival at Geneva International Airport (GVA)
- 18:30 approx. Arrival at Lausanne

**(4<sup>th</sup> Day)****POST MEETING PROGRAM****“Saturday Excursion”** Saturday, 4<sup>th</sup> June, 2005

***By nice weather: A fabulous panorama at World Heritage “Aletsch Gacier”***

[www.aletsch.ch](http://www.aletsch.ch)

By train from Lausanne to Mörel (via Vevey, Montreaux, Rhone Valley, Sion and Brig).

Departure at 07:46 (main railway station)

From Mörel to Riederalp: Cablecar, Riederalp Hohfluh: Cablecar

Arrival Riederalp: 10:31

Return:

Departure Riederalp 16:30, arrival Lausanne: 19:40

or Riederalp 17:30, Lausanne: 20:14

***Alternative if it rains:  
Visit to a traditional Cheese  
Manufacture at Moleson***

Excursion by Bus

**MEETING LOCATION, TRAVEL INFORMATION****Lausanne**

Capital of the Canton of Vaud, one of the 23 cantons making up the the Swiss Confederation. It ranks 5<sup>th</sup> in size among Swiss towns after Zurich, Basel, Geneva and Bern. 125.000 inhabitants, greater Lausanne 250.000 inhabitants. Seat of the International Olympic Committee since 1915. World Olympic Capital since 1994. Situated on the shore of Lake Geneva.

**Access**

Direct connection from Geneva International Airport in approx. 40 minutes by coach or rail.

Direct train connection by TGV from Paris, France (3.40 hours), by Cisalpino from Milan, Italy (3.20 hours), ICE from Frankfurt (5.40 hours) or Munich, Germany and by Swiss Federal Railway network from Zurich, Switzerland.

By road: A1/E25 and A9/E27 motorways.

Distances: 61km from Geneva, 95 km from Bern, 230 km from Zurich.



**Altitude**

372m / 1124 feet at lakeside, 495m / 1628 feet at city centre.

**Official language**

French.

All most common languages are understood and spoken.

**Time zone**

GMT+1 (March-October summer time: GMT+2)

**Climate**

Average annual temperature 14°C/57°F. Average temperature in summer 24°C/75°F.

**Opening hours**

Mon-Fri: 8.00/8.45 am –6.30/7.00 pm

Saturday: 8.00/8.45 am –5.00 pm

Sunday: closed

[www.lausanne-tourisme.ch](http://www.lausanne-tourisme.ch)

## PUBLIC TRAFFIC CONNECTIONS TO EPFL

**From Hotel Continental (2 Place de la Gare):**

- Metro M2 from the station *Lausanne-gare* to *Lausanne-Flon* (2 min)
- Metro M1 from the station *Lausanne-Flon* to *EPFL*

**From Hotel Agora (9 av. Rond Point)**

- On foot towards Main Railway Station, pass pedestrian underpass, then as from Hotel Continental

**From Hotel Royal Savoy (40 av. D'Ouchy)**

- Metro M2 from station *Montriond* to station *Lausanne-Flon*
- Metro M1 from *Lausanne-Flon* to station *EPFL*