INVITATION

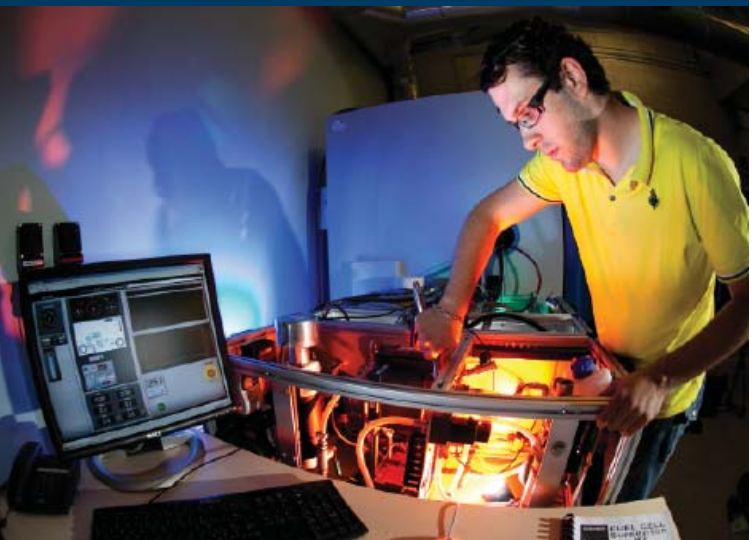
We are pleased to invite you to the international summer school "from Diagnostics to Fault Tolerant Control of Fuel Cells", that will be held, from July 4th to July 8th, 2016, in Belfort, FRANCE.

The aim of this summer school is to provide a forum for researchers and industrials around topics such as fuel cell degradation mechanisms, diagnostics, prognostics and control, as well as aspects related to the social and economic challenges for a larger diffusion of fuel cell systems. The 5-days summer school comprises several courses projects and practical work. The lectures will be given by experts in the field, and real case studies demonstrations with experimentations on PEMFC platforms will be achieved. The following topics will be addressed:

- Understanding degradation modes and ageing mechanisms in PEM fuel cells.
- Characterization of the PEMFC system.
- Diagnostics of FC.
- Prognostics of Fuel cells.
- Fault-Tolerant Control (FTC) of FC systems.

We look forward to welcoming you in Belfort,

THE ORGANIZING TEAM



SCIENTIFIC AND TECHNICAL SCOPE

The fuel cell systems' lifetime, reliability, and cost, remain principal hurdles to their large deployment on the market. In fact, fuel cells are complex systems where several phenomena occur at different scales. To ensure efficient and reliable operation with competitive lifetime span, they should be maintained in a narrow controlled range of operating conditions, blocking and mitigating the faulty operation modes that result in performance loss, system shutdown or even irreversible failure. Methods that allow increasing tolerance to faults and therefore increasing reliability and lifetime are needed.

Prognostics and Health Management PHM is a new emerging research area. It is the process of using diagnostics and prognostics information in order to manage the use and maintenance of a system by providing adequate decisions either to mitigate, prevent or avoid catastrophic failures.

The results are therefore:

- to extend the lifetime of the system by avoiding irreversible failures,
- to increase the reliability of the FC system by preventing incidents,
- to increase the availability of the system, and
- to optimize the maintenance scheduling (reduce frequency and costs) by enabling the change from reactive or scheduled maintenance to proactive (predictive) one.

During the summer school, the following topics will be addressed:

- Understanding degradation modes and ageing mechanisms in PEM fuel cells.
- Characterization of the PEMFC system.
- Diagnostics of FC
- Prognostics of Fuel cells
- Fault-Tolerant Control (FTC) of FC systems.

INVITED SPEAKERS

- Dr. Samir JEMEI, UFC, France: Introduction to fuel cells technology.
- Dr. Ulf Groos, Fraunhofer ISE, Germany: Fuel cells' monitoring and characterization: from basics to more advanced.
- Dr. Philippe Moçotéguy, EIFER, Germany: FC Degradation Mechanisms.
- Dr. Felix Büchi, Paul Scherrer Institute, Switzerland: Imaging as a diagnostic tool for PEFC – membrane degradation by pinholes.
- Dr. Marion Chandersis, CEA, France: PEM fuel cell degradation mechanisms: a multi-scale modelling approach to introduce lifetime estimation into the system.
- Pr. Daniel Hissel, UFC, France: Diagnostics of fuel cells.
- Pr. Nouredinne Zerhouni, ENSMM, France: Prognostics of Fuel cells.
- Dr. Federico Zenith, SINTEF, Norway: control of fuel cells.
- Pr. Brigitte Grondin-Perez, Université de la Réunion, France: Fault Tolerant control of PEMFCs.
- Dr. Fabienne Picard, UTBM, France: socio-economic aspects, challenges for FC industrial deployment.

REGISTRATION

The school is open to students, researchers and industrials

Registration fee (150 €) includes:

- Summer School facilities;
- Proceedings;
- Coffee breaks, daily lunches, excursion and gala dinner

Possibilities of on site payment and through order forms addressed at the UFC.

http://labex-action.fr/fr/summer-school-ftc2016

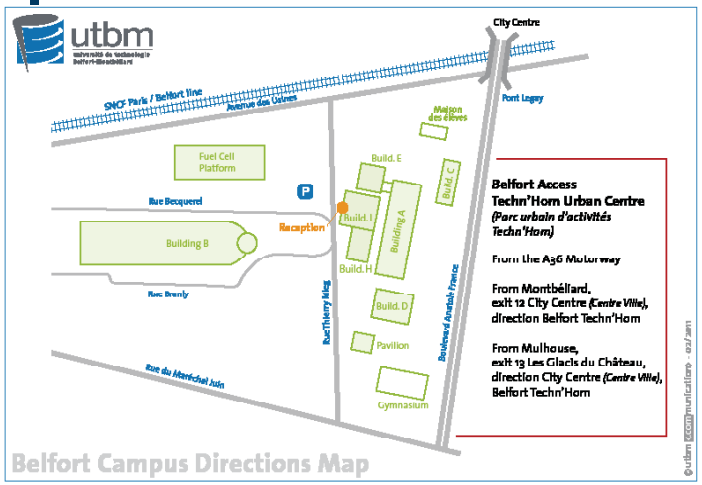
SCIENTIFIC AND TECHNICAL PROGRAM

	Monday 4	Tuesday 5	Wednesday 6	Thursday 7	Friday 8
9:00	Registration	Registration	Registration		
9:30	Introduction to fuel cells and Hydrogen energy	Fuel Cell Degradation Mechanisms	Diagnostics of Fuel Cells	Control of Fuel Cells	Socio-economic aspects
10:30	Coffee break	Coffee break	Coffee break	Coffee break	Coffee break
11:00	Fuel cell systems: modelling and characterisation	Imaging as a diagnostic tool for PEFC – membrane degradation by pinholes	Prognostics and Health Management of Fuel Cells	Fault Tolerant Control of PEM Fuel Cells	Round table, actual and remaining issues
12:00	Lunch	Lunch	Lunch	Lunch	Lunch
1:30 PM	Experimental work	PEM fuel cell degradation mechanisms: a multi-scale approach	Experimental work	Student project	
3:30 PM	Coffee break	Coffee break	Excursion	Coffee break	
4:00 PM	Student project	Student project	Social event	Student project	
6:00 PM	Lab visit	Lab visit			
7:00 PM					

VENUE

The Summer School will be held at:
University of Technology
of Belfort-Montbéliard

UTBM, site de Belfort
Rue Ernest Thierry Mieg
90010 Belfort, France



TRANSPORTATION

Location : Belfort – France

The nearest airport is the Basel-Mulhouse airport (70km from Belfort).

- regular trains exist between the Airport and Mulhouse Ville and between Mulhouse Ville and Belfort.

- Taxi can also connect the Airport to the city of Belfort (approximately 100€).

- By train: stations: "Belfort-Montbéliard TGV", or "Belfort Centre", then regular buses connect the train station and the UTBM.

ACCOMMODATION

All details can be consulted online.

CONTACT DETAILS

Scientific Program and administrative matters

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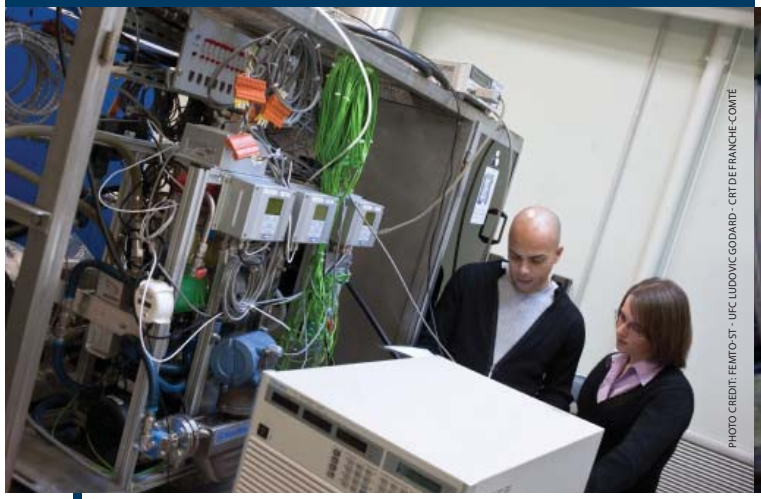
argyro.karathanou@utbm.fr

MORE INFORMATION

http://labex-action.fr/fr/summer-school-ftc2016
www.labex-action.fr
www.fclab.fr



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INTERNATIONAL SUMMER SCHOOL

JULY
04-08
2016
Belfort
France

From Diagnostics to Fault Tolerant Control of PEM Fuel Cell Systems

UBFC Université Bourgogne Franche-Comté
cnrs
ensmm École Nationale Supérieure de Mécanique et des Microtechniques
IFSTTAR
UFC Université de Franche-Comté
utbm
STGI
IUT Belfort-Montbéliard