## Key informations

- **When:** July 08-11, 2024
- **Where:** UTBM/FEMTO-ST-Energy Dpt and FCLAB, Belfort – France
- **Who:** PhD and Engineer Students, researchers, R&D staff...
- **What:** Panel sessions, lectures, trainings, interactive, social event “Gala diner”

### • Registration fees:

- €250* (early bird, before June 10th, 2024)
- €350* (standard registration, after June 10th 2024)
- Including: all lectures and meetings participation, Summer School bag and proceedings, lunches and coffee breaks, banquet, gala diner, cultural program

**Online registration : http://www.utbm.fr/summer-school-fclab**

*a reduction of 25€ will be applied for inscriptions from FEMTO-ST and LEMTA

### • Contacts:


- **Summer School Chair:** Pr. Abdesslem Djerdir - abdesslem.djerdir@utbm.fr
- **Summer School registration manager:** Dr. Daniela Chrenko - daniela.chrenko@utbm.fr
- **Summer School organizing committee:** Mrs. Carine Diez - karine.diez@univ-fcomte.fr, Mrs. Isabelle Christen - isabelle.christen@univ-fcomte.fr, Mrs. Sophie Granon - sophie.granon@femto-st.fr, Mrs. Silvia Nikolova - silviya.nikolova@univ-fcomte.fr, Mrs. Laurence Mary - laurence.mary@utbm.fr, Mrs. Pauline Doxin - pauline.doxin@utbm.fr, Mrs. Camille Schaeffer - camille.schaeffer@utbm.fr
- **Website:** http://www.utbm.fr/summer-school-fclab


### • Scientific committee

- **Chair:** Pr. Abdesslem Djerdir (FEMTO-ST, FC LAB, GdR SEEDS)
- **Co-chair:** Dr. Daniela Chrenko (FEMTO-ST, FC LAB, GdR SEEDS)
- **Industrial relations:** Pr. Salah Laghrouche (FEMTO-ST, FC LAB, GdR SEEDS)
- **Members:** David Bouquain, Djafar Chabane, Issam Salhi, Elina Breaz, Elodie Pahon, Youcef Ait-Amirat

## Organised by

femto-st SCIENCES & TECHNOLOGIES

FC LAB

## In cooperation with

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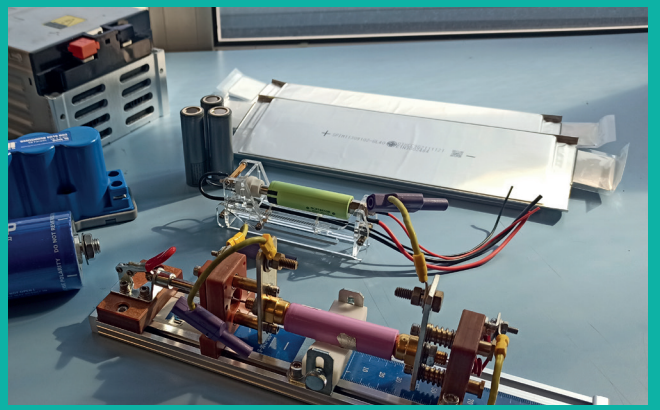
# INTERNATIONAL SUMMER SCHOOL

## July 8-11, 2024

## Electrochemical and Hydrogen Energy Storage for Mobility and Microgrids



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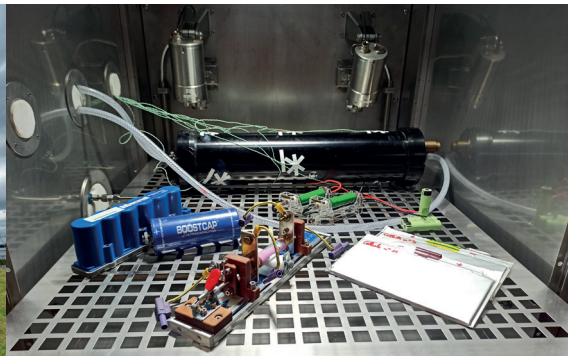
# INTERNATIONAL SUMMER SCHOOL

## Electrochemical and Hydrogen Energy Storage for Mobility and Microgrids




## Summary

**From 8 to 11 July 2024, the energy department of FEMTO-ST and FCLAB and the CNRS research group SEEDS, in UTBM Belfort - France, an International Summer school on the topic of Electrochemical and Hydrogen Energy Storage. The summer school is intended for PhD, engineer and master students, and engineers interested in the latest developments in future mobility and micro-grid systems.**

## Motivation and objectives

In a world in the midst of an energy transition, sustainable mobility, and the resilience of energy microgrids have become major imperatives to ensure a cleaner and more secure energy future. Electrochemical storage and the use of hydrogen are emerging as key solutions to address these challenges, providing efficient, clean, and versatile energy storage opportunities. The Summer School on Electrochemical and Hydrogen Energy Storage for Mobility and Microgrids aims to bring together key players from industry and research to explore these cutting-edge technologies and catalyze innovation in these vital areas.

During four days, the knowledge acquired by the speakers through their academic and industrial research projects in the field of electrochemical and hydrogen energy storage will be transmitted through seminars, courses, tutorials, and practical demonstrations. The aim is to deepen participants' knowledge by providing them with advanced training focused on the applications of electrochemical storage and hydrogen in the field of mobility and energy microgrids. Attendees will have the opportunity to explore the latest technological advances, best practices, and relevant case studies in these ever-evolving fields. An interdisciplinary approach will be implemented by bringing together experts from various fields such as chemistry, physics, electrical engineering, thermal engineering, and control. This diversity of expertise will foster a holistic understanding of the challenges and opportunities related to electrochemical and hydrogen storage for mobility and microgrids. The summer school also aims to facilitate the sharing of experiences and best practices between participants, researchers and industrialists through presentations and interactive discussions. These stimulating exchanges will encourage the emergence of collaborations and innovative research projects in the field. This will provide PhD students, engineering, and master's students as well as young professionals with the opportunity to develop their professional network by interacting with academic and industry experts.

## Program

| Day 1 08/07/2024 | | |
|---|---|---|
| **Panel Session 1** | | |
| 08:00 | Reception and Registration | |
| 08:45 | Opening session | |
| 09:00 | **Conf 1 - Industrial: Electrochimical storage** (Dr. Romain Tabusse, SWOOP ENERGY) **Hydrogen storage** (Mr Emmanuel Bouteleux, MINCATEC) | |
| 09:45 | **Conf 2 - Academic: Activities within TNO, focus on Hydrogen - ICE** (Mr. Thomas Dankers, TNO, Netherlands) | |
| 10:45 | Coffee - Break | |
| 11:00 | **Conf 3 - Academic: Materials for Batteries** (Prof. Ismael Saadoune, UM6P) | |
| 12:15 | Lunch | |
| **Courses Session 1** | | |
| 14:00 | **Courses 1 - H2 storage** (Dr. Djafar Chabane, UTBM) | **Courses 2 - Impedence spectrometry** (Dr. Elodie Pahon, UTBM) |
| 15:30 | Coffee - Break | |
| 15:45 | Training of Course 1 | Training of Course 2 |
| 17:15 | End day 1 | |

| Day 2 09/07/2024 | | |
|---|---|---|
| **Panel Session 2** | | |
| 08:15 | Reception | |
| 08:30 | **Conf 4 - Academic: SoX Battery diagnostics & prognostics** (Prof. Mohamed Benbouzid, UBO) | |
| 09:30 | **Conf 5 - Academic : ENERGETICS Euorpean project - AI based to improve Energy Storage** (Dr. Tedjani Mesbahi, INSA Strasbourg & Dr. Daniela Chrenko, UTBM) | |
| 10:30 | Coffee - Break | |
| 10:45 | **Conf 6 - Industrial: Energy management of Fuel Cells Supplied by Solid Hydrogen Tank For Autonomy Prolongation and Electricity Generation** ( Dr. Ramzi Saidi, MINCATEC) | |
| 12:00 | **Conf 7 - Academic: Mechanical behaviour and damage of materials for low and high pression hydrogen tanks** (Dr. Anne Maynadier, UFC) | |
| 12:30 | Lunch | |
| **Courses Session 2** | | |
| 14:00 | **Courses 2 - Impedence spectrometry** (Dr. Elodie Pahon, UTBM) | **Courses 1 - H2 storage** (Dr. Djafar Chabane, UTBM) |
| 15:30 | Coffee - Break | |
| 15:45 | Training of Course 2 | Training of Course 1 |
| 17:15 | End day 2 | |

| Day 3 10/07/2024 | | |
|---|---|---|
| **Courses Session 3** | | |
| 08:00 | **Course 3 - Electrochimical storage** (Dr. Issam Salhi, UTBM) | **Course 4 - HIL for energy storage** (Prof. David Bouquain & Dr. Youcef Ait-Amirat, UFC) |
| 09:30 | Coffee - Break | |
| 09:45 | Trainig Course 3 | Trainig Course 4 |
| 11:15 | **Plenary Course 1 Thermal Solar Energy Storage and Heat exchange** (Prof. Mounir Aksas, ER$^2$SD) | |
| 12:15 | Lunch | |
| **Half Day Break** | | |
| 14:00 | **Cultural program** | |
| 20:00 | **Gala Dinner** | |

| Day 4 11/07/2024 | | |
|---|---|---|
| **Courses Session 4** | | |
| 08:00 | **Course 4 - HIL for energy storage** (Prof. David Bouquain & Dr. Youcef Ait-Amirat, UFC) | **Course 3 - Electrochimical storage** (Dr. Issam Salhi, UTBM) |
| 09:30 | Coffee - Break | |
| 09:45 | Trainig Course 4 | Trainig Course 3 |
| 11:15 | **Plenary Course 2 HYD-DRIVE - A World's first hydrogen-powred semi-trailer** (Prof. Abdesslem Djerdir & Dr. Nadhir Lebaal, UTBM) | |
| 12:15 | Lunch | |
| **Half Day Break** | | |
| 14:00 – 17:15 | **Visits of plateforms UTBM & UFC** | |
| **End of Summer School** | | |