



TEESMAT

Open Innovation Test Bed for Electrochemical
Energy Storage Materials

TEESMAT Winter School

January 10th – 14th, 2022

Welcome to the TEESMAT Winter School!

During this week, you will attend lectures and workshops on characterisation held by experts from the battery research field and industry. Although we would have been very happy to welcome you in Grenoble, the event will be fully virtual. Feel free to interact online! We hope you will enjoy this Winter School!

What is TEESMAT?

Despite more than 200 years of development efforts for batteries, the physical limits of battery performance are far from being reached. The complexity of physico-chemical processes inside batteries renders any development strongly dependent on the proper description and monitoring of the evolution and interaction of all the materials involved in the functioning of an electrochemical cell. The main figures of merit (specific energy per mass, volume or cost unit, safety, and cycle or calendar life) can theoretically all be substantially improved, under the condition of a proper understanding of where and how their limits are reached in current industrialised systems. This underlines how much this important part of our technological future depends on novel and accessible characterisation techniques. Access to advanced characterisation solutions for the EU industry will be critical to accelerate innovation and reduce the substantial cost of the relevant materials.

TEESMAT is an EU-funded project aiming to bring a comprehensive response to this challenge by leveraging European strengths from 11 countries and facilitating access to physical facilities, capabilities and services implementing novel characterisation solutions with unprecedented capability & performance. Instrumental to this is the launch of a sustainable Open Innovation Test Bed (OITB) in which qualified public/private partners are demonstrating high-value services for advanced characterisation on industrial cases in the value chain of electrochemical energy storage systems. A strong EU community was built up to propel the continuity of the initiative beyond TEESMAT with a viable, business-driven and lean model of operation to create a market for advanced characterisation services.



Monday January 10th, 2022

09:35-10:00	Fabien Perdu, CEA	Presentation of the TEESMAT project and future commercial platform
10:00-10:30	Claude Chanson, RECHARGE	The EU vision on Energy Storage
10:30 - 10:40		<i>break</i>
10:40-11:20	Jakub Drnec, ESRF	An overview of the TEESMAT techniques
11:20-12:00	Tom Van Bellinghen, UMICORE	Materials for Batteries
13:30-14:30	Kristina Edström, University of Uppsala	Characterization of material for batteries at the surface level Li-ion batteries (including Solid state)
14:30-15:30	Claire Villevieille, Grenoble INP	Characterization of material for batteries at the synchrotron/neutron scale Li-ion batteries (including Solid State)
15:30 - 15:50		<i>break</i>
15:50-16:30	Arnaud Morin, CEA	Characterization on Fuel Cells
16:30-17:10	Francisco Fernandez, TECNALIA	Characterization in Redox Flow System



Tuesday January 11th, 2022

9:00-10:00	Marion Chandesris, CEA	Characterization with the help of modelisation Li-ion batteries (including Solid State)
10:00-10:40	Vincent Caldeira, EasyI	Characterization in Zn-based systems (Ni/Zn and Zn-air)
10:40 - 11:00		<i>break</i>
11:00-11:40	Céline Merlet, CIRIMAT	Characterization in supercapacitors
11:40 - 13:00		<i>break</i>
13:00-13:15	Fabien Perdu, CEA Mathieu Médina & Cyril Marino, SERMA	Summary of the previous talks and link toward the industrial needs
13:15-14:45	Benjamin Dhuiege , GENESINK Pritesh Hiralal, ZINERGY Yurii Maletin, YUNASKO Giovanna Nicol, CRF- Stellantis	How TEESMAT can help for the development of energy storage systems



Wednesday January 12th, 2022

9:00-9:45	Georgia Kastrinaki, CERTH	RAMAN-Principles, probing characteristics, examples
9:45 - 9:50		<i>break</i>
9:50-10:35	Michaël Deschamps, University of Orléans	NMR-Principles, probing characteristics, examples
10:35 - 10:45		<i>break</i>
10:45-11:30	Anass Benayad, CEA	Surface and interface characterization by X-ray Photoemission spectroscopy, from post-mortem to operando
11:30 - 11:35		<i>break</i>
11:35-12:20	Christoph Bay, In- Core Systèmes	Optical quality-Principles, probing characteristics, examples
12:20 - 14:00		<i>break</i>
14:00-14:45	Sébastien Sallard, VITO	Electrochemical characterisation
14:45 - 14:50		<i>break</i>
14:50-15:35	Grietus Mulder, VITO	EIS- Principle, probing characteristics, examples
15:35 - 15:45		<i>break</i>
15:45-16:30	Thomas Waldmann, ZSW	GD-OES Principle, probing characteristics, examples
16:30 - 16:35		<i>break</i>
16:35-17:20	Abdelaziz Abdelatiff, ZSW	Gas Analysis-Principle, probing characteristics examples



Thursday January 13th, 2022

9:00-9:45	Jakub Drnec, ESRF	Coherent X-Ray diffraction imaging and total scattering, examples	Hard X-Ray
9:45 - 9:50		<i>break</i>	
9:50-10:35	Loïc Lonardoni, CEA	ARC-Principle, probing characteristics, examples	
10:35 - 10:45		<i>break</i>	
10:45-11:30	Nicolas Guillet, CEA	Advanced instrumentation for operando monitoring and management of batteries	
11:30 - 11:35		<i>break</i>	
11:35-12:20	Sandrine Lyonnard, CEA	Neutron and X-ray small angle scattering, examples	
12:20 - 13:45		<i>break</i>	
13:45-15:15	Victor Vanpeene, ESRF	Workshop on Data acquisition and data treatment at nanotomography beamline	
15:15 - 15:30		<i>break</i>	
15:30 - 17:00	Isaac Martens, ESRF	Workshop on Data acquisition and data treatment at hard X-ray scattering beamline	



Friday January 14th, 2022

9:00-10:30	Marion Chandesris, CEA	Workshop on practical case of modelling in batteries
10:30 - 10:45		<i>break</i>
10:45 - 12:00	Jakub Drnec, ESRF Cyril Marino, SERMA	Workshop on How to solve an industrial problem
12:00 - 12:15	TEESMAT Team	Conclusion of the Winter School

