PhD Summer School 2022

Electrochemical Accumulators and Advances in Aqueous Rechargeable Batteries

5-9 September 2022, Virtual

Organised by

EU Horizon 2020 Project
LOLABAT - Long Lasting BATteries

LOLABAT
LONG LASTING BATTERY

University of Genoa, Italy

Università di Genova

Stockholm University, Sweden

Stockholm University

Course Content and Schedule

Date and Time	Topics	Instructor	
5 September 2022			
9:15 – 12:15	Overall energy issues in relation to rechargeable battery systems and how chemistry, physics, and engineering applies to batteries	Dag Noréus	SU
12:15 – 13:15 Break			
13:15 – 14:15	Basic static definitions: ΔG, ΔS, electrochemical cell, anode, cathode, Nernst eq. Nickel based chemistries with aqueous electrolytes, NiMH, NiCd, NiFe in relation to non-aqueous Li-based batteries, LCO, LMO, LFP, NMC, NCA.	Dag Noréus	SU
6 September 2022			
9:00 – 11:00	Lead acid batteries fundamental properties, voltage vs SOC, internal impedance, charge acceptance, energy density and longevity – in relation to other aqueous batteries - benchmark for new chemistries, Ni-electrodes vs. Air electrodes. Session -1	Gunder Karlsson	SU
11:00 – 11.15 Break			
11:15 – 13:00	Session -2	Gunder Karlsson (SU)	SU
7 September 2022			
9:00 – 11:00	Background on performance parameters and operational factors in battery systems Session -1	Paola Carpanese	UNIGE
11:00 – 11.15 Break			
11:15 – 13:00	Session -2	Paola Carpanese	UNIGE

Course Content and Schedule

8 September 2022			
9:00 – 11:00	Electrochemical techniques in continuous (cyclic voltammetry) and alternating current (impedance spectroscopy), in relation to different technologies characterization.	Paola Carpanese	UNIGE
11:00 – 11.15 Break			
11:15 – 13:00	Theory and practical examples, experimental set-up.	Paola Carpanese	UNIGE
9 September 2022			
9:00 – 9:45	NiZn batteries and LOLABAT project – WP4 activities (Electrical characterisation and battery pack conception & design)	Fabrice Fourgeot	SUNERGY
9:45 – 10:30	Modelling aqueous zinc batteries	Birger Horstmann	DLR
10:30 – 11:00	Environmental impact and cost analysis, raw materials, recycle potential – NiZn batteries	Ashwani Malviya	AITEC
11:00 – 11:30	Demo case: Energy balancing in smart buildings and Energy storage for remote autonomous LV supply solutions	Tommaso Reboli	UNIGE
11:30 – 11:45	Demo Case: Hybridisation of hydraulic power plants	Hugo Mesnage	SGI
11:45 – 12:00	Smart distribution grid management	Eduardo Rodrigues	EDP
12:00 – 12:15	Energy storage integration in electro-intensive industry applications	Nora Ganzinelli	RINA-C
12:15 – 12:30	Dissemination and commination and closing remarks	Avinash Renuke /Cecilia Torti	UNIGE

Course Description

The course aims to provide to future PhDs, notions and fundamentals on emerging materials and technologies for electrochemical energy production and storage: rechargeable batteries.

Course Organisation

The course will take place in virtual mode (Teams/WebEx). It will be held in English.

Instructors

UNIGE, Italy- Prof. M. Paola Carpanese (PC
SU, Sweden – Prof Dag Noréus (DN), Dr. Gunder Karlsson (GK)
SUNERGY, France – Fabrice Fourgeot (FF) and UNIGE team

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Duration And Credits

The course (20 hours) will consist of 5 lessons, 4 hours each from 5 Sep 2022 to 9 Sep 2022 (9 AM to 1 PM CET), and, for a total of 5 CFUs.
Exam – Oral/Homework - 1 from PC , 1 from DN/GK

Course Fees And Registration

Course Fees : 80 Euros

Registration:
1. Create an account on :
https://easychair.org/account/signup
1. Register using following link :
https://easychair.org/my/conference?conf=phdsummercourse2022
(On this page, on the right top corner, click on "register yourself")

Contact : Avinash Renuke- Researcher, UNIGE : supehr23@unige.it