



## LABORATORY OF APPLIED CHEMISTRY AND ENVIRONMENT

ORGANIZE A SEMINAR TITLED

### INVESTIGATION OF ELECTRONIC PROPERTIES AND SODIUM ION DIFFUSION IN POLYANIONIC COMPOUND $\text{Na}_4\text{Ni}_5(\text{P}_2\text{O}_{11})_2$

**Pr. El Kebir HLIL**

Grenoble Alpes University and Néel Institute, CNRS



**Monday 26th May 2025**  
**10h**



**Amphi Central - FST SETTAT**

KEY  
TOPICS

- Components of Sodium-Ion Batteries (SIBs) and Lithium-Ion Batteries (LIBs)
- Density Functional Theory (DFT) with the Linearized Augmented Plane Wave (LAPW) Method
- Determination of Open Circuit Voltage (Voc) via DFT in Cathode, Electrolyte, and Anode Materials
- Calculation of Activation Energy (Ea) from DFT in Cathode, Electrolyte, and Anode
- Estimation of Ionic Conductivity from DFT in Cathode, Electrolyte, and Anode
- Evaluation of Capacitance through DFT in Cathode, Electrolyte, and Anode
- Proposal of an Equivalent Electrical Circuit for Sodium-Ion Batteries



**PR. EL KEBIR HLIL**

### BIOGRAPHY

EL KEBIR HLIL IS A PROFESSOR OF SCIENCE OF MATERIALS IN THE UNIVERSITY OF GRENOBLE ALPES AT GRENOBLE, FRANCE.

FROM TEACHING EXPERIENCE POINT OF VIEW, HE IS A LECTURER OF PHYSICS OF SOLIDS AND SCIENCE OF MATERIAL INCLUDING SYNTHESIS, CHARACTERIZATIONS, MEASUREMENTS AND SIMULATIONS OF PHYSICAL PROPERTIES.

ALSO, HE IS AN INTERNATIONAL LECTURER IN THE FIELD OF MATERIALS FOR CONVERSION AND STORAGE ENERGY. HIS RESEARCH ACTIVITY INCLUDES NAMELY INVESTIGATION ON MATERIALS FOR STORAGE AND CONVERSION OF ENERGY SUCH AS METAL HYDRIDES, THERMOELECTRIC, MAGNETOCALORIC, AND PHOTOVOLTAIC MATERIALS.

FOR ALL INVESTIGATED MATERIALS, SPECIAL ATTENTION IS PAID TO THE INDUSTRIAL APPLICATIONS. HE HAS PARTICIPATED IN SEVERAL INTERNATIONAL SCHOOLS AS LECTURER OF ELECTRONIC STRUCTURE CALCULATIONS, CHARACTERIZATION AS WELL AS MATERIALS FOR ENERGY.

HE IS THE MOST CITED SCIENTIST IN THE WORLD IN THE FIELD OF MAGNETOCALORIC CERAMICS. HE SUPERVISED OVER 90 PHD STUDENTS.

HE CONTRIBUTED TO OVER 500 CONFERENCES AND HE PUBLISHED MORE THAN 900 PAPERS IN INTERNATIONAL LEARNED JOURNALS.

[HTTPS://SCHOLAR.GOOGLE.COM/CITATIONS?USER=SUA\\_TCYAAAAJ&HL=FR](https://scholar.google.com/citations?user=SUA_TCYAAAAJ&hl=FR)).

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