



PhD at LRCS

Topic Title	SODIUM – CONTAINING SOLID STATE BATTERIES
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Collaborations	Pieremanuele Canepa, pcanepa@nus.edu.sg , NUS Singapore
Funding Source, Name of project	LRCS
Web Site of Advisor	https://www.lrcs.u-picardie.fr/ ;
Date of publication of the offer	February 4th, 2020
Deadline for application	June 30 th , 2020
Date of start of the Project	September 2020
Description of the Topic	<p>A funded PhD position of 36 months, starting in September 2020, is available in LRCS (Laboratoire de Réactivité et Chimie des Solides – UPJV, Amiens, FRANCE). LRCS is a prime European centre for the development of innovative materials and solution for energy storage offering an exciting research environment consisting of internationally recognized researchers as well as young scientists with team spirit. The PhD position is funded through a bilateral research programme between France and Singapore within the 5th ANR-NRF grant under the project: Nanostructured Materials for Advanced Na Solid sTate battERies (Na-MASTER). The main objective of this project is to develop by the synergic effect of both experiments and theory a full Sodium All Solid-State Battery (Na-ASSB) with superior performances in order to compete with classical Ion-batteries. To reach this goal, the PhD student will tackle several topics such as:</p> <ul style="list-style-type: none">➤ Synthesis of solid electrolyte and electrode materials: The candidate will focus on getting highly pure samples together of controlled morphologies.➤ Structural characterizations (XRD, NMR, SEM, TEM, TGA, DSC, ...)➤ Sintering of solid electrolytes and assembly of batteries using Spark Plasma Sintering➤ Electrochemical Characterization including ionic conductivity (impedance measurements) and determination of electrochemical stability windows. <p>This work will be done in continuous collaboration with our colleagues from NUS Singapore (Ass. Prof. Pieremanuele CANEPA, Prof. Stefan ADAMS & Prof. Anthony CHEETHAM) using their input from theoretical calculations and NMR to optimize the compositions in order to obtain a final solid electrolyte showing the best performances. More details about Na-MASTER at http://tiny.cc/j7kbiz</p>
Techniques to be used	<ul style="list-style-type: none">• X-ray diffraction• Thermal analysis• Impedance spectroscopy• Spark Plasma Sintering• Scanning Electron Microscopy• Galvanostatic electrochemical cycling
Skills of the Applicant	<ul style="list-style-type: none">➤ Master degree in chemistry, materials science or related disciplines➤ Have a good knowledge in inorganic and solid state chemistry;➤ Have a good ability in materials synthesis (solid state, mechano-synthesis, sol gel, in solution);➤ Possess a good knowledge in XRD, electrochemistry, TGA/DSC, sintering;➤ Be inclined towards constructive dialogue with colleagues;➤ Be familiar, ideally, with electrochemical energy storage systems
Contact (s)	christian.masquelier@u-picardie.fr vincent.seznec@u-picardie.fr jean-noel.chotard@u-picardie.fr
List of documents to provide	Applicants from diverse backgrounds and nationalities are encouraged to apply as we are committed to improving diversity in materials sciences. In a first step, interested applicants should submit their CVs + motivation letters to the 3 contacts