GDR-NAME summer Newsletter

july, 2023

GDR Nanomaterials for Energy Applications

EDITO

Dear GDR members

During the last six month, the board of the GDR NAME has been strongly involved in the CNRS 2030 Prospectives organized by the INP and INSIS, the group "Miroir Energie" of the CNRS for the group Climat/Energy, the highlights for the PEPR DIADEM and the Regulation of Raw and Critical Materials of the European Union. Through these committees (Nanothermal physics, Materials, Energy), it has been a wonderful opportunity for our GDR to push the important scientific issues and highlights of our community.

The next significant objective for our GDR NAME is its renewal for 2025 to 2030. This will be discussed and set-up at the end of 2023.

Please add in your agendas the following important events like our Plenary Meeting in Rennes in November and the Thermoelectricity meeting of the GIS.

You will find all the necessary details in this NL, enjoy the reading and the summer break !!

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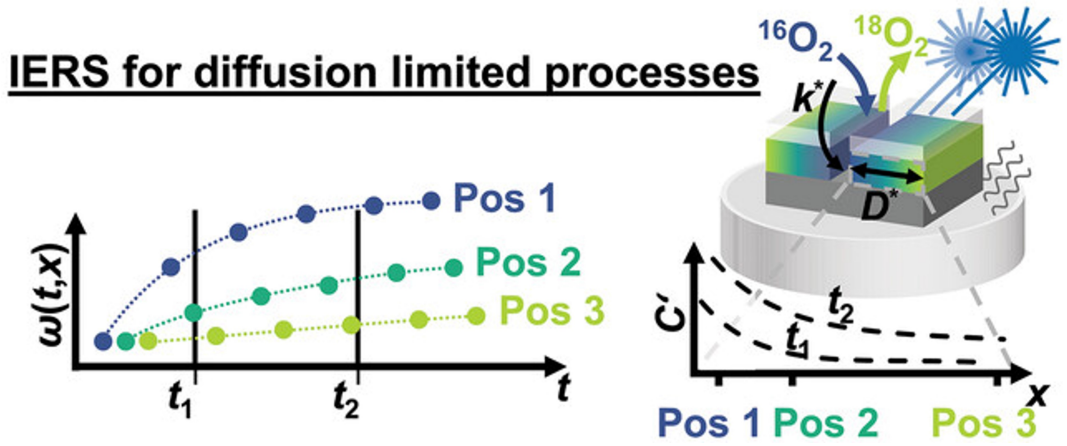
IMAGE OF THE MONTH



Isotope Exchange Raman Spectroscopy (IERS): A Novel Technique to Probe Physicochemical Processes In Situ

A novel in situ methodology for the direct study of mass-transport properties in oxides with spatial and unprecedented time resolution, based on Raman spectroscopy coupled to isothermal isotope exchanges, is developed. Changes in the isotope concentration, resulting in a Raman frequency shift, can be followed in real time, which is not accessible by conventional methods, enabling complementary insights for the study of ion-transport properties of electrode and electrolyte materials for advanced solid-state electrochemical devices. The proof of concept and strengths of isotope exchange Raman spectroscopy (IERS) is demonstrated by studying the oxygen isotope back-exchange in gadolinium-doped ceria (CGO) thin films.
See Alexander Strangl *et al*, Advanced Materials online (2023)

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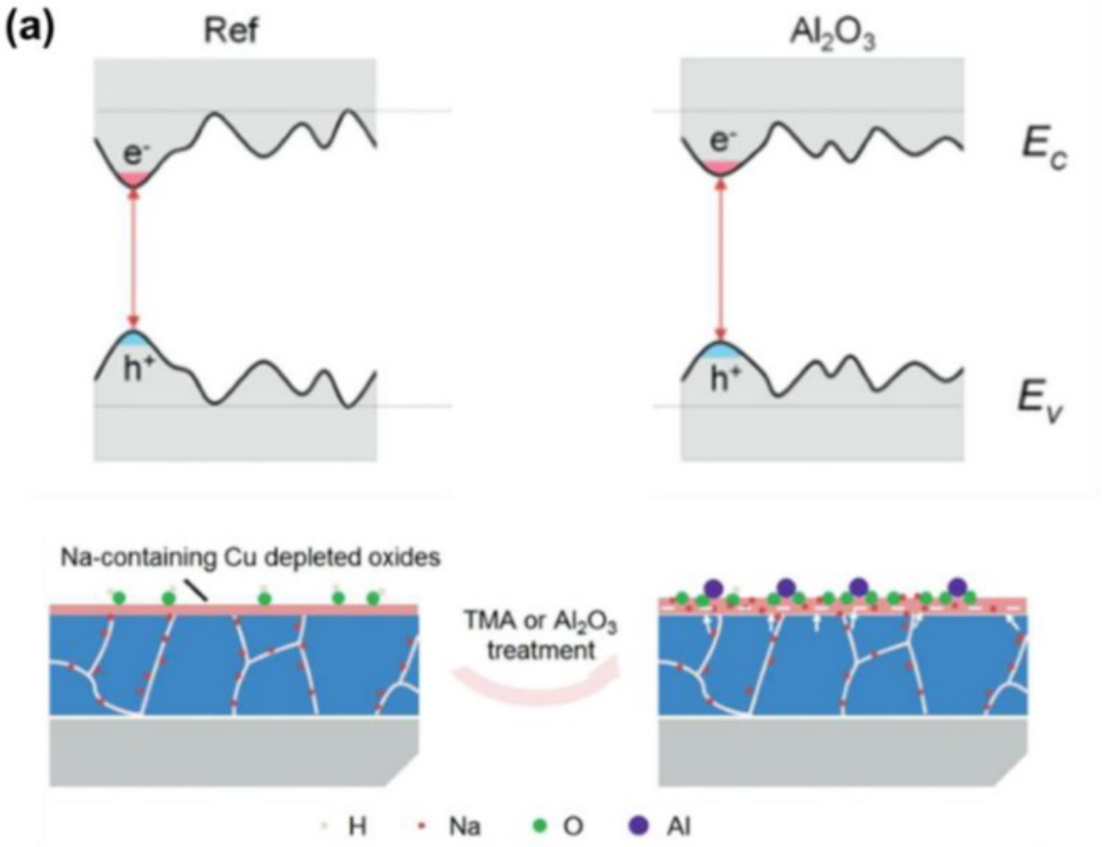
Scientific highlights



Roadmap on Energy Harvesting Materials

Ambient energy harvesting has great potential to contribute to sustainable development and address growing environmental challenges. Converting waste energy from energy-intensive processes and systems (e.g., combustion engines and furnaces) is crucial to reducing their environmental impact and achieving net-zero emissions. Compact energy harvesters will also be key to powering the exponentially growing smart devices ecosystem that is part of the Internet of Things, thus enabling futuristic applications that can improve our quality of life (e.g., smart homes, smart cities, smart manufacturing, and smart healthcare). To achieve these goals, innovative materials are needed to efficiently convert ambient energy into electricity through various physical mechanisms, such as the photovoltaic effect, thermoelectricity, piezoelectricity, triboelectricity, and electromagnetic power transfer. By bringing together the perspectives of experts in various types of energy harvesting materials, this Roadmap provides extensive insights into recent advances and present challenges in the field. Additionally, the Roadmap analyzes the key performance metrics of these technologies in relation to their ultimate energy conversion limits. Building on these insights, the Roadmap outlines promising directions for future research to fully harness the potential of energy harvesting materials for green energy anytime, anywhere.
See Vincenzo Pecunia *et al* 2023 J. Phys. Mater. in press

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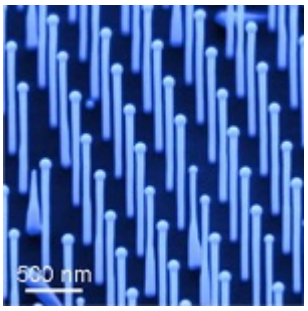
GDR-NAME NEWS

Breaking news of the GDR



Very successful EL NANO school ELaboration of NANOmaterials for the recovery, conversion, transport and storage of energy

The EL NANO thematic school of the GDR NAME was held from Monday June 12 to Friday June 16 in the Centre Paul-Langevin in Aussois, the Savoie ski resort. It has been a real success, hosting more than 60% of graduates addressing lots of subjects on growth and physical characterization of nanomaterials for energy !! Thanks a lot for all the organizers !!

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GDR NAME Thesis price 2023

The Thesis prize 2023 has been awarded to Thomas Dursap. Congratulations to him. The objectives of his thesis was to grow and characterize GaAs and GaP nanowires (NWs) obtained by molecular beam epitaxy (MBE), on silicon substrates and used as electrodes for light-driven water splitting. The geometry, morphology of these objects were studied and optimized to maximize the electrode efficiency. The crystal structure of such NWs were also intensively investigated, and in depth characterizations were performed to understand the growth phenomena.

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GDR-NAME Events

GDR NAME Pleanary meeting in Rennes (November 2023) and Lots of events to come (see also announcements at the bottom of the NL)

SAVE THE DATE !!! Next Plenary meeting GDR NAME November 8-10th

in Rennes

The plenary days of the GDR NAME will be organized in Rennes, at Pôle Numérique Rennes Beaulieu, from the 8 to the 10th of Novembre 2023. Dead line for submission of abstract for oral presentation : 08/09/2023

Registration fee:
Academic permanent : 141 € TTC
Graduate student and post-doc : free (registration mandatory)
Industrial : 345 € TTC
Stand (to be added to registration) : please contact organisers
registration and submission along with all necessary information are available on the website of the plenary session : https://gdr-name-2023.sciencesconf.org/.

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ANNOUNCEMENTS

Events, Conferences, workshop etc...!!!

CNRS thematic school: conversion of energy by thermoelectric effect, from theory to applications

The 5thy edition of the CNRS thematic school will be organized this year from October 8th to 13th in La Bresse in the Vosges. You will find all the useful information about the school as well as the links and explanations for registering on the website available at the following address: https://ecolete2023.scienccesconf.org/.
Do not hesitate to consult it regularly, it will evolve throughout the year. We remain at your disposal for any questions concerning this school or on the administrative procedures for enrolling. Registration is already possible on the azur-colloque.fr website (see the links and documents on the school's website, "Registration" section) and the deadline is July 15. See you soon in La Bresse!
Organizing team :Christophe Candolfi, Soufiane El Oualid, Bertrand Lenoir and Philippe Masschelein.

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E-MRS September 18 to 21, 2023 at the main campus of the University of Technology in Warsaw (Poland)

Non-linear and dynamic thermal transport
modeling, thermo-materials, devices and applications

FIRST SYMPOSIUM that aims to have an ecosystem of interdisciplinary speakers at different levels, from fundamental to system level. The symposium will join together research communities working on:
•theoretical analysis of materials & devices with non-linear and other types of advanced nano or micro heat transport;
•experimental demonstration of advanced thermal control devices, and;
•novel advanced thermal management approaches.
The speakers will discuss the new trends on fluidic, mechanical and solid-state thermal devices for advanced thermal control and its impact towards new thermal technology, like heat logic, or the development of a more friendly environment through better thermal management, conversion and storage of energy.
The selection of manuscripts for the Special Issue in Elsevier's iScience on Advanced thermal control: fundamentals and applications

Abstract submission due 5th of June, 2023
https://www.european-mrs.com/latest-news/fall-23-submit-your-abstract

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2nd Workshop on Thermal Radiation to Electrical Energy conversion 9-11 Oct 2023 Nantes (France)

The TREE project-team (https://tree.ies.umontpellier.fr) supported by CNRS-INSIS, is organizing the Workshop TREE 2 from October 9 (2 PM) to October 11 (noon) 2023 at LTeN (local coordination: Xavier Py) on the campus "Chantrerie" (POLYTECH Nantes), in Nantes, France.
The main objectives of the workshop are to favor:
- discussions with scientists whose expertise is likely to address the scientific challenges tackled by the project-team, i.e. Thermal Radiation to Electrical Energy conversion (such as thermophotovoltaic, thermoradiative, and

thermophotonic conversions).
- new actions and collaborations, in France and with colleagues from foreign institutions.
The topics covered are at the interface between several disciplines:
- thermal radiation,
- photovoltaics: cells, advanced concepts, light trapping,
- thermal energy storage at high temperature,
- materials at high temperature and their properties,
- advanced concepts: near-field TPV, thermophotonics, hot-carrier TPV cells,...

Registration, free but mandatory, is open until September 17th, on the website:
https://workshoptree.sciencesconf.org.

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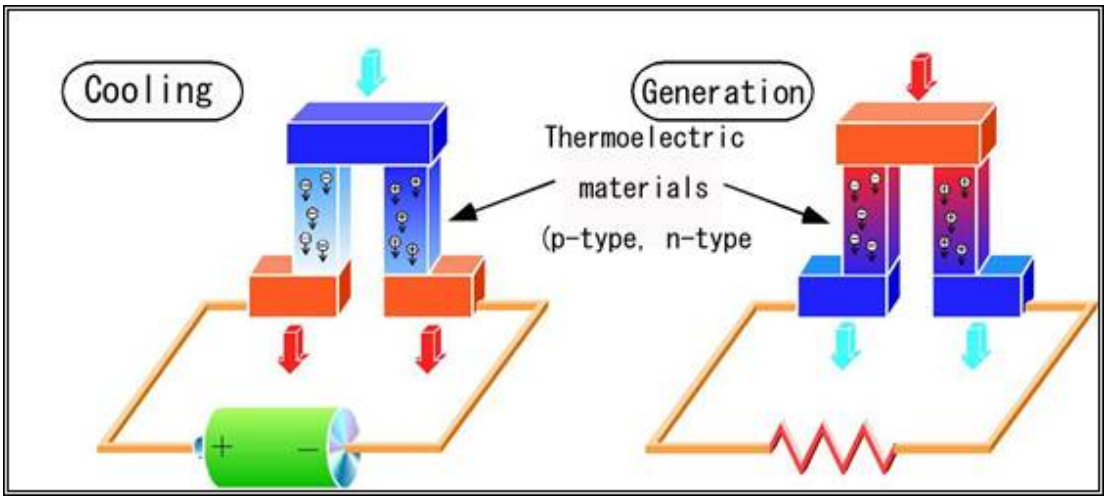

Journées Nationales de la Thermoélectricité au C2N Paris Saclay campus 2022, du 22 au 24 Novembre 2023

JNTE2023: National Days of Thermoelectricity Following the 2022 edition organized in Rennes, the National Thermoelectricity Days will be organized this year jointly by the Institute of Molecular Chemistry and Materials of Orsay, the Center for Nanosciences and Nanotechnologies, and the Laboratory of Irradiated Solids, from 22 to November 24, 2023, on the Paris Saclay campus.
This national event will allow the scientific community interested in the physical phenomena of direct conversion of heat fluxes into electricity and vice versa, to present in the form of oral presentations or posters recent results related to this "energy" theme, ranging from fundamental research (theory, materials, elaboration, thermal, micro- & macroscopic phenomena) to the most varied applications around the conversion of heat into electricity and thermal regulation. The 2023 National Thermoelectricity Days will revolve around (i) a thematic training (see below) and (ii) a symposium which will be structured around 4 thematic oral sessions, 2 poster sessions, guest lectures and the Coqblin prize awarded for the best thesis on the theme of thermoelectricity.
The training sessions will take place over 2 half-days (Wednesday, November 22, 2023 afternoon and Thursday, November 23, 2023 morning): - the training session on Wednesday afternoon will be devoted to thin layers, and will address the synthesis, characterization and metrology aspects at the same time. - the training session on Thursday morning will be devoted to numerical simulation and modeling of electrical transport and thermal transport. It will address the different tools available, before focusing more specifically on electron-phonon interactions.
Abstract submission deadline: 06/10/2023 Date of notification of oral presentations: 13/10/2023
Deadline for registration (free but compulsory) for the training (subject to availability) and/or the symposium: 20/10/2023

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C'est l'été, synonyme de vacances ?

Un livre : L'été d'Albert camus

Pour ceux qui ne partent pas en vacances, et même pour les autres, un voyage autour de la méditerranée avec la visite de l'Algérie, de la Grèce, et toujours la mer au centre. Un beau voyage avec un bilan carbone très très faible.

Les légumes farcis: une recette de l'été

Il n'y a pas une recette mais mille recettes de légumes farçis. En effet avec aubergine, courgette et poivron (mon préféré), on peut décliner tout type de farce avec ou sans viande, au fromage de chèvre ou avec des épices ! On peut laisser aller sa créativité...
Bien compter 1h30 au four, à 180°C, ca c'est moins bon pour le bilan carbone.

Une peinture : l'été de Giuseppe Arcimboldo, 1573

Ce trompe l'oeil amusant représente l'été dans les quatre tableaux des saisons de Arcimboldo. Peint pour l'empereur Maximilien II, ce tableau représente l'abondance de cette saison pleine de fruits et de légumes pour faire de bonnes recettes !
A voir au Louvre.
Pour en savoir plus:
https://actualitesartistiques.home.blog/2019/06/16/une-oeuvre-lete-giuseppe-arcimboldo-1573/

N A M e
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