

La Newsletter de l'été du GDR NAME !

De : Olivier BOURGEOIS <olivier.bourgeois@neel.cnrs.fr>

jeu., 21 juil. 2022 16:13

Expéditeur : gdr-name-request@services.cnrs.fr

Objet : La Newsletter de l'été du GDR NAME !

À : GDR NAME <gdr-name@services.cnrs.fr>

Répondre à : Olivier BOURGEOIS <olivier.bourgeois@neel.cnrs.fr>

GDR-NAME Newsletter

july, 2022



N A M E

GDR Nanomaterials for Energy Applications



EDITO

Dear partners

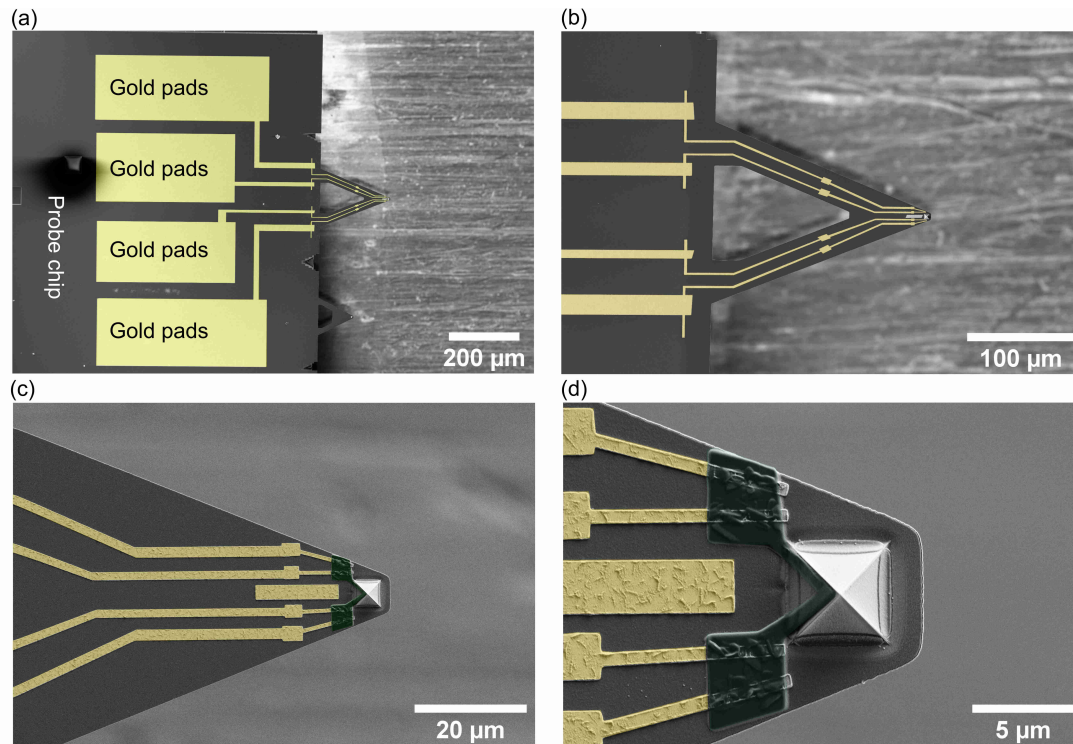
The academic year is finishing. We can draw up a first assessment for our GDR. A first thematic school has been organized: the MONACOSTE SUMMER SCHOOL in Mai at Frejus on "Modeling of nanostructured materials for energy conversion and transport", a theme at the heart of our GDR. Second, the writing of the white paper is finished, it is now under proof corrections, the pre-final version is available on the GDR website.

The plenary session will be organized this year in Lyon, (see announcement below), please get registered. We are looking forward to meet you there ! Meanwhile we wish you a nice summer break !



LINK

IMAGE OF THE MONTH

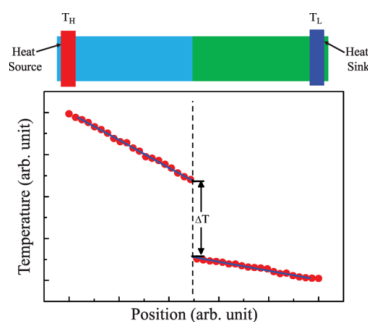


A new SThM tip for local thermal studies !

Electron beam lithography on non-planar, suspended, 3D AFM cantilever for nanoscale thermal probing by R. Swami *et al.* Nano Futures 6 (2022) 025005.

LINK

Scientific highlights

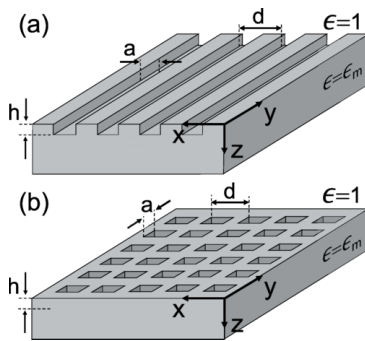


A theoretical review !
Interfacial thermal resistance: Past, present, and future

computational, and experimental developments in the 30 years after the last review given by Swartz and Pohl in 1989. To be self-consistent, the fundamental theories, such as the acoustic mismatch model, the diffuse mismatch model, and the two-temperature model, are reviewed.

by Jie Chen, Xiangfan Xu, Jun Zhou, and Baowen Li
Rev. Mod. Phys. 94, 025002 (2022)

[LINK](#)



Spoof surface plasmon photonics

In undergraduate courses on classical electromagnetism, it is taught that a perfect conductor expels the electromagnetic (EM) field, and hence its surface is not able to support the propagation of bound EM waves. However, when the surface of a perfect conductor is structured at a length scale much smaller than the operating wavelength, geometrically induced surface EM modes can be supported. Owing to their similarities with the surface plasmon polaritons (SPPs) in the optical regime, these surface EM modes were named spoof surface plasmons. The concept of spoof surface plasmons has opened up a new line of research within plasmonics with the aim of transferring all the potentialities of SPPs in the optical regime to lower frequencies (microwave, terahertz, and midinfrared regimes) in which a metal behaves as a quasiperfect conductor. In recent years, several research groups have extended this concept from planar surfaces to waveguides, and eventually to resonators, covering the entire range of structures studied in standard plasmonics. This review provides a detailed perspective on the recent developments in spoof surface plasmon photonics from both the fundamental and applied sides.

Francisco J. Garcia-Vidal, Antonio I. Fernández-Domínguez, Luis Martín-Moreno, Hao Chi Zhang, Wenxuan Tang, Ruwen Peng, and Tie Jun Cui
Rev. Mod. Phys. **94**, 025004 (2022)

[LINK](#)

GDR-NAME NEWS

GDR-NAME Plenary meeting at Campus La DOUA close to Lyon !



Plenary session at Campus La Doua in LYON, *please register asap* 3-5 of october 2022

We are pleased to invite you to the next Plenary Days of the GDR which will take place in Lyon, on the Doua campus, from October 3 to 5, 2022. The program is under construction and will include, among other things, guest presentations, plenary lectures, exchange sessions, posters, a session on the collaborations initiated within the GDR, as well as the award ceremony thesis 2021 of the GDR and the announcement of the winners of the 2022 interlaboratory AAP of the GDR.

Important dates to remember!

Abstract submission deadline for oral presentations:
07/29/2022

Registration deadline: 07/29/2022

Notification of acceptance of abstracts: 09/09/2022

Registration payment deadline: 09/16/2022

Registration fees Permanent academic: 120 € Non-permanent academic: 60 € Industrial: €300 Stand (in addition to registration): €200 Submissions and registrations will soon be open on the conference website (<https://gdr-name-22.sciencesconf.org/>). This site will also give you other practical information. Do not hesitate to already block the dates from October 3 to 5, 2022!

LINK

Advanced Materials and Systems for Triboelectric Kinetic Energy Conversion



Kick-off of the International Research Project AMSTEC (Advanced Materials and Systems for Triboelectric Kinetic Energy Conversion). July 2022

The IRP (International Research Project) CNRS AMSTEC brings together researchers and students from ESYCOM, LIP6 and the Advanced Materials Science and Engineering (AMSE) faculty of SKKU (Sungkyunkwan University, South Korea). For the first 2 years, this project is also coupled with Campus France funding via a PHC STAR. The objective is to develop systems using triboelectricity for energy and/or health.

GDR-NAME THESIS PRIZES

2022 GDR NAME thesis prizes: congratulations to the two laureates. They will present their work at the GDR plenary session at La Doua October 2022 !!



2022 Best PhD Thesis Award, Prize #1 for Nikita KAVOKINE (ENS, Paris)

Many-body effects in nanoscale fluid transport

(nkavokine@flatironinstitute.org)

The transport of confined fluids at the nanometric scale is the fundamental ingredient of many complex processes, ranging from the desalination of seawater to neurotransmission. While the experimental systems for the study of these transport phenomena today reach molecular sizes, the models used to describe them are best formulated in a mesoscopic framework. This thesis develops new theoretical tools, specific to nanoscale fluids, which shed light on unexpected phenomena in extreme confinement. We first show, by non-equilibrium statistical physics methods, that ion correlations in confined electrolytes result in nonlinear transport phenomena, ranging from ionic Coulomb blockade to memory effects and neuromorphic behaviors. We then show, using field theory tools, the emergence of quantum effects at the solid-liquid interface, through a contribution of electronic excitations to hydrodynamic friction. These results suggest the possibility of controlling nanofluidic transport by the electronic properties of the confining walls, and establish a link between liquid physics and condensed matter physics. The thesis also includes an experimental part, which presents the study of the instability of a suspension of nanoparticles, as well as the development of a device for measuring water flow in two-dimensional channels.

[LINK](#)



2022 Best PhD Thesis Award, Prize #2 for Lipin CHEN (INSTITUT FOTON, Rennes)

Optoelectronic, vibrational and transport properties of III-V/Si antiphase boundaries for photonics and solar energy harvesting

(lipin.chen@universite-paris-saclay.fr)

In this thesis, we investigate the specific optoelectronic properties of III-V/Si Anti-Phase Boundaries (APBs) and its use for energy harvesting devices theoretically and experimentally. Strong electron-phonon coupling around stoichiometric APBs are first demonstrated due to simultaneous confinement of charge carriers and phonons in the same region, based on structural and optical characterizations and density functional theory calculations. The GaPSb/Si tandem materials association for solar water splitting is then studied. Combining ellipsometry measurements and tight binding calculations, the bandgap of GaPSb alloys in the whole Sb range and band lineups of GaPSb/Si with water redox levels are obtained, which shows the potential of the GaPSb/Si association for the hydrogen evolution and oxygen evolution reactions. Then a GaP_{0.67}Sb_{0.33}/Si photoanode with an almost optimal bandgap combination (1.7eV/1.1eV) was investigated for photoelectrochemical (PEC) water splitting with promising performances related to efficient sunlight spectrum absorption. Finally, the transport and PEC properties of III-V/Si with vertical non-stoichiometric APBs are investigated by experimental characterizations and first-principle calculations. We demonstrate that epitaxial III-V/Si materials with vertical non-stoichiometric APBs are hybrid structures, composed of bulk photo-active semiconductors with 2D topological semi metallic vertical inclusions, enabling simultaneously good photo-activity, efficient charge transport and separation, and interesting ambipolar properties.

[LINK](#)

ANNOUNCEMENTS

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



Les Journées de la Matière Condensée JMC 2022 in Lyon

Since 1988, the Condensed Matter Days (JMC) have been organized every even-numbered year by the Condensed Matter Physics Division of the French Physical Society (SFP). The topics cover all areas of condensed matter, from concepts to applications. The success of these days makes it the largest national condensed matter physics congress in France (600-700 participants). The 18th edition will be held in Lyon from August 22 to 26, 2022.

At least, three minicolloquium are of interest for our GDR:

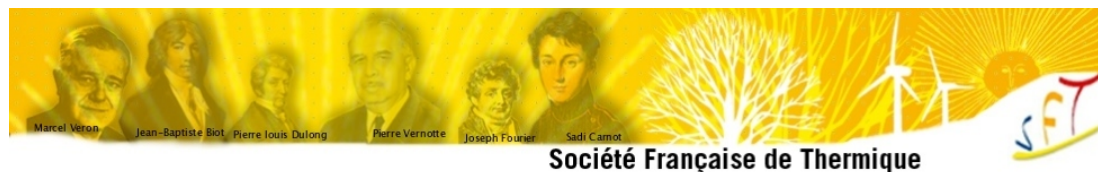
MC 22-26/8 @ Lyon, (avec les trois minicolloques) <http://jmc2022.univ-lyon1.fr/fr>

MC11. Lattice vibrations: lifetime, transport and (quantum) thermodynamics

MC14. Micro Nanoscale Heat Transport Management

MC31. Vibrations of mechanical nano-resonators: detection, modeling and applications.

LINK



SFT BEYOND FOURIER days in Paris 9 september 2022

"Beyond Fourier" 9/9/22 @ Paris, <https://gdrname.wordpress.com/2022/06/09/sft-day-beyond-fourier-september-9-2022/>.

Understanding heat transfer at the nanoscale remains one of the greatest intellectual challenges in the field of thermal dynamics, by far the most relevant under an applicative standpoint. When thermal dynamics is confined in short time and length scales and/or at low temperatures, non-diffusive heat transport regimes set in, ranging from ballistic to hydrodynamic. Depending on the system, different heat carriers may be involved such as electrons, phonons, spins just to mention few of them. Within these regimes, the validity of Fourier's law, the milestone constitutive relation describing diffusive heat transport, fails, thus calling for novel heat transfer characterization techniques and interpretative schemes. Under an applicative stand point, managing Non-Fourier heat transport is a key-factor for micro- and nano-devices operations and their further downscaling.

During this thematic day, we will focus on recent developments in the general topic of non-Fourier heat transfer at the nanoscale. The scope is to bring together different views on this emerging topic, merging experimental investigations and theoretical studies. This meeting is an opportunity for the community to share ideas and foster new collaborations. Young researchers are especially welcome to present their work, either in the form of oral or poster presentations.

Contacts : Francesco BANFI (francesco.banfi@univ-lyon1.fr), Paolo MAIOLI (paolo.maioli@univ-lyon1.fr), Konstantinos TERMENTZIDIS (konstantinos.termentzidis@insa-lyon.fr)

LINK



N A M E

GDR Nanomaterials for Energy Applications

GDR-NAME Plenary Meeting at Campus La Doua in LYON, please register asap 3-5 of october 2022

We are pleased to invite you to the next Plenary Days of the GDR which will take place in Lyon, on the Doua campus, from October 3 to 5, 2022. The program is under construction and will include, among other things, guest presentations, plenary lectures, exchange sessions, posters, a session on the collaborations initiated within the GDR, as well as the award ceremony thesis 2021 of the GDR and the announcement of the winners of the 2022 interlaboratory AAP of the GDR.

Important dates to remember!

Abstract submission deadline for oral presentations: 07/29/2022

Registration deadline: 07/29/2022

Notification of acceptance of abstracts: 09/09/2022 Registration payment deadline: 09/16/2022

Registration fees Permanent academic: 120 € Non-permanent academic: 60 € Industrial: €300 Stand (in addition to registration): €200 Submissions and registrations will soon be open on the conference website (<https://gdr-name-22.sciencesconf.org/>). This site will also give you other practical information. Do not hesitate to already block the dates from October 3 to 5, 2022!

LINK



7th ASME International Conference of Micro/Nanoscale Heat and Mass Transfer August 7 - 9, 2023

The 7th ASME Micro/Nanoscale Heat & Mass Transfer International Conference (MNHMT2023) will be held in Nottingham, UK, August 7 - 9, 2023. It is a follow-up conference to the first six conferences, which were held in Tainan (January 2008), Shanghai (December 2009), Atlanta (2012), Hong Kong (2013), Singapore (2016) and Dalian with over 300 attendees in each.

Research and education on micro/nanoscale heat and mass transfer have advanced rapidly over the last two decades through many dedicated individuals and team efforts, with direct impact now extending into various fields in both science and engineering.

The conference is intended to provide a forum for researchers, educators and practitioners around the world to exchange ideas on the state-of-the-art research and development and identify future research needs in this interdisciplinary emerging field. The conference will include keynote and invited presentations, contributed oral and poster presentations, as well as panel discussions on the current status and future opportunities.

LINK

**You have received this email because you have subscribed to the GDR mailing list.
Don't forget to submit your announcements, proposals for highlights, image of the month, information of all types... Thank you!**



© 2021 GDR Name