INSTITUT NEEL Grenoble

Post-doctoral position

Lead-free piezoelectric nanowire-nanocellulose hybrids for flexible energy harvesters

Context:

The ANR-PRCI project 'NanoFlex' aims at enhancing the performance of lead-free flexible piezo-energy harvesters by exploiting III-Nitride alloy nanowires hybridized with bio-sourced nanocelluloses and graphene. The choice of materials is to minimize the environmental footprint of the flexible energy harvester, while ensuring high flexibility and maintaining an appreciable electromechanical efficiency. We offer a 12-months postdoc position in this framework.

Objectives and means available:

The objective is to develop an inorganic-organic flexible piezoelectric hybrid film for the next-generation piezo-harvesters. The targets are to use the inorganic III-Nitride nanowires such as AlN and their alloy for piezo-charge generation and exploring various options for boosting their piezoelectric performances. Combining with bio-sourced nanocellulose and graphene, we will evaluate the electromechanical properties of the hybrid films as flexible piezo harvesters in nanogenerators and self-sustained mechanical sensors with respect to ZnO and other lead-free competitors at local and large scale.

The experiments will be performed at Néel/Grenoble and strongly collaborate with CERMAV teams and PDI/Berlin. Institute Néel has high-ended clean-room facilities for nanofabrications as well as electrical, structural, and optical characterizations (scanning electron microscopy, atomic force microscopy, etc). The institute is part of the largest French national research institutes in condensed matter physics and material sciences. Grenoble features a unique scientific, industrial, and cultural ecosystem.

Possible collaboration and networking: CERMAV/Grenoble, and Paul Drude Institute/Berlin
Required profile: We are looking for a highly motivated post-doc with strong background in piezoelectric nanomaterials, semiconductors, clean-room processing and nanofabrications. She/he must be able to conduct an experimental project with large autonomy and have a strong team spirit.

Foreseen start for the position: Beginning 2023
Salary: between 2805 and 3963 € according to experience
Duration: 12 months

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