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Vandœuvre-lès-Nancy, le 2 Mai 2021

To the members of the EURIZON evaluation committee,

It is my pleasure to write this support letter for the project "*Machine learning-based defect engineering in silicon structures for thermal management and photovoltaics*" proposed by colleagues from the Faculty of Physics of the Taras Shevchenko National University of Kyiv (TSNUK). This application is in the frame of the call EURIZON fellowship program "Remote Research Grants", and is carried by the research team under the supervision of Prof. Oleg OLIKH.

The proposed research project aims to improve the efficiency of photovoltaic devices for green energy production using artificial intelligence-based approaches and defect engineering. This topic is very promising and perfectly fits the objectives of the green energy transition supported by the European Union

The TSNUK research team has a long-lasting collaboration with our laboratory in Nancy, the LEMTA, which is a joint unit between the University of Lorraine (UL) and the CNRS. This cooperation lies on student and staff exchanges, collaborative scientific activities, and preparation of several EU projects. An illustration of this fruitful scientific collaboration between our groups is the large number of joint publications

In the proposed project, the LEMTA will bring support by sharing computational resources available at the computation mesocentre EXPLOR (https://explor.univ-lorraine.fr/) of the UL, escaping issues related to electricity interruptions that remains numerous in Kyiv. In addition, the LEMTA will also provide support for the analysis of the calculated data about thermal transport properties of the investigated systems and cross-validation with the data measured during the project. In this frame, LEMTA will welcome young researchers from Kyiv University through existing partnerships (ERAMSUS+, Lorraine University of Excellence (LUE) program, bilateral agreements) to perform characterization of the samples with the use of our laboratory research facilities. The latter are, optical characterization tools, Raman spectrometry, scanning thermal microscopy, etc.

Concerning the research environment, it can be noted that the LEMTA members are involved in several research networks, at the French level (like GDR "NAME", French Society of Thermal sciences SFT, Carnot Institute, etc.), but also in Europe and worldwide. Specifically, LEMTA is very active in two joint programs of the European Energy Research Alliance (EERA), one concerning materials and processes for energy applications (AMPEA), and the other on fuel cells and hydrogen (FCH). These networks will help disseminate project results, and thus increase the TSNUK team's visibility.

To conclude I truly believe that the TSNUK research group deserves to be supported to fulfil the objectives of their project as it will significantly contribute to the development of new pathways for the improvement of the stability and reliability of the silicon solar cells

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