**Contact person:**

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**Institution**

Instituto Superior Técnico (IST) (PIC 999992983)

**Description of the infrastructure**

Name of the infrastructure (and its installations, if applicable):

Laboratory of Accelerators and Radiation Technologies, LATR

Center for Nuclear Sciences and Technologies, C2TN

Researchers are from C2TN, working in the LATR installations

Location (town, country) of the infrastructure: *If the infrastructure comprises more than one installation (i.e. parts of the infrastructure that can be used independently and for which the operating costs can be singled out) at different locations, indicate briefly the location of each installation and give a justification for considering them as a single infrastructure.*

LATR and C2TN are located at Campus Tecnológico e Nuclear,

Estrada Nacional 10
2695-066 Bobadela LRS
Portugal

Web site address:

[https://tecnico.ulisboa.pt](file:///Users/adammaj/Library/Containers/com.apple.mail/Data/Library/Mail%20Downloads/E8DFBC59-0600-4B95-A506-639B02EB369D/https%3A/tecnico.ulisboa.pt%20)

 <http://c2tn.tecnico.ulisboa.pt/>

Annual operating costs (excl. investment costs) of the infrastructure (€):

500.000 €/year

Description of the infrastructure: *Give a brief general description of the infrastructure to which access is offered. Illustrate, in particular, its state-of-the-art equipment and services offered to users that make it rare or unique in Europe. Outline the areas of research normally supported by the infrastructure, as well as new areas opening to users, if any. If the infrastructure is composed of several installations, describe these including their specific features. If parts of the infrastructure are still under construction, specify the starting date of construction and indicate the date when access can realistically be made available.*

Center for Nuclear Sciences and Technologies, C2TN, is a multidisciplinary and interdisciplinary Research Unit of Instituto Superior Técnico (IST), Universidade de Lisboa, established in 2013, and located in Campus Tecnológico e Nuclear (CTN), one of the IST science and technology poles. It groups several tens of researchers (physicists, chemists, pharmaceutics, biologists, geologists, among others) recognized internationally as the Portuguese experts in matters related to Nuclear Sciences and Technologies and applications of Ionizing Radiation, having as lemma Radiation for Science and Society.

The Laboratory of Accelerators and Radiation Technologies (LATR) hosts two electrostatic accelerators and an implanter. A 2.5 MV Van de Graaff with three experimental beam lines, with all the relevant ion beam techniques available, RBS, PIXE, NRA, Channeling, ERDA and a Nuclear Microprobe.

The nuclear microprobe participating in this project is an Oxford Microbeams® type with a lateral resolution of 3 um. It is possible to perform, individually or simultaneously, different ion beam analytical techniques such as PIXE, RBS, STIM, IBIC, PIGE or IBIL. Measurements can be done under vacuum conditions or in open air thanks to the external beam end-station. The external beam is mostly dedicated to the study of cultural heritage materials, although other type of samples can be also studied using this configuration.

The nuclear microprobe is between the few available in Europe, being dedicated to materials science and cultural heritage. Researchers have a wide experience in several fields, so scientific support to external users is assured.

Services currently offered by the infrastructure: *Describe the services offered by the infrastructure and its research environment, and demonstrate how they will enable scientists to carry out high-quality research, giving examples of relevant scientific achievements it enabled. Demonstrate that there is a widespread interest from users in other countries to conduct research at the infrastructure (or make otherwise use of its services), e.g. by indicating the number of international users currently using the facility per year.*

The IBA techniques are being applied to multiple fields such as environment, biomedicine, geology, semiconductors and cultural heritage. The members of the Group have established a network of collaborations with researchers from all over the world to perform studies on different areas taking advantage of the non-destructive and quantitative nature of the ion beam techniques.

In the frame of EUROLABS project, Portugal provides access to the nuclear microprobe from LATR and the experience of the researchers working on it, from C2TN. In this installation it is possible to have alpha or proton beams with energies up to 2.3 MeV. Researchers have multiple international collaborations thanks to their participation in international projects and platforms.

In standard mode, all measurements performed at the nuclear microprobe are done under the support from researchers participating in the call. Measurements are made jointly with the users under national and international agreements.

**Description of work**

Modality of access under this proposal: *Outline how a user, or user group, will be given access to the infrastructure or to its services (e.g.* ***trans-national/virtual****, type of equipment/service used, expected output/deliverables, etc.).*

*For* ***trans-national access*** *indicate the typical execution and duration of work (if access is provided ‘in person’, thus not remotely, indicated the estimated number of days spent at the infrastructure), and, where relevant, how the users will be integrated into the scheduling of the infrastructure and the degree of independence they will experience with respect to the normal research activity of the infrastructure.* *Define clearly, for each installation, the* ***unit of access*** *used to measure the access offered and indicate what is covered and included (e.g. preparatory work, specific training courses) in one unit. This is essential for monitoring the access provided under this project, but also to justify the corresponding costs. Indicate for each installation which modality will be used to declare access costs (on the basis of* ***unit cost****, as* ***actual cost****, or as a* ***combination*** *of the two) and justify your choice.*

The main objective of trans-national access is to enlarge the community of ion beam technologies to users from new disciplines and new industries. The aim is to have a sustainable increase in new users by the end of the project.

Duration of experiments using the nuclear microprobe is about 40 hours per project. Time available includes the time needed for turn on/off the accelerator and the operation time needed to achieve the ideal experimental conditions for the measurements.

After approval of the proposal, the measurement date will be allocated considering the dates chosen by the users in the proposal and availability of the researchers. The objective is to achieve the best date for both parties.

Access cost includes travel, accommodation and subsistence costs during the measurements and the cost of installation is based on unit cost, according with the budget approved by all the members of the proposal.

*For* ***virtual access****, define clearly, for each installation, the* ***unit of access*** *used to measure the access offered and indicate what is covered and included in one unit. This is essential for monitoring the access provided under the project, but also to justify the corresponding costs. Indicate for each installation which modality will be used to declare access costs (on the basis of* ***unit cost****, as* ***actual cost****, or as a* ***combination*** *of the two) and justify your choice.*

Support offered under this proposal: *Describe the scientific, technical and, for trans-national access, logistic support that would be offered to the users. Where relevant, emphasise the quality of the scientific environment in which the users will be working and explain how this might stimulate their research. Explain to what extent such support is already routinely provided to external users.*

During preparation of proposal users can ask for scientific help.

Special attention will be assured for new, first time users of Ion beam techniques and the nuclear microprobe.

Trans-national Access offers sample preparation, characterization, data interpretation, and sample storage amongst other things. Preparatory work is also included, discussing which the optimal experimental conditions are in order to obtain as much information as possible, considering the objectives of the user and the characteristics of the nuclear microprobe.

During measurements and results discussion support by the scientific team will be assured.

These procedures are provided to all external users in the Institution, so researchers have experience with this methodology.

Outreach to new users: *State what measures are taken to attract new potential users (e.g. web page, call for proposals, etc.), including specific user groups such as users coming from SMEs or representing new areas of research, if appropriate. Indicate why and to which extent the EU funding of this trans-national and/or virtual access activity will provide European research teams with new opportunities of access to the infrastructure. Indicate whether the number of trans-national and/or virtual users is expected to increase as a result of this proposal, and how you will monitor such an increase. If trans-national access to the infrastructure is being opened to users other than those from the host country of the infrastructure for the first time, what evidence is there that there will be sufficient demand for the access offered under this proposal?*

C2TN has a very dynamic Outreach Group, GO, with 3 main objectives: i) To promote and disseminate the relevance of the research, development and innovation activities and services provided by C2TN for the society and scientific communities, thus promoting the various aspects of scientific culture and knowledge; ii) To increase the visibility of C2TN in national and international events and in social media; iii) To encourage collaborative and cooperative links between C2TN and various stakeholders and actors in the academic, scientific, business, industrial and health fields.

GO is in charge of C2TN's official website, social media accounts (such as Facebook and LinkedIn), and Blog, giving focus to all important and pertinent dates and events and also to the achievements of the C2TN researchers. Additionally, GO works towards bridging the gap between C2TN members and other research centers, institutes, municipalities, schools and society in general, both at a national and international level, including with the IST's Communication Office and students' associations.

Access to the infrastructure will be announced via GO, among other official channels.

The opportunity to have trans-national access which also includes travel and subsistence costs for users will increase the interest and attractiveness of the IBA techniques.

Review procedure under this proposal: *For trans-national access activities, describe the peer review procedure that will be used to select users under this proposal. Outline the composition of the User Selection Panel. Demonstrate that the selection of users will follow the principles of transparency, fairness and impartiality. As the selection will be based on the evaluation of scientific merit of the applications, but with priority to new users and users coming from countries where such infrastructure is not available, indicate any additional selection rule that you would like to add.*

*For virtual access activities, describe how and when the periodical assessment of the services offered to the scientific community will be carried out (e.g. by an international review panel). The corresponding assessment reports must be defined as deliverables to the EC.*

The Cluster of Low Energy Accelerators for Research will follow the same procedures, having a common platform, rules and criteria to select the proposals.

In Seville description it is the selection rules, which Portuguese team agrees.