EUROPEAN MICROKELVIN PLATFORM

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TRANSNATIONAL ACCESS PROPOSAL EVALUATION – BRIEFING DOCUMENT

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1 INTRODUCTION

The European Microkelvin Platform (EMP) is an **advanced research infrastructure community** of 17 partners, which has an extensive portfolio of capacities and expertise in ultralow temperature physics. EMP has been established in 2014 to provide **access to the milli- and microkelvin temperature capabilities and services around the Europe**. To maximize the benefits and impacts of the community, EMP organizes user meetings, trainings, harmonization and standardization of access services. Also, since the lowest accessible temperatures are continuously falling, we lay considerable weight on **improving and upgrading our infrastructure**. These advances allow us, and our users from across Europe, to study new phenomena, thereby generating new knowledge, applications and commercial opportunities. We have a particular interest in the benefits of ultralow temperature physics for driving forward the inter-related areas of **quantum materials, nanoscience, and quantum technology**. The activities of the EMP hold enormous potential for innovation (see Fig. 1).

EMP builds on the very successful FP7 MICROKELVIN Integrating Network (2009-2013) resulting in integration of the three leading microkelvin laboratories in Europe, in Grenoble (FR), Helsinki (FI) and Lancaster (UK), along with the activities of a cluster of other European centres. The network opened up the microkelvin temperature regime to nanoscience in Europe. While much of the activity was devoted to building the necessary research infrastructure, the inheritance of MICROKELVIN is the European coordination and collaboration of the existing centres, that laid the foundations for EMP.

EMP works to continuously **integrate, improve and augment the access** provided already by MICROKELVIN, to create a major European "laboratory without walls". The platform has committed to **increase the access-provision** with the inauguration of the EMP of eight centres which will become integrated during the course of the H2020 activity. Secondly, EMP offers access to **wider selection of fields** (see Fig. 1). Here a key instrument is the participation of five further sites, with excellence and expertise covering a broad range of topics, to diversify and develop our microkelvin measurement breadth and capability. The participants include seven industrial partners and one National Measurement Institute, which will contribute to specific projects and more generally promote innovation and impact, and improved metrology.

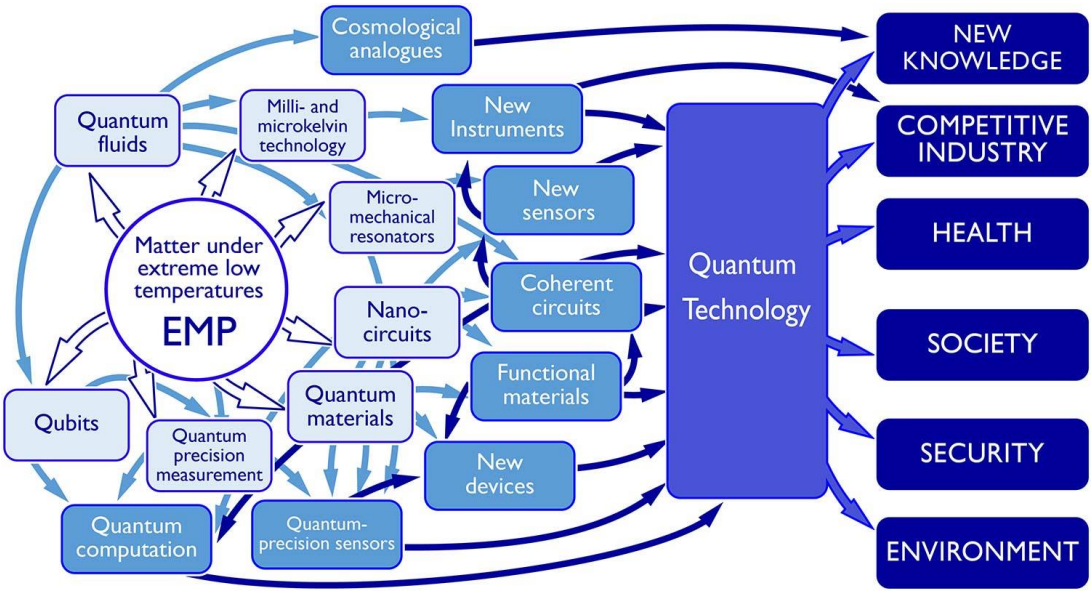

Figure 1 Research areas of EMP.

2 TRANSNATIONAL ACCESS IN EMP

The EMP Transnational Access (TA) program gives researchers from outside the EMP community the opportunity to do research in the unique facilities of the platform. This opportunity is advertised through the EMP website, newsletters, user meetings, international conferences, and trainings, in which all participating facilities are offered. Objectives of the EMP TA activities are:

- **optimal use** of the RI at the access providing sites
- **widened user base, and spectrum of research**, promoting science advancement at the ultralow temperature frontier
- **access for industry** to promote innovation
- **optimal support** for small under-critical-size European low-temperature research groups and small/medium sized enterprises

Under the EMP contract, access for international groups of researchers will be provided by **8 access giving sites**. The facilities are based at Aalto University, Basel University, CNRS Grenoble, Lancaster University, Heidelberg University, Royal Holloway University of London, Slovak Academy of Sciences Kosice, and Technical University Vienna. Table 1. gives the number of days of access to be provided by each provider for the whole duration of the EMP project.

Table 1 EMP access giving equivalents

ACCESS SITE SHORTNAME	ACCESS SITE	LOCATION	ACCESS EQUIVALENTS
AALTO	OtaNano, Aalto University	Helsinki, FI	40 user months + 200 user hours of fab
CNRS	Institut Néel, CNRS Grenoble	Grenoble, FR	30 user months
RHUL	London Low Temperature Laboratory, Royal Holloway University of London	London, UK	36 user months + 100 user hours of fab
SAV	Centre of Low Temperature Physics, Slovak Academy of Sciences Kosice	Kosice, SK	48 user months
TUW	Vienna Microkelvin Laboratory, Technical University Vienna	Vienna, AU	25 user months
UBAS	Basel Cryolabs, Basel University	Basel, CH	24 user months
UHEI	KIP Low Temperature Laboratory, Heidelberg University	Heidelberg, DE	20 user months
ULANC	Lancaster Low Temperature Physics, Lancaster University	Lancaster, UK	36 user months + 100 user hours of fab

A summary of the available facilities is presented in Fig. 2. More detailed description of the facilities in each of the sites is available on the EMP website: http://emplatform.eu/about/facilities

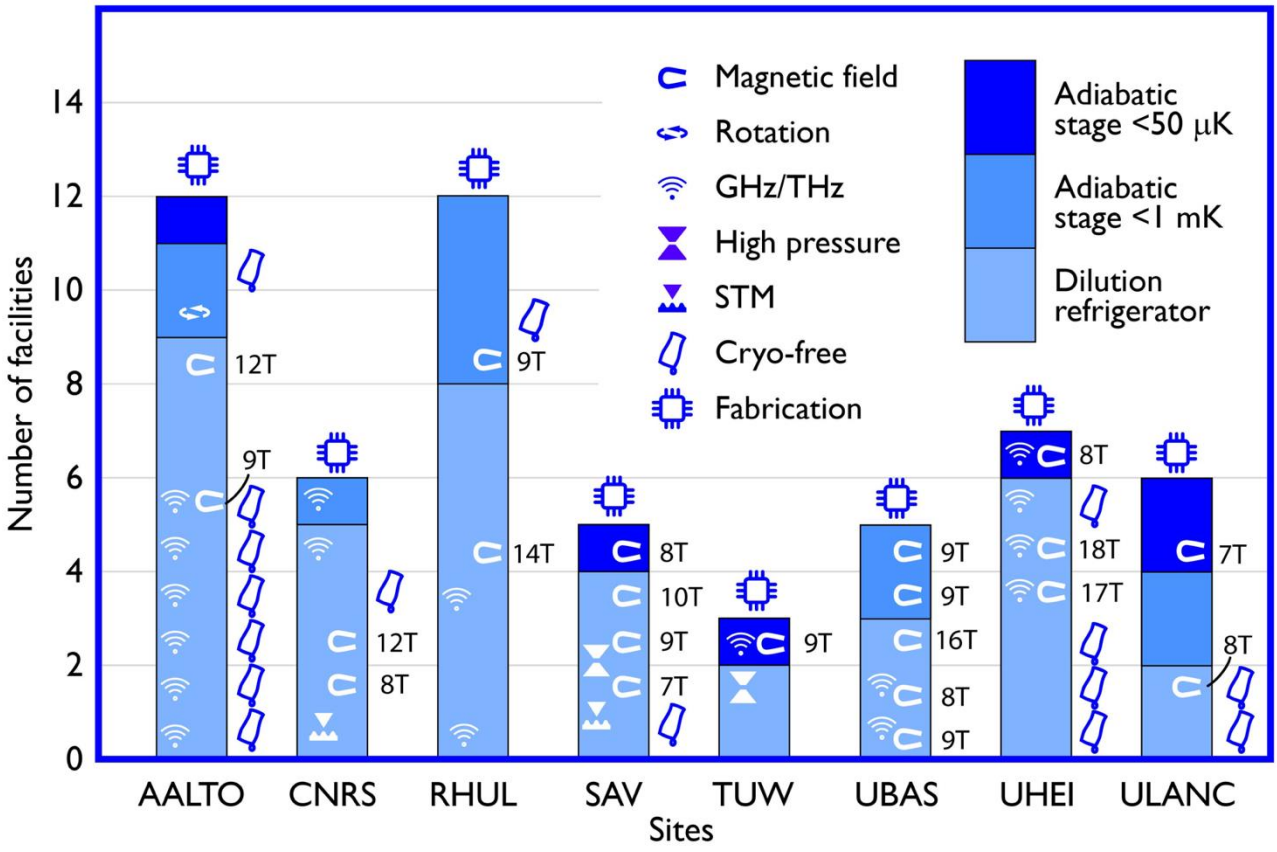

Figure 2 Infrastructure available for users at EMP access giving sites.

A researcher in this project is called a 'user', while a partner which provides access is a 'provider'. (International) 'user-groups' from academia and industry, i.e. teams of one or more researchers (users) led by a 'user group leader' have the **opportunity to carry out research free of charge in specific facilities of EMP**. The user group leader and the majority of the users must work in a country other than the country(ies) where the installation is located. Also, user groups with a majority of users not working in an EU or associated country[1] can be accepted, but the total access of these users is limited to 20 %[2].

The TA activities include **free of charge access** to the EMP facilities for users' research project, **travel and subsistence costs** (within prescribed limits). Access is made available for short duration projects, not exceeding 3 months. State-of-the-art measuring instruments, data-acquisition and processing systems will be available, as well as modern support facilities, such as library, computers and internet access. Furthermore, visiting researchers are offered a scientific and intellectual environment, with assistance and guidance from experts at the host institute. Previous experience in measurements are not a prerequisite since technical support and training is provided.

[1] Albania, Armenia, Bosnia & Herzegovina, Faroe Islands, the former Yugoslav Republic of Macedonia, Georgia, Iceland, Israel, Moldova, Montenegro, Norway, Serbia, Switzerland, Tunisia, Turkey, and Ukraine. http://ec.europa.eu/research/participants/docs/h2020-funding-guide/cross-cutting-issues/international-cooperation_en.htm

[2] This will be monitored on the EMP Website and shall be taken into account by the Chair of the SP.

3 CALL FOR PROPOSALS

An invitation to access the EMP facilities is published on the EMP portal[3]. New proposals can be submitted at any time online (requires registration). Users are encouraged to discuss projects with the EMP partners prior to their application. The proposal form includes content defined in Appendix 1. The users are asked to submit a proposal addressing the following subjects:

- Scientific objectives of the project (incl. reference to the state-of-the-art and relevant measurements carried out in the past)
- A project description
- A technical description of the planed project

In addition, potential users need to comply with the Data Management Plan[4] and can choose their preferred infrastructure site.

4 Selection Panel

The selection panel of EMP consists of typically five representatives of the user community and industrial companies, and four representatives of the EMP access sites[5]. The panel members are appointed by the EMP General Assembly, with advice from the International Advisory Board and the Joint Industrial Advisory Board[6]. The panel members represent the following fields:

- Quantum fluids and Solids
- Nanophysics
- Novel Materials
- Quantum Technology
- Low Temperature measurement techniques (scanning probe etc.)
- Cryogenics at ultra-low temperatures
- Condensed matter theory

The selection panel elects a chair among the members, convenes on the call of the chair, meets in person at the at the user meetings (Sep 2019, Jun 2020, Mar 2021, Dec 2021) and online as appropriate.

5 SELECTION PRINCIPLES

The evaluation of the proposals must be **transparent, fair and impartial**. The selection of the proposals is based on **scientific merit** and **feasibility at EMP facilities**, taking into account that priority should be given to user groups composed of users who:

- have not previously used the installation and
- are working in countries where no equivalent RI exist

[3] http://emplatform.eu/user/call
[4] Only user groups that are allowed to disseminate the results they have generated under the action may benefit from the access, unless the users are working for SMEs. Target to make data as open as possible, yet as closed as necessary.
[5] Site representatives do not have a voting right, but shall comment on the proposals.
[6] http://emp.kip.uni-heidelberg.de/about/boards

Further preference is given to new EU-member states, young starting professors, female researchers and users from small under-critical-size European low-temperature research groups and from small/medium-sized enterprises.

6 SELECTION PROCEDURES

Selection panel members are granted access to the portal for review purposes. Submitted proposals are passed through an automated sanity check and can then be distributed to the panel members by the panel chair in the portal[7]. After receiving a proposal, the selection panel members have four (4) weeks to evaluate the proposal and submit their report in the portal. The chair of the selection panel will then change the proposal status to 'accepted' or 'rejected' based on the vote of the selection panel members. This decision is then communicated to the user group via the portal by an automated email. Details of this process are depicted in Appendix 3.

7 SELECTION CRITERIA

The selection and ranking criteria found in Appendix 2 deal with:

- Scientific level of the proposal
- Relevance of the possible outcome of the project or to the areas of quantum materials, nanoscience, and/or quantum technology
- Eligibility, feasibility and fit within the logistics of the host institute
- Conformity with the objectives of the EC and EMP
- The number of access days required for the project

A. two primary criteria must be fulfilled:

1. the proposal has to be eligible and feasible; and
2. the project has to fit within the logistics of the host institute

Feasibility is defined as technical feasibility, e.g. the facility should be suitable for the proposed research project. If one of these conditions isn't met, the proposals will be rated with a C score and will not get access.

Eligibility means that a user group must satisfy the following three conditions:

- The user group leader and the majority of the members of the user group must work in a country other than the country where the installation is located,
- The amount of access time granted to user groups from outside EU Member States or Associated States (i.e. more than 50% of their respective members) may not exceed 20% of the access time granted in total[8],
- The user groups are allowed to disseminate the results they have generated under the action, exception: users working for SMEs

B. The scientific merit, i.e. the relevance of the possible outcome of the project and the scientific level of the proposal is evaluated with equal importance.

If the actually available access time is limited, preference should be given to groups composed of users who:

- have not previously used the installation and
- are working in countries where no equivalent RI exist

[7] A printable PDF-Version of each proposal will be provided within the portal.
[8] The „Proposal Administration" Portal on emplatform.eu will monitor this

Further preference is given to:

- new EU-member states
- young starting professors
- female researchers
- users from small under-critical-size European low-temperature research groups
- small/medium-sized enterprises

For acceptance of a proposal a majority agreement of the selection panel members is required.