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Discussion on the formation of a Portuguese Synchrotron and FEL Users Association

ENURS2023

21st of June 2023

FCT-ALBA synchrotron framework agreement (April 2019-April 2023)

The ALBA synchrotron and Portugal boost their scientific collaboration



This agreement creates the conditions for collaboration and the various lines of activities / possible initiatives, such as:

- Competitive access for national researchers to the laboratory under the same conditions as Spanish researchers;
- Participation of Portugal as an observer on the ALBA Scientific Advisory Committee (ALBA SAC), through the appointment of a Portuguese scientist of recognized merit;
- Creation of a joint Post-Doctoral Program.

I. OBJETO DO ACORDO

O objeto do Acordo é o estabelecimento das bases de cooperação entre o CELLS e a FCT, I.P. de forma a implementar um programa pós-doutoral dirigido a investigadores portugueses, com a finalidade de desenvolver projectos de investigação no sincrotrão, nas instalações do CELLS.

V. VIGÊNCIA DO ACORDO

O presente Acordo tem uma vigência de 4 anos, que se inicia na data da sua publicação no Boletim Oficial do Estado e depois de registado no Registro Eletrónico Estatal de Órgãos e Instrumentos de Cooperação do Sector Público Estatal. Este período inicial poderá ser prorrogado por 4 anos adicionais mediante acordo entre partes.

Institutional TOP-DOWN approach



Joint ALBA Synchrotron-FCT (online) meeting, 17th December 2020

80 Portuguese Users from 15 Institutions

Projects scientific strategic areas:
Batteries, Catalysis, Electronic Materials and Nanomagnetism, and Life Sciences.



15:30 → 16:00 **4 Parallel meetings on the following subjects: Life Sciences, Catalysis, Batteries, Electronic materials and nanomagnetism.**

Meeting 1. Unveiling the function of calcium deposits in deinococcus radiodurans and its role in regulation
Speaker: Dr Célia Romão (ITQB, Portugal)

Meeting 1. Cryo X-ray Tomography for anti-cancer treatments
Speaker: Dr José Javier Conesa (CNB, Spain)

Meeting 2. Designing better heterogeneous catalytic coordination polymers
Speaker: Dr Filipe Paz (UAveiro, PT)

Meeting 2. Tailoring active sites in porous and non porous materials
Speaker: Dr Patricia Concepción (UPV, Spain)

Meeting 3. Development of nanoclusters for energy harvesting systems
Speaker: Dr César Laia (FCTJUNL, Portugal)

Meeting 3. Soft X-ray spectromicroscopy in battery materials
Speaker: Dr Dino Tonti (ICMAB, Spain)

Meeting 4. Magnetic 2D crystals, a fertile arena for new physics
Speaker: Dr Joaquin Rossler (INL, Portugal)

Meeting 4. Spintronics in topological insulators and 2D materials: interfacial phenomena
Speaker: Dr Adriana Figueroa (ICN2, Spain)

Meeting 4. Structure, properties and applications of nanomaterials towards a sustainable development
Speaker: Dr Pedro Barquinha (CENIMATH3N, Portugal)

16:00 → 17:00 **Open discussion within each of the parallel meetings. During the open discussions participants will have the opportunity to present their institutions and research groups, explain briefly their on-going projects, what they expect from ALBA and potential interest in a shared post-doc (approx. 5 min).**

Overview of the selected projects: provenience, complementarity and excellence of the teams

- Multi-length scale imaging in life sciences



INSTITUTO
DE TECNOLOGIA
QUÍMICA E BIOLÓGICA
ANTÓNIO XAVIER /UNL



Universidad de Oviedo
Universidá d'Uviéu
University of Oviedo

- Rational design of catalysts



FEUP FACULDADE DE ENGENHARIA
UNIVERSIDADE DO PORTO



INSTITUTO DE
TECNOLOGIA
QUÍMICA



- Electrical storage: E-mobility in an economic and environmental context



INTERNATIONAL IBERIAN
NANOTECHNOLOGY
LABORATORY



INSTITUT DE CIÈNCIA DE MATERIALS DE BARCELONA



- Design of 2-D materials: new paths to quantum computing



INTERNATIONAL IBERIAN
NANOTECHNOLOGY
LABORATORY



Institut Català
de Nanociència
i Nanotecnologia



FCT-ALBA synchrotron framework agreement: implementation timeline



April 2019

- Signature of the collaboration agreement

...

Dec 2020

- FCT-ALBA joint (online) meeting

Jan 2021

- Call for IBERIAN projects

In Feb

- 4 projects were selected, one for each of the four strategic areas

May 2021

- Call for post-docs

- Approx. 20 applicants,
- Only 3 fulfilled the requirements
- 1 candidate selected which rejected the position

Explore the European Research Landscape

- **IBERIAN collaboration and its integration in the new European Research Area**
- **Transnational access: free of charge access to EU research infrastructures**
- **LEAPS - <https://leaps-initiative.eu/>**
- **ESUO - <https://www.esuo.eu/>**



FUNCTIONAL LAYERED MATERIALS FOR ADVANCED APPLICATIONS

- Horizon Europe Twinning initiative aimed to propel INL's (Braga, Portugal) research excellence in the field of layered materials whilst unfolding its potential applications for energy storage and spintronics.
- Partners: **INL - International Iberian Nanotechnology Laboratory, MPG – Max Planck Institute of Microstructure Physics and ALBA**
- Running from Jan 2023 to Jan 2026 with a total budget of 1.5 M€.
- ALBA is leader of the WP3 “Strengthening Research Management Capacities and Administrative Skills” and of the WP6 “Foundations for Long-term Sustainability” and contributes to the other 6 WPs, remarkably WP5 “Joint Research Activities”.



Kick-off meeting at INL on January 2023

LEAPS is the largest consortium of analytical facilities world-wide and further expanding its service to an interdisciplinary European user community

19 facilities - **16** institutions - **10** countries

> **300** operating End Stations

> **1.000.000** h beamtime /year
Excellence-driven access free of charge

> **5.000** publications/year

> **15** spin off companies

> **35.000** users from all EU & beyond
researchers from all research area



Construction and Operation (~ 800 M€/year) through national funding

“LEAPS meets” - biannual conference series

LEAPS meets
Quantum Technology
Elba, 15-19 May 2022



<https://agenda.infn.it/event/19730/>

LEAPS meets
Life Sciences
Elba, 14-18 May 2023



<https://agenda.infn.it/event/33026/>

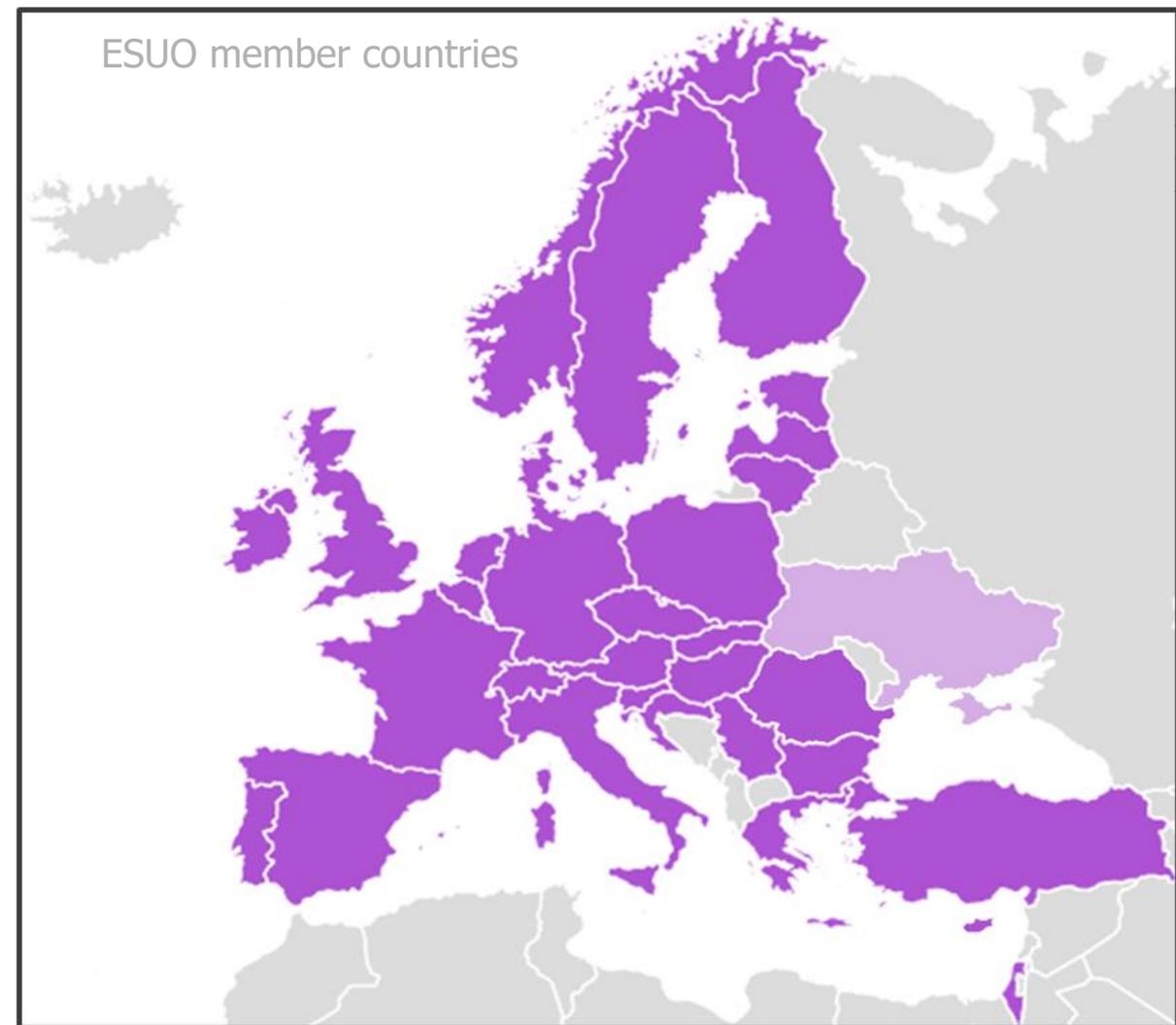


The European Synchrotron and Free Electron Laser User Organisation, ESUO

Discussion on the formation of a Portuguese Synchrotron and FEL Users Association

Bárbara Machado Calisto (LEAPS/ALBA)
João Pedro Oliveira (UNL-FCT, ESUO delegate)

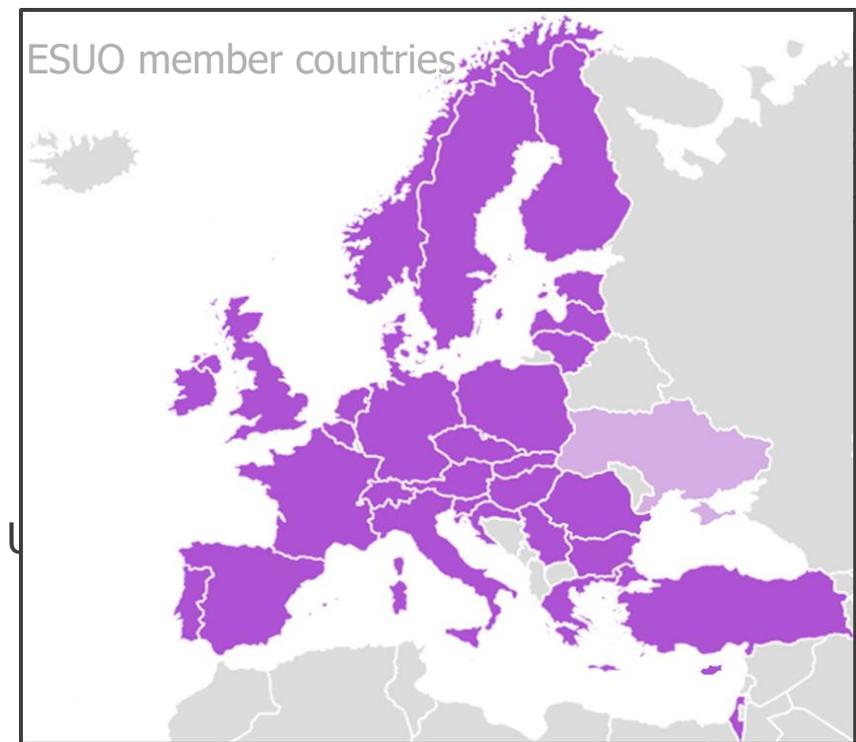
esuo.sr.fels@gmail.com





ESUO: a brief introduction

- ESUO was established in 2010 to represent all European photon science users*.
- Today, ESUO represents ~35,000 users of the European Synchrotron (SR) and Free Electron Laser (FEL) facilities.
- **Users of 31 nations** from European member states, EU candidate and associated countries are represented by ~50 ESUO national delegates from National and Facility User Organisations (NUOs/FUOs).
- Executive Board of 8 is elected from the national delegates with rules for national diversity, SR/FEL representation, and gender.
- ESUO is a fully registered non-profit international organization (AISBL) under Belgian law since September 2021.
- **ESUO is a strategic partner of LEAPS since 2020.**
- ESUO receives administrative support from LEAPS, & for its General Assembly meetings.
- **ESUO supports establishment of National User Organizations (NUOs)**



- **31 nations, Romania in 2022 and now Ukraine as an observer.**
- New NUOs in Greece, Romania, Netherlands as of 2022

*U. Pietsch and M. J. Cooper, [J. Synchrotron Rad. \(2010\) 17, 428-429.](#)



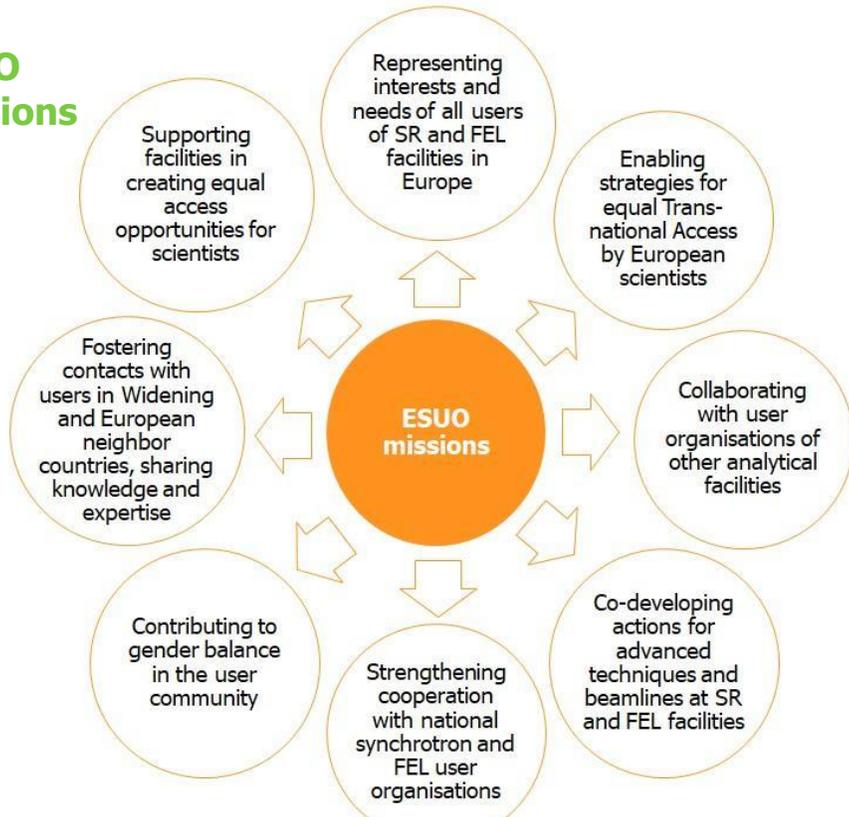
ESUO Executive Board

President and Executive Board (September 2022)

- **Cormac McGuinness (IE)** [Trinity College Dublin], **President**
- **Bridget Murphy (DE)** [Kiel University, Germany], **Vice President**
- **Carla Bittencourt (BE)** [University of Mons], **Treasurer**
- **Derek Logan (SE)** [University of Lund], **Secretary**
- **Tom Hase (UK)** [University of Warwick]
- **Rainer Lechner (AT)** [Montanuniversität Leoben]
- **Moniek Tromp (NL)** [University of Groningen]
- **Wojciech Gawelda** [IMDEA, Universidad Autonoma de Madrid]



ESUO Missions



ESUO vision

Is to support a thriving (European) Synchrotron and FEL user community with **equal opportunities of access** and participation for all scientists based solely on the **scientific merit** of their ideas.

- Promote Trans-national Access (TNA) to Facilities and European Commission
- Lobbying to support elimination of geographic or financial barriers in user participation, with as simple an access model as practicable.



ESUO: access for all users



Demand for TNA programme from National User Delegates and NUOs remains:

- Summarised in state of 'access' and facility membership maps [as of 2022]
- Curiosity-driven TNA remains important and is complementary to challenge-driven access

Financial Support for User Access

National Access Only ■

Limited International Access ■

National & International ■

No Access Funds ■

Support for Portuguese user access to ALBA has now ceased.

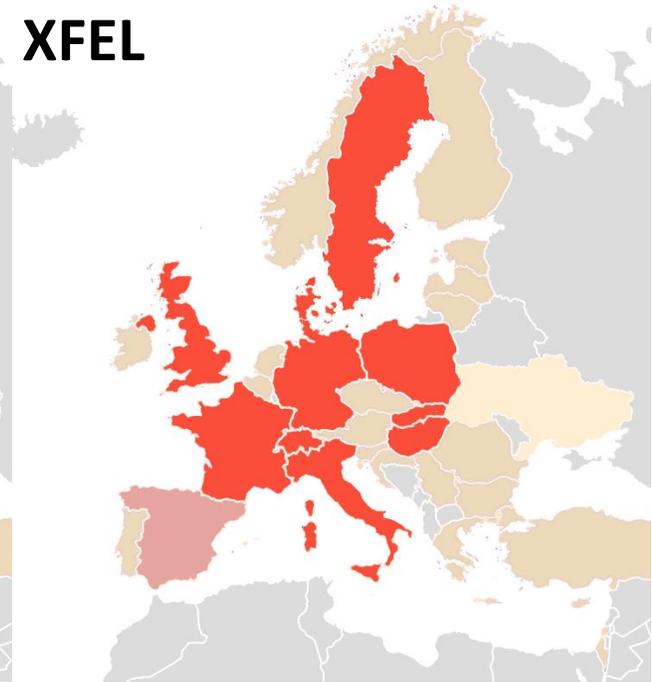


ESRF



CZ and SK leaving

XFEL



ES rated likely to join

Other access programs: NFFA, CERIC-ERIC, ReMade@ARI

Facilities Funding International Access at similar TNA levels to CALIPSOplus ⊙ [Diamond & ELETTRA]



ESUO: access for all users

Demand for TNA programme from National User Delegates and NUOs remains:

- Summarised in state of 'access' and facility membership maps. [As of 2022]
- Curiosity-driven TNA remains important – complementary to challenge driven access.

How important was EU-funded TNA for access to facilities?

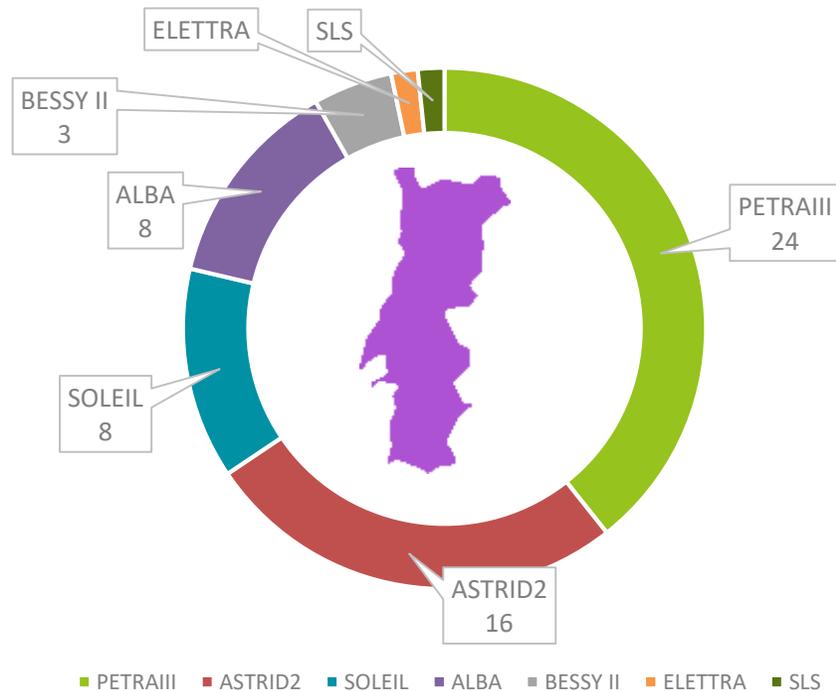
- **CALIPSOplus** (2017-2021) provided TNA funding to **~3600 user visits by 2630 individuals** (over 4.5 yrs), **provided 40,000 h/year of user access**
- **5% of all annual user access in LEAPS had been TNA funded via CALIPSOplus.**
- **User visits funded with CALIPSOplus TNA were ~12.5% of all "cross-border visits" in a given year.**
- **Impact on user access for non-facility countries**



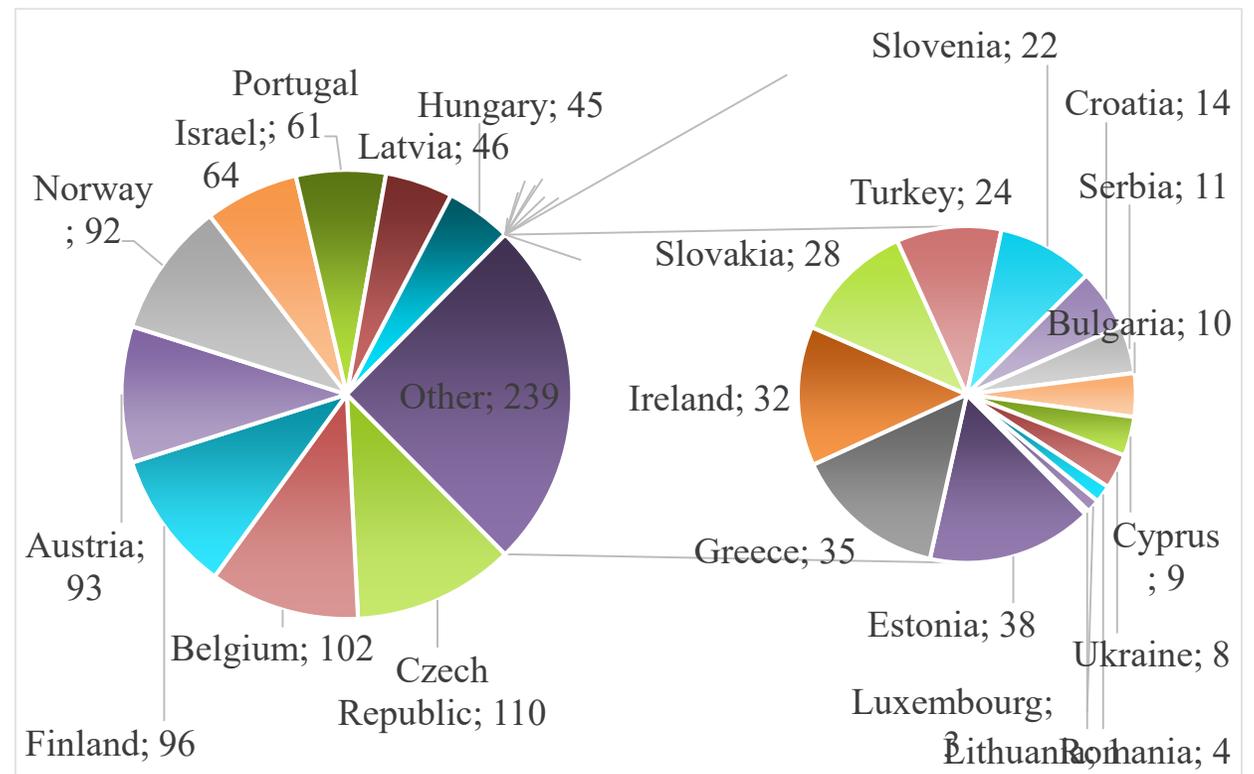
TNA support for Portuguese Users under CALIPSOplus (2017-2021)

- CALIPSOplus provided **TNA support to 61 Portuguese user visits by 40 users to 7 facilities** (PETRAIII, ASTRID2, SOLEIL, ALBA, BESSY II, ELETTRA and SLS)
- This does not include other funded access to e.g. ESRF or ALBA under agreements, or self-funding of access)

Destinations of Portuguese users receiving TNA



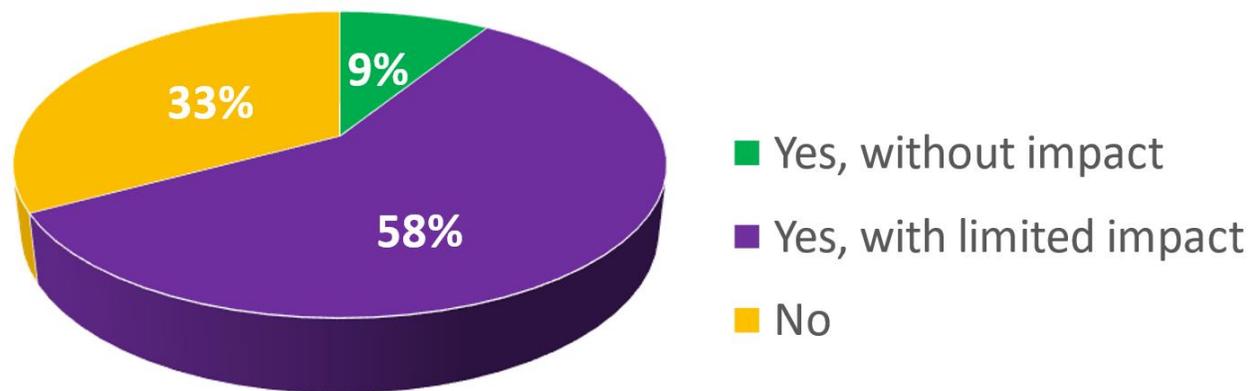
Other non-facility countries users receiving TNA





Selection of comments from the ESUO user survey on the impact of the lack of TNA to the question:

In the absence of TNA funding support will you still be able to visit synchrotron and FEL facilities in order to conduct your research if in receipt of a granted beamtime?



Observations:

- 33% of respondents state they will not be able to visit the synchrotron or FEL.
- **91% are affected.** 58% indicate impact and detail a significant impact through comments.

IMPACT BEST REVEALED IN COMMENTS

Expected drastic effect of the absence of TNA on the visits and participation at SR/FELs by those who need it most.



Selection of comments from Portuguese users:

In the absence of TNA funding support will you still be able to visit synchrotron and FEL facilities in order to conduct your research if in receipt of a granted beamtime?

HALF OF PORTUGUESE RESPONDENTS SAID “NO”.

ALL INDICATED SIGNIFICANT NEGATIVE IMPACT OF ABSENCE OF TNA FUNDING.

Selected comments:

- Expenses for a number of users are usually unaffordable with the current funded projects
- Funds are scarce and TNA was paramount for assessing ALBA.
- This will imply reducing the number of trips to the synchrotron, as the meager research grants from our national funding agency had a success rate of ~5% for the last 2 calls...
- Currently I have limited funding for traveling to synchrotron radiation sources - this will impact on training of young researchers
- Most of the funding sources I have do not consider the costs for travelling to and staying at ALBA as eligible.
- Depends on the financed project. My most recent one got a budget cut exactly on the traveling expenses to infrastructures.
- The number of visits and the number of participating scientists will be reduced, as the current grants do not fully cover these costs.
- Limited funds in my institution for traveling
- We have limited funds and we will have to find alternative funding to continue trips. We will prefer to visit ESRF, which is already funded by our national funding agency.
- Funding support is crucial for us to be able to go to Alba synchrotron.
- No alternative funding available



Selection of comments from Portuguese users:

If you are the principal or lead investigator of a granted beamtime, would younger researchers of the team be affected?

**HALF OF PORTUGUESE RESPONDENTS SAID “NO” TO THE FIRST QUESTION
ALL INDICATED SIGNIFICANT NEGATIVE IMPACT ON YOUNGER RESEARCHERS**

Selected comments:

- No money, no experiments!
- No funds, no travels; no travel, no data; no data, no structures; no structures, no papers; no papers, no funding.
- Less young researchers will travel and they will do so less often, as the existing funding is not enough to cover the expenses of this essential training tool at the current rate.
- Currently I have limited funding for traveling to synchrotron radiation sources - this will impact on training of young researchers
- We will have to limit the number of team member to to 2 persons - lead investigator and 1 experienced collaborator.
- Most beam time usage is presently remote; however, it is desirable that, at least once in their PhDs, a true visit to the infrastructures is made possible.
- They will be the ones more seriously impacted by a reduction in the number of visits and scientists, which will translate into poorer training.
- Students or young researchers have very limited resources for traveling
- Again the funding is limited and we will prefer to send only experienced users instead.
- Young researchers do not have financial support of other sources to cover expenses.
- No alternative funding available



NEPHEWS

Neutrons and Photons Elevating Worldwide Science



Trans-national access regardless of user location

HORIZON-INFRA-2023-SERV-01-03: "RI services advancing frontier knowledge: co-fund pilots

NEPHEWS Core & Goal:

1. Neutron and photon communities working together for curiosity driven TNA programme for users of European PaN RI
 2. Dedicated measures to outreach to Widening countries and Africa
 3. The key role of ESUO and ENSA; user-to-user approach
- Supervisory Board composed of ENSA and ESUO national delegates
 - User twinning as a main "training tool" (new users joining experienced users)
 - Involvement of national delegates in outreach and training activities



ESUO and ENSA would like to thank SOLARIS as coordinator, and all of LEAPS, and of LENS, in helping answer the HORIZON-INFRA-2023-SERV-01-03 call via NEPHEWS. Thanks to all those who have contributed, but particularly Michał Młynarczyk, and Piotr Piwowarczyk of SOLARIS for their work.

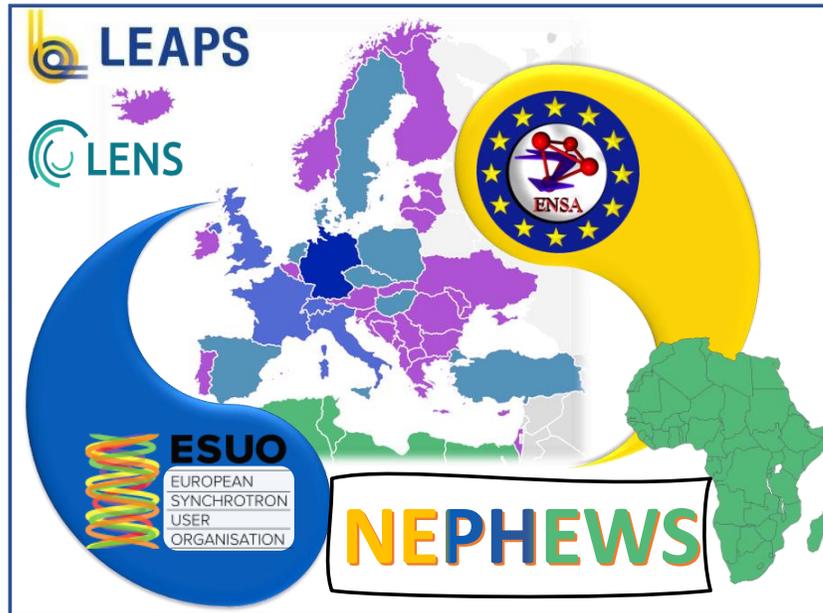
Cormac McGuinness, President ESUO
Bridget Murphy, Vice-President ESUO

Henrik Rønnow, Chair ENSA
Lambert van Eijck, Vice-Chair ENSA

ESUO and ENSA would also like to acknowledge the support of Trinity College Dublin and the Provost, Prof. Linda Doyle



NEPHEWS Consortium – 21 Photon and Neutron RIs



NEPHEWS:

- Resources for curiosity-driven TNA will be available in NEPHEWS (if funded).
- Neutron and photon communities working together!
- Dedicated measures to outreach to Widening countries and Africa.
- Emphasis on Widening countries and non-facility countries for Twinning and Early-Stage Researcher supports.
- BUT** ultimately less funds than in CALIPSOplus

NEPHEWS in numbers

	FELs	Neutron RIs	Synchrotrons	TOTAL
Number of facilities	6	6	9	21
TNA provision (hours)	3 890	7 800	26 600	38 290
Experiments supported	79	95	277	451
Users supported on site	152	162	476	790
Value of beamtime provided (eur)	3 583 100	539 600	11 369 648	15 492 348
Number of twinned users	24	84	28	136
# ESRs supported	4	6	14	24



ESUO: message from the Executive Board

ESUO Vision: Is to support a thriving (European) synchrotron and FEL user community with **equal opportunities of access** and participation for all scientists based solely on the **scientific merit** of their ideas

“One of ESUO's aims is to promote the **establishment of National User Organizations (NUOs)**”

NUOs can help support national communities in their seeking to access national funds for their users access to these European research infrastructures, and ESUO can support them in this through their central interactions with LEAPS.

The NEPHEWS proposal if funded is intended to help deliver on that, but ESUO recognizes that this must also occur independently of that action.

ESUO suggests the formation of ENURS should be a priority for the community in Portugal!”

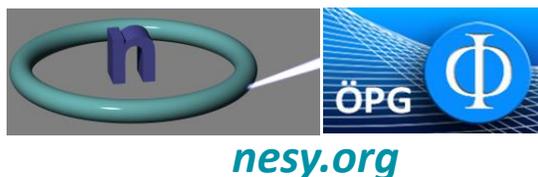
- *Cormac McGuinness, ESUO President*



List of NUOs across Europe working with ESUO



AUSTRIA



BELGIUM



CZECH REPUBLIC

Informal Synchrotron section within the Czech and Slovak Crystallography Association (CSCA), www.xray.cz

DENMARK



ESTONIA



FINLAND



FRANCE



GERMANY



GREECE

Informal Greek Synchrotron Users Network (GrSUN)

HUNGARY

Hungarian Synchrotron Committee (of the Hungarian Academy of Sciences (HAS))

POLAND



IRELAND

Irish Synchrotron, Free Electron Laser & Neutron Facility Users Organisation

ISRAEL



ITALY



LATVIA



NETHERLANDS

Dutch User organisation for Accelerator-based Light Sources

ROMANIA

Romanian Synchrotron User Organisation

SERBIA



SLOVENIA



SPAIN



SWEDEN

Swedish Synchrotron User Organisation

SWITZERLAND

JUSAP, PSI Users Organisation

TURKEY



UK

Diamond Users Committee