LEAPS League of European Accelerator-based Photon Sources

LEAPS, an European asset

Caterina Biscari
ALBA Synchrotron
LEAPS Chair

21 October 2021

LEAPS

League of European Accelerator-based Photon Sources

19 facilities - 16 institutions - 10 countries

+35000 users from all EU & beyond

+300 operating End Stations

+25000 publications In last 5 years

offering +800000 h/year

Associate: SESAME (Jordan)
Partners: ESUO, LENS, CLS

LEAPS League of European Accelerator-based Photon Sources

Vision

A world where European science is a **catalyst for solving global challenges**, a key driver for competitiveness and a compelling force for **closer integration and peace** through scientific collaboration.

Mission

LEAPS use **the power of its combined voice** to ensure that member light source facilities continue to be world - leading, to act as a powerful tool for the development and integration of skills with a view to address 21st century global challenges, and to consolidate Europe's leadership in the field.

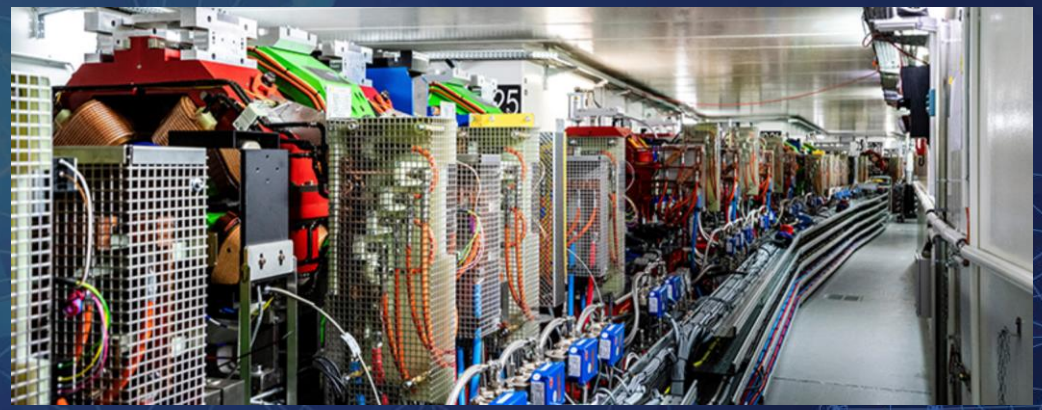
World leadership in technologies

At the front end of synchrotrons and FELs technologies

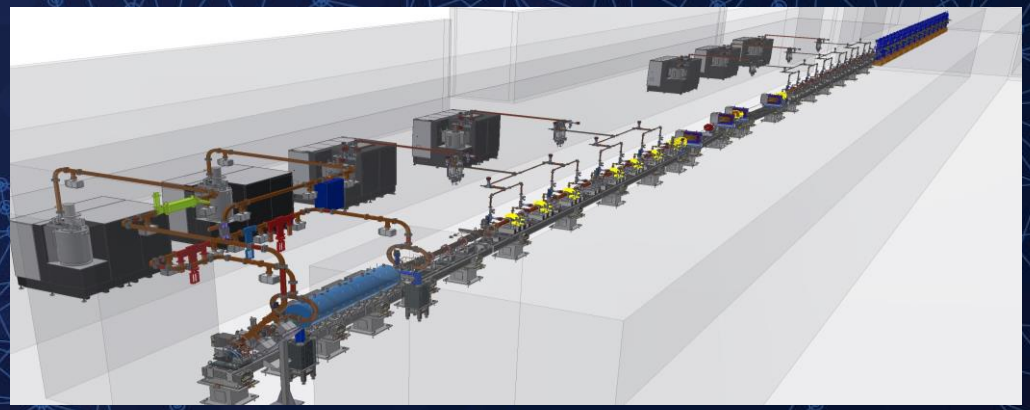
MaX IV, the first 4th gen Synchrotron

EuXFEL the highest energy FEL

ESRF-EBS, the first upgraded from 3rd to 4th



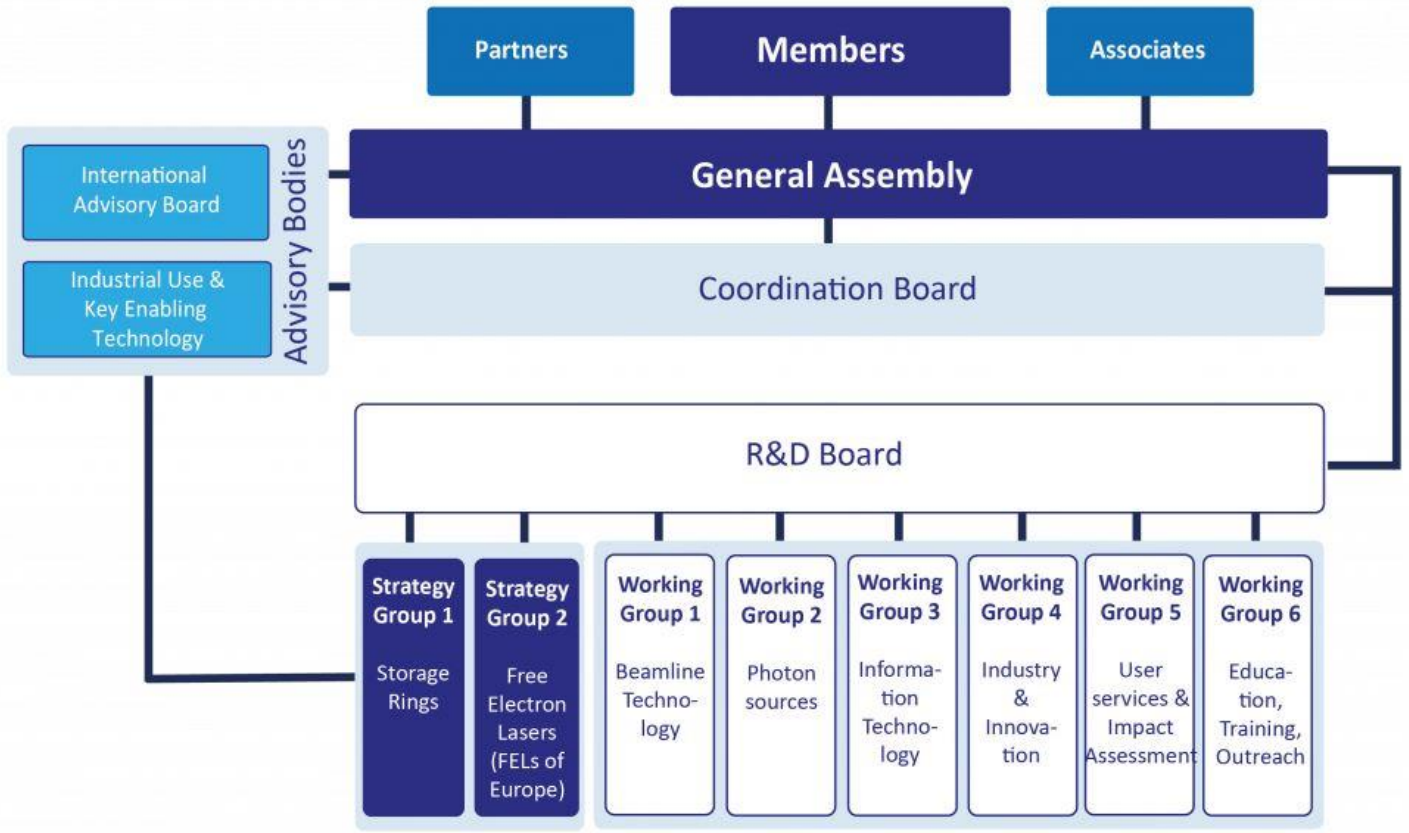
EuPRAXIA - in construction, LNF



Its example followed all over the world. @ LEAPS: Alba, BESSY II, Diamond, Elettra, Petra III, Soleil, SLS

the 1st plasma acceleration based FEL facility, based on H2020 EU design study

LEAPS organization



LEAPS chairs

(Present/past/incoming)

General Assembly
Caterina Biscari (ALBA)
Helmut Dosch (DESY)
Lenny Rivkin (PSI)

Coordination Board
Gastón García (CMAM-UAM)
Rafael Abela (PSI)
Ute Krell (DESY)

TASK FORCES
- *ESUO*
- *IDEA- Inclusion, Diversity, Equity and Anti-discrimination*
- *Internal project funding*
- *LEAPS positioning on the ERA*
- *Strategic Access*

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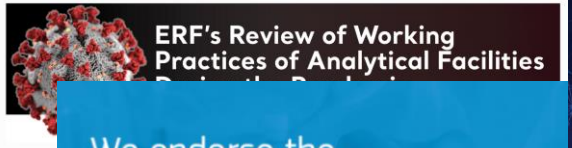
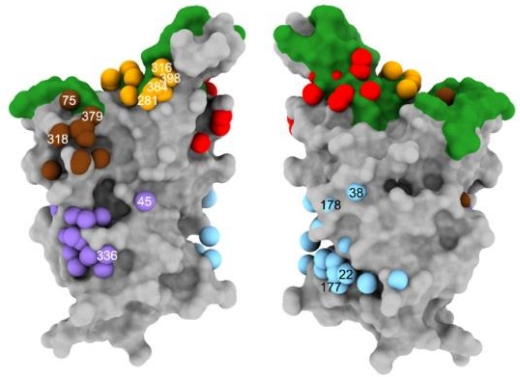
LEAPS, providing solutions for the pandemic

*Dedicated **fast track access mode** on almost all LEAPS facilities, addressed to Academy and Industry from the very first moment, compatibly with each country pandemic conditions*

See Tim Salditt and Dave Stuart talks, in today Session 2

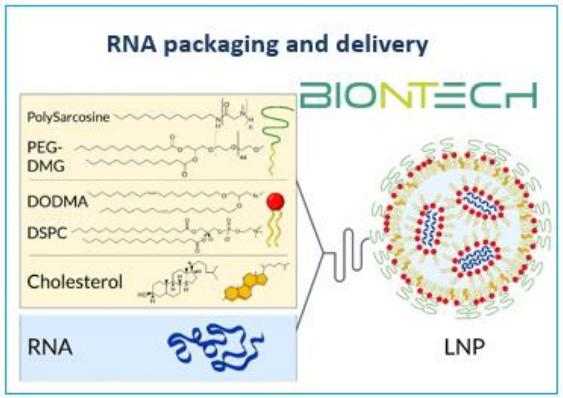
ERF's Review of Working Practices of Analytical Facilities During the Pandemic





Academy

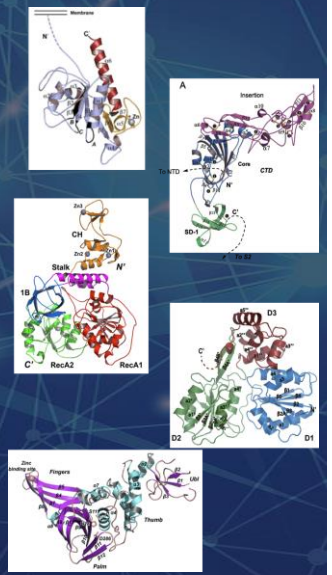
https://doi.org/10.1016/j.cell.2021.02.032



Industry

Developing the new generation of mRNA vaccines with enhanced transfection efficiency and overall effectiveness of the vaccine.

EMBL DESY.



https://leaps-initiative.eu/leaps-and-covid-19-one-year-later/

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LEAPS, providing solutions for facility operation in the pandemic and bridging it to the future

Safety first
Teleworking conditions ensured for all staff
Operation with safe conditions, closing when unavoidable

Beam availability and mean time to recover had not been significantly affected by the pandemic.

From WOP (Workshop on Operation for Facilities)
Control rooms the safest place in each facility
Able to operate whenever the national rules in each country allowed for it.

Developing on the fly operation modes
New user services for substituting user presence at facilities

Remote access **Mail-in sample**

Remote operation will stay, combined with **digital twinning** and **AI** to enable more efficiency and resilient operation of our facilities

See DIGITAL LEAPS

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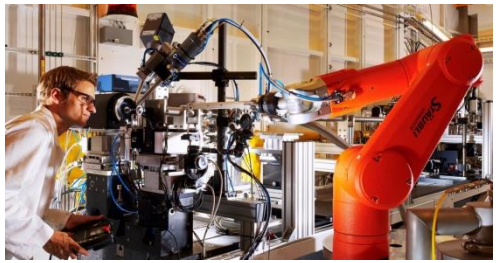
Digital LEAPS

From 2020 idea to 2021 pillar proposals



Users
Training
Green operation

Stretegic elements for a transition to a green DIGITAL LEAPS

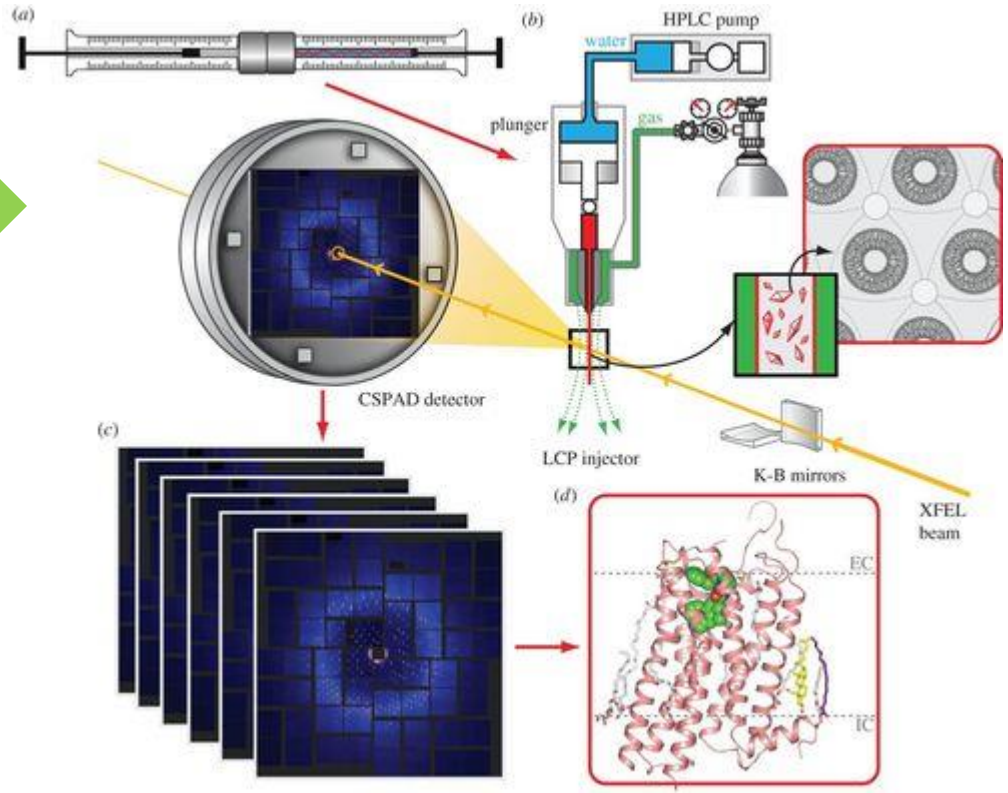
- Remote User Operation
- Digital Communication
- Digital Training
- Resilient & energy saving operation
- AI-assisted molecular infection fight
- Advanced materials for digital transformation & circular economy

DIGITAL LEAPS pillars

STARS | HR⁴ | LIP

Impact to ERA and societal challenges

LEAPS facilities become more resilient and more green & serve better the scope of European Green Deal and resilience to future pandamics & serve Missions of Horizon Europe



See next talk by Michele Svandrlik

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example

LEAPS High-impact on INDUSTRIAL developments for the societal challenges

Light Source infrastructures are ideal tools for industrial battery research and innovation

Exceptionally high-level engagement with battery stakeholders

directly and via European funded programs across the LEAPS facilities (some highlights are shown)

LONG-TERM COMMITMENT

Johnson Matthey
Inspiring science, enhancing life

Co-sited high-end analytical microscopes at **Diamond** and co-funded three positions with each of the large scale facilities at Harwell, increasing collaboration

JOINT RESEARCH

Johnson Matthey
Inspiring science, enhancing life

umicore

"InnovaXN" Marie Sklodowska Curie PhD program at **ESRF** and ILL has many battery related projects including two driven by Umicore and Johnson Matthey

FACILITY EXPLOITATION

umicore

Using **ALBA** beamlines for advanced characterization of new cathode materials for new generation efficient batteries

EUROPEAN FUNDING

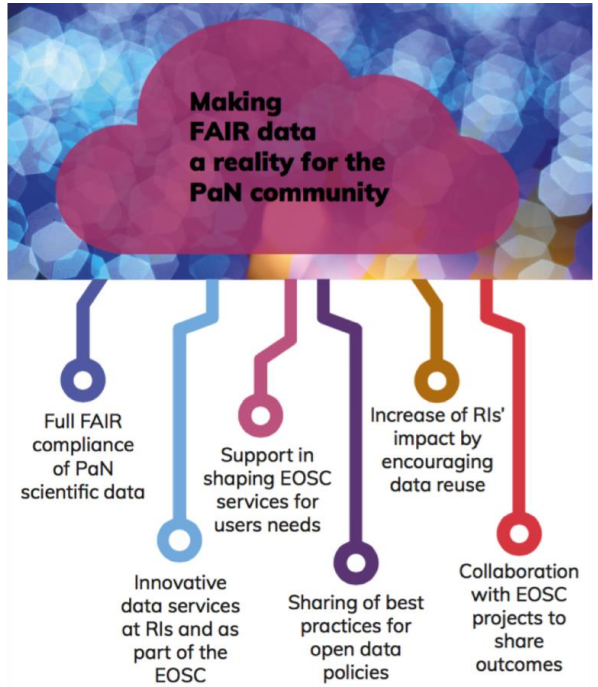
BATTERY 2030+

TEESMAT

BIG-MAP

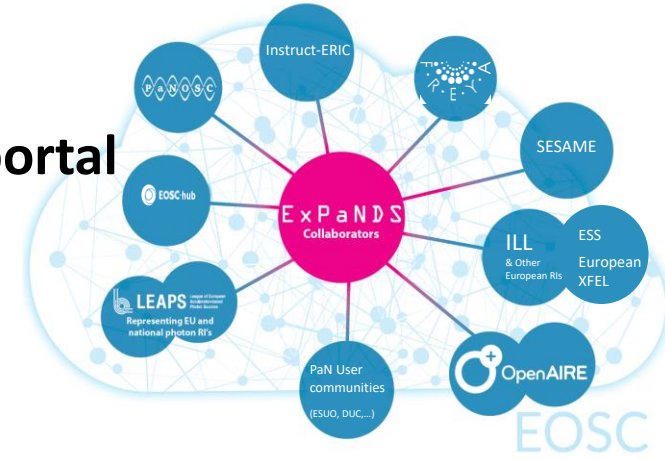
Strategic engagement with battery stakeholders and industry actors at European level partnerships and applied research programs for challenge-driven research

LEAPS and its data



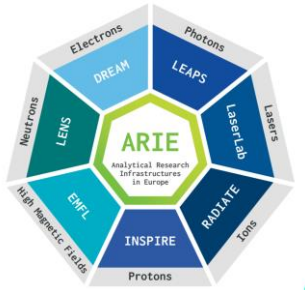
PaNOSC and ExPaNDS – on going projects (H2020) with large participation from LEAPS (and LENS) members

- ✓ **Most of the LEAPS facilities have interest in adopting the outcomes and many are already being adopted**
- ✓ More useful tools: **FAIR data policy, DMPs, Nexus HDF5, DOIs and Open data portal**
- ✓ **Debating details on common open data portal**

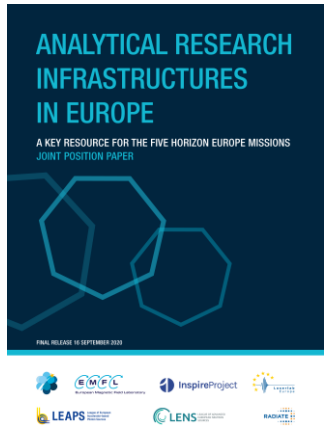


See Andy Gotz and Patrick Furhmann talks, in today Session 2

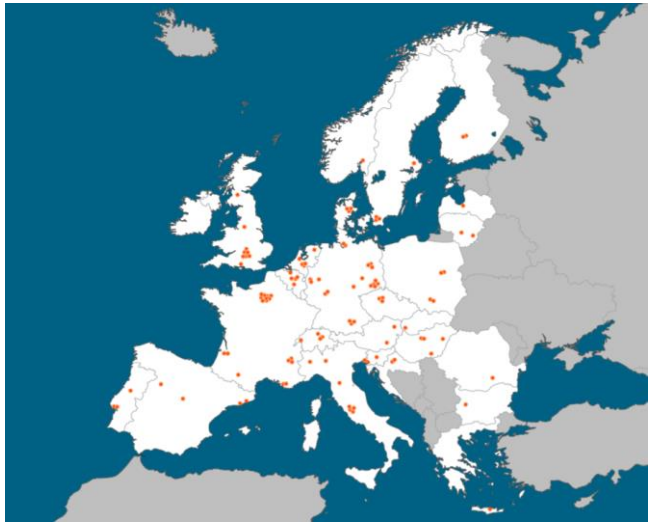
ARIE, boosting complementarity of European Analytical RIs



- Seven networks
- Enhanced communication among facilities
- Optimizing the RI answers to EC calls opportunities
- Preparing to open combined user platforms
- Further developing the existing collaborations



More than 120 European RIs

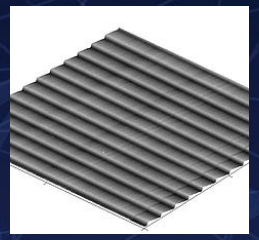


ARIE Board
Caterina Biscari (LEAPS)
Rafal Dunin-Borkowski (eDREAM – 2021 chair)
Stefan Facsko (RADIATE)
Karen Kirkby (INSPIRE)
Helmut Schober (LENS)
Claes-Göran Wahlstrom (Laserlab-Europe)
Jochen Wosnitza (EMFL)

Complementary
Multi-scale
Multi-modal


ARIE's complementary characterisation capabilities provide a unique vision into materials and living matter
Chemical sensitivity
Map chemistry
Fast time resolution
Watch high speed changes in real time
High spatial resolution
See the fine details
Smart access modes
Mail-in, remote control, industrial support…
In situ
Study real systems under real conditions
Magnetic sensitivity
See quantum effects
Extreme conditions
To explore and create new materials
Non-destructive
Preserve valuable samples
COMPLEMENTARY MULTI-SCALE MULTI-MODAL

Contributing to H2020 programs

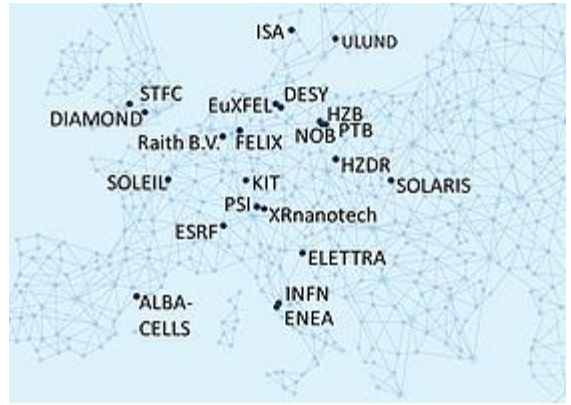


LEAPS-INNOV

Open innovation for accelerator-based light sources in Europe

Learn More

LEAPS INNOVATION



WPs

- **Project Management and Dissemination**
- **Development of High Throughput X-ray Spectroscopy Detector System**
- **SuperFlat, mirrors and grating substrates**
- **NeXtgrating, diffraction gratings**
- **New positioning and scanning systems for speed and accuracy**
- **LIDs, Insertion Devices**
- **Data Reduction and Compression**
- **Industrial Innovation through Light Sources**
- **Innovation by Co-creation towards Global Challenges**

Budget: *10m €, add. 8.3m € own contr.*
Timeline: *4 years (Apr 1, 2021 – Mar 31, 2025)*
Coordinator: *DESY*

To develop a LEAPS strategy for sustainable industry partnership

Kick-off annual meeting f2f
Barcelona 3-5 May 2022

This project has received funding from the European Union´s Horizon 2020 research and innovation programme under grant agreement No. 101004728

Visit https://www.leaps-innov.eu/

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Contributing to HE programs

Proposals presented by consortia which include
- LEAPS
- LEAPS + some ARIE Network
- LEAPS + all ARIE Networks and Industries

- **INFRA-2021-SERV-01-04**
- **INFRA-2021-TECH-01-01**
- **INFRA-2021-DEV-01-03**

Preparing the technological development proposals for **INFRA-2022-Tech-01-01**

LEAPS League of European Accelerator-based Photon Sources

ESUO News

from Ullrich Pietsch, Cormac McGuinness (former and new ESUO chairs)

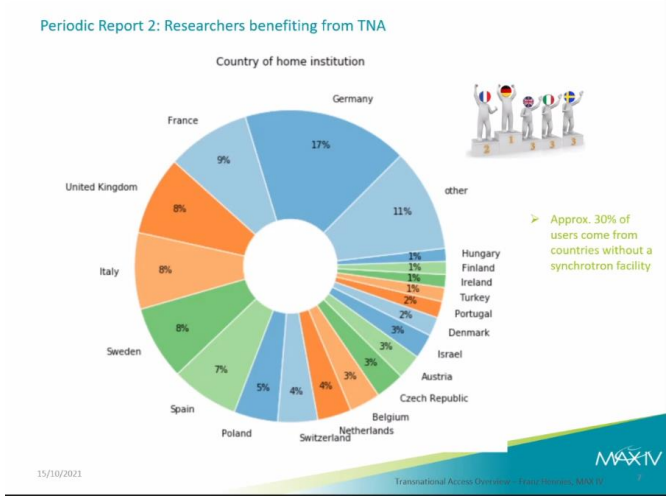
Nov 2020: ESUO as LEAPS Strategic Partner
Nov 2020: ESUO Statutes approved
July 2021: ESUO as a legal entity, AISBL

- Participation in all LEAPS WGs, with special attention to WG5, WG6
- Strategic lines for future activities → strong focus on continuation of TNA
- Review of the CALIPSOplus final meeting last week → discussion of new options to continue TNA
- First review on ESUO questionnaire about *Possible impacts of the absence of TNA funding support for the user community* → extended deadline for feedback until Feb 2022

Some preliminary answer (only few hundreds users). In the absence of TNA will you still be able to visit synchrotron and FEL facilities if in receipt of granted beamtime? Only 10% sees no impact


Handover of the ESUO chair on
16th ESUO GA - 18 & 19 Oct 2021

TNA Overview in CALIPSOplus on going



All countries profit from TNA

ESUO
EUROPEAN SYNCHROTRON AND FEL USER ORGANISATION

LEAPS Declaration

LEAPS aims at supporting TNA on the basis of science-topic-specific HE calls:

The LEAPS Consortium thus aims to:

1) Encourage and facilitate discussion and exchange among its members on issues relevant to the shaping of future science and technology at accelerator-based light sources in a worldwide perspective, and involving as required other organisations which develop enabling technologies for SR and FEL user facilities.
2) Promote a collective strategy across European facilities.
3) Exchange with stakeholders and organisations such as the European Commission in all matters relevant to the development and sustainability of SR and FEL user facilities, with the objective of informing and shaping future policies.
4) Engage with current and new user communities to discuss their respective needs, with

6) Contribute to finding solutions to the Grand Challenges of our societies in Europe and on a world level by strategic cooperation with academic and industrial actors in research projects of high relevance and impact, by opening LEAPS infrastructures for strategic access to large projects and research consortia based on peer-reviewed long-term proposals, guaranteeing highest standards of scientific excellence and compliance with the beamtime access procedures and availability at the concerned LEAPS facilities.

the impact of SR and FEL user facilities in the EU and associated countries and the developments required in order to address the scientific and societal challenges of the future.

8) Develop and periodically update roadmaps and action plans for key technologies.
9) Promote:
   - The standardisation of access procedures in the spirit of the European Charter for Access to Research Infrastructures[1];

On-going: Defining the process

Visit https://leaps-initiative.eu/about/leaps-documents/

LEAPS League of European Accelerator-based Photon Sources

2021: LEAPS IDEA - Inclusion, Diversity, Equity and Antidiscrimination a toolbox of best practices at LEAPS facilities

LEAPS IDEA

LEAPS Statement on Inclusion, Diversity, Equity, and Anti-discrimination (IDEA)

The League of European Accelerator-based Photon Sources (LEAPS) brings together Synchrotron Radiation and Free Electron Laser user facilities in Europe in a strategic consortium that aims to actively and constructively ensure and promote the quality and impact of fundamental, applied and industrial research

biases and greater society.

In order to achieve the goals of inclusion, diversity, equity and anti-discrimination, it is our commitment to provide a range of specific tools, tailored to each of the LEAPS facilities, making them the ideal location for large international, interdisciplinary and intermixed teams to thrive and achieve their highest potential.

LEAPS

LEAPS_IDEA #1

May is European Diversity Month

LEAPS

We are committed to

As a European consortium focusing on scientific excellence, LEAPS is committed to strengthening diversity and is acutely aware of owing its success to the talents, ideas, cooperation, and collective and complementary collaboration of its scientists. The ingredients to this success are respect and fairness, appreciation and openness. Ensuring equity and achieving an inclusive environment, free from discrimination at all levels, is LEAPS's responsibility.

Seminar at the 4th LEAPS Plenary Meeting (21st Oct 2021)

12:40 - 13:30	**Seminar promoted by the LEAPS-IDEA TF**	*Chair: H. Dosch (DESY, LEAPS vice chair)*
12:40	The Science of Inclusion	*S. Estradé (IN2UB and iiEDG, U. Barcelona)*

Visit https://leaps-initiative.eu/leaps-idea/

LEAPS League of European Accelerator-based Photon Sources

LEAPS Conference

1st event on May 2022

Originally organized in 2020, postponed two years looking forward to a f2f meeting at ELBA

LEAPS League of European Accelerator-based Photon Sources

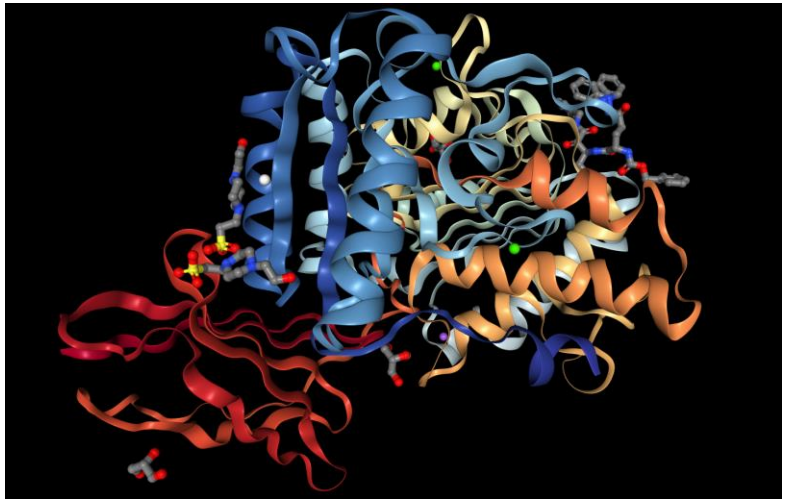
LEAPS meets Quantum Technology

15-21 mayo 2022
Hotel Hermitage, La Biodola Bay, Elba Island, Italy
Europe/Rome timezone

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

2nd event in 2023

LEAPS meets emerging challenges in Life Sciences



European LEAPS Strategy for new ERA

- LEAPS is the sum of great national and international facilities
- LEAPS provides a forum for growing together in a concerted commitment serving the European Research Area
- LEAPS Landscape is in fast evolution thanks to technical advancements, digitalization, open data and open science
- European industry needs LEAPS for its competitiveness to develop
- All Member States researchers benefit from LEAPS instruments
- Panel today devoted to LEAPS Strategy for new ERA
- 2022: European LEAPS Strategy for new ERA

See panel later in the morning

From yesterday internal session of the Plenary Meeting

SG and WG reports

Impressive momentum

Activities contributing to EC programs
- Executing grants, and expanding their reach
- Presented proposals, waiting for evaluation
- Preparing projects for applying to new calls
- Including ARIE networks

Activities aiming at even better service to users
- Common user platforms
- Common data platforms
- Introducing the LEAPS Identity concept for users
- Including ARIE networks

Preparing Internal Projects
- Technological challenges
- Fully advanced concepts

Industry contributing to activities
- As partners in projects
- As users of innovation malls

(i.e. see DIGITAL LEAPS)

Hundreds of people involved
Many more needed

Wednesday, October 20th *LEAPS internal*

9:00 - 9:20	**All LEAPS members**	*Chair: C. Biscari (ALBA, LEAPS chair)*
9:00	Welcome message	*C. Biscari (ALBA, LEAPS chair)*
9:05	Brief overview of RDB activities in 2021	*M. Svandrlik (ELETTRA, LEAPS RDB chair)*
9:20 - 10:40	**Parallel working meetings of SGs and WGs**	*Chair: Spokesperson of each group*
10:40 - 10:45	*Break*	
10:45 - 11:40	**Reports by SGs and WGs spokesperson on ongoing and future activities (5 min each)**	*Chair: L. Rivkin (PSI, LEAPS vice chair)*
11:45 - 11:55	*Break*	
11:55 - 12:40	**Panel discussion on SGs and WGs future activities**	***Moderator:*** *G. García (CMAM/ALBA, LEAPS CB chair)* ***Panelists:*** *A. Taleb (SOLEIL, LEAPS SG1)* *C. Blasetti (ELETTRA, LEAPS WG5)* *D. Spruce (MAX IV, LEAPS WG3)* *L. Rivkin (PSI, LEAPS vice chair)* *M.Calvi (PSI, LEAPS WG2)* *M. Svandrlik (ELETTRA, LEAPS RDB chair)*
12:40 - 13:30	**Seminar promoted by the LEAPS-IDEA TF**	*Chair: H. Dosch (DESY, LEAPS vice chair)*
12:40	The Science of Inclusion	*S. Estradé (IN2UB and iiEDG, U. Barcelona)*
13:25 - 13:30	Closing remarks	*C. Biscari (ALBA, LEAPS chair)*

Transforming the challenges of the last period in opportunities for a brighter future

LEAPS League of European Accelerator-based Photon Sources

Tool for European inclusiveness

“The strength of LEAPS lies in its staff and users, hailing from all European countries, beyond those which host the facilities.”

Tak

Tack

Thanks

Bedankt

Danke

Dziękuję

Merci

Grazie

Gracias

https://leaps-initiative.eu

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