Introduction

Caterina Biscari

ALBA Synchrotron

LEAPS League of European Accelerator-based Photon Sources

Meets Life Sciences

15 – 18 May 2023 – Isola d'Elba

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

at a glance

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

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.

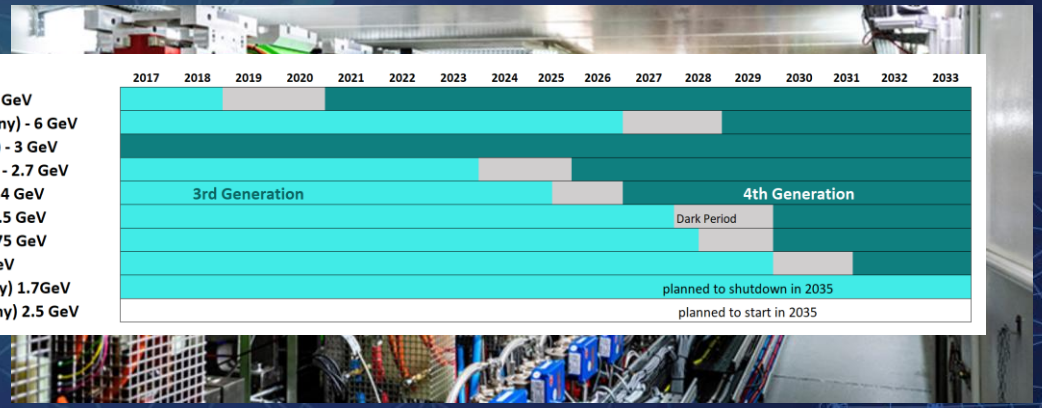
World leadership in technologies

At the front end of synchrotrons and FELs technologies

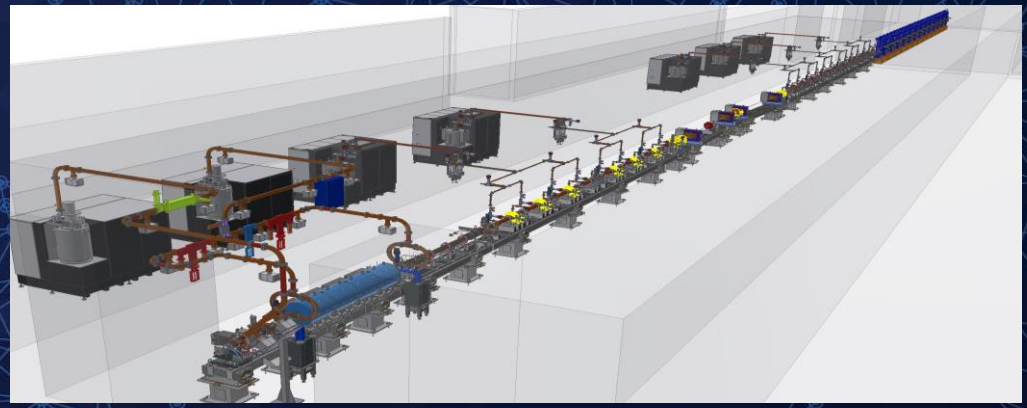
MaX IV, the first 4th gen Synchrotron

EuXFEL the highest energy FEL

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



EuPRAXIA - in construction, LNF



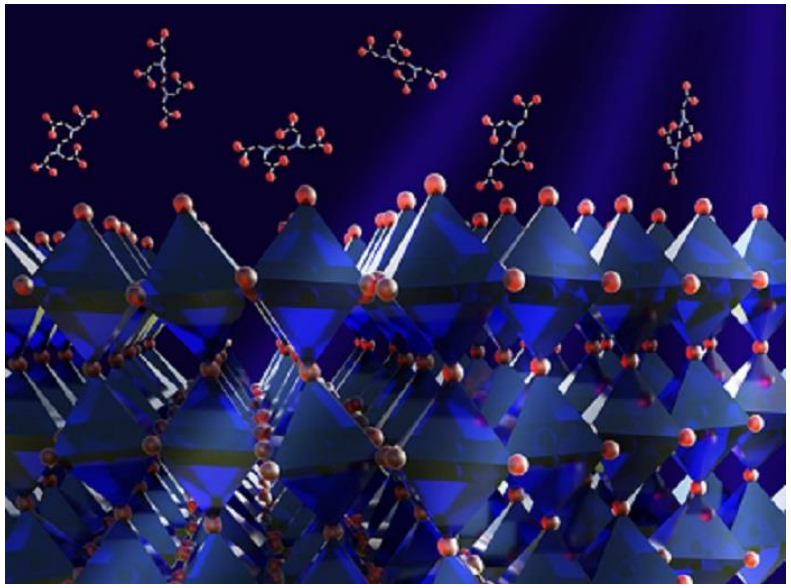
Its example followed all over the world. @ LEAPS: Alba, BESSY II, Diamond, Elettra, Petra III, Soleil, SLS

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

at a glance

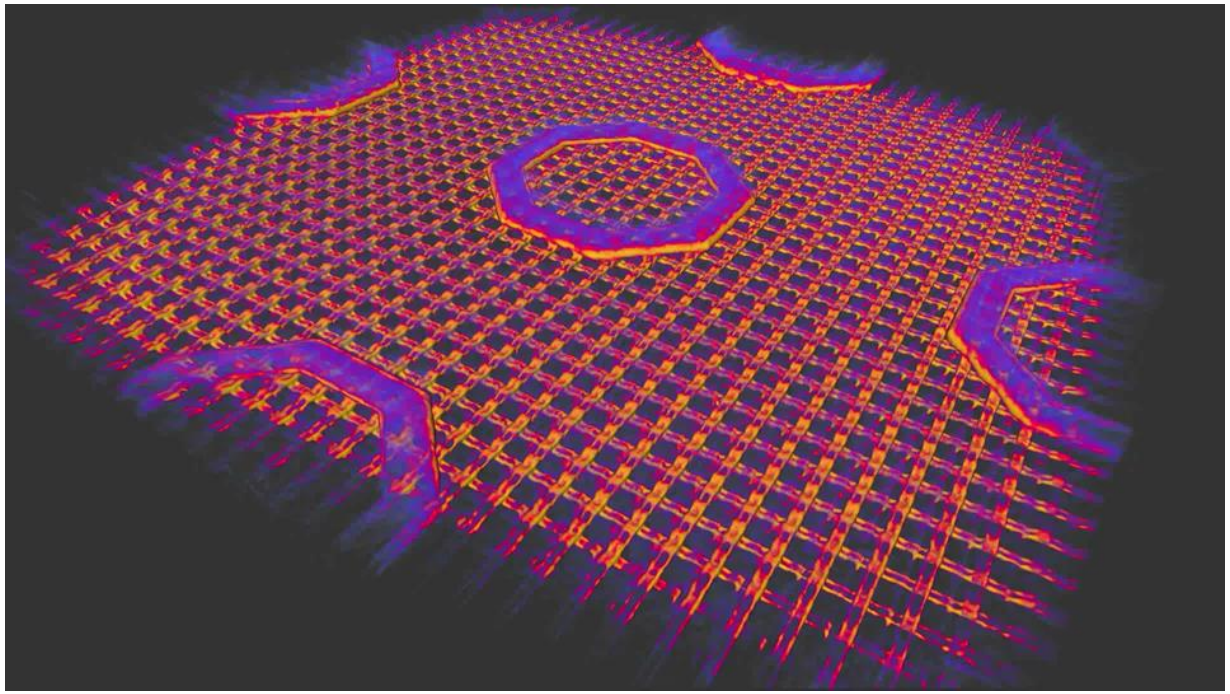
LEAPS provides unique solutions to broad scientific areas
Material science

Electronic and magnetic properties of matter
Quantum materials
Atom and molecule physics
Energy materials
Surface science
Catalysis
Environmental sciences
Information technologies
Cultural Heritage



Perovskite research - Diamond

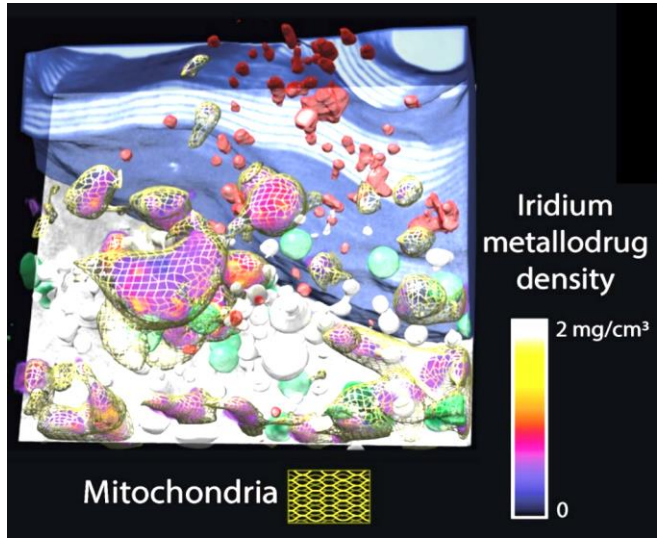
[Microchip Structure - PSI]



Collaboration with research institutions, universities, advanced material industry, strategic projects

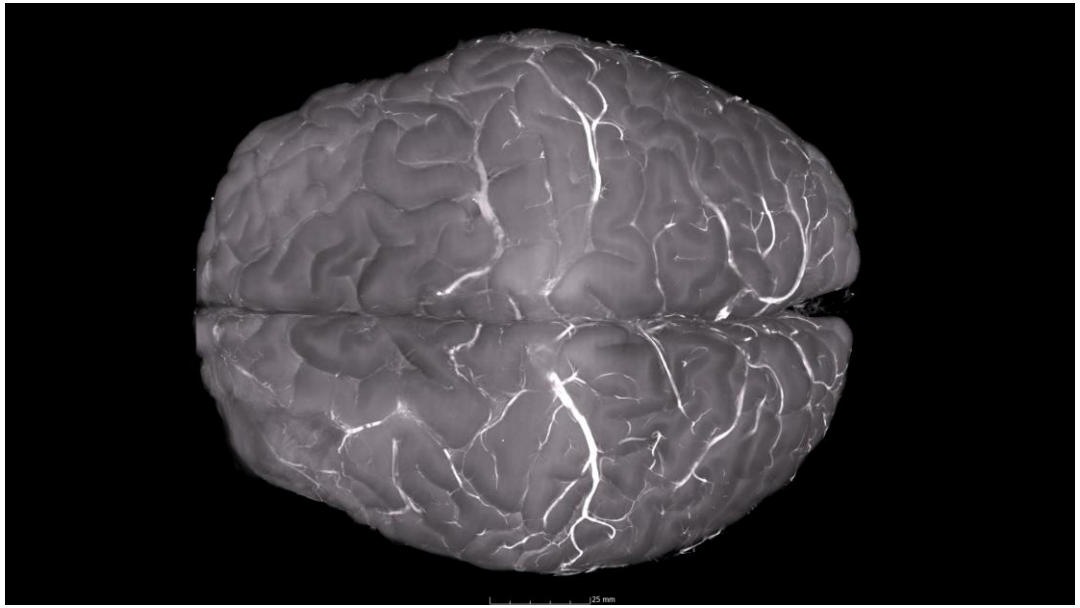
LEAPS provides unique solutions to broad scientific areas
Life Sciences – Health

From proteins, through cells, tissues up to massive high resolution tomography



Credit CNB-CSIC/ALBA/ESRF

Credit ALBA



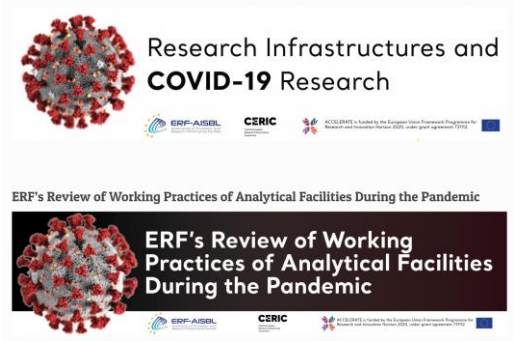
Human Atlas, credit ESRF

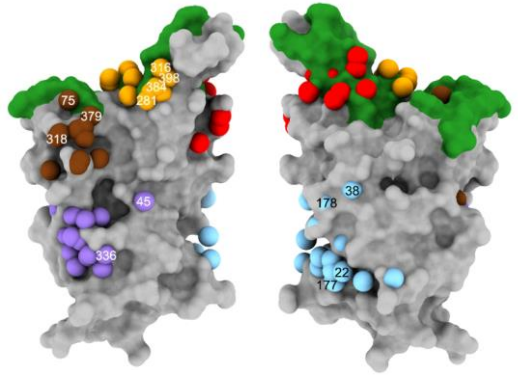
Collaboration with research institutions, universities, medical centers, pharma industry

at a glance

LEAPS providing solutions for the COVID19 pandemic

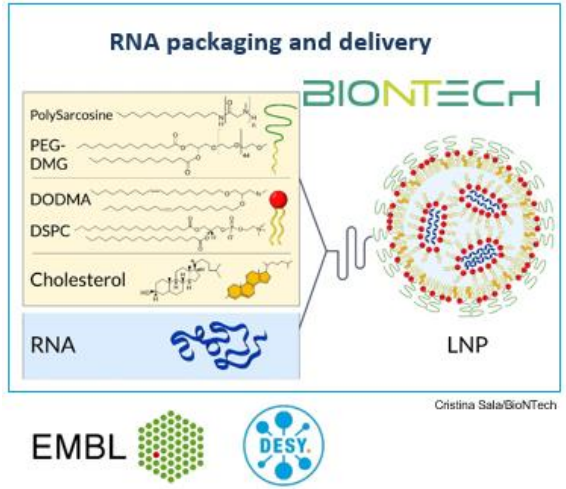
*Dedicated **fast track access mode** on almost all LEAPS facilities, addressed to Academy and Industry from the very first moment, compatibly with each country pandemic conditions*





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

Academy



Industry

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

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

Use case – COVID19

LEAPS USERS

Several facilities
Include TEM centers

LEAPS members joining
EOSC partnership

Academic

Competitive and free access
Public results

Joint academic and industrial

Private

Direct access covering operational costs
Results can be confidential

Timeline

2015-2017	2018 - 2019	2020 - 2021	2022
Kick-off	Organization	Working together	ESAPS

End of 2015: first meeting
Consortium declaration

Launch in Brussels
Organizing the structure
Collaborating teams

Answer to Pandemic => stronger links
On-line event with EU Parliament hosted by Lina Galvez
DIGITAL Leaps as strategic program
H2020 LEAPS INNOV granted – partnering with industry
LEAPS IDEA (Inclusion, Diversity, Equity and Anti-discrimination)
ARIE start-up – fostering complementarity
Participation in HE calls, also with ARIE

ESAPS 2022

Timeline

2015-2017	2018 - 2019	2020 - 2021	2022
Kick-off	Organization	Working together	ESAPS

End of 2015: first meeting
Consortium declaration

Launch in Brussels
Organizing the structure
Collaborating teams

Answer to Pandemic => stronger links
On-line event with EU Parliament hosted by Lina Galvez
DIGITAL Leaps as strategic program
H2020 LEAPS INNOV granted – partnering with industry
LEAPS IDEA (Inclusion, Diversity, Equity and Anti-discrimination)
ARIE start-up – fostering complementarity
Participation in HE calls, also with ARIE

ESAPS 2022

Timeline

2015-2017 Kick-off

2018 - 2019 Organization

2020 - 2021 Working together

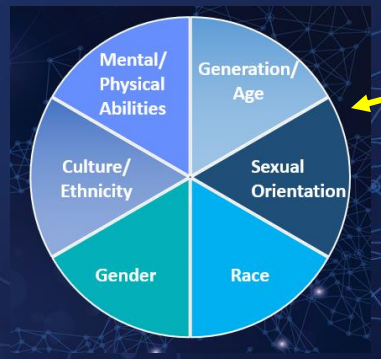
2022 ESAPS

End of 2015: first meeting
Consortium declaration
Launch in Brussels
Organizing the structure
Collaborating teams

Training centers
(ERA priority action 5)
Outreaching to society

DIGITAL LEAPS

LEAPS INNOVATION



ERA priority action 4

Answer to Pandemic => stronger links
On-line event with EU Parliament hosted by Lina Galvez
DIGITAL Leaps as strategic program
H2020 LEAPS INNOV granted – partnering with industry
LEAPS IDEA (Inclusion, Diversity, Equity and Anti-discrimination)
ARIE start-up – fostering complementarity
Participation in HE calls, also with ARIE

ESAPS 2022

Timeline

2015-2017	2018 - 2019	2020 - 2021	2022
Kick-off	Organization	Working together	ESAPS

End of 2015: first meeting
Consortium declaration
Launch in Bruss
Organizing the s
Collaborating te

nic => stronger links
EU Parliament hosted by Lina Galvez
strategic program
OV granted – partnering with industry
sion, Diversity, Equity and Anti-discrimination)
stering complementarity
calls, also with ARIE

ESAPS 2022

LEAPS League of European Accelerator-based Photon Sources

ESAPS2022

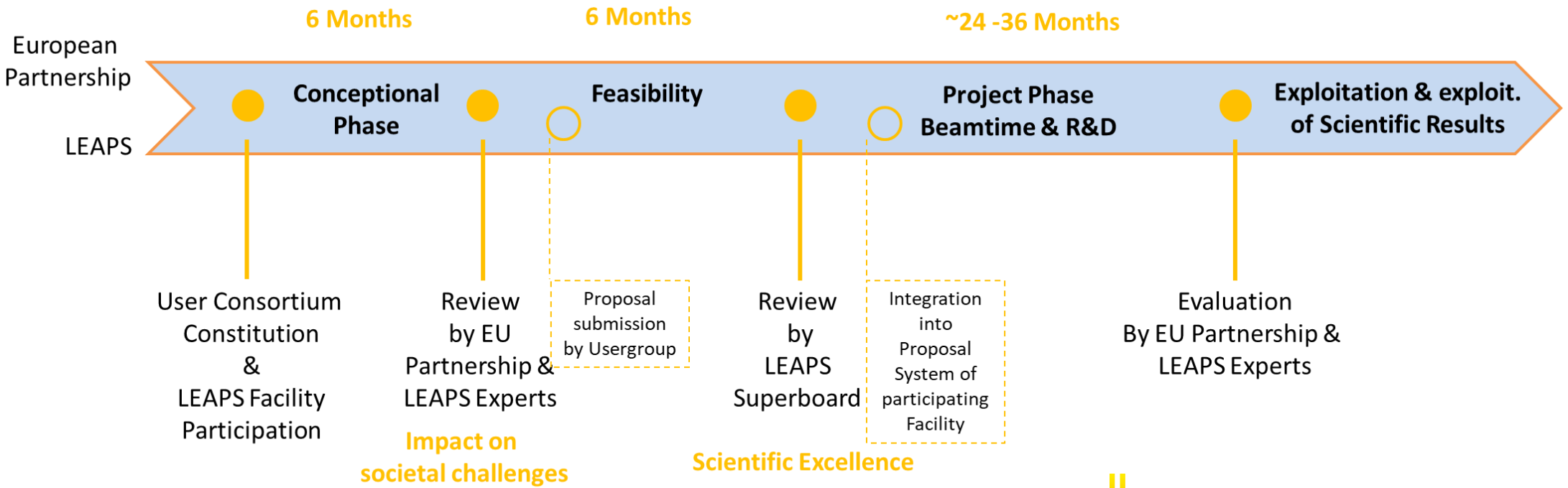
The **European Strategy ESAPS 2022** charts a route into the future that features environmentally friendly technologies and research strategies to **support solving societal challenges** while making a critical contribution to keep Europe at the international forefront of research and development.

ESAPS 2022

- supports high quality scientific research in Europe
- contributes to develop the skills of the next generation of scientists and engineers in Europe
- devises particle accelerators and associated technologies of tomorrow for a wide range of use in manufacturing and service industries in health, materials design, energy and security
- supports European industry in new product development and market and by accelerating product design and development

LEAPS Strategic Access – Challenge Driven Service Provision

Process for developing new services in cooperation with European Commission one of the LEAPS-European Partnership calls (project duration: 2-3 years) together with scientists from an European Partnership (and if applicable from others) aligned by the European Partnership roadmap. Such a project will be submitted to LEAPS for getting access to a set of LEAPS facilities under the „LEAPS Strategic Access Programm“.



Strategic Access

LEAPS League of European Accelerator-based Photon Sources

ESAPS 2022

ESAPS 2022

This new cooperation between RIS and partnerships/missions

requires

A) common understanding on the need
to **bridge Pillar 1** (RIS) and **Pillar 2** (Missions)

B) European funding for targeted access
to support
taylored operando technologies at LEAPS facilities
and
specific operation costs

→ **recommendation: targeted calls in HE**

European Commission

LEAPS League of European Accelerator-based Photon Sources

“LEAPS meets” - biannual conference series

Conference series

LEAPS meets Quantum Technology

Elba, 15-19 May 2022

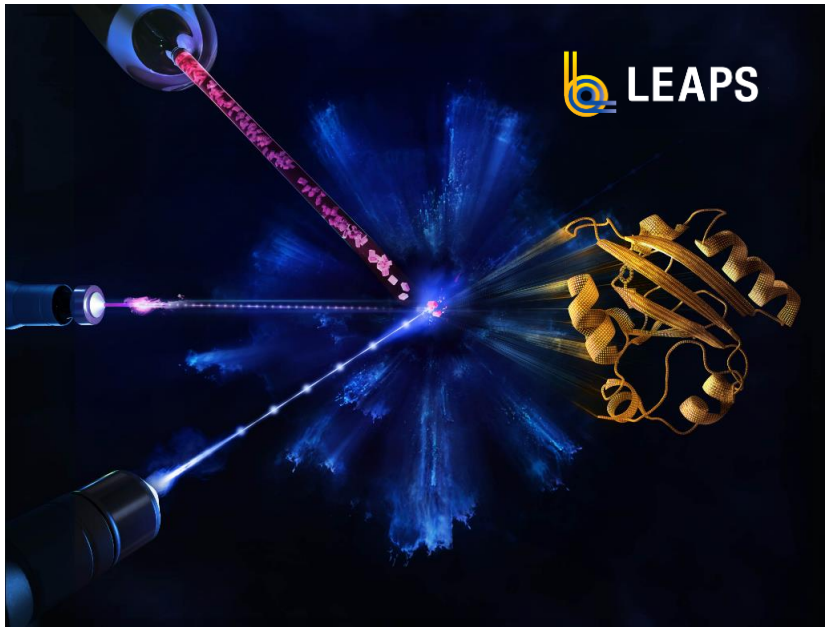
https://agenda.infn.it/event/19730/

Today

May 2023

LEAPS meets Life Sciences

Elba, 14-18 May 2023



LEAPS League of European Accelerator-based Photon Sources

LEAPS meets Life Sciences conference

14-19th May 2023, La Biodola, Elba, Italy

Conference Chair: Caterina Biscari

Scientific Chair: Gebhard Schertler (PSI and ETH Zürich)

Scientific Vice-Chair: Kristina Djinović-Carugo (EMBL Grenoble)

Organisers:

Søren Pape Møller (ISA, LEAPS GA), Massimo Ferrario (INFN, LEAPS CB),
Rafael Abela (PSI, LEAPS CB Chair)

Support: Bárbara Calisto, Cristina Pereira, Julia Hauk, Francine Weber (PSI), Valeria Rosicarelli (INFN)

LEAPS meets Life Sciences conference

Overview on registrations and hotel booking

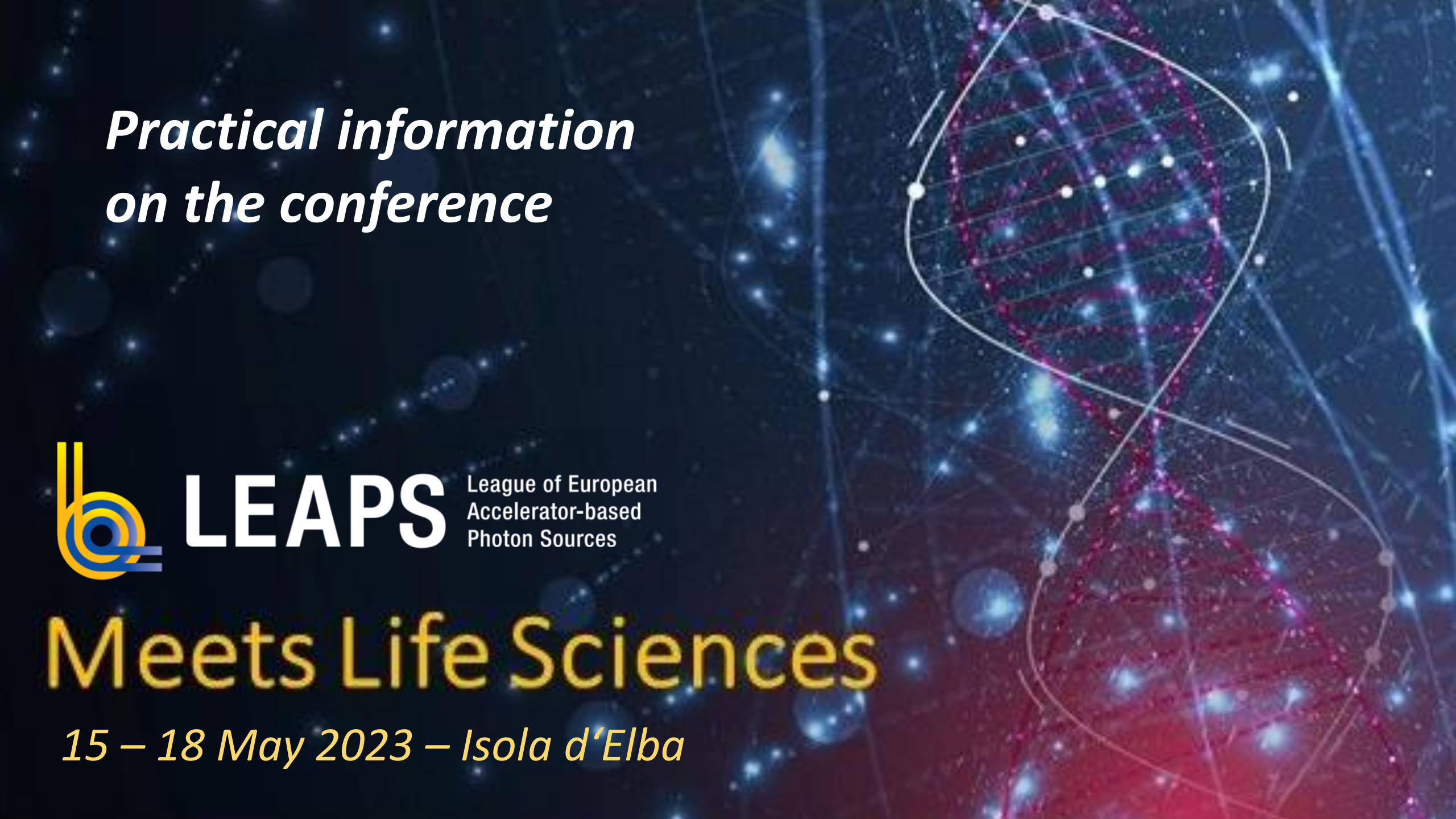
TOTAL nr. Registrations (pre-registrations 133)	**110** (65 paying participants)	Valeria
Nr. Student grants (29 submitted)	*18 (1 financed by ERNEST)*	Julia
Nr. Organisers	10	
Nr. VIP (Speakers included)	26	Francine
(Eva Pereiro and Nina Eleni-Christou withdraw their registration)		
Nr. Sponsors	9	Cristina

ATTENTION:
Number of rooms pre-booked for the conference: 65 at Hotel Hermitage and 30 at Hotel Biodola

Overview (*status*) of Hotel booking: Valeria

- 4 rooms available at Hotel Biodola
- No more rooms available at Hotel Hermitage

LEAPS League of European Accelerator-based Photon Sources


Practical information
on the conference
LEAPS
League of European
Accelerator-based
Photon Sources
Meets Life Sciences
15 – 18 May 2023 – Isola d'Elba

LEAPS League of European Accelerator-based Photon Sources Meets Life Sciences

Elba | Italy | 14-19 May 2023

Programme

	May 14th	May 15th	May 16th	May 17th	May 18th	May 19th
	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday
08:45		Welcome	Tutorial 3 Allen Orville	Keynote 5 Matthew Higgins	Keynote 7 So Iwata	7:00 a.m. Bus Departure
09:00		Tutorial 1 Oded Beja		Hasan Demirci	Guillermo Montoya	
10:00		Coffee Break	Valérie Panneels	Adrian Wanner	Jean Susini	
		tbd	Coffee Break	Coffee Break	Coffee Break	
11:00		Keynote 1 Henry Chapman	Helmut Grubmüller	Sofia Lovestam	R. Falcone/G. Hura	
12:00		Poster flash talks Selected poster talk	Keynote 3 Kristina Djinovic Carugo	Winfried Weissenhorn	Strategy discussion	
13:00		Lunch / free time	Lunch	David Stuart	Lunch / free time	
14:00			Excursion	Lunch / free time		
15:00						
16:00		Tutorial 2 Jana Selent	Poster flash talks Selected poster talk	Selected poster talk Selected poster talk Selected poster talk Keynote 6 Michael Hennig	Selected poster talk Montserat Soler Lopez Arwen Pearson tbd Richard Neutze	
17:00	Registration	Thomas Schulthess	Tutorial 4 Marco Stampanoni	Poster session	Coffee Break	
18:00		Poster session	Coffee Break			
19:00		Florence Tama	Keynote 4 Peijun Zhang	Nurettin Tokay	Strategy discussion summary and outlook	
	Welcome Cocktail	Keynote 2 Ulrich Lorenz	Jakob Reichmann	Amadeu Llebaria		
20:00		Julien Orlans	Francesca Palermo	Jörg Standfuss	Conclusion Kristina Djinovic Carugo	
					Social Aperitivo	
21:00	Dinner	Dinner	Dinner	Social Dinner	Farewell dinner	

https://agenda.infn.it/event/33026/timetable

- Novel Biology
- Computational Biology
- Modern Methods
- Bioimaging
- Unmet Medical Needs
- Drug Discovery
- Strategy Discussion
- Life Sciences Outlook

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

شكك

@leaps_initiative

@LEAPSinitiative

https://leaps-initiative.eu

LEAPS League of European Accelerator-based Photon Sources

www.leaps-initiative.eu

Europe is building a knowledge-based economy, paving the way with an ambitious green & digital transition as a strategic response to public health challenges, climate change, global competition and geo-political instabilities. A strong EU R&I capacity is key for this.

Large-scale research infrastructures are a backbone of the European Research Area and key to making Europe attractive for the best researchers across the world, contributing to knowledge sharing and innovation (communication...).

THE LARGEST NETWORK OF RESEARCH INFRASTRUCTURES IN EUROPE CONTRIBUTING TO EUROPEAN GLOBAL LEADERSHIP

Astrophysics-Astronomy
Physical-Sciences Energy
Earth-Science-Environment
Human-Sciences **Biology-Health**

10 countries
16 institutions
19 facilities
>15 spin off companies

LEAPS actively collaborating with other facilities (ARIE) and with ESFRI

LEAPS facilities are open science pioneers

>300 operating End-Stations
>5.000 publications / year
>1.000.000 h beam time / year
>35.000 user / year from all EU and beyond
55k Protein Data Bank entries supporting health industry

Funding (reference period 2021-2027)

800 M€ (yearly) Yearly/Total operational budget

450 M€ (5 years) Budget for investments

550M€ (5 years) Budget for the upgrade programs (partly already funded)

TECHNOLOGICAL SOVEREIGNITY

- Europe needs world-class facilities to maintain global competitivity
- LEAPS is critical in technology development with strategic position in the value chain
  - Health
  - Climate neutral technologies
  - Quantum computing/ technologies
  - Chips act

INNOVATION AND TECHNOLOGY

- Infrastructure and technology roadmap
  - Clearly demonstrating smart specialization
  - LEAPS-INNOV very successful pilot demonstration of cooperation with European industry with more than 50 industrial partners.
- Impact demonstrated by socio-economic studies

→ Support for as an ambitious joint technology development program with industry (upscaling LEAPS-INNOV pilot)

→ Support to strategic access programs focused on European priorities

TRAINING AND EDUCATION

- LEAPS is a unique platform that brings academia and industry close together as users, providers and collaborators

→ COFUND of early stage researchers

LEAPS ACTIVELY CONTRIBUTES TO EUROPEAN SCIENCE DIPLOMACY

- SESAME, CLS
- Light for Ukraine: action to include Ukrainian scientists in the LEAPS community
- Africa, Latin America

→ LEAPS offers to be a strategic partner of European science diplomacy

EUROPEAN COHESION

- Free access for all academic users

→ Cofund high level chairs in widening countries (including ESRs)

→ Support users from widening countries

An ambitous LEAPS program would/will have a major impact on European scientific leadership, technological sovereignty and innovation capacity, education and cohesion.