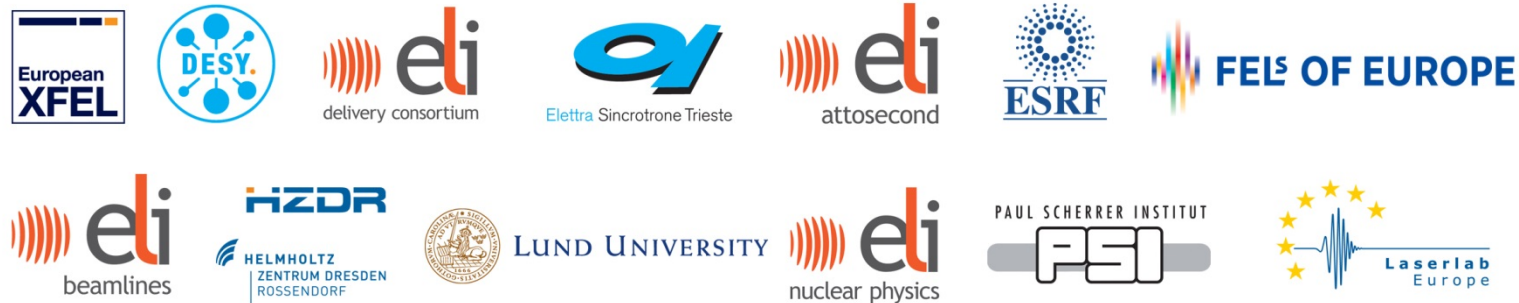


Value added through cross-community activities – Highlights of EUCALL

Panel Discussion – Moderation: G. Appleby (European XFEL) and F. Canova (ELI-DC)



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EUCALL's Strategic Goals and Objectives

Goals

Develop & implement cross-cutting services for XFEL, ESRF and ELI

Optimize use of advanced laser light sources in Europe.

Stimulate & support common long-term strategies & research policies

Objectives

Analyze & promote efficient use of facilities

Identify & develop combined research potential

Analyze & promote innovation potential by the ensemble of facilities

Identify joint foresight topics in science & research policy

Develop & implement a simulation platform

Develop ultrafast data acquisition

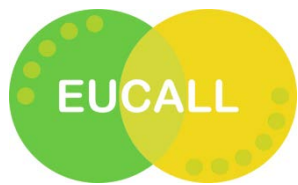
Develop ultrafast sample handling systems

Develop advanced beam diagnostics

WP 3

WP 4 - WP 7

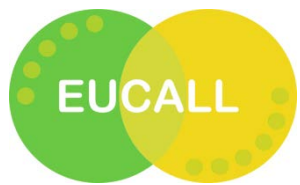




Panellists

- Cecilia Blasetti – International Project Officer at Elettra, Italy
- Markus Gühr – Professor and Group Leader of Experimental Quantum Physics at Potsdam University, Germany
- Sakura Pascarelli – Leader of “Matter at Extremes” Group at ESRF, France
- Antonio Bonucci – Leader of Industrial Liaison Office at European XFEL, Germany
- Aleš Hála – Head of Technology Transfer Office, ELI-Beamlines, Czechia





Landscaping exercise of European UV/x-ray instrumentation at RIs

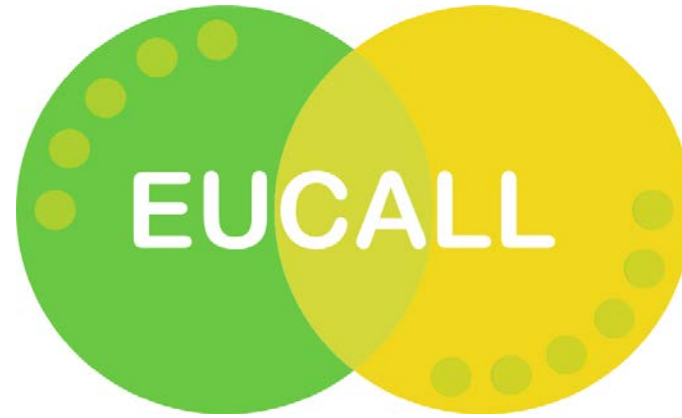
EUCALL spreadsheet "UV-x-ray Instrumentation at Advanced Laser Light Sources"

Goal:

- allowing the identification and analysis of duplications and missing elements
- new research opportunities arising from the combination of offers by different RIs
- Include international RIs for an assessment of the international scientific competitiveness of the Europe in this field.
 - Comprehensive list of EUCALL facilities and their application areas
 - x-ray, laser(-like) [pump-probe, coherence, fs-scale, etc]
 - 124 facilities/beamlines with each 22 properties
 - ~2700 entries

Integrate the compiled data into a searchable database available for external users. WP3 extended to Elettra and the started an upgrade to the www.wayforlight.eu database [include ELI, LLE facilities]





EUCALL – wayforlight database

C. Blasetti, Elettra Sincrotrone Trieste



LUND UNIVERSITY



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Wayforlight's past & present

First developed under FP7 Integrating Activity CALIPSO

- SR & FELs facilities and BL datasheets (>250 instruments)
- Pilot standardized proposal form

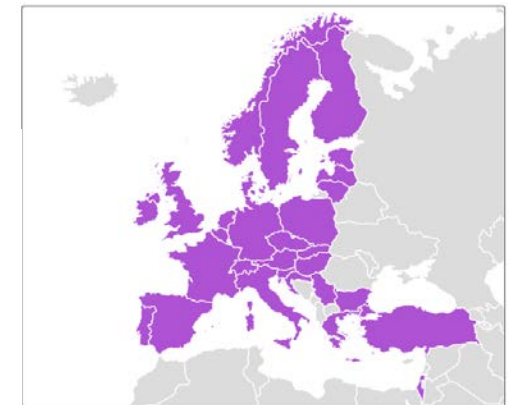


European Synchrotron and FEL User Organisation (ESUO)

- National delegates from 30 countries, new to come

H2020 Integrating Activity CALIPSOplus

- Industry section with multi-language option
- ESUO intranet to be developed
- Training pillar to be populated



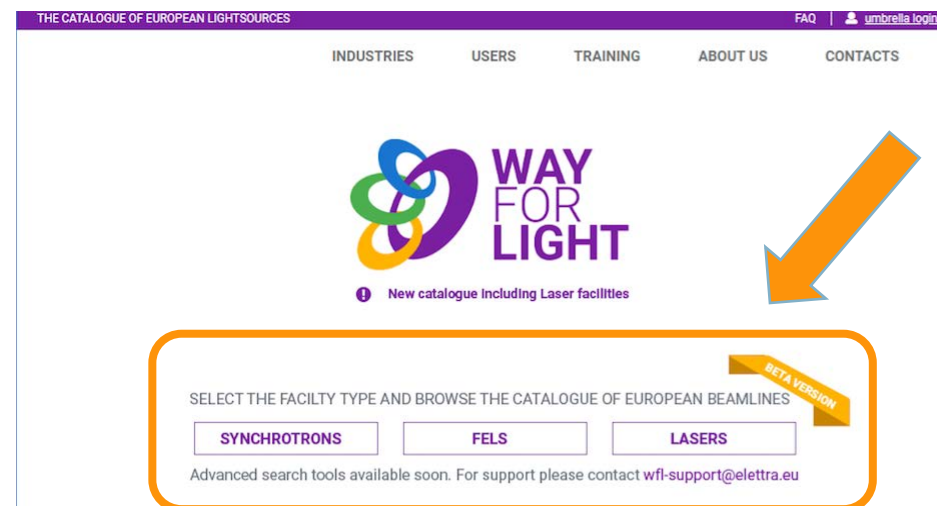
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Wayforlight's present: EUCALL - 1

A full spectrum of standardization

- New sheets designed for Optical Laser facilities
- Renewed datasheets for X-ray FELs and IR FELs
- Enriched datasheets for Synchrotron facilities



ELI BEAMLINES		Gammatron Website	CONTACTS																				
Gammatron			<p>USER OFFICE user.office@eli-beams.eu</p>																				
<p>The Gammatron beamline in E2 experimental hall at ELI Beamlines delivers ultrashort X-ray pulses with X-ray photon energies ranging from 1 keV up to 1 MeV with 10^{18} photons in pulses of a few femtosecond duration. Moreover, these pulses can be precisely synchronized with the pump pulse which is split from the Gammatron main driving laser pulse. The Gammatron beamline enables two modes of operation:</p> <p>1) The betatron source with the following features: broadband spectrum (1 – 100 keV), low divergence beam (< 20 mrad), small source size (~μm), short pulse duration (a few fs).</p> <p>2) The Compton source with a broadband or quasi-monochromatic (at least 10% $\Delta E/E$) spectrum (few tens of keV to few MeV). Beam divergence, source size, and pulse duration are comparable to the case of betatron.</p> <p>Gammatron beamline is driven by the HAPLS L3 laser system, which is why there will be a single shot mode, followed by 3 Hz repetition rate mode and eventually 10 Hz repetition rate mode of operation depending on the development stage of the laser system.</p>			<p>TECHNIQUES</p> <p>Absorption EXAFS NEXAFS Time-resolved studies</p> <p>Imaging Medical application X-ray microscopy X-ray tomography</p> <p>Scattering Nuclear resonant scattering Time-resolved scattering</p>																				
<p>LASER-BASED LIGHT SOURCE PARAMETERS</p> <p>GAMMATRON</p> <table border="1"> <thead> <tr> <th>Source type</th> <th>Laser-driven betatron and inverse Compton scattering source</th> </tr> </thead> <tbody> <tr> <td>Peak Photon energy / central wavelength</td> <td>50000 [eV]</td> </tr> <tr> <td>Spectral Bandwidth FWHM / %</td> <td>30 + 80 [keV]</td> </tr> <tr> <td>Beam shape</td> <td>Gaussian</td> </tr> <tr> <td>Pulse duration FWHM</td> <td>10 [fs]</td> </tr> <tr> <td>Polarisation</td> <td>Linear Vertical</td> </tr> <tr> <td>Pulse repetition rate</td> <td>10 [Hz]</td> </tr> <tr> <td>Maximum pulse energy</td> <td>0.0008 [mJ]</td> </tr> <tr> <td>Peak power</td> <td>80000000 [W]</td> </tr> <tr> <td>Source size (spot)</td> <td>X = 5 [μm], Y = 5 [μm]</td> </tr> </tbody> </table>		Source type	Laser-driven betatron and inverse Compton scattering source	Peak Photon energy / central wavelength	50000 [eV]	Spectral Bandwidth FWHM / %	30 + 80 [keV]	Beam shape	Gaussian	Pulse duration FWHM	10 [fs]	Polarisation	Linear Vertical	Pulse repetition rate	10 [Hz]	Maximum pulse energy	0.0008 [mJ]	Peak power	80000000 [W]	Source size (spot)	X = 5 [μm], Y = 5 [μm]		<p>DISCIPLINES</p> <p>Engineering & Technology New production processes</p> <p>Life Sciences & Biotech Molecular and cellular biology</p> <p>Physics Atomic & molecular physics High energy & particle physics Nuclear physics Plasma physics</p>
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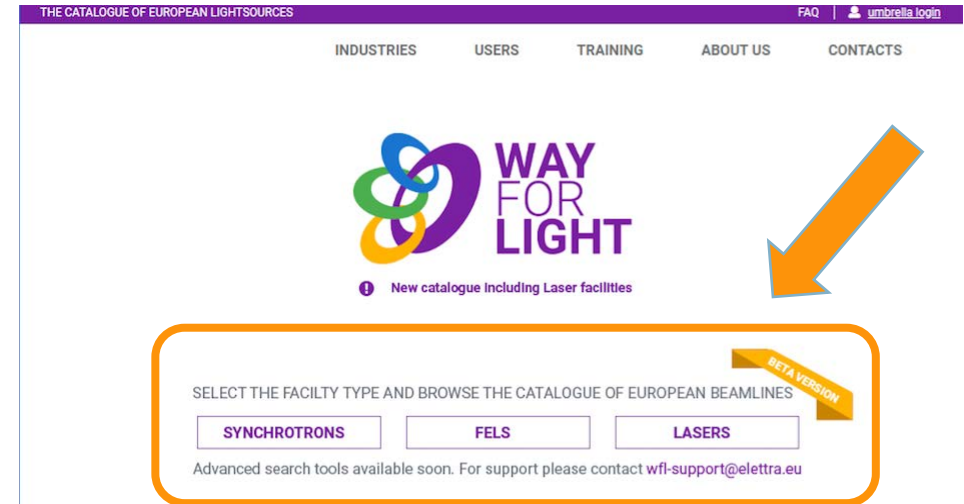
> 90% common fields between FELs & Optical Lasers

Techniques & Disciplines classification in each of the three facility types

Wayforlight's present: EUCALL - 1

A full spectrum of standardization

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- Renewed datasheets for X-ray FELs and IR FELs
- Enriched datasheets for Synchrotron facilities



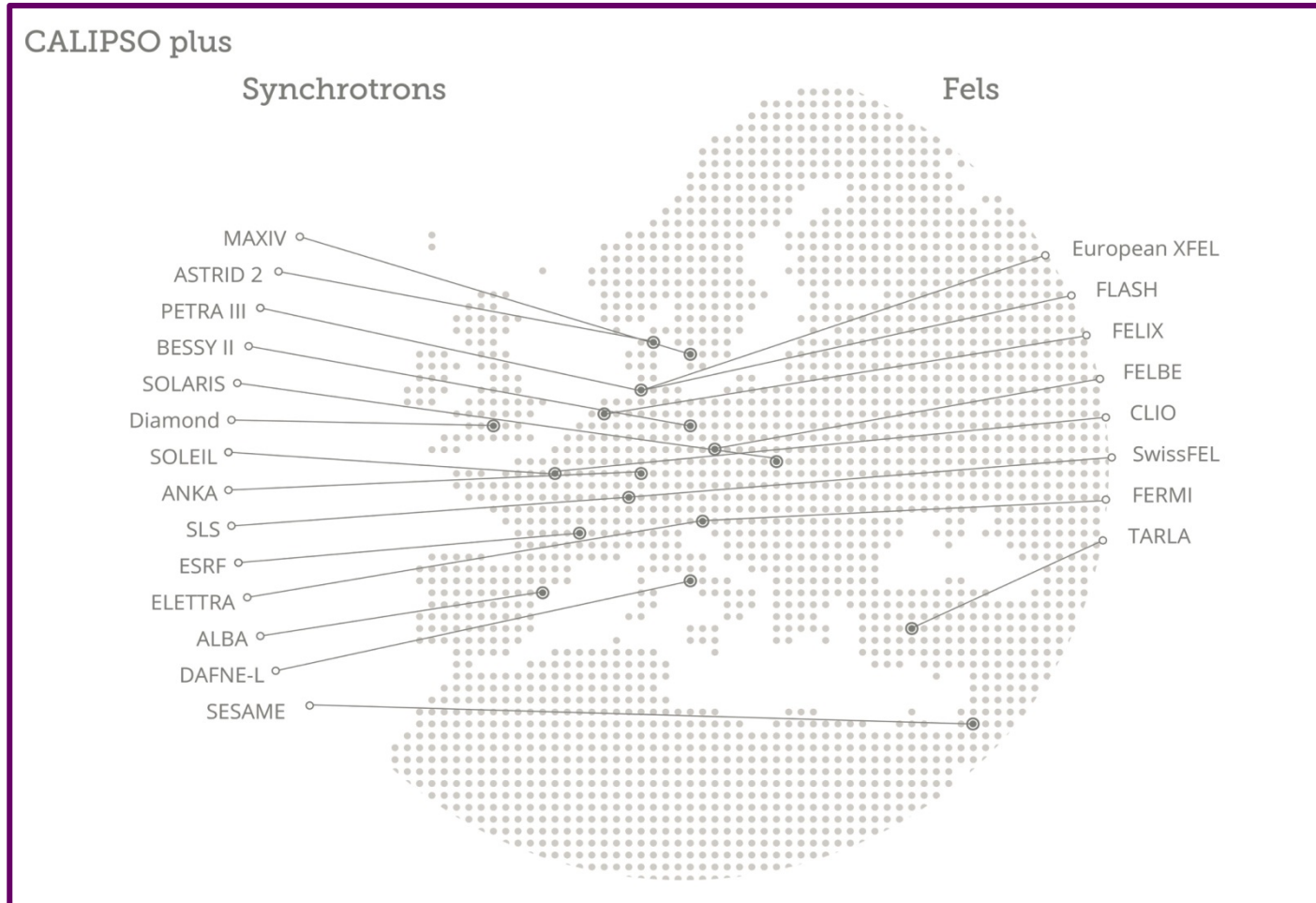
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Techniques & Disciplines classification in each of the three facility types

HIJ BEAMLINES	
<p>FCL</p> <p>Techniques: Absorption Emission or Reflection</p> <p>Disciplines: Physics</p>	<p>Jeti 100</p> <p>Techniques: Absorption Diffraction Emission or Reflection Imaging Ion Spectroscopy</p> <p>Disciplines: Physics</p>
<p>Jeti 40</p> <p>Techniques: Absorption Emission or Reflection</p> <p>Disciplines: Physics</p>	<p>POLARIS</p> <p>Techniques: Absorption Diffraction Emission or Reflection Imaging Ion Spectroscopy</p> <p>Disciplines: Physics</p>

Wayforlight's present: EUCALL - 3

A full spectrum of facilities

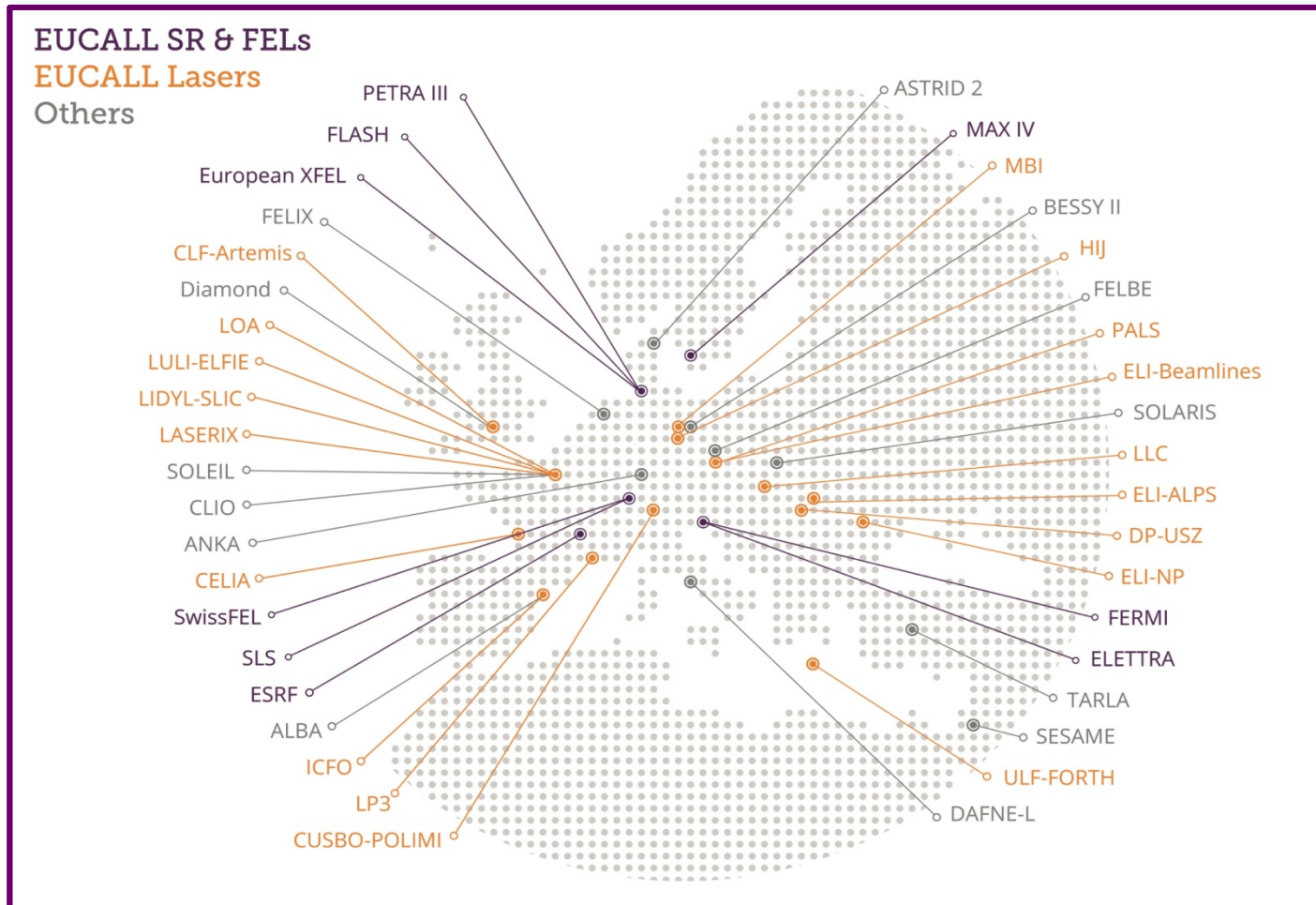


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Wayforlight's present: EUCALL - 3

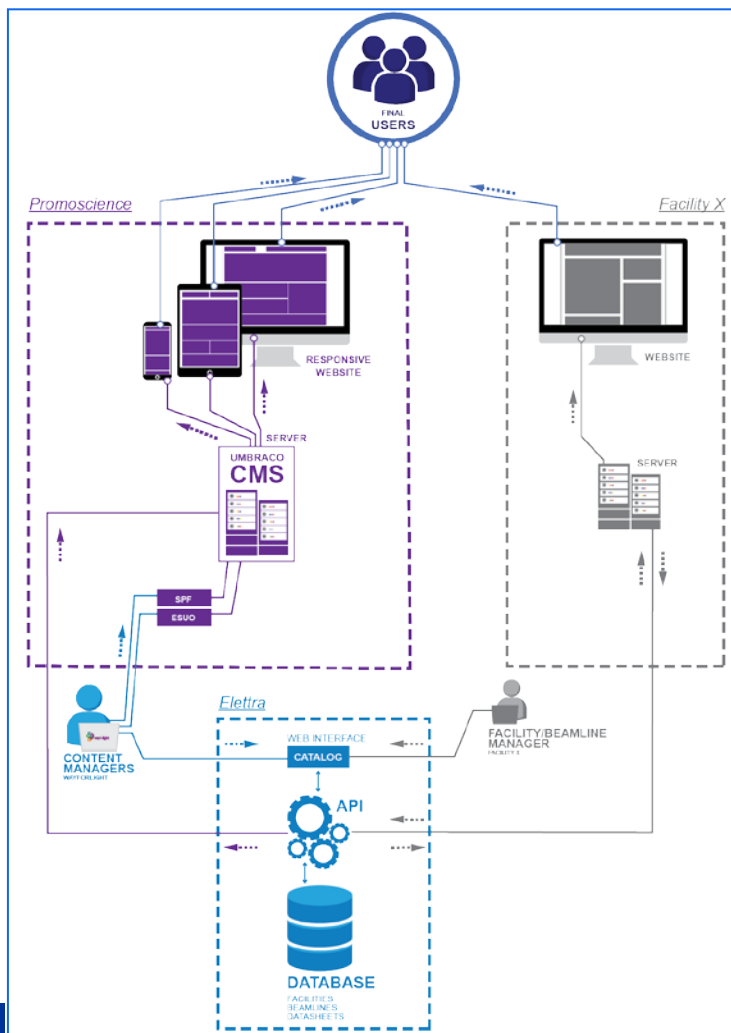
A full spectrum of facilities




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Wayforlight's present: shared benefits



A smart sustainable system

- Designed and created at Elettra
- Scientists will have to fill data only once
- Elettra provides advanced programming interfaces (APIs) for easy data export
- Login is based on Umbrella 
- Key for any future interface with other websites - facilities and/or project ones

Wayforlight's future

Jointly developed by complementary projects & communities
→ a portfolio of partner initiatives for growth and sustainability

- FELs of Europe: www.fels-of-europe.eu



- Laserlab Europe: <https://www.laserlab-europe.eu>



- The global portal: www.lightsources.org



- The LEAPS initiative: www.leaps-initiative.eu



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Landscape analysis – User Feedback / Markus Gühr

- The value in the EUCALL landscape approach to optimize the research potential of European light sources
- Major conclusions / recommendations that come from the EUCALL spreadsheet and the following report
- What can be done with these recommendations? What is the best way to ensure that facility managers implement the suggestions?



Experience Exchange – Sakura Pascarelli

- ESRF's activities within the context of EUCALL
- The main lessons learnt from these experiences
- The best way in the future to facilitate cross-community projects. How to tackle the difficulties you've observed and experienced?



Innovation Potential of Advanced Light Sources

- Joint development of technology with industry
- Protection and commercialization of intellectual property
- Commercial/proprietary access to light source infrastructure
 - Survey of Technology Transfer practices of 14 light sources (EU, USA, Japan)
 - Recommendations of best practices
 - Experience Exchange workshop in November 2017, with 19 organizations represented



Perspectives on innovation potential from ELI - Aleš Hála

- Transfer and Industrial Liaison policies of the future ELI ERIC.
- Value of EUCALL's activities in defining ELI's policies



Perspectives on innovation potential from Eu.XFEL - Antonio Bonucci

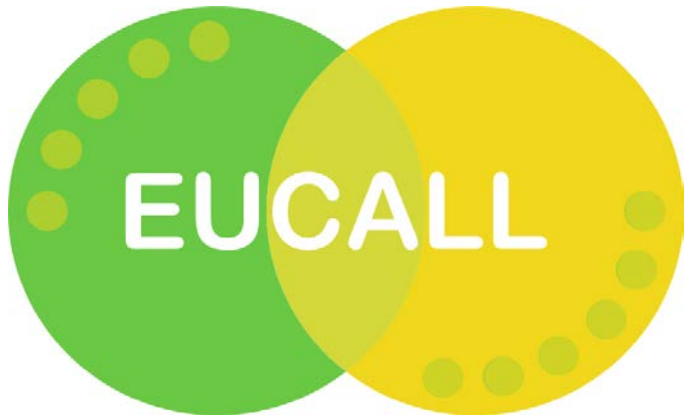
- Commonality between the different types of Advanced Light Sources, despite the differences between FELs, synchrotrons and optical lasers.
- Further networking work on innovation topics could be done at the cross-community level or even at a more macro level (eg involving neutron sources)



Summary

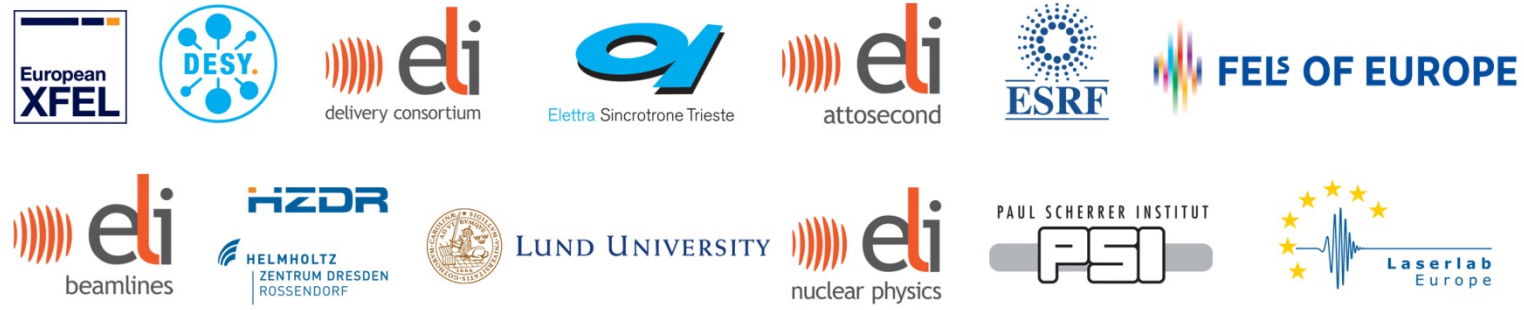
- Landscape exercise very useful both for RI operators and users
 - Repeat / update regularly
 - Keep database updated
- Experience exchange between scientists and RI operators very beneficial
- Survey of innovation potential at light sources of great use for “best practices” and for networking and further clustering activities





Many thanks to the Panelists, and to you for your attention

www.eucall.eu



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