nephews
Neutrons and Photons
Elevating Worldwide Science

Accessing beam time at large scale neutron facilities

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Co-funded by the European Union

LEAPS League of European Accelerator-based Photon Sources

ESUO EUROPEAN SYNCHROTRON AND FEL USER ORGANISATION

LENS LEAGUE OF ADVANCED EUROPEAN NEUTRON SOURCES

SOLARIS CENTRE

Europe enjoys a versatile and broad network of neutron sources

Large-scale research facilities equipped with neutron sources,
such as reactors or spallation sources, used for scattering experiments

NEUTRONS FOR SOCIETY

The neutron is a unique and irreplaceable probe, with characteristics that cannot be supplanted by other methods

Neutrality

As neutral particles neutrons can penetrate deep within materials to reveal buried structures and interfaces

Magnetism

As magnetic particles neutrons are sensitive to magnetism and magnetic processes in materials

Energy

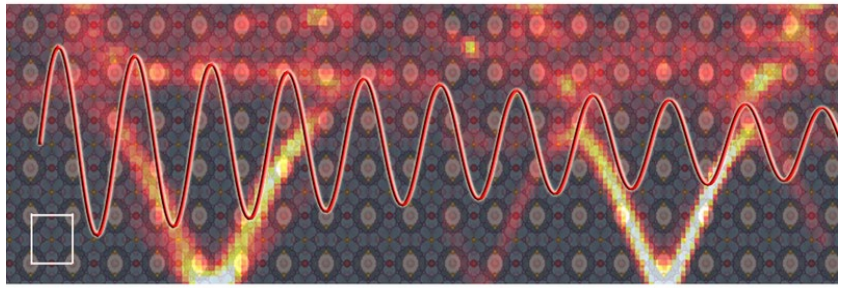
Exchanges of energy between neutrons and samples can be detected and used to follow the dynamics of atomic, molecular and lattice processes

Wavelength

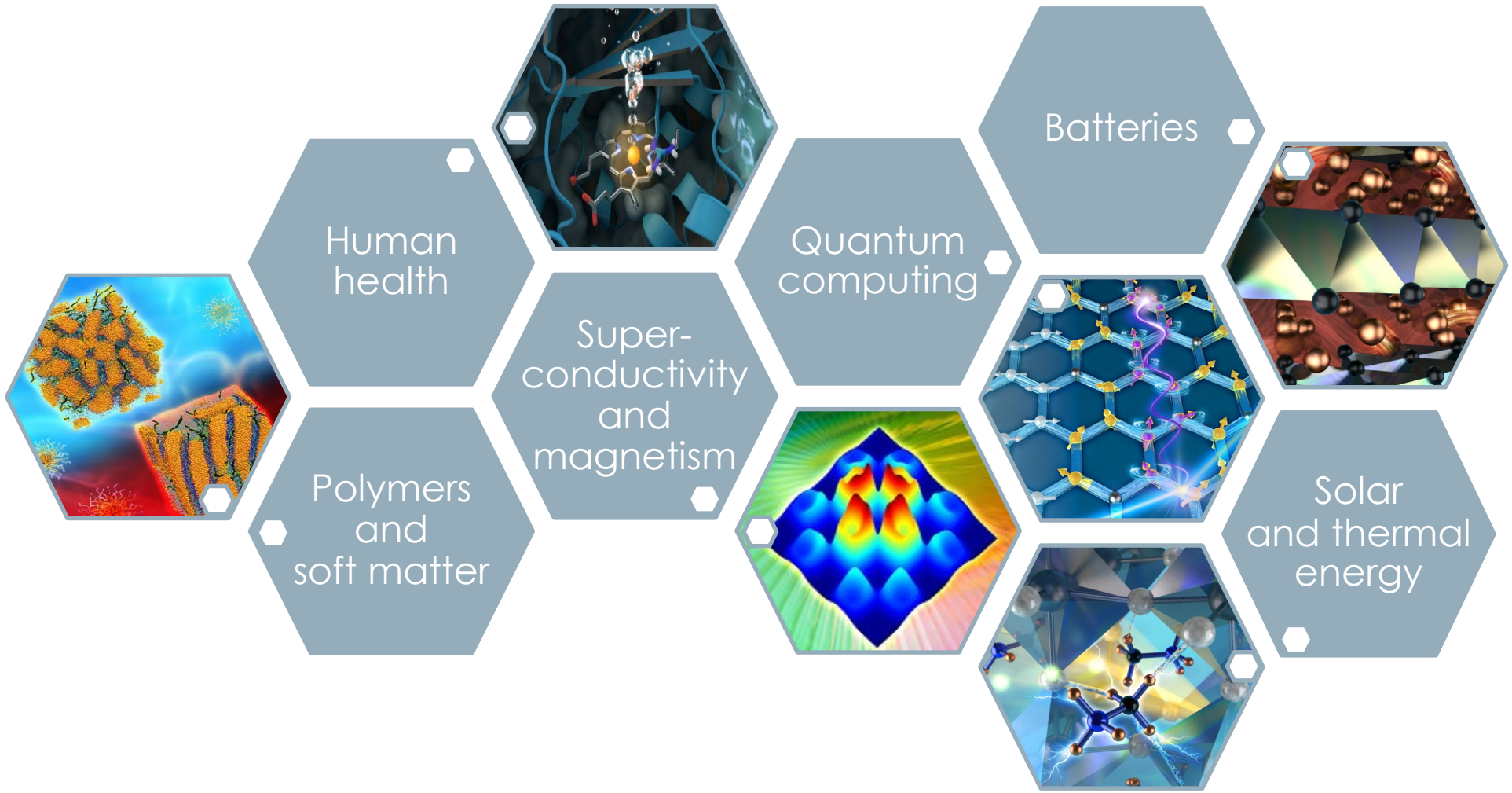
Neutrons have a broad range of useful wavelengths, allowing examination of structures as small as atoms and as large as biological cells

Selectivity

The ability of neutrons to see light elements, to distinguish between elements with similar atomic number and to to distinguish between specific isotopes can provide unique structural and dynamic information



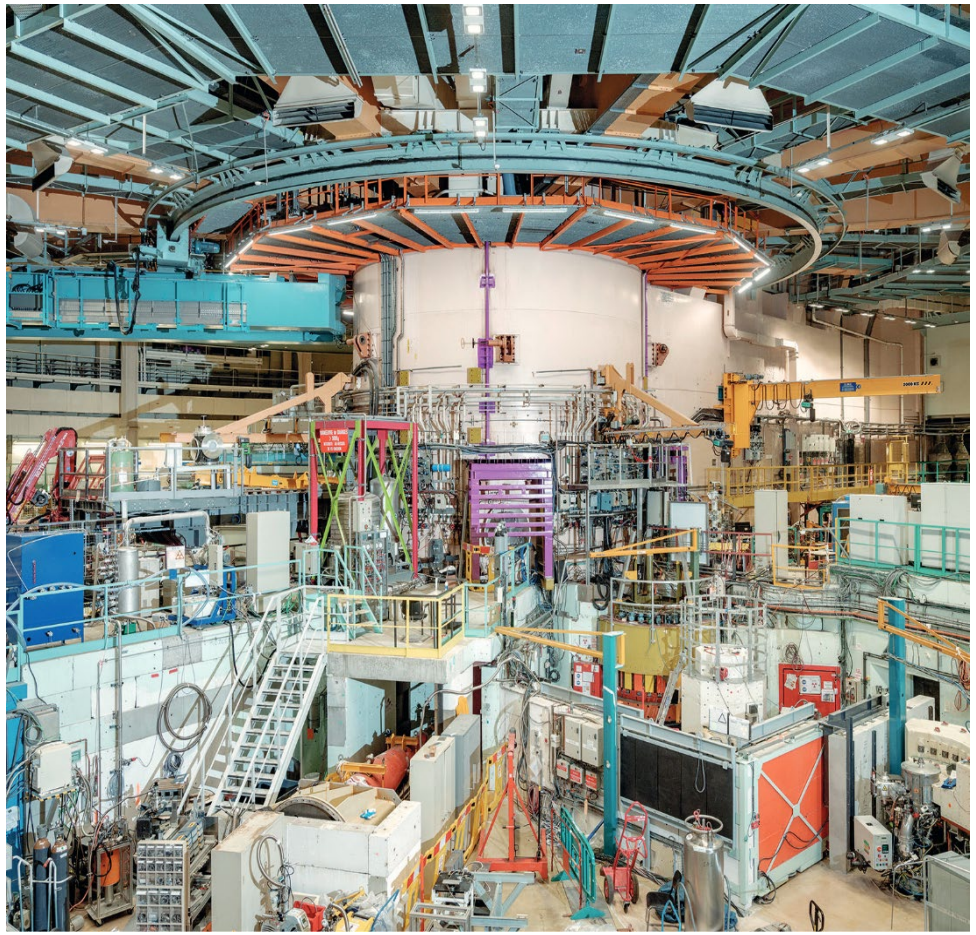
Neutrons provide information needed to solve challenging problems across a variety of research areas



After 50 years of operation, we are still number one

BECAUSE THE ILL:

- Is the most intense neutron source in the world
- Adapts to scientific trends and the needs of the user community
- Offers the best cutting-edge instrumentation
- Attracts and benefits from the best researchers on the international stage



Key figures about the ILL

1400 users from an active community of 12 000 scientists

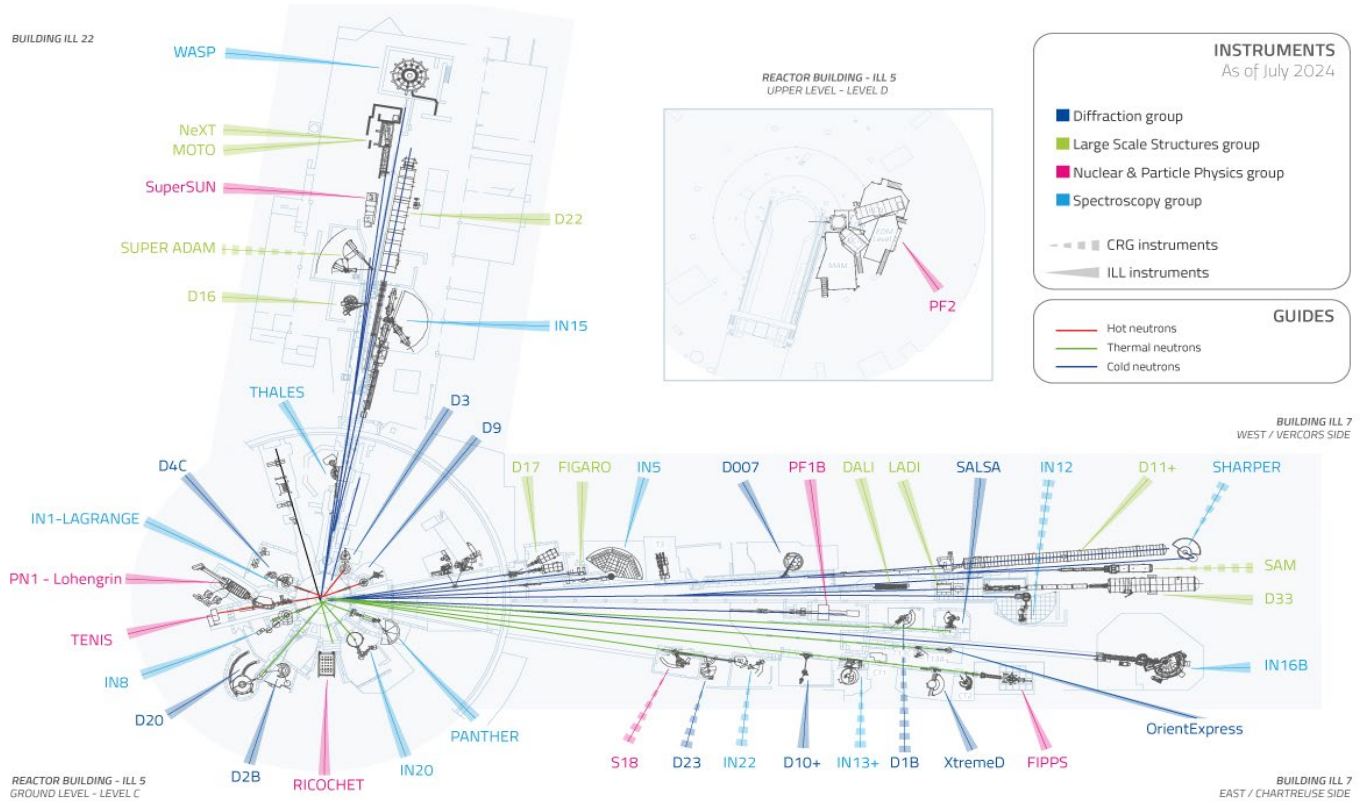
1000 experiments/year

600 publications/year
of which 20% in high impact journals

65 countries

28 instruments + 10 CRG

160 reactor days for experiments



Research areas covered by the ILL

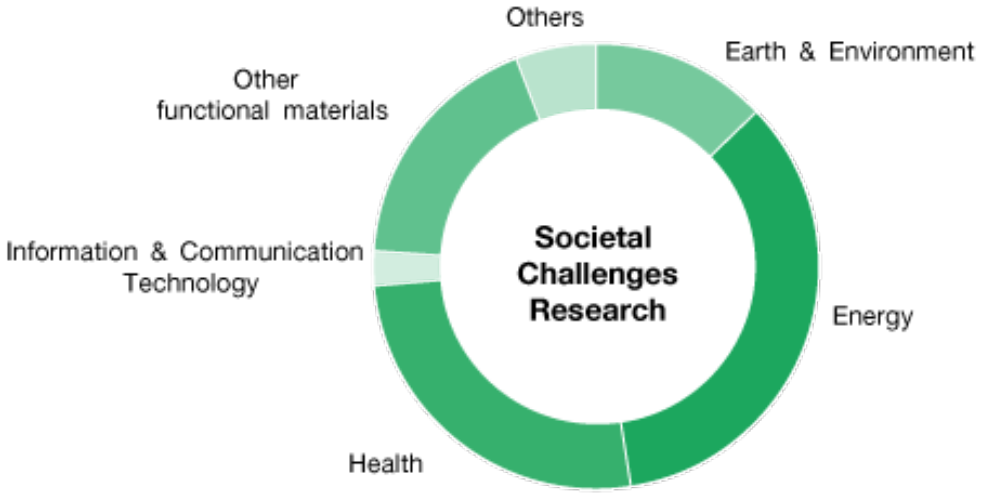
As per accepted proposals

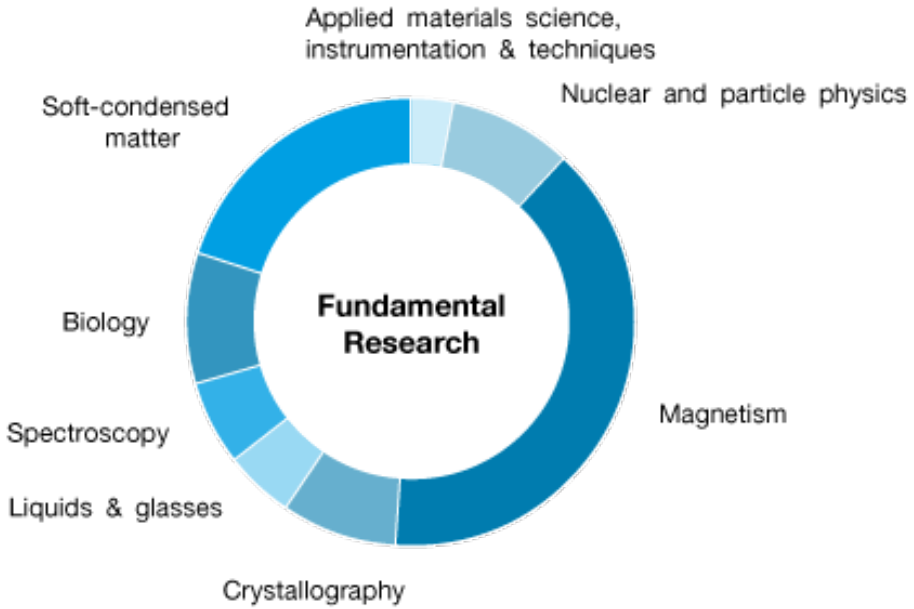
Research for societal challenges

40%

60%

Fundamental research



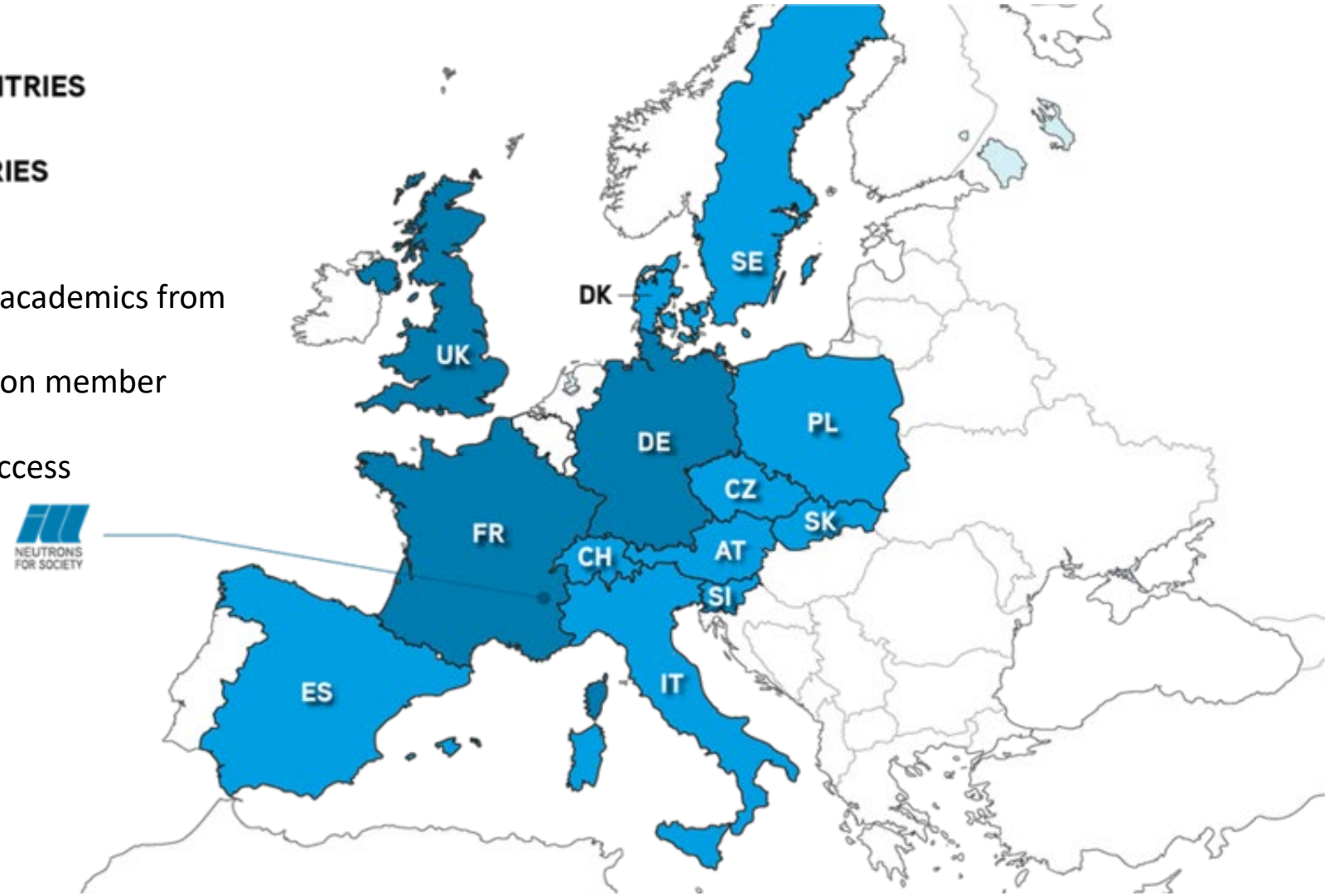


The ILL member countries

ASSOCIATE COUNTRIES

MEMBER COUNTRIES

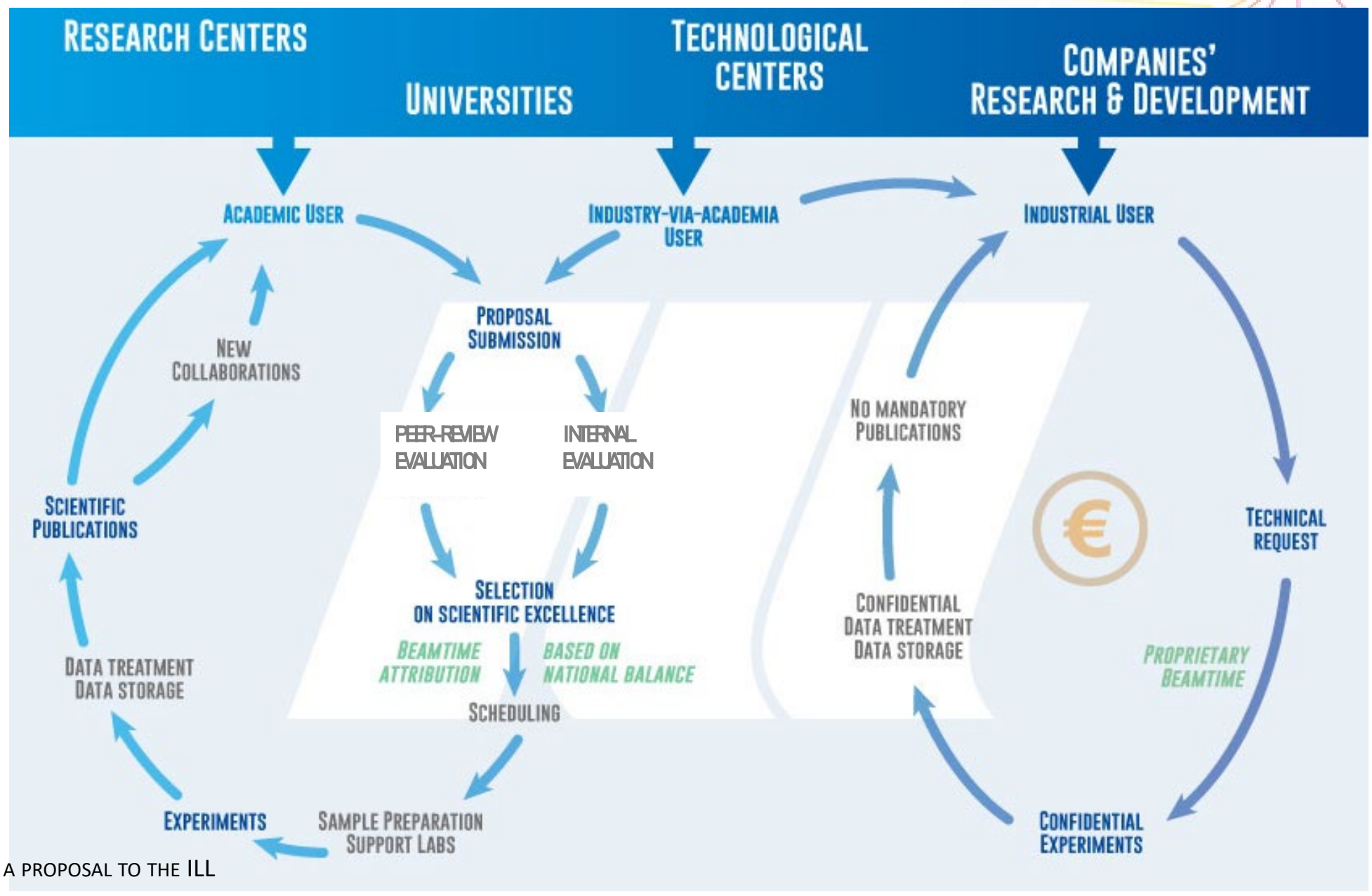
- Free of charge access to academics from member countries
- Conditioned access for non member countries
- Purchased commercial access



Types of beamtime

	APPLIES TO	WHEN	WHO FOR	RESPONSE TIME
External peer review				
Standard	All experiments, all instruments, all conditions. Next deadline 15 February 2025.	Deadlines twice a year, spring and autumn	All users from member countries	4 to 8 months after deadline
BAGs	College 8 proposals on D22	Deadlines twice a year, spring and autumn	All users from member countries	4 to 8 months after deadline
CRG	All experiments, CRG instruments, all conditions	Depends on CRG policy	All users from CRG collaboration	Depends on CRG policy
D-Lab	Access to the ILL sample deuteration lab	All year	All users from member countries	
Internal peer review				
DDT	Urgent experiments, hot topics, excellent science from non-member countries, all instruments, all conditions	All year	All users	ASAP
EASY	A small amount of beamtime, not a full experiment; must be very simple measurements, all instruments, limited number of configurations	All year	All users from member countries	From one to a few weeks
LTP	All instruments, for projects over several cycles if it can be demonstrated that they bring extra resources or capabilities that are of benefit to all users	Once a year, autumn round	All users from member countries	4 to 8 months after deadline
No peer review				
TEST	Test of sample, equipment, instrument configuration, all instruments	All year	All users from member countries	Usually on same day
INDU	Proprietary beamtime	All year	Contact the Industrial Liaison Office	ASAP
INTER	Internal beamtime, available for ILL scientists to do their own research. Must have an ILL scientist involved but can also have external people as co-proposers (form available on the intranet).	All year	Ill scientists (possible collaboration with users from member countries	Anytime during reactor cycles

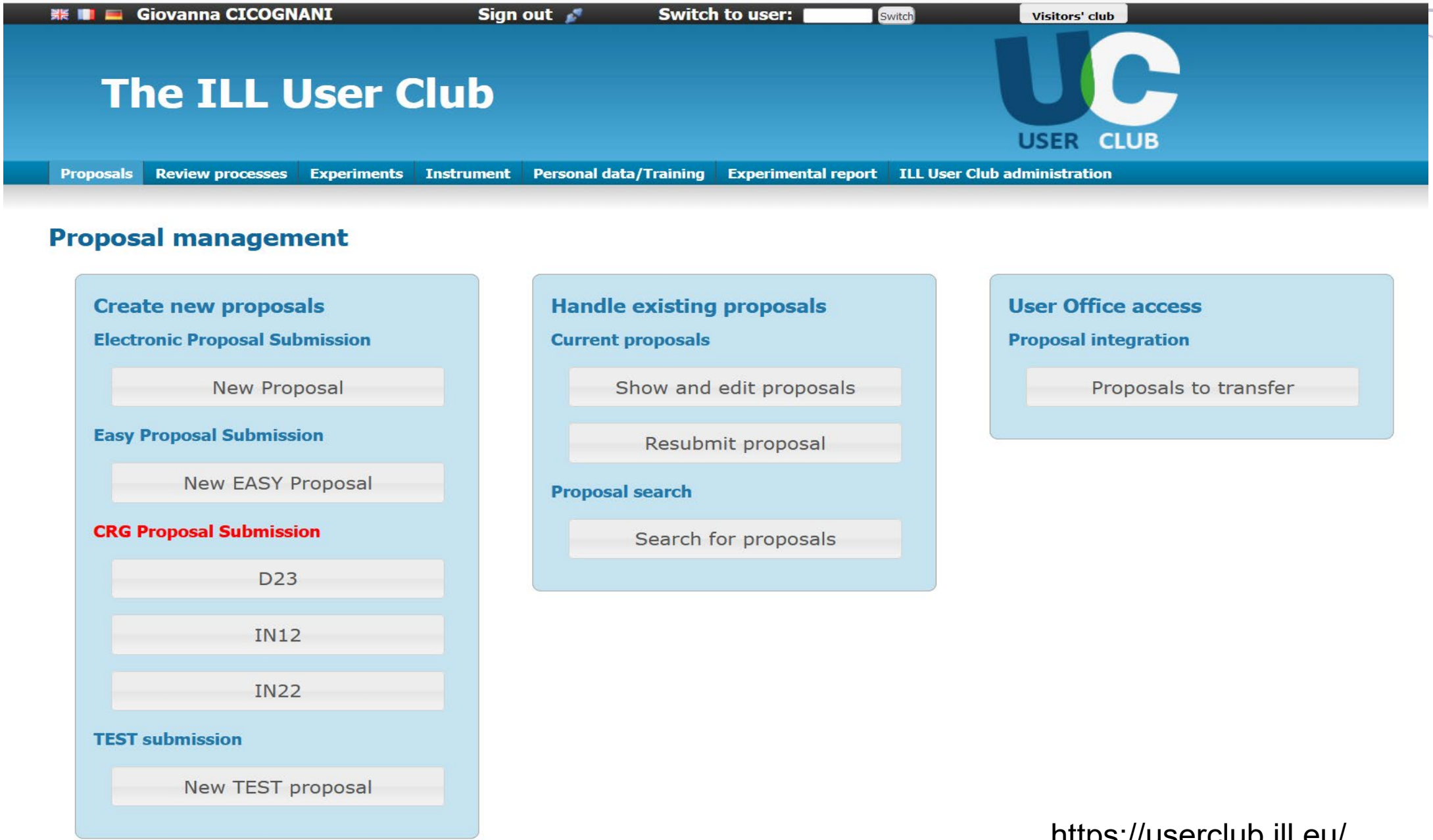
How to request beamtime at the ILL?



HOW TO SUBMIT A PROPOSAL TO THE ILL

Review criteria

- Scientific excellence: Novelty, significance, and potential impact
- Feasibility: Experimental design, required resources, and preparatory work
- Neutron suitability: Appropriateness of neutron methods for the research question
- Potential Outcomes: Clear hypothesis and potential for high-quality publications
- Team qualifications and previous track record



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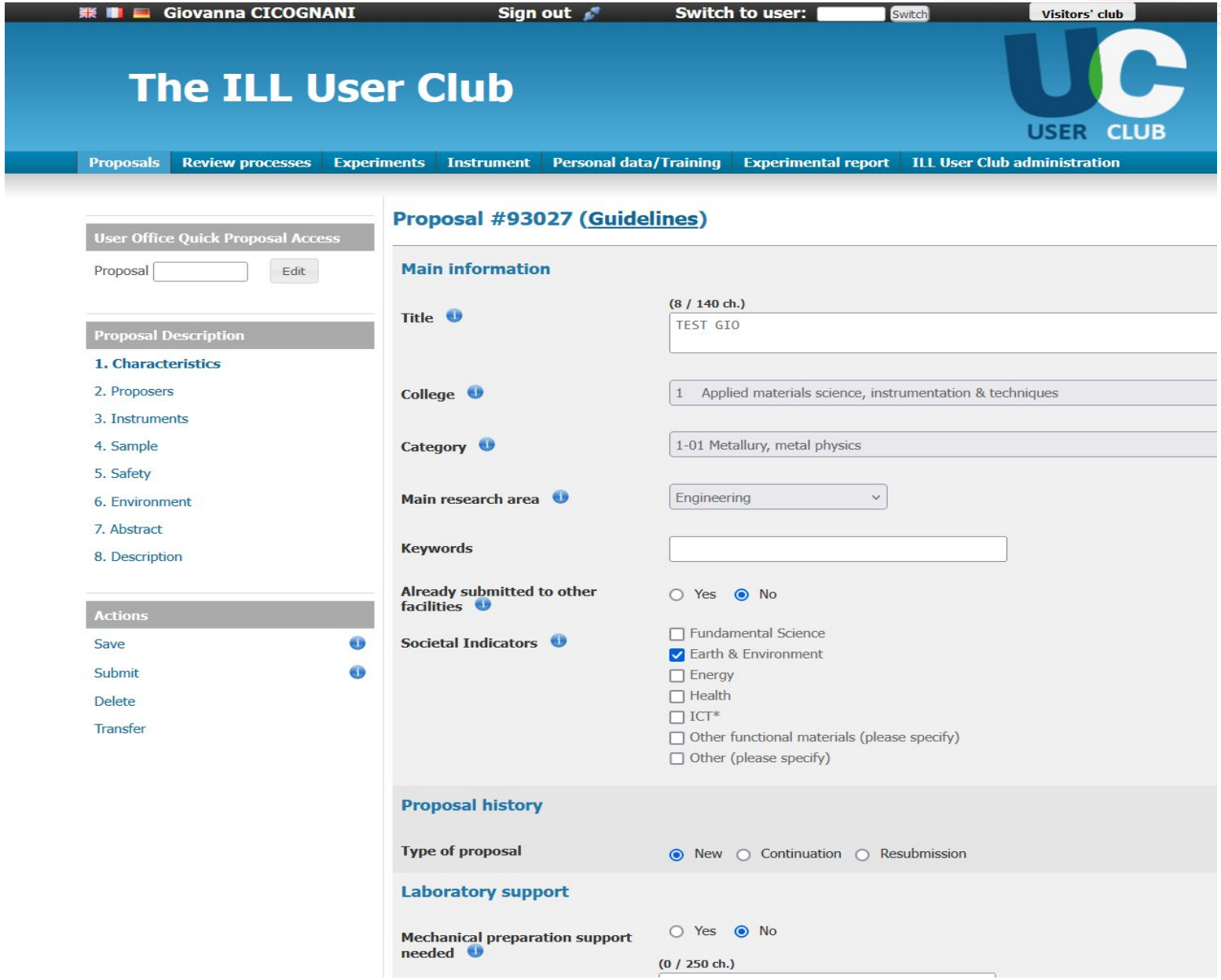
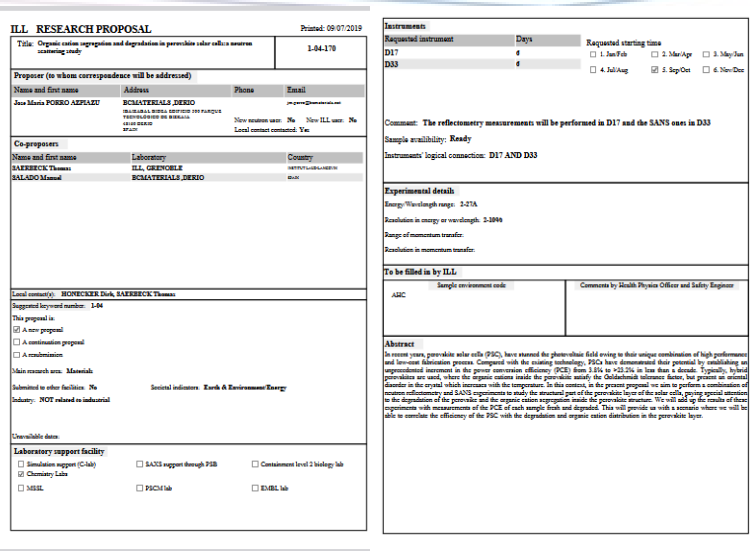
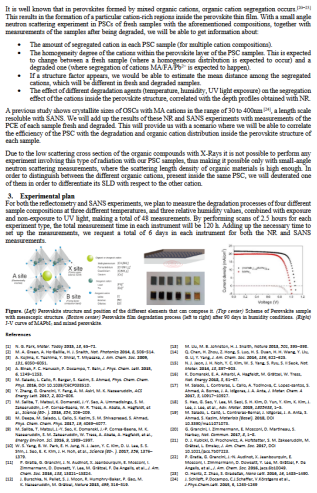
NEUTRONS FOR SOCIETY







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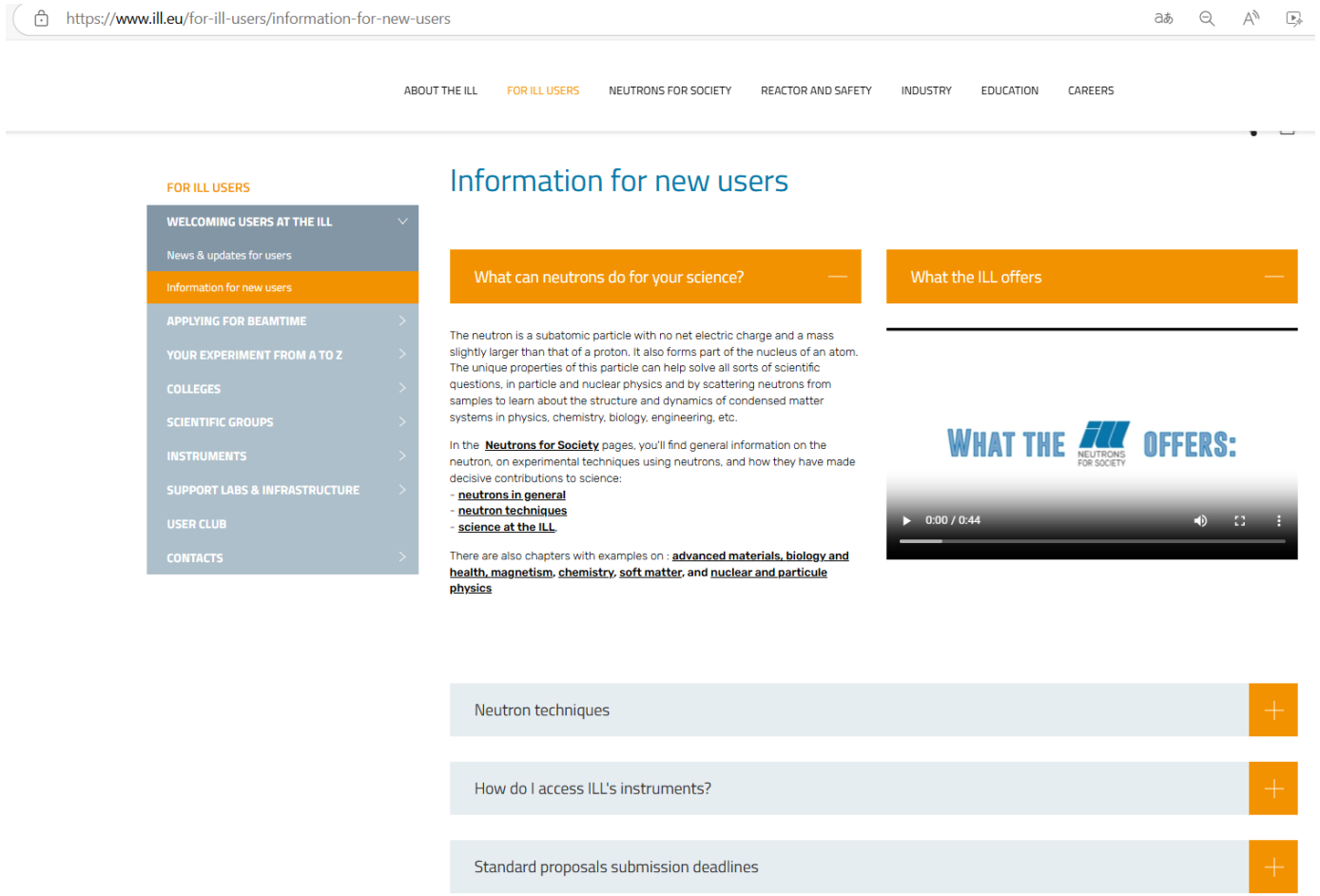
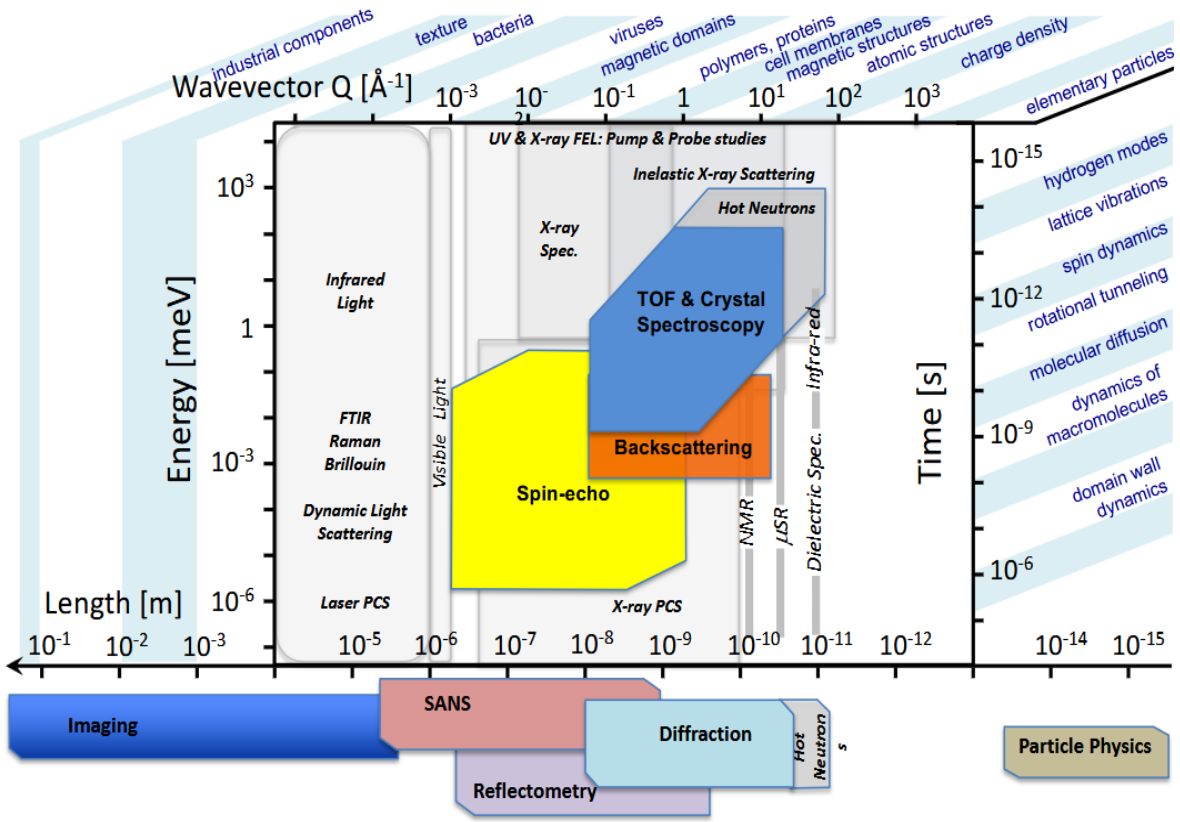
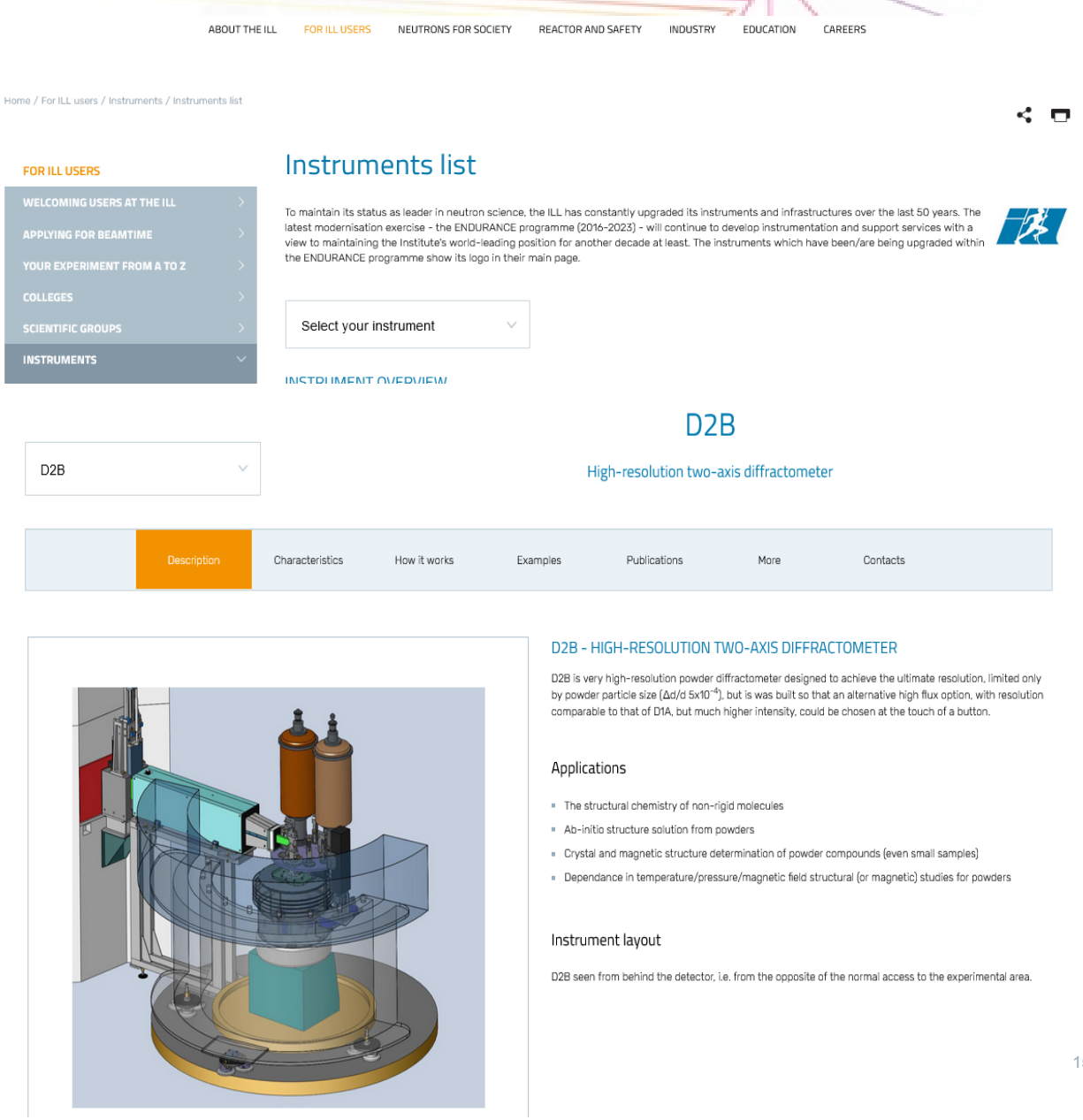
Proposal writing – plan your proposal

- What are you trying to learn from neutron scattering
- Which technique best matches your needs
- Which instrument do you need
- What sample environment do you need
- Discuss with instrument scientist




industrial components
texture
bacteria
viruses
magnetic domains
polymers, proteins
cell membranes
magnetic structures
atomic structures
charge density
elementary particles
Wavevector Q [Å-1]
10-3
10-2
10-1
1
101
102
103
UV & X-ray FEL: Pump & Probe studies
Inelastic X-ray Scattering
Hot Neutrons
X-ray Spec.
Infrared Light
TOF & Crystal Spectroscopy
Backscattering
Spin-echo
Visible Light
Infra-red
NMR
µSR
Dielectric Spec.
FTIR
Raman
Brillouin
Dynamic Light Scattering
Laser PCS
X-ray PCS
Energy [meV]
Length [m]
Time [s]
hydrogen modes
lattice vibrations
spin dynamics
rotational tunneling
molecular diffusion
dynamics of macromolecules
domain wall dynamics
Imaging
SANS
Diffraction
Reflectometry
Hot Neutrons
Particle Physics


ABOUT THE ILL
FOR ILL USERS
NEUTRONS FOR SOCIETY
REACTOR AND SAFETY
INDUSTRY
EDUCATION
CAREERS
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FOR ILL USERS
WELCOMING USERS AT THE ILL
APPLYING FOR BEAMTIME
YOUR EXPERIMENT FROM A TO Z
COLLEGES
SCIENTIFIC GROUPS
INSTRUMENTS
Instruments list
To maintain its status as leader in neutron science, the ILL has constantly upgraded its instruments and infrastructures over the last 50 years. The latest modernisation exercise - the ENDURANCE programme (2016-2023) - will continue to develop instrumentation and support services with a view to maintaining the Institute's world-leading position for another decade at least. The instruments which have been/are being upgraded within the ENDURANCE programme show its logo in their main page.
Select your instrument
INSTRUMENT OVERVIEW
D2B
D2B
High-resolution two-axis diffractometer
Description
Characteristics
How it works
Examples
Publications
More
Contacts
D2B - HIGH-RESOLUTION TWO-AXIS DIFFRACTOMETER
D2B is very high-resolution powder diffractometer designed to achieve the ultimate resolution, limited only by powder particle size (Δd/d 5x10-4), but is was built so that an alternative high flux option, with resolution comparable to that of D1A, but much higher intensity, could be chosen at the touch of a button.
Applications
The structural chemistry of non-rigid molecules
Ab-initio structure solution from powders
Crystal and magnetic structure determination of powder compounds (even small samples)
Dependance in temperature/pressure/magnetic field structural (or magnetic) studies for powders
Instrument layout
D2B seen from behind the detector, i.e. from the opposite of the normal access to the experimental area.

Proposal writing – structure and content

- Clear objective
  - Clear, concise summary of the project
  - Brief mention of the scientific aims and expected outcomes
- Scientific rationale
  - Highlight the novelty of the proposed work
  - Why is this experiment important ?
  - What gap in knowledge does it fill ?
- Methodology
  - Detailed description of the experimental setup
  - Specify the neutrons scattering technique to be used
  - Explain how the technique address your research question
- Expected results and impact
  - What outcomes are anticipated from the experiment?
  - How will these results contribute to the field ?
- Timeline and Beam Time Request
  - Estimate the required number of days for the experiment
  - Suggest a feasible timeline for completing the work
- Preliminary data and background
  - Include relevant previous work and literature
  - Provide any initial data or pilot studies to strengthen your case
- References
  - Cite literature that supports the experimental approach

Tips for writing successful proposals

- Start early

  Proposals require careful planning and preparation. Give yourself time to gather necessary data and refine your ideas

- Know your audience

  Reviewers may not always be experts in your specific field, so make sure the proposal is accessible to a broad scientific community

- Be concise

  Stick to the point and avoid excessive jargon

- Provide supporting data

  Include any preliminary results that shows the experiment is feasible

- Contact the experts!

  Engage with facility staff or experienced users to refine your proposal and increase its strength

Common mistakes to avoid

- Unclear objectives

  Vague or poorly defined scientific aims

- Overly ambitious

  Be realistic about what can be achieved

- Lack of feasibility

  Failing to clearly explain how the experiment can be performed at the facility

- Weak rationale

  Insufficient background or literature support can undermine the proposal's impact

We are looking forward to welcoming you