

EUROPEAN

FEL



Support for Polish XFEL users

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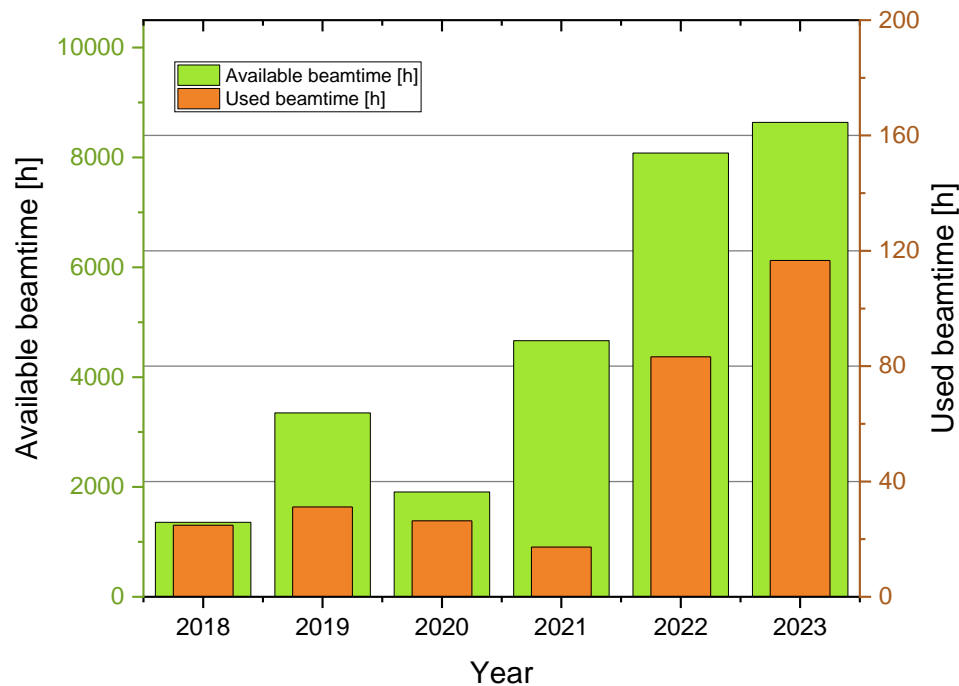
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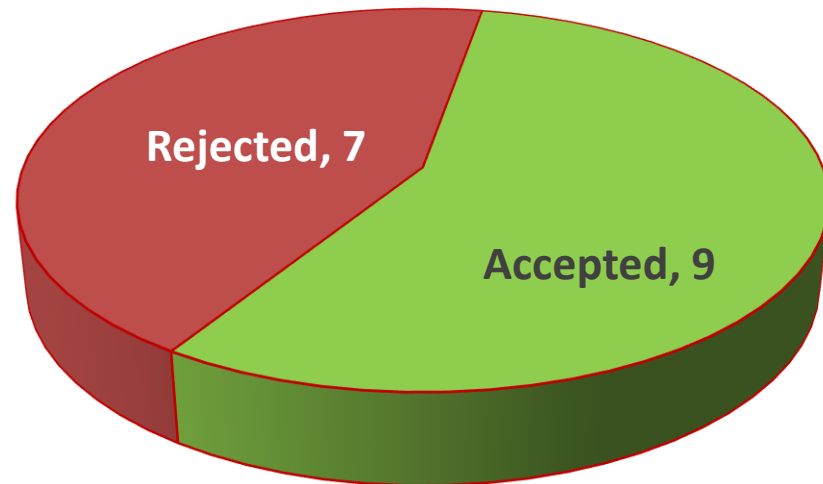
⁴Nat'l Centre for Nuclear Research



Polish XFEL proposals



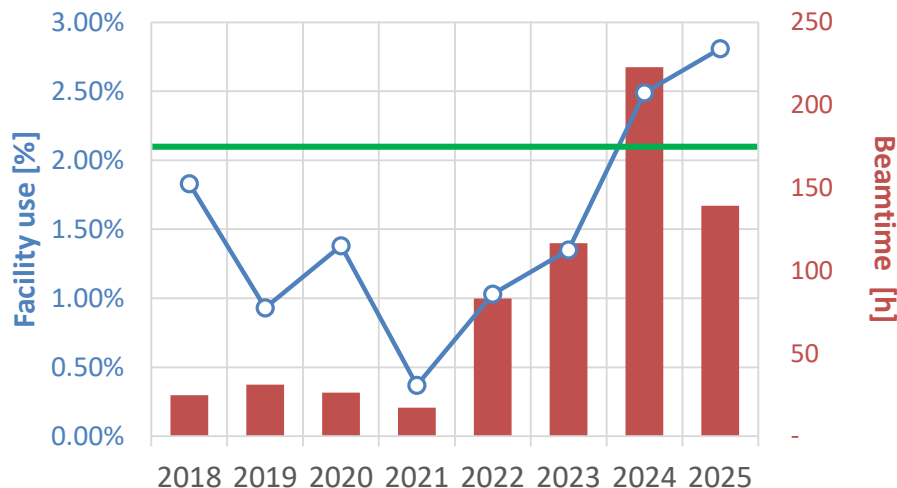
XFEL projects in 2023/2024



**UW, AGH, UwB, UAM, UW, SOLARIS, IMIM PAN,
IFJ PAN, IChO PAN, PW, UAM, IF PAN**

Polish XFEL proposals

"Polish" beamtime



Allocated beamtimes in 2025
7 proposals submitted
5 proposals accepted

Total proposers	Total dept/labs	INSTRUMENT
30	14	HED
26	11	MID
6	4	SPB
16	7	SQS
12	4	SCS

1 Polish PI

Building XFEL users community in Poland – Ministry of Science and Higher Education support



- XFEL lectures for master and PhD students
- organization of schools, workshops, scientific sessions devoted to XFEL
- financial support for Polish scientists to participate in foreign XFEL conferences
- organization of internships at EuXFEL for PhD students and PostDoc
- support in the preparation of research applications for EuXFEL – CD XFELs



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EVENTS

Call for applications for a research internship at EuXFEL

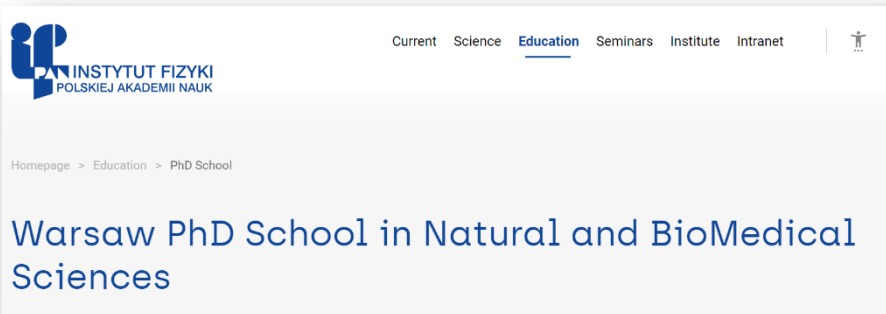
We are organizing internships at European XFEL
research stations for PhD students and young
scientists. Application deadline: 15.09.2024

Show more +

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Lectures for Msc and PhD students: „Science with X-ray Free Electron Lasers”



Winter semester
2024/25



- the **principles of operation and properties of radiation** produced by XFELs,
- **interaction of X-ray with matter**
- **basic X-ray research techniques**
- **examples of XFEL applications** in fields such as protein crystallography, photochemistry, studies of atomic and electronic structure dynamics, magnetism, matter under extreme pressure and temperature conditions, non-linear x-ray optics
- Interested students will have the opportunity, under guidance of experts, to prepare **XFEL research projects related to their field of research** or another selected topic.

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XFEL sessions

65th Polish Crystallographic Meeting

26-28.06.2024, Wrocław

Joint Meeting of PSRS Members and SOLARIS Centre Users 2024

11-13.09.2024, Kraków

66th Polish Chemical Society Meeting

15-20.09.2024, Poznań

Zakopane School of Physics

20-24.05.2025

The 15th International School and Symposium on Synchrotron Radiation in Natural Science (ISSRNS)

25-30.05.2025, Szczyrk



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Workshops



„XFEL-Hubs Kick-off meeting”

14-15.09.2023, Institute of Physics PAS, Warsaw

„XFEL Applications in Material Sciences and Nanotechnology”

5-16.12.2024, Institute of
Physics PAS, Warsaw

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XFEL conferences, workshops, schools



„European XFEL Users’ Meeting 2024”

22-26.01.2024, Hamburg, Germany

„Ultrafast Phenomena 2024”,

14-19.07.2024, Barcelona, Spain

„X-ray Free Electron Lasers: A combined virtual lab and real-lab experience of EuXFEL”,

7-22.08.2024, Aarhus Denmark, Hamburg Germany, Lund Sweden

„School for XFEL and synchrotron radiation users (SFEL)”,

14-18.10.2024, Liptovský Ján, Slovakia

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XFEL conferences, workshops, schools



January

20-24.01.2025: **EuXFEL Users Meeting 2025** - Hamburg, Germany

May

20-24.05.2025: **Zakopane School of Physics - Zakopane** (Krakow), Poland

25-30.05.2025: **ISSRNS 2025** - Szczyrk, Poland

05.2025: **LEAPS Meets Advanced Materials for Energy**, Sopot, Poland

23-27.06.2025: **Femtochemistry 16** - Trieste, Italy

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July

06-11.07.2025: **ATTO X 2025** - Lund, Sweden

14-18.07.2025: **Cost Action NEXT 2nd Annual Meeting** - Vipava, Slovenia

20-25.07.2025: **GRC on X-ray Physics 2025** - Stonehill College, Boston, USA

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Up to 10 applications will be accepted in 2025!

Internships @ EuXFEL



First call for applications - until 15.09.2024

Time: 1.10.-15.12.2024

Topics:

1. Ultrafast Soft X-ray Spectroscopy of Coordination Complexes (SCS)
2. Work with the FXE laser experts on optical setups and measurements
3. X-ray spectroscopy setups and measurements for time-resolved experiments
4. X-ray scattering or diffraction techniques
5. Highly sophisticated X-ray detectors as used for X-ray scattering and spectroscopy experiments.
6. Ultrafast pump-probe studies of structural transformations at MID.

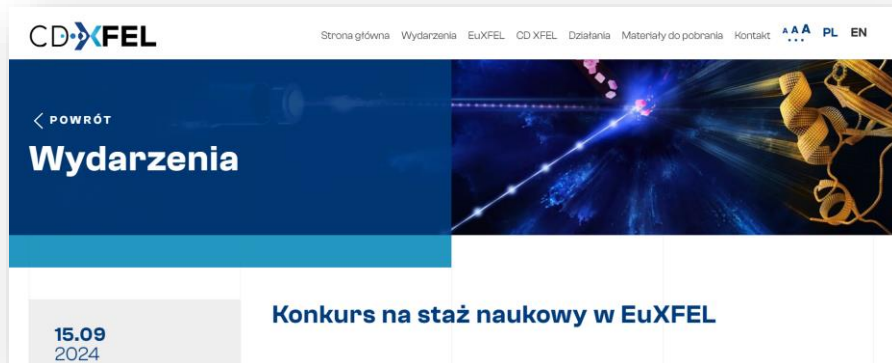
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Internships @ EuXFEL



Second call planned for January/February 2025

Stay tuned!!!! www.ifpan.edu.pl/cd-xfel



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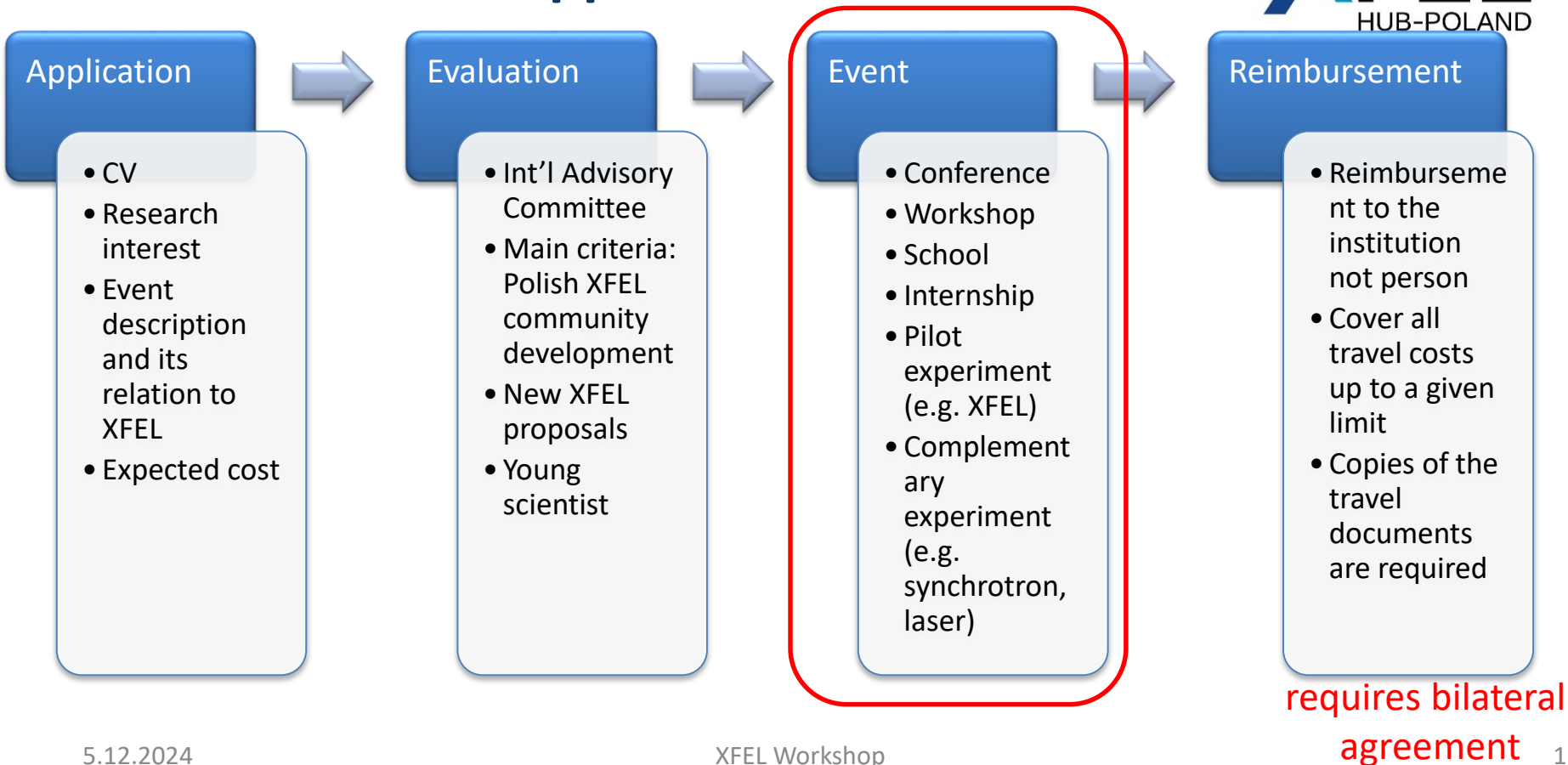
Support for XFEL-related research



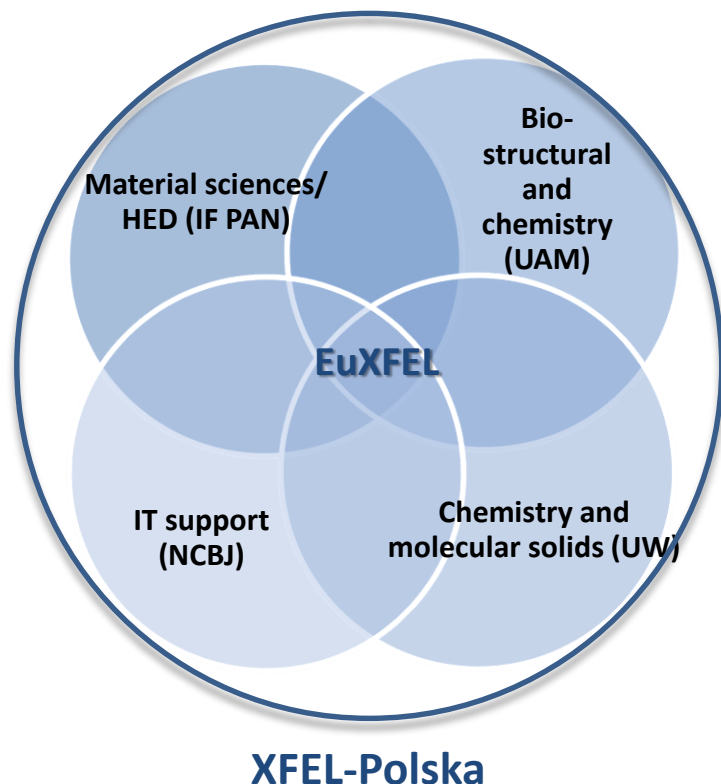
1. Travel reimbursement for experiments, e.g. at synchrotrons, laser labs
2. Materials for samples preparations
3. Electronic and atomic/molecular characterisation
4. Time-resolved studies
5. Support with XFEL beamtime proposals, experiments and data analysis

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Reimbursement applications



XFEL Center of Excellence (Centra Doskonałości XFEL)



CD XFEL network consists of unique research laboratories using the experience and infrastructure of current Polish XFEL users. They bring together scientists who already have extensive experience in research using XFEL, whose knowledge and commitment will support new Polish users of this infrastructure.

Planned activities:

- reaching out to the Polish scientific community
- teaching XFEL techniques to the new users
- preliminary and complementary studies required for XFEL proposals
- support in the preparation of XFEL research applications
- support during XFEL experiments and in data analysis

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XFEL-Hub – IF PAN

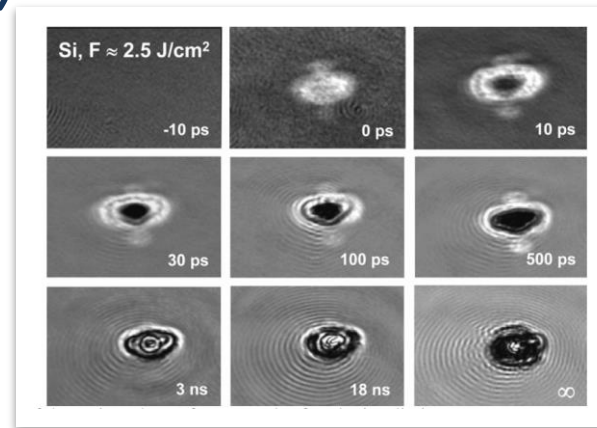
(Inst. of Physics, Polish Acad. of Sciences)



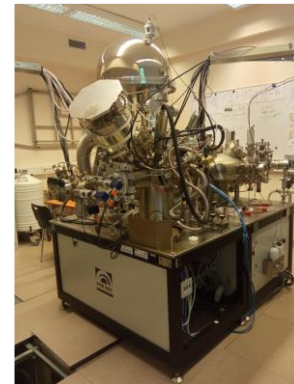
Studies of ultrafast structural transformations in condensed matter by means of time-resolved optical microscopy and interferometry (with sub-ps time- and a few micrometer spatial-resolution) ...

... supported with static structural and electronic characterisation techniques:

- Phillips powder and high-resolution powder diffractometers
- FEI Helios nanolab 600 scanning electron microscopy
- FEI Titan CUBED 80-300 - FEG transmission electron microscope
- X-ray photoelectron spectrometer
- Secondary-ion mass spectrometer



*Towards experiments on
HED, FXE and MID
beamlines at EuXFEL*



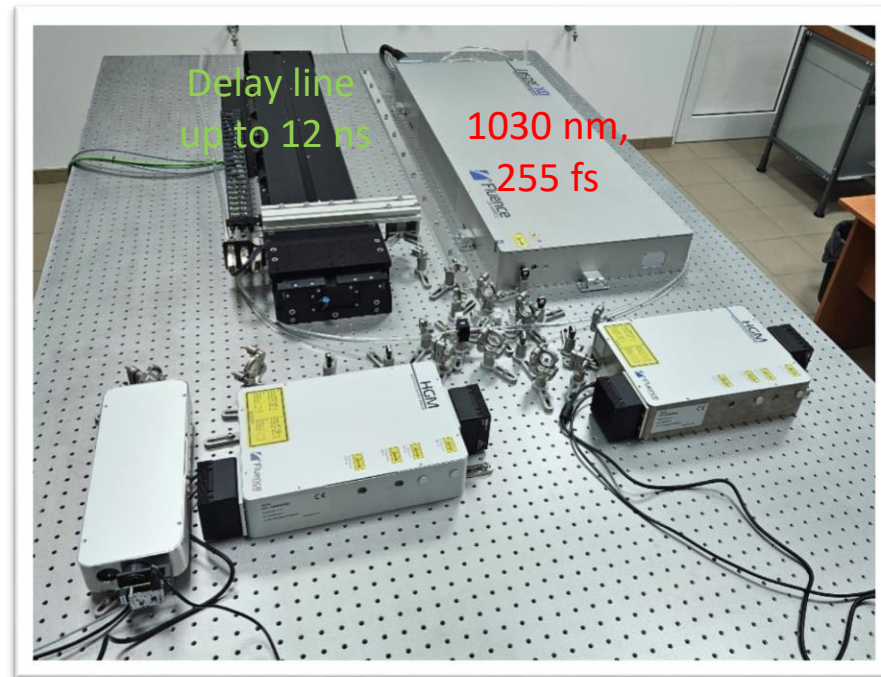
XFEL-Hub – IF PAN

(Inst. of Physics, Polish Acad. of Sciences)



Studies of ultrafast structural transformations in condensed matter by means of time-resolved optical microscopy and interferometry (with sub-ps time- and a few micrometer spatial-resolution) ...

- ultrashort pulses : **255 fs FWHM**
- broad spectral range:
1030, 515, 343 nm and white light
- high pulse energy: **up to 400 μ J @ 1030 nm**
 \sim 50 μ J @ 515 and 343 nm
- delay line: **up to 12 ns with 50 fs resolution**



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OPEN POST-DOC POSITION

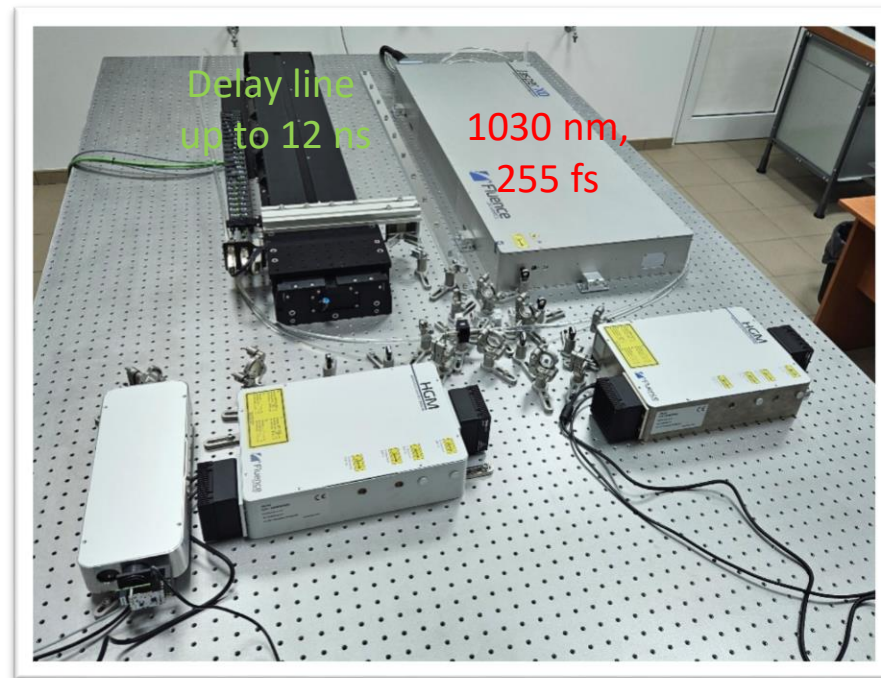
The Post-doc be responsible for

- **construction and operation of an experimental setup** for time-resolved optical microscopy and interferometry,
- **research** on ultrafast structural changes in matter using the developed instrument and XFEL sources,
- **initiate and foster collaboration** with new users of these advanced infrastructures.

Applications deadline: 11.12.2024

Type of contract: full time, 31.12.2026

Salary: 140 000 zł (before taxes) / year



XFEL-Hub – AMU

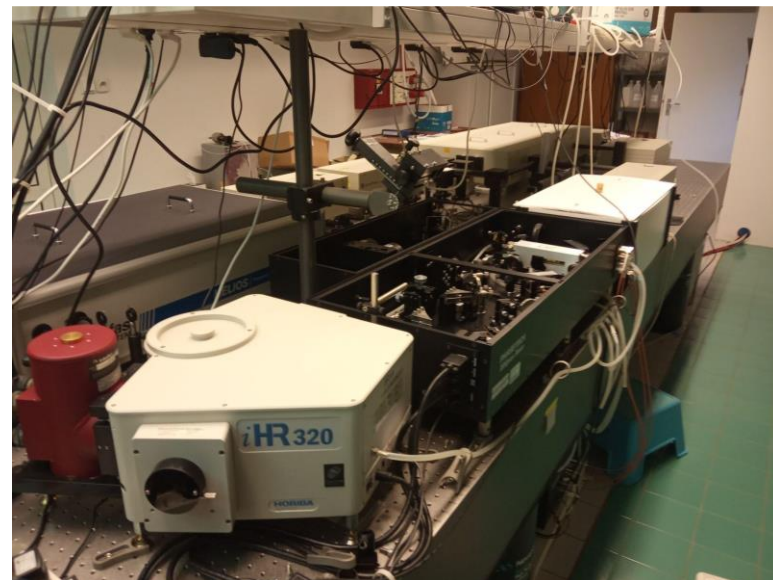
(Dept. of Physics, Adam Mickiewicz Univ.)

Ultrafast photophysical and photochemical processes in solutions and solid state samples using laser spectroscopy:

- **Transient absorption spectrometer with 200 fs** temporal resolution in UV-VIS, NIR and excitation within 235–1200 nm
- mid-IR Transient absorption spectrometer (detection within 3-10 μm)
- Time-correlated single photon counting emission spectrometer (ca. 10 ps temporal resolution)
- Stationary optical spectroscopy techniques (UV-VIS-NIR), FTIR



Towards experiments on FXE, MID and SFX/SPB beamlines at EuXFEL



XFEL-Hub – AMU

(Dept. of Physics, Adam Mickiewicz Univ.)



*Towards experiments on FXE, MID
and SFX/SPB beamlines at EuXFEL*

Structural studies on biological particles (proteins, nucleic acids, macromolecular complexes, lipid membranes, etc.) using **SAXS** (small-angle X-ray scattering) system with:

- MetalJet (liquid metal anode)
- Semiconductor detector Pilatus3 1M
- Wide temperature range (from -196 to 300°C)



XFEL-Hub – UW

(Dept. of Chemistry, Univ. of Warsaw)

Combined structural and spectroscopic studies of molecular materials exhibiting photoactive properties (luminescence, photoswitchability) using:

- Single-crystal diffractometers (100 K – RT, laser/LED assembly for *in situ* crystal irradiation, high-pressure equipment)
- Microscope setup for absorption/emission measurements of solid-state and solution samples with ns time resolution (100 K – RT)
- **IR solid-state spectrometer** (10 K – RT)
+ additional synchrotron photocrystallographic experiments



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on FXE or SFX/SPB
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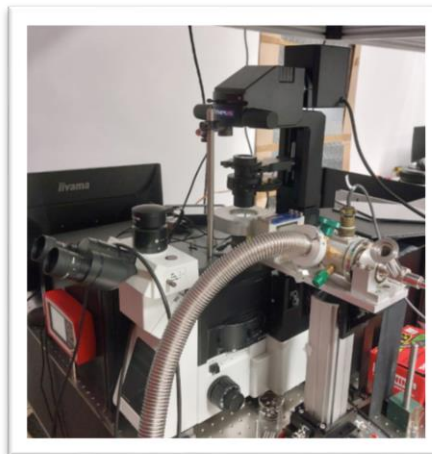


Laser in abs./em. spectroscopy

- pulses: **2–5 ns fwhm**
- broad spectral range:
tuneable: 300-2600 nm
- high pulse energy: **up to 15 mJ from OPO**
(2 mJ in UV)
- frequency: **100 Hz**



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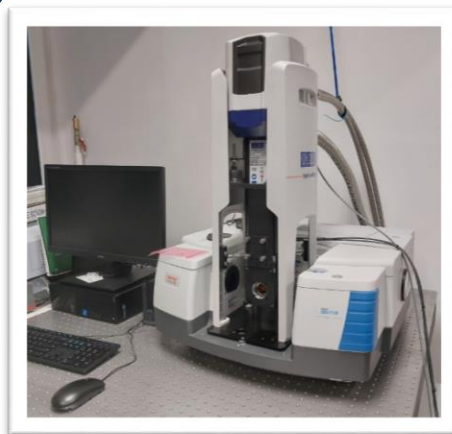
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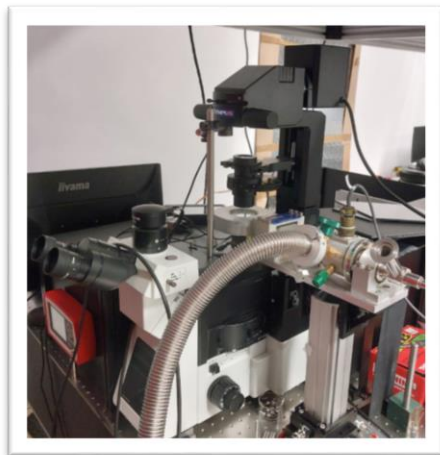


IR spectrophotometer

- range: **350–7800 cm⁻¹**
- resolution: **at least 0.09 cm⁻¹**
- scan speed : **up to 65 per 1 s**



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XFEL-Hub – NCBJ

(Nat'l Centre for Nuclear Research)



Analysis of large data streams from EuXFEL:

- 100 Gbps dedicated link between EuXFEL and NCNR, 40 Gbps from NCNR to Polish Academic Network PIONIER
- 1.45 PFLOPS data analysis cluster
- 26.5 PB disk + 16 PB tape storage
- Interactive nodes with remote GUI and Jupyter notebook environment
- Experienced team of administrators (CrystFEL, Cheetah, etc.)
- Access via VPN



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Thank you for your attention

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