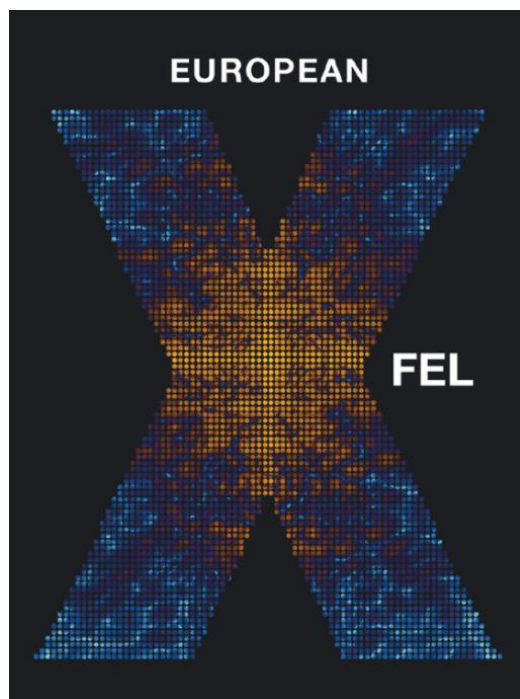


The "**X-ray free electron laser - XFEL**" course begins on **October 16, 2023** as part of the Warsaw PhD School in Natural and BioMedical Sciences (WSD) lecture program. It will cover interdisciplinary research with the use of X-ray free electron lasers in the fields of physics, materials sciences, chemistry and biology. During the lecture, students will learn about:

- principles of operation and properties of radiation produced by XFELs,
- the instrumentation used in XFEL facilities
- basic x-ray research techniques and examples of their applications in such fields as: protein crystallography, photochemistry, studies of dynamics of atomic and electronic structure of materials, magnetism and matter under extreme pressure and temperature conditions, non-linear x-ray optics etc.



The lecture is dedicated mainly for PhD students and can be attended externally by students from outside the WSD. The course will be given by specialists in selected fields related to the application of free electron laser radiation: Prof. Ryszard Sobierajski (Institute of Physics Polish Academy of Sciences), Prof. Jerzy Antonowicz (Warsaw University of Technology), Dr. Wojciech Błachucki (Institute of Nuclear Physics Polish Academy of Sciences), Dr. Wojciech Gawęda (Adam Mickiewicz University), prof. Katarzyna Jarzemska, (Warsaw University), Prof. Maciej Kozak (Adam Mickiewicz University), Prof. Marcin Sikora (AGH University of Science and Technology).

The course will be given **in English** in the remote formula on the **ZOOM platform**. In the winter semester it will be held on **every Monday from 9:15 am until 11:00 am**. Each participant will have an opportunity of interactive consultation with the lecturers. The course will end with test on the lecture material (required to pass) and (optional) with the preparation of the XFEL research project. For successfully completed studies, **2 ECTS** credits will be awarded.

Students interested to participate are asked to contact at the email address:
cd-xfel@ifpan.edu.pl

I cordially invite you to participate,
Ryszard Sobierajski
Institute of Physics PAN