

**REGISTER
NOW!**

X-ray diffraction theory & experiment
Hands-on experience with the use of equipment
Structure solution of your own crystal

2022 X-TechLab Training session

An Intensive Introductory Course In Crystal Structure Solving
November 21st - December 2nd, 2022

Register until October 29, 2022

➔ x-techlab.co/formation/2022-training-session



X-TechLab
Bright solutions for Africa

A unique regional training initiative

Advance your knowledge of X-ray crystallography by attending the 2022 X-TechLab training session that will be held in Cotonou from November 21st to December 2nd.

The X-TechLab training session aims to endow the local and regional scientific communities with technical skills that will allow them to use X-ray techniques as tools for solving various problems in their specific fields.

SKILLS YOU WILL ACQUIRE

At the end of the training, you will receive a Certificate of attendance that will allow you to demonstrate skills to:

- ➔ explain the importance of X-ray crystallography in modern science;
- ➔ describe the phenomenon of X-ray diffraction by crystals;
- ➔ recognize a good quality crystal;
- ➔ identify the suitable crystallization technique for a given study;
- ➔ describe the operation of a single crystal diffractometer;
- ➔ implement a routine data collection using a single crystal diffractometer;
- ➔ solve and refine small-molecule single-crystal structure.



WHAT YOU WILL LEARN

Module I	Fundamentals of X-ray crystallography	History of Crystallography, X-ray diffraction compared with other structural techniques, crystalline state, crystal lattice, Miller indices, crystal symmetry (point group symmetry, translational symmetry, space groups determination, ...).
Module II	Crystal diffraction theory and experiment	Introduction to X-rays & X ray sources, Diffraction of X-rays by crystals, Instrumentation, Crystal growth, selection & mounting, Fourier maps, Introduction to structure solution methods, crystal diffraction data processing, twinning, Polymorphism.
Module III	Hands-on experience with the use of equipment	Crystal selection & mounting, Recording the diffraction patterns, Determining the unit cell geometry and symmetry, measurement of intensities, data reduction.
Module IV	Crystal structure solution & refinement	Crystal structure solution, refinement, absolute structure determination, interpretation of results & validation, tutorials on Cambridge Structural Database.
Module V	Crystallography in specific areas	Introduction to bio-crystallography, crystallography in the development of magnetic thin films materials for computing applications, Introduction to high pressure single crystal X-ray diffraction, Sublimation of multi-component crystals.

NB: The x-ray crystallography courses require some **mathematical background**. Therefore, it is highly recommended that learners revise some mathematical notions (vector products, matrix operations, tensors, Fourier Transform) prior to the training session.



WHO CAN APPLY

To apply to this course, you must:

- ➔ Hold a Master degree (or being at Master 1 or 2 level) in fundamentals and applied sciences (chemistry, material sciences, pharmacology, geology, physics, etc.);
- ➔ Be enrolled in an academic institution (university, research center, ...);
- ➔ Have some knowledge in mathematics (vector products, matrices and matrix operation, tensors, Fourier transform);
- ➔ Have single-crystal samples to characterize during the training session.

HOW IT WORKS

The training includes **70 hours** of intensive courses over two (02) weeks. The particularity lies in the association in equal parts between theory and practice with the opportunity for attendees to work on their own samples. All learners and lecturers will be present in person at Sèmè City in Cotonou, except for a few lecturers who will attend remotely. At the end of the training, the learners will undergo a **two-hour knowledge test** intended to assess the knowledge gained from the training for each participant.

APPLY NOW!

Applications are submitted here: www.xtechlab.co/formation/2022-training-session

The following documents must be scanned and attached to the form:

- ➔ Curriculum Vitae;
- ➔ Copy of your last degree (at least Master's degree or a proof of study level in Master 1 or 2, student card for Ex.) ;
- ➔ Copy of ID card or Passport;
- ➔ A recommendation letter from the supervisor (applicable for PhD students only);
- ➔ A motivation letter (1 page max.) presenting reasons for applying to the X-TechLab training session.



COURSE FEES

The overall cost of the training session is 3,200 euros per learner.

However, Sèmè City and the French Embassy in Benin have fully subsidized the 2022 training session for the twenty (20) best candidates, including travel and accommodation costs. Only registration fees of **80€ for Beninese applicants** and **160€ for other nationalities** will be charged.

Bright Solutions for Africa

X-TechLab provides scientific communities from Benin and Africa with the necessary skills to use X-ray techniques as tools for solving specific and critical socioeconomic issues, particularly in the health, agriculture, energy and environment sectors.

For more information visit : www.xtechlab.co