Poster

Crafting Engaging and Impactful Crystallography Courses: Insights from Higher Education and Summer Schools Worldwide

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Teaching crystallography requires more than just conveying technical skills; it entails fostering an understanding of the scientific discipline as a whole. Drawing from experiences gained through teaching crystallography classes at the higher education level, and by organizing and teaching at diverse summer school settings globally, this abstract offers strategies to design impactful courses that transcend the misconception of crystallography as merely a technique.

Defining learning objectives that emphasize crystallography as a scientific discipline encompassing theory, methodology, and application, and highlighting the interdisciplinary nature of crystallography by exploring its connections to chemistry, physics, biology, pharmacology, mineralogy, materials science, and beyond is pivotal to instil a deep appreciation for crystallography's theoretical foundations, methodological rigor, and diverse applications, empowering participants to become proficient practitioners and thoughtful stewards of this dynamic field.

A range of interactive methods to engage participants in *active learning experiences*, from hands-on activities to group discussions, encourage exploration and critical thinking to deepen understanding beyond technical proficiency. Whenever and wherever possible, providing *access to well-equipped laboratories* for hands-on experimentation, emphasizing the scientific process and data interpretation over procedural techniques, help design experiments that showcase the *interdisciplinary nature of crystallography* and its role in scientific inquiry. Furthermore, fostering a sense of international collaboration and cultural exchange, by featuring research examples and perspectives from different regions, enriches participants' understanding of *crystallography's impact on a global scale*.

Summer schools greatly benefit from the presence of lecturers from diverse fields to demonstrate the relevance and applicability of crystallography across scientific domains. Passionate instructors who not only possess technical expertise but also a profound appreciation for crystallography as a scientific discipline and availability to offer *mentoring and expert guidance* during and after the courses, will be recognised by students as reference points in their careers, thus representing the legacy of the event.

A key aspect of any educational event is the *assessment of participants' technical proficiency and conceptual understanding*. This is of particular importance both before and after the event. A pre-course survey is a useful tool for determining the content that will best suit the course duration and audience, as well as for identifying any misconceptions that may hinder learning. Encouraging *open dialogue and feedback* is an effective approach for addressing these issues, thus enhancing the learning outcomes for all participants.

Examples will be shown from several initiatives implemented in diverse parts of the world and targeting different audiences, including several National and Regional crystallography schools [*e.g*., 1], joint schools of different associations, IUCr-UNESCO OpenLabs [2], training sessions at the X-TechLab in Benin [3], introductory courses at newly launched crystallographic facilities, like for example crXstal in Jamaica, and others.

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