

Crystallography for sustainable development: UNESCO's role and strategy

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Investment in the forward-thinking field of crystallography, the study of atomic and molecular structure, is veritably an investment in a sustainable global future. Beyond offering a widely diverse number of practical applications actively employed today, spanning from energy to medicine, mining and cultural heritage, crystallography also significantly contributes to the efficient and sustainable use of our planet's natural resources. Thus under the threshold of the United Nations 2030 Agenda for Sustainable Development, the development of this defining discipline must be prioritized on a global scale in order to unlock its rich potential for significant advancements in science, innovation, and sustainable growth.

Three years following a successful and productive celebration of the International Year of Crystallography, jointly organized by the IUCr and UNESCO, there remains much to accomplish going forward in terms of innovative partnerships and international cooperation, particularly concerning the South-South region. Advocacy for crystallography-based knowledge and technology must continue to be reinforced among both policy-makers and the public, necessitating strong synergistic action between UNESCO and the crystallography community in view of an effective and efficient impact.

Lessons learned through UNESCO's experience over the past few decades have clearly demonstrated that no single country can develop sustainably alone. Global-scale issues which span across borders require global-scale multisector collaborative solutions. Climate change, loss of biodiversity, water pollution and SESAME-like large scale facilities, for example, cannot simply be contained within national borders. Cohesive international coordination is thus imperative to the effectual conceptualization and implementation of creative innovative solutions to these and other issues, as well as to related knowledge sharing. The field of crystallography is a valuable cross-disciplinary tool available to global actors in response efforts, fostering a great deal of relevant research and innovation, and should therefore be placed at the forefront of sustainable development planning, especially in the Global South.

UNESCO contends that novel, innovative, forward-thinking processes and practices are essential for progress in the scientific domain, and by extension for advancements in sustainable development. Moreover, an increasingly interconnected world demands a scientific field increasingly linked to policy-makers and in touch with the general public, especially in relation to UNESCO's Global Priorities of Africa and Gender Equality, in order to effectually respond to the needs and aspirations of societies. Thus within the field of crystallography for example, a more inclusive educational system must be developed to create conditions which encourage increased participation of women in the creation of knowledge, and to strengthen crystallography higher education institutions.

In summary, UNESCO stands firmly alongside IUCr to advocate for advancements in the field of crystallography, in light of the tremendously valuable role that this innovative discipline has to play in solving global challenges facing sustainable growth and development.

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