

**Address in UNESCO, Paris in the opening ceremony of the
International Year of Crystallography
20th January, 2014**

Madame Director General, Excellencies, representatives of the member states of UNESCO, crystallographers, students and friends,

On behalf of the International Union of Crystallography and its Executive Committee, I am honored to welcome all of you to this opening ceremony of the International Year of Crystallography.

The origins of crystallography can be traced back to ancient times when man looked at gemstones, minerals and the beautifully formed salt and sugar crystals that could be obtained from substances as common as sea water and molasses. Crystals are obtained in all sizes and shapes and are found everywhere. Crystallography is the study of the macroscopic and microscopic symmetry of crystals, of their internal structure in terms of where atoms, ions and molecules are situated with respect to one another and their properties. A century ago, it was found by Max von Laue in Germany that crystals diffract, that is they bend, X-rays and this discovery was harnessed almost immediately by W. H. Bragg and W. L. Bragg, father and son, in the U.K. to internally image them. These remarkable discoveries, of the highest intellectual merit, and whose centenaries we celebrate today, paved the way for a scientific revolution.

Today, there is literally no branch of structural science that is untouched by crystallography. The benefits to mankind have been enormous and range from the discovery of medicines and drugs, to materials that make the quality of life better for all. Crystallography has been called an unsung technique but it is worthwhile to record here that more than 25 Nobel Prizes have been awarded in the last 100 years for discoveries in physics, chemistry, biology and medicine that depend more or less directly on this subject.

The United Nations have declared 2014 as the *International Year of Crystallography* and have charged the International Union of Crystallography to Works with UNESCO in celebrating the Year and popularizing this very important subject. While crystallography is a high level scientific discipline, its applications that are easy to enjoy and appreciate by all. The IUCr and

UNESCO have undertaken a wide ranging program of activities from crystal growing experiments for school children to summit meetings for researchers and science administrators. An ambitious program of open laboratories in at least 20 countries worldwide, many in less endowed regions of Africa, South and Central America and South Asia has been launched and in these labs there will be an opportunity for students and young researchers to obtain hands on training with sophisticated equipment that measure the diffraction of X-rays by crystals.

The International Union of Crystallography or IUCr was founded in 1948 and has its headquarters in Chester, U. K. Today, 51 countries adhere to the IUCr, through three Regional Associates (American, European and Asian Crystallographic Associations) and nearly 40 National Associates. A fourth regional associate, the newly formed Latin American Crystallographic Association, is likely to adhere to the IUCr later this year. The aims of the IUCr are : (1) to promote international cooperation in crystallography; (2) to contribute to the advancement of crystallography in all its aspects; (3) to facilitate international standardization of methods, of units, of nomenclature and of symbols used in crystallography and; (4) to form a focus for the relationship of crystallography to other sciences. The IUCr publishes very high quality crystallographic research; till now it had eight journals and a ninth one, an open access journal called simply IUCrJ, is being launched right now to coincide with the International Year.

Research scientists communicate their results to each other in the columns of their journals and in high level meetings and conferences. Why is it then that the IUCr approached the UN to declare 2014 as the International Year of Crystallography? What is the relevance and context of an International Year for a scientific subject? How and why does UNESCO come into the picture? Why have International Years at all? Such questions have been considered by many in this audience here.

While humankind has involved itself in scientific pursuits since antiquity, there is little doubt that modern science as we know it today may be traced to the Renaissance. Science leads to technology and this in turn leads to human development across the world. The connection between science, economic development and geopolitical influence is therefore quite straightforward. It is no coincidence that the development of scientifically influential ideas since the time of the Industrial Revolution, and this includes advances in crystallography, were the

most prominent in the economically advanced nations: Germany, France, U.K., Russia, Japan, and finally the U.S.A.

Today, however, strategic equations in the world are changing rapidly and with the spread of education, the world is becoming flat. Geographical constraints are not as relevant today as they were, say 50 years ago. The developing countries are catching up in all areas of science and technology. The future of science, and of crystallography in particular, will lie in those parts of the world that have people power and economic strength.

Realizing that we must make a strong commitment to parts of the world that are beginning to see an economic upswing if we are to remain viable and relevant as a scientific union, the IUCr has decided to develop its plans for the International Year with special focus on Africa, Latin America and parts of East and South Asia that are rapidly coming into the mainstream. We cannot afford to do otherwise because these are the regions where maximum growth and future influence is anticipated.

I do not need to mention in UNESCO that Africa will be an enormously important continent in the future. The IUCr has made a strong commitment to encourage the development of crystallography in Africa, with a formal program in place since 1999, and the present plan of open laboratories in Ghana, Morocco, Gabon, Algeria, Congo and Côte d'Ivoire and a summit meeting in Bloemfontein, South Africa will encourage the study of our subject with special reference to the importance of strategic minerals through the technique of X-ray powder diffraction. The IUCr is also committed to bringing together the Francophone and Anglophone regions of Africa. IUCr is strongly interested in promoting a pan-African identity through science, and in particular crystallography, during IYCr and beyond.

Ultimately, though, the future of crystallography will hinge on all the member states. The IUCr is committed to the spreading of the subject of crystallography in all parts of the world because it is only through such a global initiative that all round material progress will be obtained and the quality of life will improve for all. The IUCr welcomes the opportunity to work with UNESCO during this International Year of Crystallography.

Thank you very much for your attention.