

## Preface

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X-rays were discovered by Röntgen, in Würzburg, Germany towards the end of the 19th century. Röntgen was awarded the first Nobel Prize in Physics for this discovery which had a lasting impact in diverse fields ranging from Chemistry to Health. The discovery of diffraction of X-rays by crystals by Max von Laue and its subsequent analysis by the father and son duo, William Henry Bragg and William Lawrence Bragg, that the observed scattering is due to the reflections from evenly spaced planes of a crystal heralded the applications of X-ray crystallography in the structure elucidation of molecules and materials. Although initially restricted to only specialists, rapid strides in the analysis of X-ray diffraction data aided by powerful computational methods as well as extremely sophisticated instrumentation, has allowed this technique today to be used as a routine characterization tool that affords important information about the structure and the bond parameters in molecules and materials. X-ray crystallography has had many triumphs: from solving the crystal structures of Vitamin B-12 and Hemoglobin to ion channels. Indeed, the diffraction patterns of DNA obtained by Rosalind Franklin and Maurice Wilkins have been the important clues for the postulation of the double helix structure for DNA, by Watson and Crick. In India, X-ray crystallography was championed by several great scientists such as Prof. G. N.

Ramachandran and Prof. S. Ramaseshan. The use of X-ray crystallography to arrive at the structure for collagen by G. N. Ramachandran is one of the most important contributions from India using this technique. In recent years, Prof. G. R. Desiraju has pioneered the analysis of new supramolecular interactions in crystals including weak hydrogen bonds and has put India prominently on the Scientific map of Crystal Engineering. In spite of its tremendous potential and utility, X-ray diffraction methods are still not accessible to many researchers in this country. They have to depend on obtaining data from elsewhere. Fortunately, there are now a reasonably large number of Institutions that have access to sophisticated X-ray diffraction instruments and this has allowed this technique to be used widely.

It is matter of great satisfaction that The National Academy of Sciences of India, Allahabad, has decided to bring out a special issue on the utility of X-ray crystallography in Chemistry. I am grateful to all the contributors drawn from various places of the country who have readily responded to my invitation. The articles in this special issue deal with structures of organic/inorganic/organometallic compounds as well as supramolecular interactions present in them. Also, issues about polymorphism in crystals and their role in pharmaceutically important compounds are addressed.

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