

THE ADSTOCK SCIENCE CLUB



Don't miss our forthcoming talk

by

Mike Glazer

Emeritus Professor of Physics at Oxford University

The Crystal World

The Science of Crystallography

**On Thursday 18th April 2013 at 7:30pm
in the Adstock Village Hall**

Admission is Free

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CRYSTAL WORLD

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Crystals have been objects of mystery and fascination for the last two millennia: but people in general are unaware that much of the solid material around us is in fact made up from crystals, including all rocky planets such as the one we live on. The importance of crystals lies not just in their beauty and their intrinsic value as gem-stones, but in their practical applications that are at the centre of today's technological society. The study of crystals, known as "crystallography", has had a major impact throughout all the sciences, including biology, physics, chemistry, materials science, mathematics and engineering. In the first part of this talk we shall follow some of the historical developments that have enabled scientists to discover and describe the role of *symmetry* in understanding the nature of crystalline solids. Despite centuries of interest and study, until the early part of the 20th century, ideas about the atomic arrangements that make up the crystal structure were primarily theoretical, with almost no real experimental evidence to back them up. This talk celebrates the 100th anniversary of the discovery of the technique of x-ray diffraction, which has enabled modern scientists to determine crystal structures from experiment. The first demonstration of this was made by von Laue and co-workers in Germany in 1912. Then in the following year, father and son, W.H. and W.L. Bragg in Britain showed how x-ray diffraction could be used to locate the positions of all the atoms in a crystal. Thus was born the modern era of x-ray crystallography, which has led to numerous Nobel prizes, great scientific advances, such as in the development of computers, modern genetics, new materials and much else. We shall see how the science has advanced over the last 100 years from the first very simple crystal structures, such as in common salt, to today's complicated molecular crystals, such as proteins and viruses that can contain 10's of thousands of different atoms. With today's computing power and sophisticated instrumentation, even these complex crystal structures can be solved almost routinely, an enormous feat that the Braggs and their contemporaries could not possibly have imagined.