THE NOBEL PRIZE

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Snowflake. Photo: Pen Waggener, CC BY 2.0, via Wikimedia Commons.

Absolutely crystal clear

Crystals are everywhere in nature – from snowflakes to sea salt – and are often admired for their symmetrical patterns. However, for most people, the science of crystallography remains relatively unknown. Modern crystallography originated around 110 years ago, thanks to the work of 1914 physics laureate Max von Laue who showed that X-rays are diffracted in crystals. His work laid the foundation of a field which today underpins many technological developments in our modern society, such as drug development, nano- and biotechnology. ()

Read more: ‘X-ray’s identity becomes crystal clear’

A successful father-and-son team

Lawrence Bragg. Photo from the Nobel Foundation archive.

Max von Laue's ingenious discovery of the diffraction of X-rays in crystals revealed both that X-rays are a form of electromagnetic wave and that crystals are lattice-like in structure. However it wasn't clear whether the structure of the crystal and the wavelength of X-rays had any influence on the diffraction pattern produced. This connection was established by the Braggs, father and son, who were awarded the Nobel Prize in Physics in 1915.

Read more: 'The parent trap'

Dorothy Crowfoot Hodgkin. Photo from the Nobel Foundation archive.

Captured for life by chemistry and by crystals

"Captured for life by chemistry and by crystals," as she described it, Dorothy Crowfoot Hodgkin turned a childhood interest in crystals into the ground-breaking use of X-ray crystallography to "see" the molecules of penicillin, vitamin B12 and insulin. Her work not only allowed researchers to better understand and manufacture life-saving substances, it also made crystallography an indispensable scientific tool. Crowfoot Hodgkin was awarded the Nobel Prize in Chemistry in 1964.

Learn more about Dorothy Crowfoot Hodgkin's life

The discovery of quasicrystals

Dan Shechtman in the lab. Courtesy Dan Shechtman.

In quasicrystals, we find the fascinating mosaics of the Arabic world reproduced at the level of atoms: regular patterns that never repeat themselves. However, the configuration found in quasicrystals was considered impossible, and chemistry laureate Dan Shechtman had to fight a fierce battle against established science.

Watch an interview with Dan Shechtman