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The Nature of Science – Using Models to Communicate and Understand Science

Biggest Ever Crystal Built in Vienna

The world's biggest crystal structure model – a 3D chemical illustration made from little balls and sticks – is being assembled in Vienna's city hall. It replicates the repeating lattice of sodium ions and chloride ions found in a crystal of table salt, Na*C*l.

Standing more than 3 m tall, the model was built by Dr. Robert Krickl from nearly 40 000 balls and 10 km of sticks.

The world record attempt will be adjudicated by the Guinness Book of Records on 23rd November. It will be on public display until 30th November, and has already been commemorated on an Austrian postage stamp.

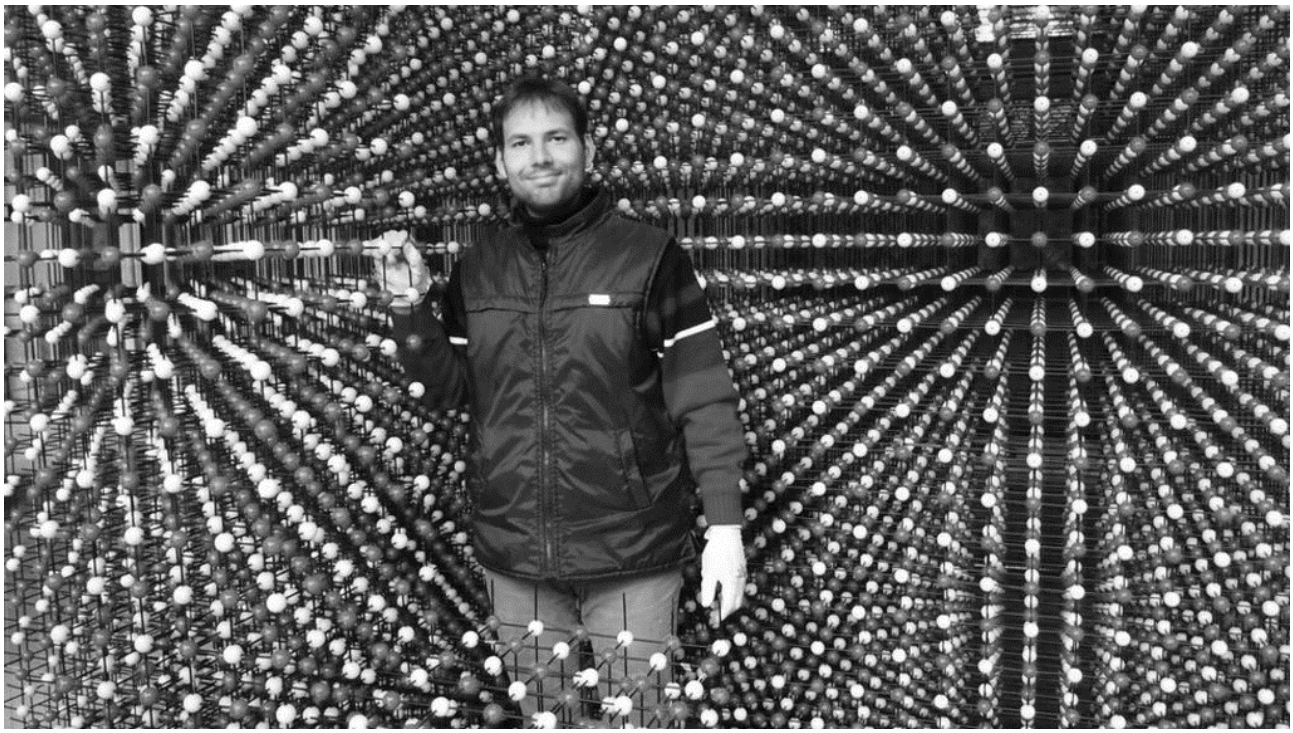
- The model appears on an Austrian postage stamp.

"I want to show – to visualise – how our world looks when it's magnified about a billion times," Dr. Krickl, a crystallographer turned science communicator, told Science in Action on the BBC World Service.

Because of the regular pattern it is built-up from, which causes hundreds of the sodium ions and chloride ions to form precise lines from multiple angles, the huge model has a rather dazzling appearance.

It also has particular significance this week, Dr. Krickl said. "This week is the 100th anniversary of the Nobel Prize for discovering what I show with this model: the arrangement of atoms in crystals." The British father-and-son team of William and Lawrence Bragg won the Nobel Prize for Physics in 1915 for originating the technique that is now known as x-ray crystallography.

"This discovery really had a major impact on science and our understanding of the world," Dr. Krickl said. "It led to the determination of the structure of DNA, of viruses, of proteins – and on the other hand, of materials used in our daily lives, for technology to build faster, better lighter machines."



- Dr. Krickl constructing the model of sodium chloride. The dazzling model shows the ionic structure that would make up a crystal of table salt just 0.0000096 mm across.

Essential Questions

- Why must scientists communicate their ideas with clarity and precision?
- Why do scientists often use models to communicate their ideas?
- Apart from physical models, what other types of models do scientists use?
- How do models help scientists understand complex ideas and theories?
- What are the limitations of using models to communicate ideas?

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