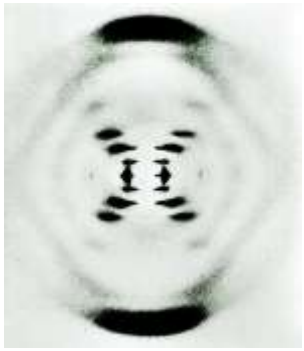
THE ADSTOCK SCIENCE CLUB



The world is full of them, by this I mean crystals. From the salt sprinkled on your fish and chips to a diamond on an engagement ring and even individual snowflakes, these are all forms of crystals. In April, Mike Glazer, Emeritus Professor of Physics at Oxford University, took us on a fascinating journey into the world of crystals and crystallography. He explained how through the work of William Henry and William Lawrence Bragg, father and son, the science of crystallography was born and how this was used in the 1950s to tease out the structure of DNA from X-ray photographs (see picture) taken by Rosalind Franklin and by the now famous work carried out by James Watson, Francis Crick and Maurice Wilkins.

He explained how X-rays are diffracted when passing through a crystal to form a series of dots on a photographic plate and by using modern computers these images can be used to determine the position of atoms within a crystal, and can even produce complex 3D images of their structure.

Francis Crick James Watson Maurice Wilkins Rosalind Franklin

These techniques can also be used to work out how non-crystalline structures such as proteins are formed. He demonstrated, by using marbles, how crystals are able to self-assemble from a small “seed”, a particle of dust say, to form large repeating geometric structures.

On a different note in May, Dr Harin Sellahewa, from Buckingham University’s computing faculty gave a very interesting and thought provoking talk about how images taken by smartphones and sent to others, for whatever purpose, can be used to identify the manufacturer, make and model and also possibly the exact smart phone which took the image. This work, it is hoped, will one day be used to identify suspects in criminal investigations where smartphone images are used for blackmailing or other illegal purposes.

Harin explained that there are basically 16 different characteristics, from the type of lens to optical sensor specifications, which can be used to define the mobile being used to take the picture. Currently he is working with a number of his students to develop the algorithms necessary to accomplish this. He also showed us how secret messages, including security details can be embedded within an actual picture without it being obvious. So be warned, if you’re thinking of taking any naughty photographs and using them for nefarious purposes, don’t be so sure that you won’t be found out.

Our next Science Club meeting will be on Thursday 13th June and may be of interest to the sleuths amongst you. If you’re into CSI and murder mysteries then Dr John Bond (no relation to James) has something interesting to talk to you about. He will be telling us all about a technique called “visualisation” which is used to identify fingerprints on metal surfaces even though they may be badly corroded. He will show how visualisation can be achieved by various methods including optical interference, digital colour mapping and electrostatic attraction and will demonstrate how fingerprints deposited on brass cartridge cases, pre-firing, can be “visualised” after the gun has been fired with examples given from real life homicides where this technique has been used.

Finally, on the 11th June between 8:00 and 9:30pm The Adstock Science Club will be present at the Adstock Village open evening in the village hall, so if any of you are interested in what we do and would like to find out more, don’t be shy - come and talk to us.

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