

Judith Howard

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Professor Judith Howard FRS is a leading international figure in the field of Structural Chemistry. During her career she has pioneered new methodology in the field of X-ray crystallography; showing how the three-dimensional structure of a material can be determined down to atomic level by firing a high-intensity beam of X-rays at a crystal and interpreting the complex scattering patterns that emerge.

Judith's group has developed techniques that can do this at extremely low temperatures, as low as just a couple of degrees above absolute zero (that's -273°C – colder than the depth of outer space). At these temperatures thermal vibration can be greatly reduced, allowing the positions of atoms to be pinpointed to less than a trillionth of a meter. The wonderful 3d pictures, showing the structures of molecules that emerge from this, help Chemists to understand how molecules work.