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identifying point defects in technologically important semiconductors

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Impurities and their complexes, whether introduced deliberately or accidentally during fabrication dominate the properties of semiconductor devices. Determining the actual elemental and physical structure of a defect responsible for undesirable effects in devices can be remarkably difficult. A good example is the Boron-oxygen degradation mechanism in Silicon solar cells. This defect degrades the performance of commercial cells by as much 10% (relative) of their efficiency. With the exponential uptake of solar energy around the planet this one defect is losing the energy equivalent of millions of tons of carbon every year. Yet despite this effect being known about for over 40 years there is still no consensus over what the defect is or how it degrades the cell. The Manchester Defects group have worked in this field for over 40 years, using a wide range of electrical and optical techniques to identify defects in semiconductors. The speaker will give an overview of this work and will discuss how ISOLDE could be used to solve some of the most difficult to attack problems in this important field

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