

Investigating the local properties of optoelectronic devices using Transmission Electron Microscopy

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Emerging optoelectronics technologies (thin film solar cells, LEDs) often rely on the optimisation of local properties, including fine tuning of local composition, morphology and grain structure. Furthermore, understanding how the manufacturing process and imperfections can affect performance is of crucial importance in the design and upscaling of most microelectronic devices.

Transmission Electron Microscopy and associated spectroscopic studies enable the study of the local structure, chemistry and electronic properties in devices with resolution down to the nanometre scale. In this talk we'll show some of the insights that can be gained and fed into the design process, taking solar cells as an example. As a complementary technique, we will also show how cathodoluminescence in the SEM can be used to integrate the TEM studies.