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3-D Structure of Semiconductor Nanomaterials ILKE ARSLAN, University of Cambridge, NIGEL BROWNING, University of California-Davis, TIMOTHY YATES, JENNA TONG, PAUL MIDGLEY, University of Cambridge — In recent years, nanotechnology has become a key component in the field of materials physics, placing a more rigorous demand on characterization of nanomaterials, ultimately in three dimensions. This has led to the development of electron tomography for inorganic materials using Z-contrast imaging in the scanning transmission electron microscope (STEM). Here we present high resolution 3-D reconstructions of quantum dots and tetrapods. The results from Sn quantum dots in a Si matrix illustrate the ability to identify the size, shape and distribution of embedded dots in a layer in three dimensions, as well as identifying their formation mechanism. Dual axis tomography is demonstrated for the first time for inorganic materials on semiconducting nanorods in the shape of tetrpaods made of CdTe. These results indicate approximately 1nm resolution in all three dimensions using single axis tomography.

Ilke Arslan

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