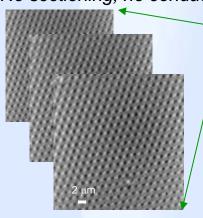
# Non invasive 3D Characterization

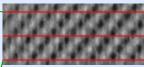
from Nanomaterials to Nanoelectronics...

#### 1. Non Invasive Imaging

No sectioning, no conductive coating



CT (computed x-ray tomography) slices of polymer nanophotonics crystals at 50 nm spatial resolution with nanoXCT

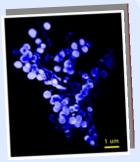


Polymer nanophotonics crystals

Observe surface or buried structures of variety of nano materials in 3D at ambient - with minimal or no sample preparation.

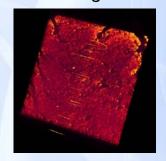
## 3. High Contrast Imaging

Visualizing low Z materials, cracks, delamination - without contrast agents



Self assembled magnetic particles

3D CT image of self assembled magnetic particles- cobalt spheres with polymer coating, imaged at 50 nm resolution

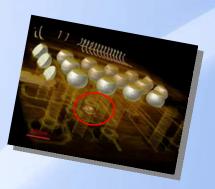


Die attach delamination in IC package

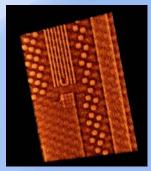
3D CT image of low contrast cracks and delamination in die attach of semiconductor package with MicroCT

### 2. Multilengthscale Imaging

Package to die level defects (microns to sub 50 nm spatial resolution)



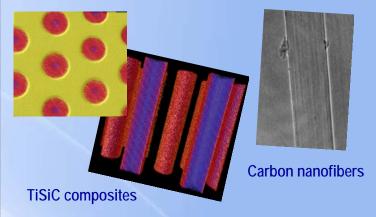
Package level defects, showing defective via @ 3 µm resolution



Die level defects missing via @ 50 nm resolution

### 4. Versatile Imaging

3D, 2D, microscopic to large samples, in-situ



3D CT image of TiSiC composite (left image) imaged at 1.5 micron resolution and 2D x-ray image of a carbon nanofiber imaged at 50 nm resolution

Novel x-ray micro and nanotomography systems from Xradia ...

Simplifying the way microscopy is done



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