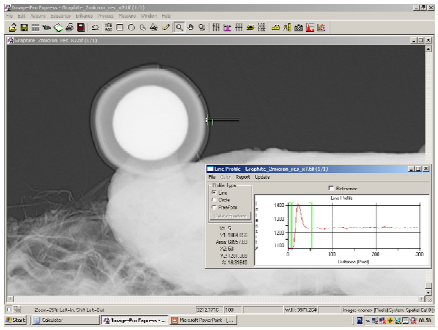
Photonic Science
Scientific Detector Systems

X-ray micro and Nano CT detectors

## Extended energy X-ray absorption X-ray CCD detectors

**Photonic Science delivers a new generation of Very High Resolution X-ray CCD detectors with extended energy coverage using both fan and cone beam geometry**

Extending energy response includes extending primary absorption, which means an extended mean free path for absorbing primary high energy X-ray photons. Using a structured scintillator helps increasing the absorption efficiency without sacrificing spatial resolution and obtaining better signal to noise ratio.
A detector operating in fan beam geometry for extended absorption through a well collimated slits assembly will deliver good sensitivity and medium spatial resolution at high energy as it offers a longer mean free path for X-ray absorption.

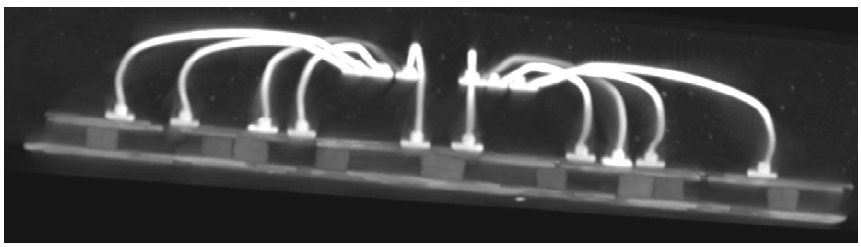


**1 micron source 60kV Operation
Graphite pellet x15 magnification, > 1 micron resolution
Courtesy INSA Lyon**

The same detector can be used in fan beam geometry and will deliver optimized spatial resolution and contrast in a lower energy range, by switching acquisition modes onto the detector from 1D to 2D scanning.
Moderate geometric magnification is used in order to enhance the 20lp/mm native resolution of the detector up to >500 lp/mm.

## Micrometer range resolution with no geometric magnification

**Photonic Science delivers a new generation of X-ray CCD detectors for micrometer range resolution with very short sample to detector distance operation**



**1 micron source 60kV Operation
Graphite pellet x15 magnification, > 1 micron resolution**

Single crystal scintillators are well known for being able to deliver micrometer range resolution.
The trade off for a poorer absorption can be compensated for a much shorter working distance which is quite accessible with the latest range of micrometer range nanofocus X-ray source.
In order to preserve the stability of such small spot size, these sources are often limited to 40-60 kV operation. This gives a quite soft X-ray spectrum that is compatible with very thin phosphor operation.
The resulting system is very compact, typically down to micro positioner stage dimensions.
Sample structures up to 5mm diagonal can be reconstructed in 3 dimensions micrometer range resolution, sub micron resolution can be attained using only > 2x geometric magnification.

## Recommended Detectors

**X-ray VHR detector**
**X-ray Image Star detector**
**X-ray FDI**

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