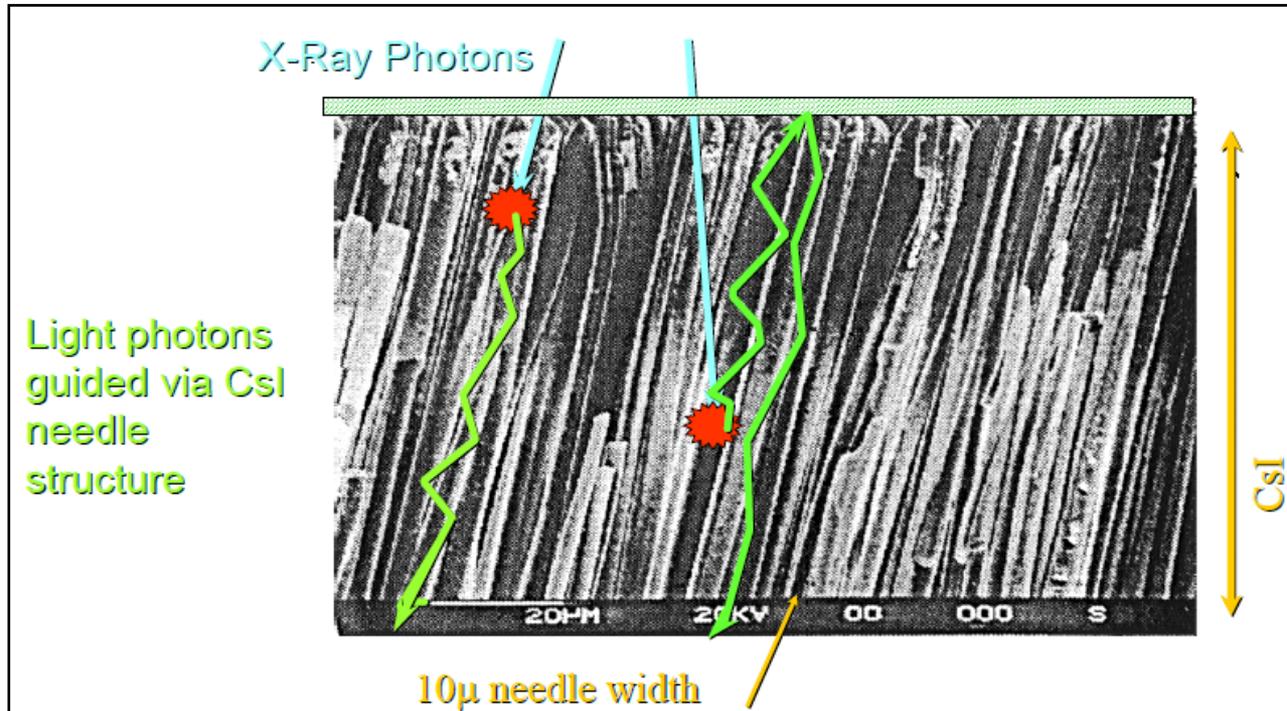


Structured vs. Columnar Scintillators

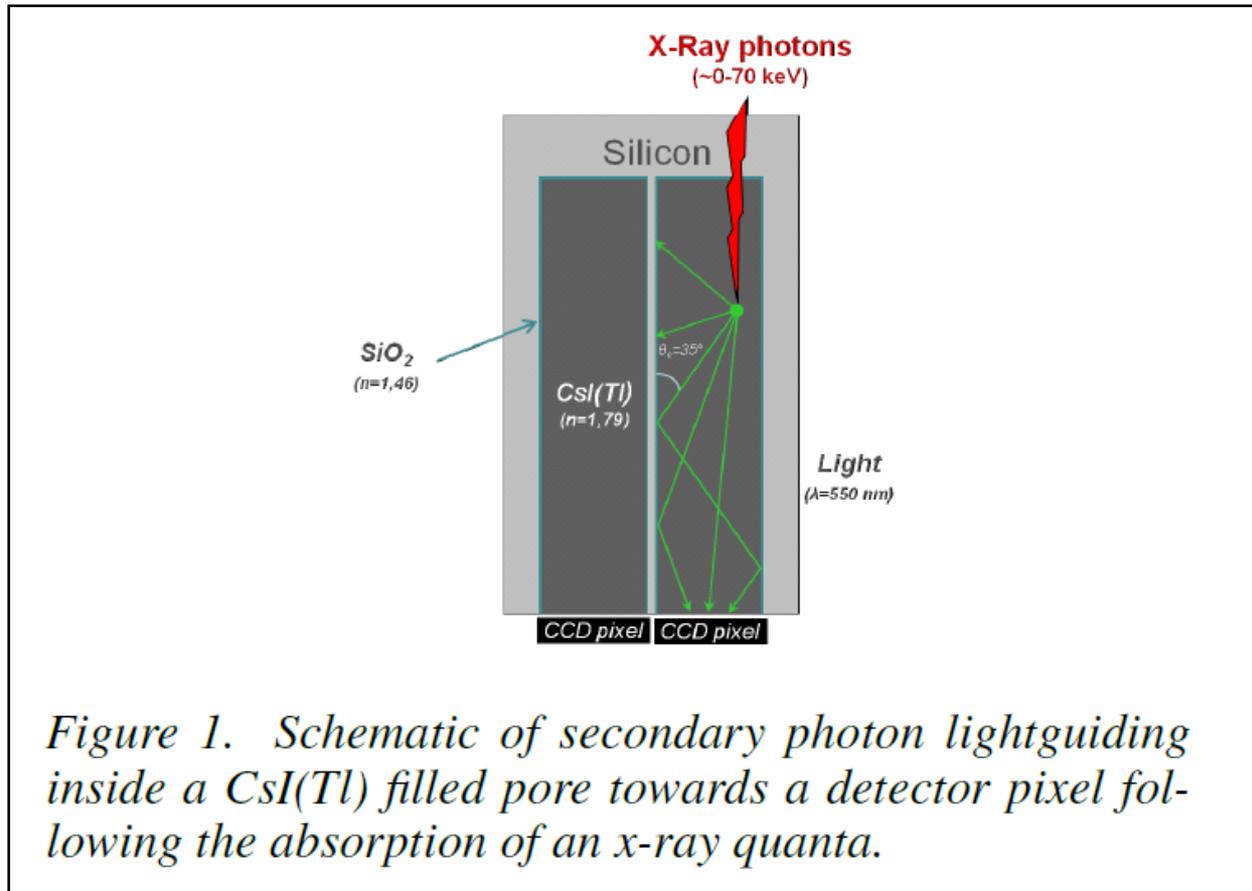
Nino

Columnar



- Crosstalk between needle structure still exists, but is reduced with columnar scintillators.
- Columnar is better than traditionally grown CsI films

Structured Scintillators



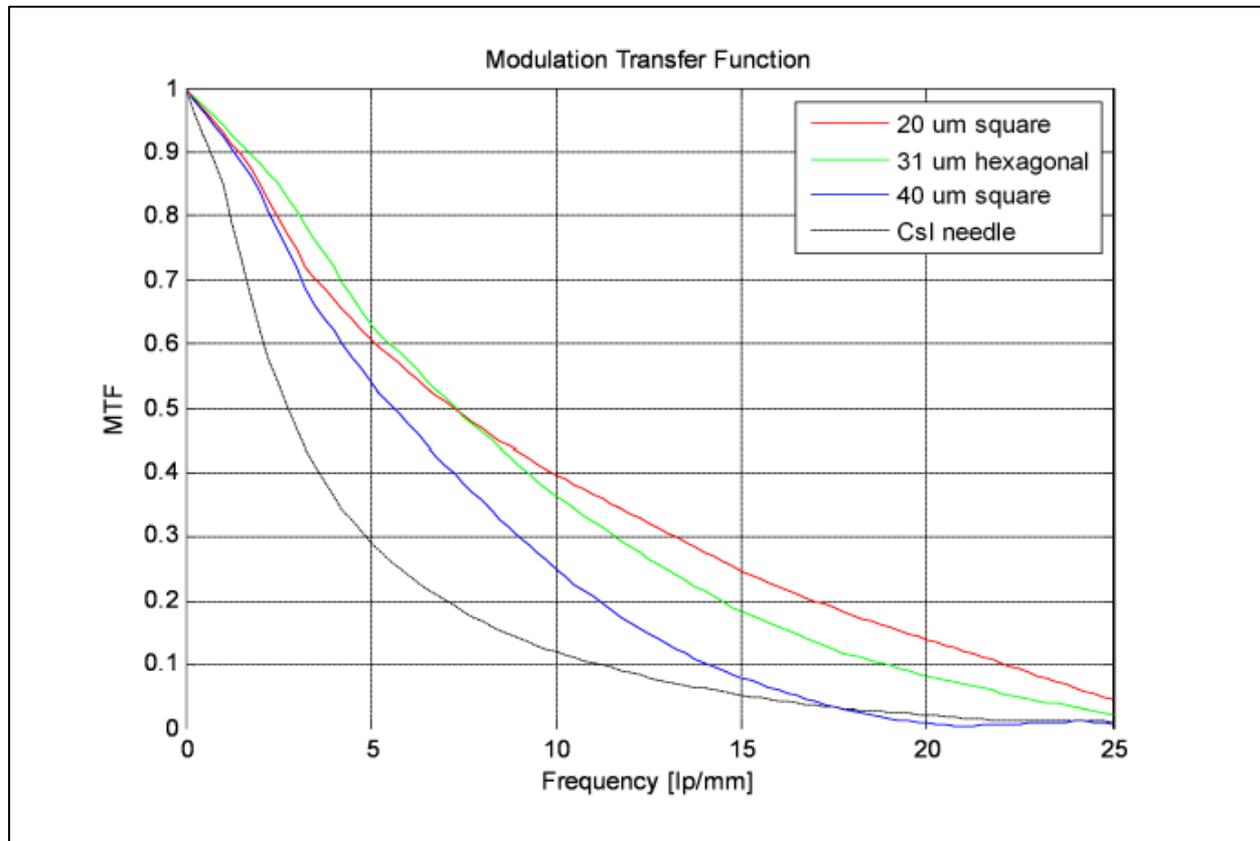
Crosstalk is virtually eliminated because silicon will absorb any optical photons that are not internally reflected in the pore, thus preserving spatial resolution

Modulation Transfer Function -- MTF

- MTF = Fourier Transform of Line Spread Function (LSF)
 - MTF gives spatial resolution as a function of spatial frequency.

MTF Plots

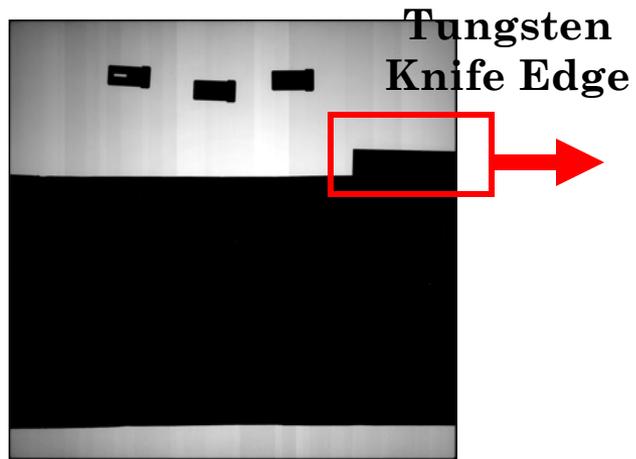
- Comparing columnar and structured



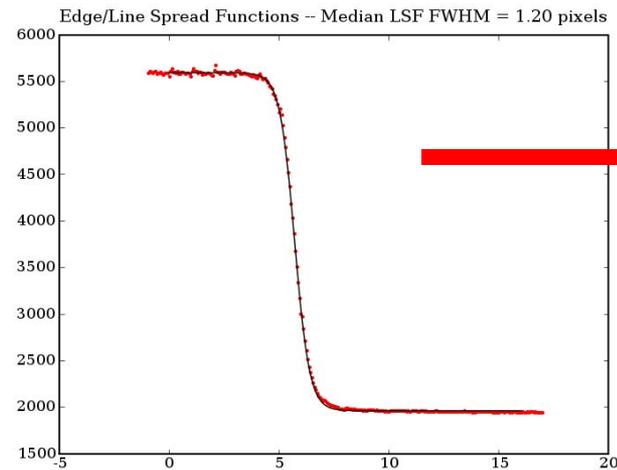
Black Curve (“CsI needle”) is the columnar scintillator; it has less spatial resolution than the structured ones (in color).

Columnar scintillator on GE a-Si

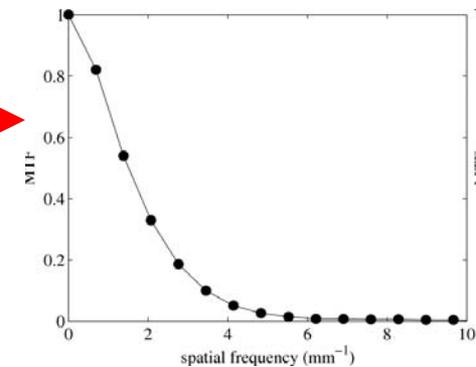
- Large area detectors (e.g., GE a-Si flat panel, with 200 micron pixels) use columnar scintillators (~ 400 micron thick CsI) at 50keV



GE a-Si Spatial Resolution



Edge Spread Function



MTF