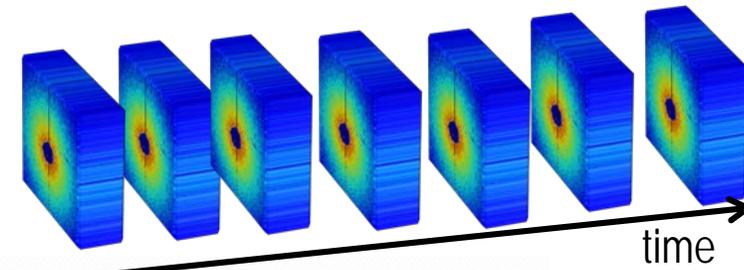
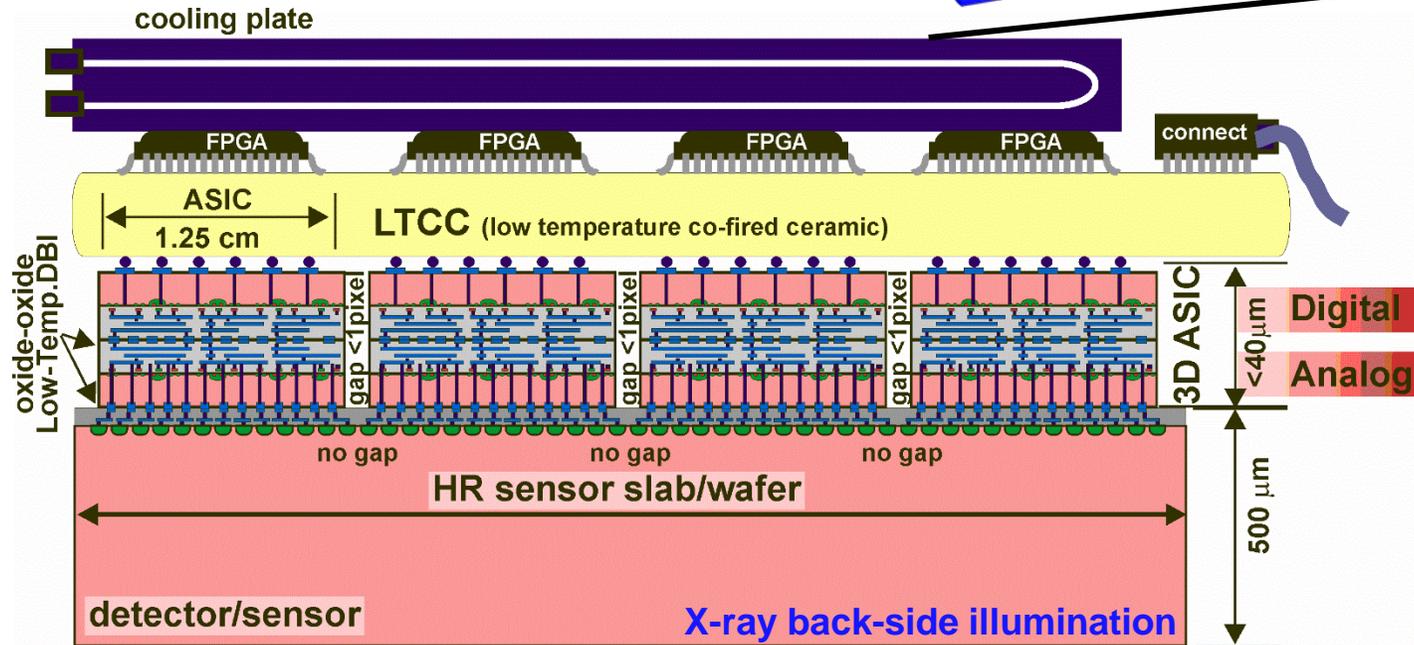


# VIPIC-L camera (Fermilab, BNL, ANL)



Vertically-Integrated Photon Imaging Chip - Large



1.2M-pixel, single module camera for X-ray Photon Correlation Spectroscopy, 8-12 keV X-rays, Funded by DOE Office of Science Office of Basic Energy Sciences (1M\$ for Fermilab manpower) (FWP started in Oct. 2014, completion planned for Sept. 2017)

- VIPIC-L ASIC is a two tier 3D ASIC  $1.25 \times 1.25 \text{ cm}^2$  with  $\sim 120\text{M}$  transistor (largest ASIC built by a US national lab) and  $65\mu\text{m}$  pixel pitch and is configurable in sparsification or imaging mode (up to 78kfps)
- 1 Mpixel = 3 slabs of  $2 \times 6$  VIPIC-L LTD-bonded directly to a Si sensor wafer
- 1FPGA per VIPIC-L (in its footprint) for on the fly data processing (up to 0.72 Tbps of raw data produced)
- Multi-layer ( $>20$  routing layer LTCC) supports b-bonded detector structure