

XSD - Beamline Technical Support Group

John T. Weizerick ¹, Patricia Fernandez ¹, John Lee ¹, Tim Madden ¹, Antonino Miceli ¹, Steve Ross ¹, Michael Molitsky ², Daniela Capatina ³, Matthew Church ⁴,

Howard Padmore ⁴, Peter Denes ⁵, Jean-Marie Bussat ⁵, Jean-Pierre Walder ⁵

¹ XSD – APS - Argonne National Laboratory, ² Biosciences Division - Argonne National Laboratory, ³ AES – APS - Argonne National Laboratory, ⁴ Experimental Systems Group – ALS - Lawrence Berkley National Laboratory, ⁵ Engineering Division - Lawrence Berkley National Laboratory

Detector Pool

- GE Amorphous Silicon Flat Panel
- mar 165 CCD Detector (2)
- mar 345 Image Plate (2)
- Ketek Silicon Drift Diode (6)
- Radiant Technology Vortex SDD (5)
- Single & multi - element Germanium (3)
- Bruker 6500 CCD Detector
- Photometrics Roper Cool Snap (2)
- Detector Test Facilities
- ~300 requests per year from entire APS community

http://www.aps.anl.gov/Xray_Science_Division/Beamline_Technical_Support/Detector_Pool



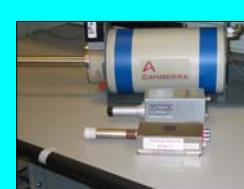
GE a-Si flat panel



mar 165



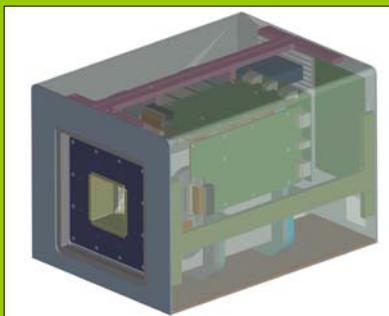
13-element Ge XRF



Ge & SDD XRF

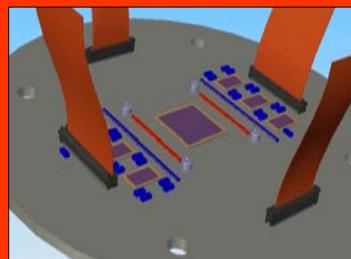
BESSRC CCD Detectors

- CCD X-ray detector
- Single CCD and **2x2 Mosaic** of CCDs
- 1.75 Demagnification Fiber-Optic Taper
- Kodak KAF-4320E CCDs
 - 2084 x 2084, 24 μ m pixels
 - QE of .65
- Readout in .2 sec (5 fps)
- Deployment: last quarter of 2006.



Fast CCD X-ray Detector (FCCD)

- LBNL and ANL Collaboration
- Custom CCD with almost **column-parallel readout**
 - Fast Readout IC with Pipeline ADCs (FRIC)
 - Low noise (~ 10 electron read noise)
 - Large Dynamic Range of 14+ bits
- First **prototype** CCD currently in fabrication
 - 480 x 480 CCD with 30 μ m pixels
 - Target of 2.5 ms readout (400 fps)
 - Thick depletion region (250 μ m)
 - Direct detection & phosphor-coupled models
- Prototype Camera System expected early 2007



LBNL Contributions

- Custom CCD
- Custom Fast Readout IC
- Mechanical, Optics and Cooling



ANL Contributions

- DAQ Readout Electronics
- User Interface
- Image Processing



Argonne National Laboratory is a U.S. Department of Energy laboratory managed by The University of Chicago.



U.S. DEPARTMENT OF ENERGY

Use of the Advanced Photon Source was supported by the U. S. Department of Energy, Office of Science, Office of Basic Energy Sciences, under Contract No. W-31-109-ENG-38.