



SAXS / WAXS X-ray camera with photon counting sensitivity.

## 50 to 100 mm LARGE AREA TAPERED X-RAY CCD DETECTOR

- ☞ 100% duty cycle smear free fast acquisition.
- ☞ Very high antiblooming capacity (>100x) allows acquisition at 16 bit dynamic range without saturation artefacts.
- ☞ Equivalent read out noise 5 times than 1 X-ray quantum at 8 -20 keV.
- ☞ Full data processing software: integrated with the CCD detector: all acquisition and correction routines which handles image files to a remote PC dedicated to data visualisation.
- ☞ Full support Documentation including drawings, list of spares, hardware, software and API.
- ☞ Includes Factory acceptance procedures and test reports.
- ☞ On site installation services.
- ☞ Quality Assurance documents for the completed device with copies of all quality control checks and intermediate test results.
- ☞ Service and warranty for a period of 18 months from delivery.



### Photonic Science SAXS Camera system with photon counting sensitivity:

- Black kapton exclusion membrane in front of scintillator layer
- Scintillator: **Customed made GdOS:Tb** designed for maximum X-ray detection efficiency **in the range of 0.1-30 keV**
- On chip binning for increased sensitivity- user selectable: from 1 x 1 to 8 x 8
- Effective useful resolution 1392 (h) x 1040 (v) pixels
- Integral electronic shutter with simultaneous exposure and read out, gives 100% duty cycle when exposure > read out time - user selectable exposure from  $\approx$  1ms to hours
- Mains input voltage Via control unit nominally 110/ 220 V ac auto-sensing

### Performance:

- 12 an 16-bit image digitisation.
  - Less than 1 X-ray Quantum Read out noise with up to 2,000:1 amplification:
  - Dark count rate: 0.05 electrons/pixel/second
  - Selectable sensitivity 1 to 100 ADU/incident X-ray with gain set at 3.21 electron/ADU
- Up to 6 full frame per second with standard fast 10 MHz driver with 12 bit digital output and 1x1 binning
- Input pixel size: 28,8 $\mu$  x 28,8 $\mu$  @ 1 x 1 binning, with image distortion correction and remapping algorithm (includes pixel sampling interpolation)
- Resolution with 50mm input: 72.6 microns FWHM
- Larger input size up to 80mm available with de-magnifying fibre optic taper, with 46 microns pixel size and 107 microns resolution FWHM
- Air forced cooling

### Included Items:

- X-ray camera head with removable scintillator assembly with a mounting plate / foot to permit attachment to a (end-user supplied) mounting plate / arm.
- Power supply unit, user manual(s), standard software drivers
- Interconnecting cables: power supply unit to Camera head: 2m (standard), camera to PSL supplied firewire interface card: 10m (**included with order**)

### Items supplied for SAXS (to be discussed at the time of order):

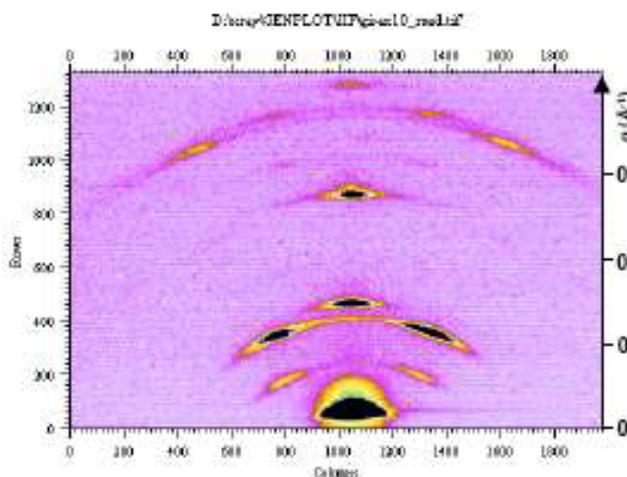
- X-ray generator with W or Mo point focus source and X-ray radiation shielding.
- X-ray collimation with good Kbeta suppression
- Adjustable mounting plate / foot to permit camera attachment to a supporting table plate.
- Evacuated beam path, sample holder, furnace and or high pressure cell
- Indexing software

# Photonic Science

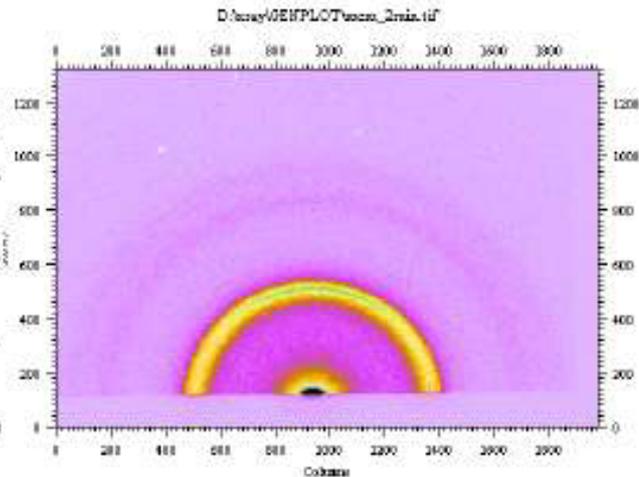
## Scientific Detector Systems

Millham, Mountfield, Robertsbridge, E.Sussex, TN32 5LA  
Email: daniel@photonic-science.com

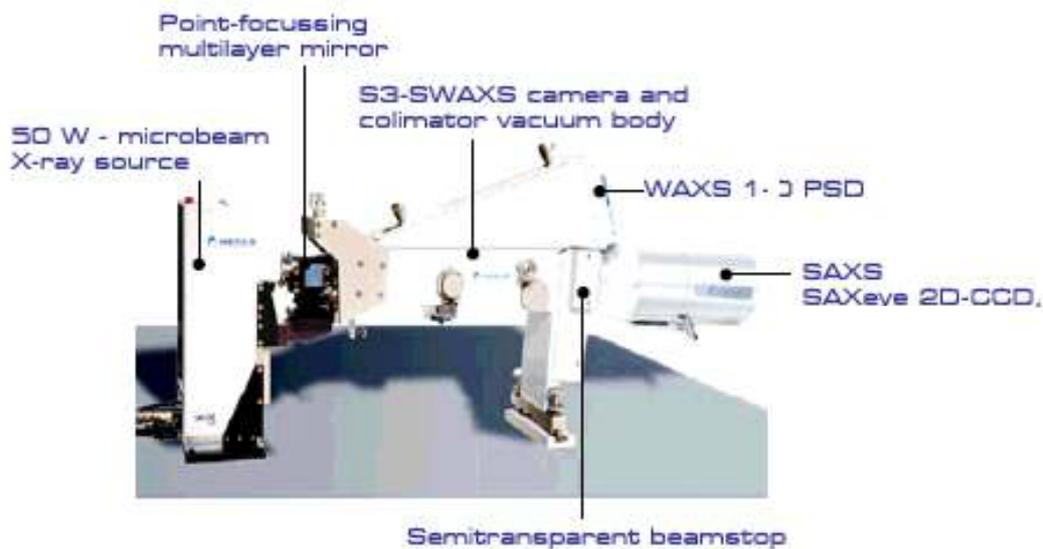
Tel.: +44 (0)1580 881199 Fax: +44 (0)1580 880910  
Web site: <http://www.photonic-science.co.uk>



**GISAXS mode:**  
Lipid rhombohedral phase (DOPC)  
on Si chip, dry/vacuum  
10 min exposure



**Transmission SAXS mode:**  
Porous silica powder (hexagonal,  
 $d_1 = 46.4 \text{ \AA}$ )  
2 min exposure



Courtesy Hecus X-ray GmbH



### Acquisition software:

- Drivers, including 12/16 acquisition modes, (32 bit Windows O/S including 98/ NT/ 2000 and XP)
- PSLink library with DLL and sample C++ code for camera Link driver to assist end-user driver development – Application Programmable Interface support
- Automatic offset correction (gives flat pedestal)
- Automatic dark correction (for long integration)
- Automatic flat field correction (homogeneity response)
- Sequential acquisition with software selectable variables: number of images, time between images, image display during sequence or direct storage to disk, acquisition on RAM
- Sequential tool including frame averaging, frame extraction, frame difference
- Frame accumulation in 16 bit frame buffer for extended dynamic range without binning
- External Hardware trigger mode
  - rising or falling edge, with pre defined exposure in software
- Software trigger mode
  - Predefined in software with sync pulse output when read out cycle is accomplished
- Auto exposure option with saturation warning
- Spatial and intensity calibration (angular measurements, position, distances between diffraction spots)
- Arithmetic operation between images (subtraction, addition, logic)
- Histogram and line profile with DDE to excel
- Remote FTP access / transfer from integrated image database
- Morphological spatial filtering for image enhancement

### PC system minimum recommended specifications:

- 32 bit Pentium 3GHz core duo or better
- 2Gb RAM minimum (256 Mb+ recommended)
- 300Gb + minimum available hard disk space.
- CD-ROM and 3.5" floppy disk drive
- On free fully PCI standard compliant expansion slot

### Recommended X-ray source specifications:

- 10 W Air cooled W microfocus source with 60 microns spot
- X-ray conditioning optics with less than 1 mrad residual divergence
- Kbeta suppression down to 0.5%
- X-ray shutter with optional filters (Zr, Ni)