

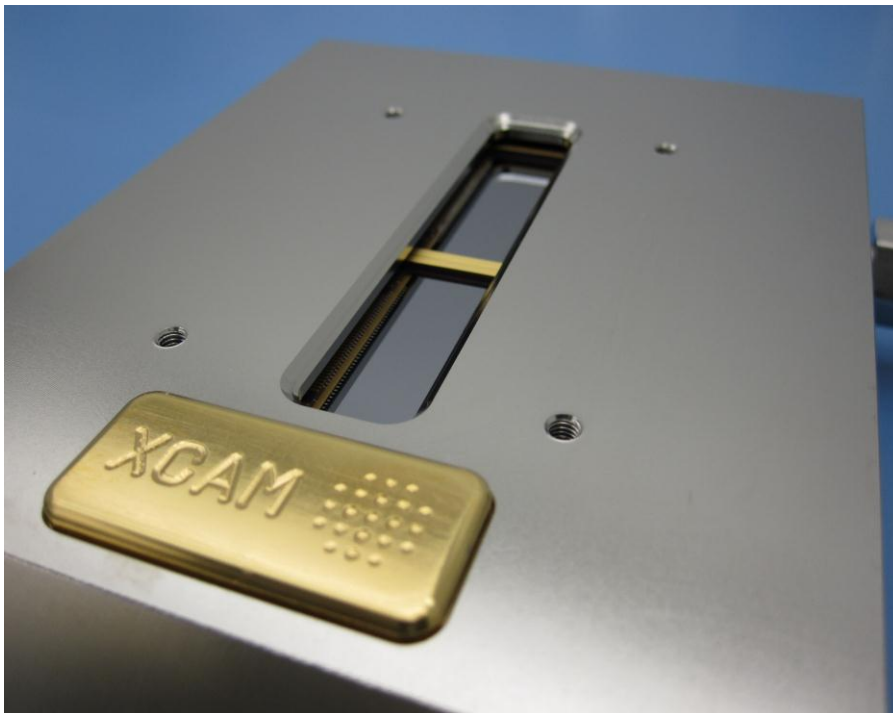


# Dual CCD Camera for Dispersive, Soft X-ray Spectroscopy

## Introduction

Xcam specialises in producing custom and prototype CCD cameras for leading-edge science experiments all over the world.

Xcam has produced a Dual CCD camera specifically for dispersive, soft X-ray Spectroscopy at energies of 0.2keV to 8keV; imaging and photon-counting is possible with an energy resolution of 200ev FWHM. The use of 2 CCDs close-butted provides a cost-effective solution to providing a long detection area with minimal dead area between the CCDs. The system operation allows the user to treat the CCDs as if they were one single device, and presents a single image to the user for analysis.



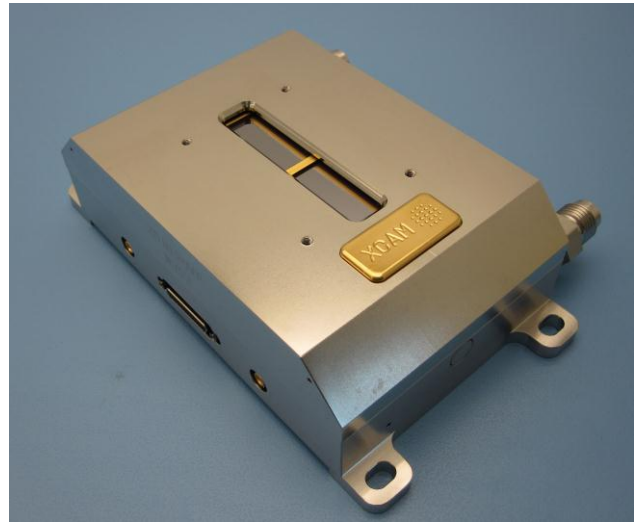
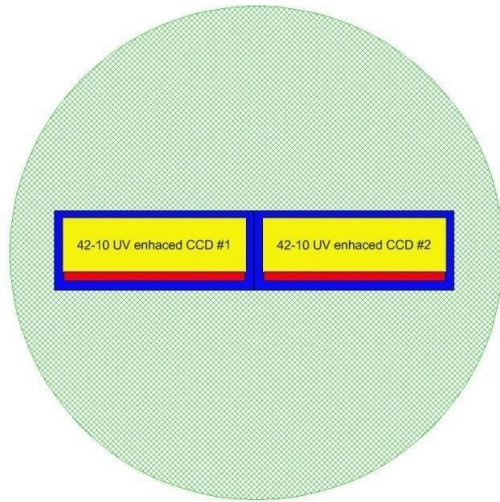
**Figure 1:** The Dual CCD Camera

## Features of the Dual Unit CCD42-10 Camera

- Pixel size 13.5 microns square
- Number of pixels 4096 x 512
- Image area 55.3mm x 6.7mm
- Full well capacity 100 ke-/pixel (for full resolution, low gain option)
- Read-out speed 200KHz for low noise operation and high resolution
- 2 low noise output nodes from each CCD
- Energy range 0.2-8keV; energy resolution of 200ev FWHM
- UHV compatible
- Read-out out of all 4 CCD output nodes simultaneously, 5-6 electrons total noi



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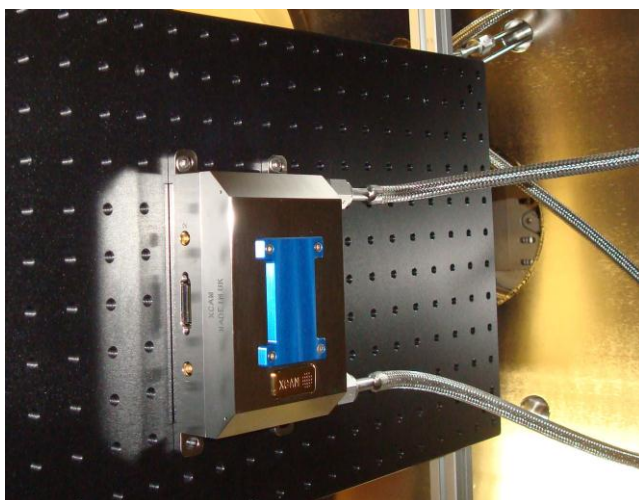
**Figure 2: The Camera head contains 2 close-buttet e2v Technologies CCD42-10 (left); the camera has UHV-compatible water-cooling connections (right)**

**Vacuum-Compatible Construction:** All vacuum compatible materials and processes are used, and can be adjusted to suit customer's preferences or requirements. Camera can reside inside vacuum chamber or interface via an O-ring seal. Camera can be locally pumped if required.

**Cooling:** Peltier and water cooling to cool CCD down to  $-50^{\circ}\text{C}$ ; water connections are vacuum and pressure-tested

**Software/Hardware Triggering** to start Erase and Integration sequences, to operate with your experiment. Custom triggering schemes are catered for.

**Full Software Control:** Options available are (1) Xcam application software (2) user-written software to call .dlls to control system or (3) Xcam written custom control software.



**Fig 3: Installation in vacuum chamber ready for operation; camera has finger plate maintained in position over the CCDs to protect exposed wirebonds, until ready for operation**