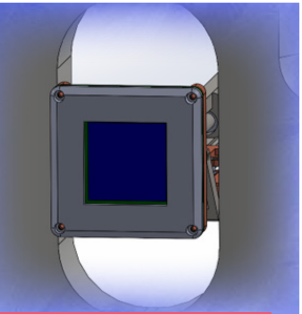
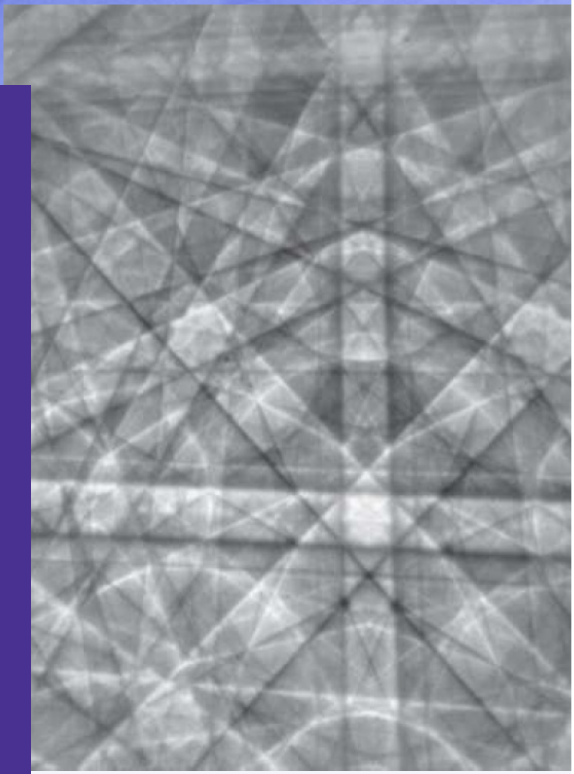
SEMCam

Extraordinary Resolution For EBSD



Delivering Bigger | Better | Faster | Cameras For Electron Microscopy



Kikuchi pattern of single crystal silicon with DE-SEMCam at 12 kV. 255 fps 1 second exosure with 4 nA beam current. *Courtesy of Dan Gianola, (University of California, Santa Barbara, USA).*

DIRECT DETECTION FOR ELECTRON BACKSCATTER DIFFRACTION

- Stunning sensitivity at 5kV and 10 kV for beam sensitive samples.
- 2k × 2k (4.2 million) pixels at 281 fps.
- Fine features resolved in sharp detail for unmatched HR-EBSD results.
- **New mechanical design** places sensor in a traditional EBSD detector geometry
- High signal-to-noise ratio (SNR) for each electron.
- Open software to easily integrate with many versions of indexing software.
- Integrated with CrossCourt4 for HR-EBSD analysis
- Compressive sensing mode detection enables 6000 pps imaging over the full area of the sensor.
- Detect strain differences of 1 in 10,000.
- Low energy HR-EBSD pushes spatial resolution to <20nm step size.
- Automated tilting to TKD mode.
- Integrating mode weights electrons by energy, optimizing image quality.
- Electron counting provides energy filtering capability.
- Adjustable sensor threshold.
- The largest impact hardware upgrade you can make per dollar.

DETECTOR APPLICATIONS:

Materials

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SEMCAM SYSTEM

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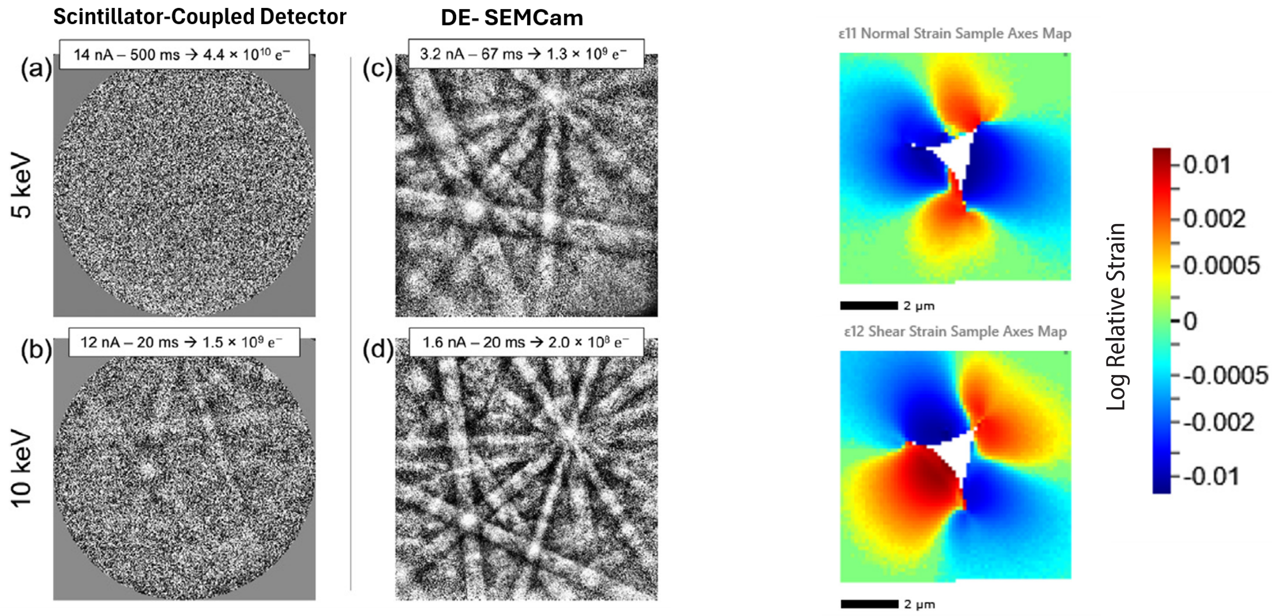
Electron Energy	Sensitive for 3 - 40 kV (optimized for 8-20 kV)
Pixel Array Specification	2048 × 2048 (4.2 million pixels) | 13 µm pixel pitch
Single Electron SNR	~50:1 (15 kV)
Sensor Design	>3T pixel design with on-chip correlated double sampling (CDS) backthinned | radiation hardened
Acquisition Frame Rate	281fps max, full-frame | subarray readout up to 4,237 fps (2048 × 128) compressive sensing readout enables >6000 fps over full sensor area
Mounting Position	EBSD port mount | extend/retract motion | automated tilting to TKD mode high-performance computer | Windows 10 | NVidia GPU(s) | up to 58 TB storage
Computer System	Non-proprietary to ensure broad compatibility | TIFF, MRC, AVI, MP4, etc.
Image Format	TIFF, MRC, h5EBSD, etc.
Acquisition Software	DE Mission Control software for advanced data acquisition | Integrated scan control | Live virtual imaging during acquisition | Compatible with CrossCourt4 for HR-EBSD strain-map generation



Left: Comparison of low energy sensitivity on SEMCam with traditional indirect detectors. (a), (c) EBSD pattern of Hafnia at 5kV, the pattern on SEMCam has 33 times less dose. (b),(d) EBSD pattern of Hafnia at 10kV, the pattern on SEMCam has 7.5 times less dose but still produces a much better image. Right: HR-EBSD strain maps of a silicon indent at 12kV. Yellow represents ~0.02% strain.
Data is courtesy of Gianola group, UC Santa Barbara and processed using CrossCourt Rapide.

Flyer - Product Overview - SEMCam System - Revision 2025-7-15.