



ZENITH

Fast EBSD Detector for Large Area Mapping

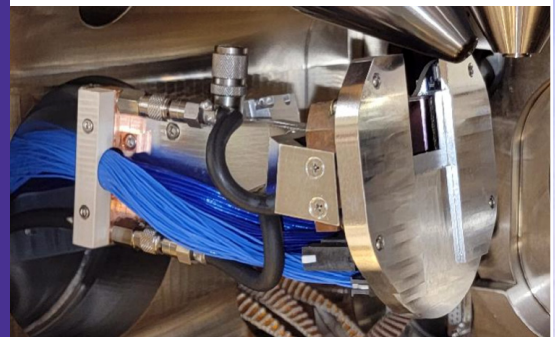
Delivering Bigger | Better | Faster | Cameras For Electron Microscopy

DIRECT DETECTION FOR ELECTRON BACKSCATTER DIFFRACTION

- Blisteringly fast EBSD with high pattern quality.
- Enables mapping from the mesoscale to the nanoscale in one scan.
- $2k \times 2k$ (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.
- Live Hough indexing and pattern sharpness maps through DE Mission Control software.
- Open software to easily integrate with many versions of indexing software.
- Exceptional sensitivity at 5kV and below for beam sensitive samples.
- Reduced ROI and transmission-mode bracket allow 4D-STEM in SEM, 64×64 pixels at 99,000 pps.
- Detect strain differences of 1 in 10,000.
- Low energy HR-EBSD pushes spatial resolution to $<20\text{nm}$ step size.
- Multi-gain sensor increases dynamic range to handle $> 100\text{nA}$ beam current.
- Electron counting provides energy filtering capability.
- Adjustable sensor threshold.
- Without binning, $1k \times 1k$ sensor runs at 2,000 pps for HR-EBSD.



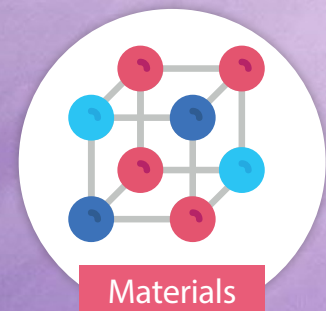
Retracted



Inserted

Chamber-door view of the Zenith EBSD direct detector mounted in a TFS Versa chamber at UC Santa Barbara.

DETECTOR APPLICATIONS:

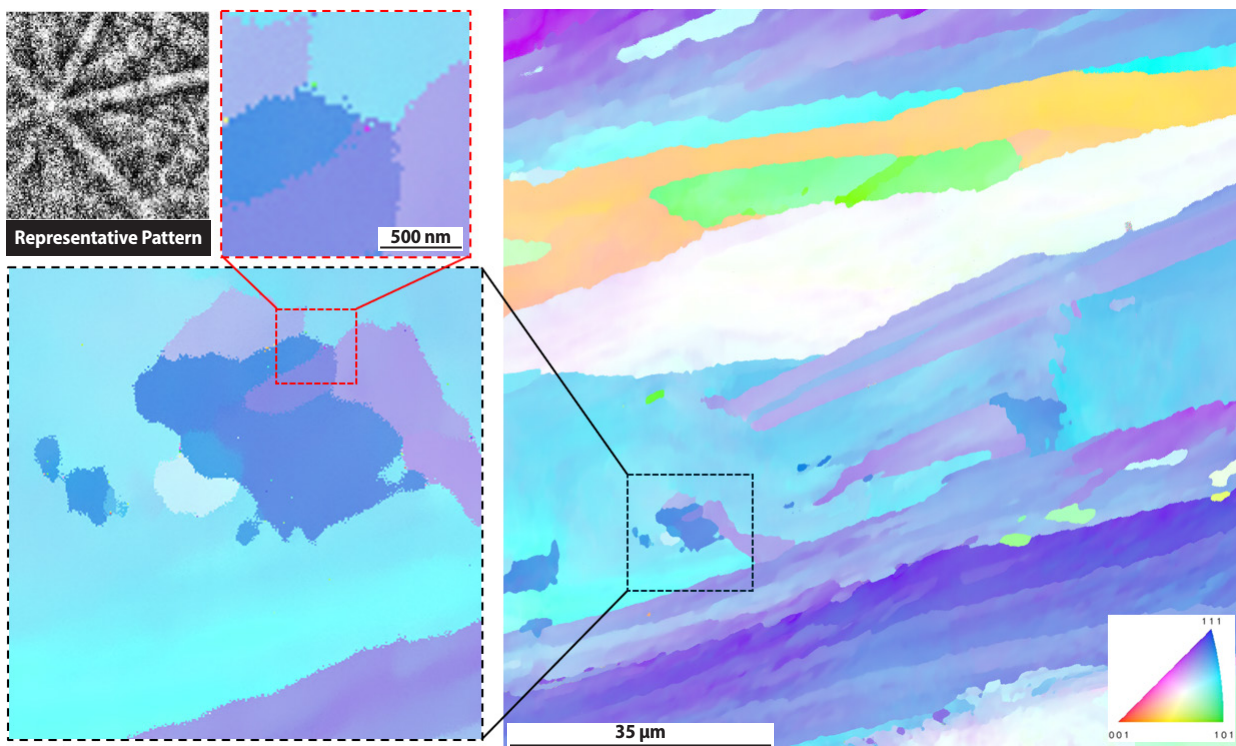


Materials

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Electron Energy	Sensitive for 3 - 40 kV (optimized for 8-20 kV)
Pixel Array Specification	1024 x 1024 pixels 15 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 multi-gain
Acquisition Frame Rate	Bin 2x : 5,850 pps Bin 1x: 2,265 pps reduced ROI : up to 99,000 pps
Mounting Position	EBSD port mount extend/retract motion tilting to TKD mode high-performance computer Windows 11 NVidia GPU(s) up to 58 TB storage
Data Format	.UP2 , .mrc, .h5EBSD
Acquisition Software	DE Mission Control software for advanced data acquisition Integrated scan control Live Hough indexing and pattern sharpness maps to see Orientation and GNDs Compatible with CrossCourt4 for HR-EBSD strain-map generation



Additively Manufactured CoNi Superalloy -- Solidification cells in melt pools.
100 μm HWF, 2000 x 2000 points, 50nm step, 10kV, 5850 pps, 11 min scan.