LV-126 Camera System

a revolutionary advancement for LEEM/PEEM

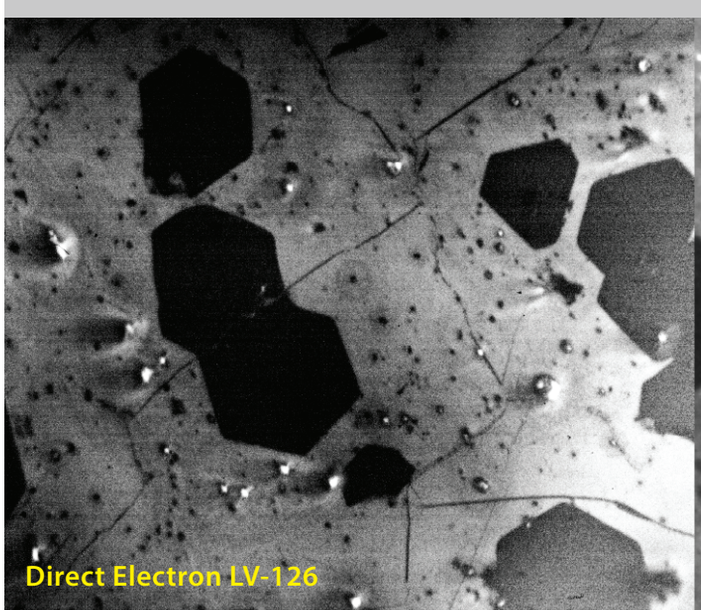
Direct Electron delivers | bigger | better | faster | cameras for electron microscopy

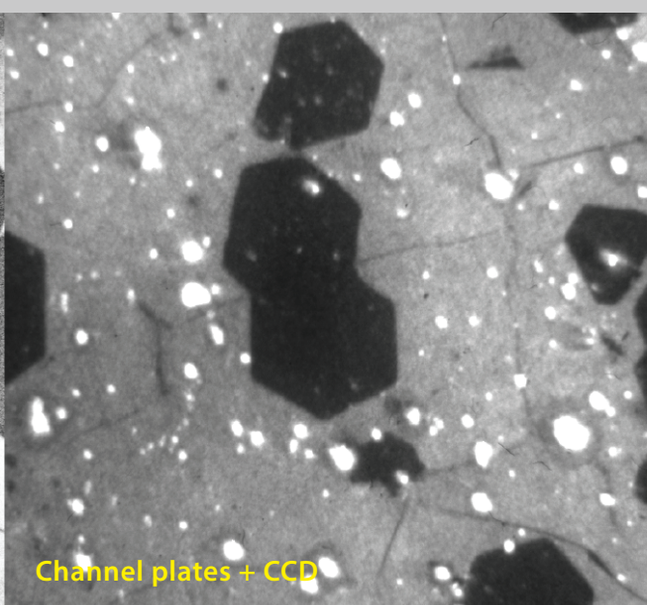
Direct Electron®
INNOVATION PROPELLING DISCOVERY

Better Science, Faster – Brilliant Results in Less Time

- Direct detection of low keV primary electrons—***a revolutionary advancement for LEEM/PEEM***.
- High signal-to-noise ratio (SNR) and a large field-of-view delivers ***>6× the information*** content compared to microchannel plates with a CCD.
- Extensible and open software to easily integrate with custom workflows and maximize image processing capabilities.
- "***Movie mode***" provides high-speed acquisition of a continuous stream data.
- Innovative movie-processing software further enhances data quality through drift correction, post-acquisition exposure setting, etc.
- ***The ultimate camera for LEEM/PEEM.***

Comparison between the Direct Electron LV-126 (*left*) and traditional channel plates + CCD (*right*). The images show cropped images of graphene layers on copper substrate, collected in PEEM mode. The bias voltage was set so that the monolayer of graphene appears bright while the bilayers appear dark. Courtesy of Rudolf Tromp, IBM.





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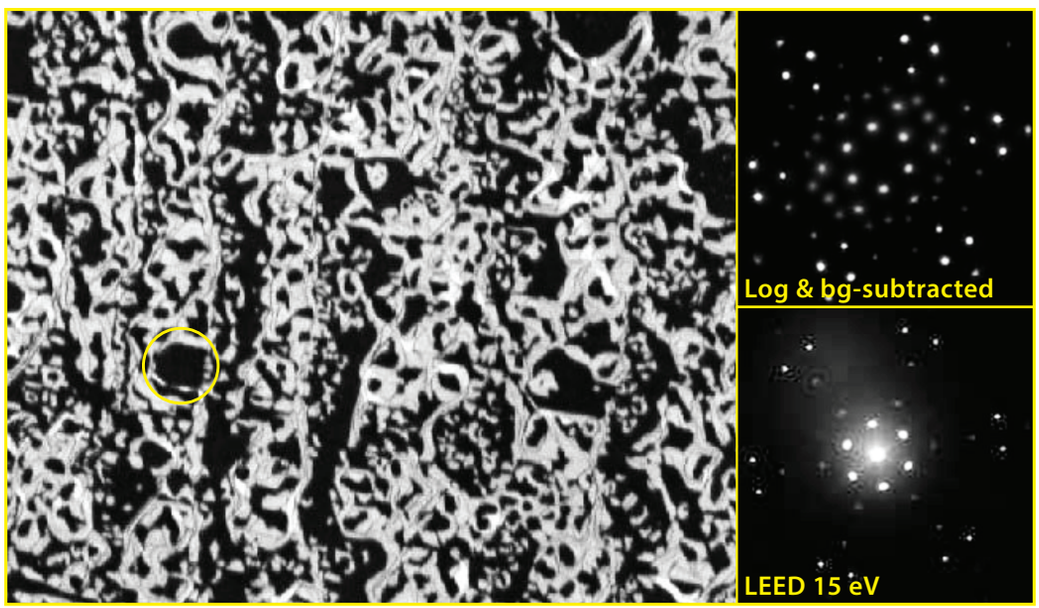
detection electron energy	optimized for 10 keV – 40 keV
pixel array specification	4096 × 3840 (12.6 million pixels) | 6.0 µm pixel pitch
single electron SNR	~10:1 (15 kV)
sensor design	>3T pixel design with correlated double sampling (CDS) | backthinned | radiation hardened
acquisition frame rate	40 fps max, unbinned full-frame | 75 fps, bin 2× full-frame subarray readout up to 960 fps max
acquisition modes	integrating mode | counting mode (with optional counting system)
mounting position	optional fully retractable
exposure measurement	integrated Faraday plate for exposure measurement with each acquisition
sensor protection	integrated physical protection shutter | microscope blanking/shuttering | failsafe software
computer system	optional certified high-performance computer system with large >4 TB RAID array
image format	image data stored in non-proprietary format to ensure broad compatibility
acquisition & processing software	*conventional acquisition*: DE-IM (full-featured, user-friendly) | µManager (free, open-source) *in situ movie acquisition*: DE-StreamPix (continuous streaming) *"movie" processing*: DE image processing software (free, open-source, Python-based) | others *customization*: software development kit (SDK) for integration with custom software

* Note: Specifications and performance are subject to change.



Left: Cropped image of graphene on SiC, imaged in LEEM mode at 11.3 eV (detected at 15 keV).
Right: A selected-area LEED diffraction pattern for the crystal circled above. Courtesy of Rudolf Tromp, IBM.

there is much more...

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