



DirectView2 Camera

versatile & economical direct detection

delivering | bigger | better | faster | cameras for electron microscopy

Direct Detection for Transmission Electron Microscopy

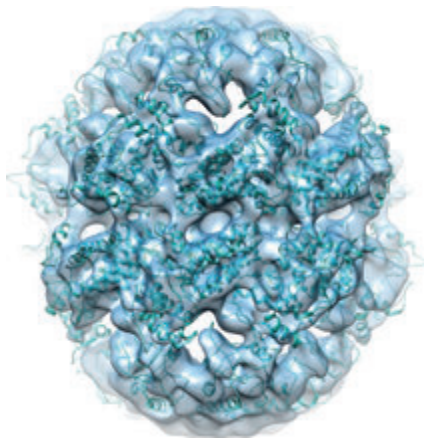
- Direct detection device (DDD[®]) delivers **ultra-high speed**, **extraordinary resolution**, and **ultra-low noise**.
- 4k × 4k (16.8 million) pixels.
- Ideal for a **broad range of applications** for both materials science (including in situ TEM, 4D-STEM, low-dose, etc.) and biological cryo-EM.
- Reach sub-nanometer resolution with cryo-EM on 120 kV LaB6 TEMs.
- **High-speed continuous streaming** for in situ TEM movies and motion-corrected imaging.
- **Integrated Faraday plate**.
- Based on our DE-Series platform which has a long track record of **proven performance**.
- Low total cost-of-ownership and exceptional support.
- The **most impactful and cost-effective** upgrade to a TEM's capabilities.

Microscopy
TODAY
INNOVATION AWARDS

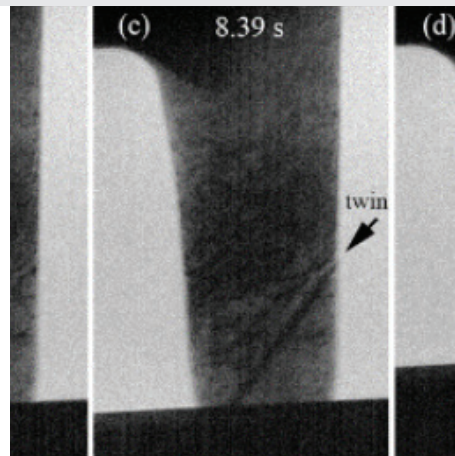


Direct Electron[®]
INNOVATION PROPELLING DISCOVERY

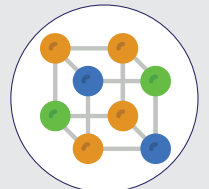
Cryo-EM of Mm-Cpn on a 120 kV LaB6 TEM, yielding ~10 Å resolution with about 1-hour data collection.



Frame from an in situ TEM movie at 57 fps. Courtesy of Zhiwei Shan (Xi'an Jiaotong University, China).



Applications



MATERIALS



BIOLOGY

TEM electron energy	sensitive to 80 keV – 200 keV optimized for 120 - 200 keV
pixel array specification	4096 × 4096 (16.8 million pixels) 6.5 μm pixel pitch
single electron SNR	~20:1 (200 kV)
sensor design	>3T pixel design with on-chip correlated double sampling (CDS) backthinned radiation hardened
acquisition frame rate	42 fps max, unbinned full-frame subarray readout up to 1000 fps (4096 × 128) user-selectable hardware frame rate
acquisition modes	integrating mode counting mode (optional)
exposure rate	large dynamic range with consistent performance (e.g., >250 e ⁻ /pixel/s)
mounting position	fully retractable mounted on-axis TEM bottom port or in JEOL film drawer
exposure measurement	integrated Faraday plate for exposure measurement with each acquisition
sensor protection	integrated sensor protection shutter TEM blanking/shuttering failsafe software
computer system	high-performance computer Windows 10 NVidia GPU(s) up to 48 TB storage
image format	non-proprietary to ensure broad compatibility TIFF, MRC, HDF5, etc.
acquisition software	DE-MissionControl (DE-MC)
compatibility	SerialEM Leginon JADAS (JEOL) Panta Rhei (CEOS)
customization	open application programming interface (API) and software development kit (SDK) with examples in C, C++, C#, and Python

Specifications and performance are subject to change.

Example images of various camera applications were collected by researchers using one of Direct Electron's cameras (not necessarily the DirectView2).