DE-64 Camera System

the ultimate direct detector for high-end TEMs

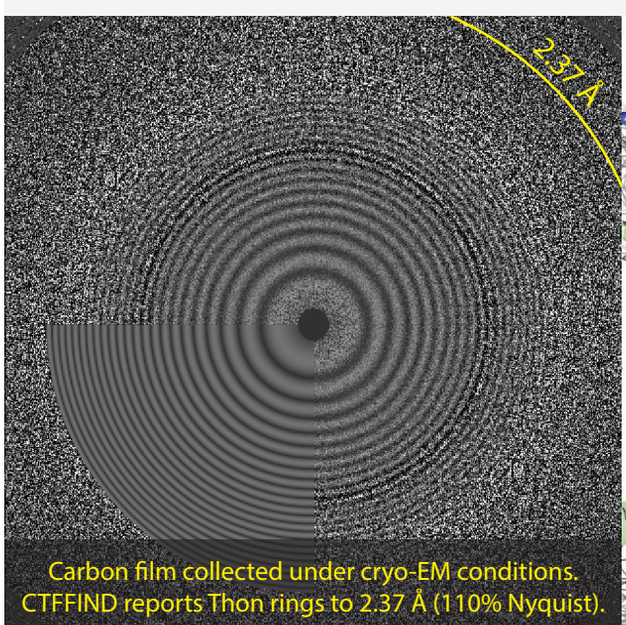
Direct Electron delivers | bigger | better | faster | cameras for electron microscopy

Direct Electron®
INNOVATION PROPELLING DISCOVERY

Better Science, Faster – Brilliant Results in Less Time

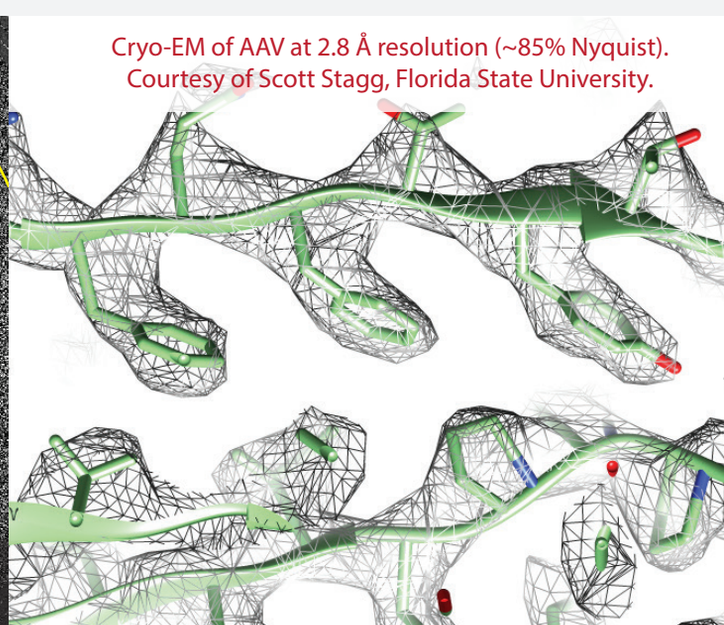
- Direct detection device (DDD®) delivers ***high resolution and excellent sensitivity***.
- ***8k × 8k*** (67.1 million) pixels!
- Capture >4× more area in each image. Complete experiments >4× faster.
- ***High-speed*** continuous streaming for "movie-mode" processing (e.g., motion correction) and continuous-tilt tomography.
- ***Unrivaled features***: integrated survey sensor & Faraday plate.
- ***Electron counting*** to maximize signal-to-noise ratio when needed.
- ***The best of all the new TEM camera technology in a single integrated system.***
- Low total cost-of-ownership and exceptional support.

Microscopy TODAY Innovation Awards



Carbon film collected under cryo-EM conditions.
CTFFIND reports Thon rings to 2.37 Å (110% Nyquist).

Cryo-EM of AAV at 2.8 Å resolution (~85% Nyquist).
Courtesy of Scott Stagg, Florida State University.



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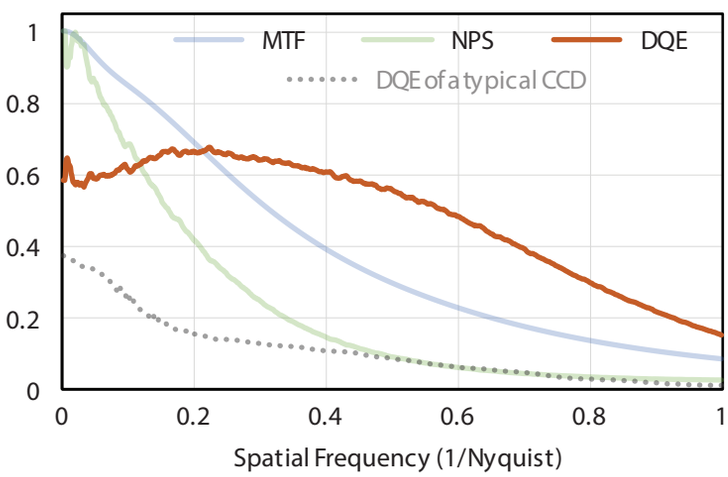
detection electron energy	optimized for 80 keV – 1.25 MeV
pixel array specification	8192 × 8192 (67.1 million pixels) | 6.5 µm pixel pitch
single electron SNR	~50:1 (300 kV)
sensor design	>3T pixel design with correlated double sampling (CDS) | backthinned | radiation hardened
acquisition frame rate	30 fps max, unbinned full-frame subarray readout up to 1920 fps max
acquisition modes	integrating mode | counting mode (with optional counting system)
exposure rate	large dynamic range with consistent performance in integrating mode (e.g., 4 – 400 e-/pixel/s)
mounting position	fully retractable | mounted on-axis TEM bottom port or in JEOL film drawer
"buddy" camera	integrated near-axis 2048 × 2048 scintillator-coupled survey sensor
exposure measurement	integrated Faraday plate for exposure measurement with each acquisition
sensor protection	integrated physical protection shutter | microscope blanking/shuttering | failsafe software
computer system	certified high-performance computer system with large >25 TB RAID array for data streaming
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) *automated acquisition*: Leginon | SerialEM | EMTools (TVIPS) | others using the DE SDK *"movie" processing*: DE image processing software (free, open-source, Python-based) | others *customization*: software development kit (SDK) for integration with custom software

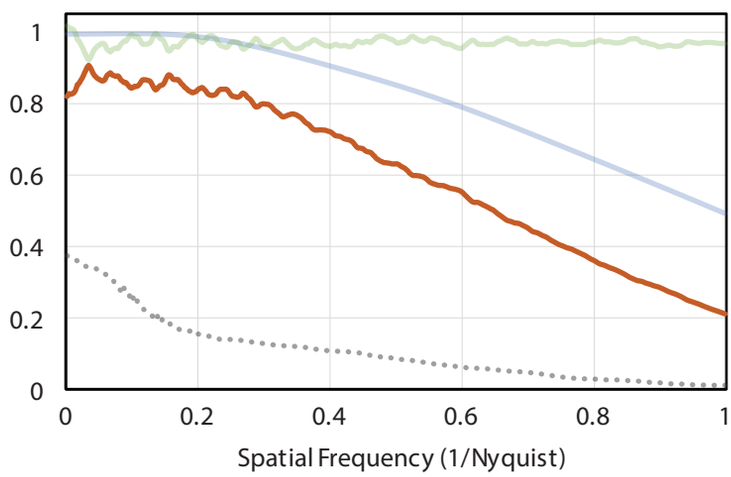
Integrating Mode

best for maximizing overall productivity



Electron Counting Mode

best for maximizing signal-to-noise ratio



* Note: Specifications and performance are subject to change.

there is much more...

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