JEOL® JEM-ARM200F NEOARM Transmission Electron Microscope 200 kV with Cold-FEG source and aberration correctors

The JEOL JEM-ARM200F NEOARM is a next generation transmission electron microscope fine-tuned for the atomic resolution study of organic and inorganic materials sensitive to radiation damage. The presence of a cold cathode field emitting electron gun (C-FEG), having high brilliance and spatial coherence, combined with a dual CETCOR/ASCOR spherical aberration corrector, allows to obtain images with very high resolution and quality within a range of acceleration values between 30 kV and 200 kV.

The JEOL JEM ARM200F NEOARM is also equipped with an electron biprism with a platinum filament that permits to obtain images of organic macromolecules (single proteins, protein complexes, etc.) by using electron holography.

Moreover, the instrument is equipped with a series of JEOL detectors (JEOL-EDS SDD), Gatan® devices (GIF CONTINUUM ER, RIO16 CAMERA, K3 IS CAMERA), and different types of sample holders that enable:

- **Morphological analysis in HR-TEM and STEM/HAADF modes:**
  - 72 pm resolution
- **Structural Analysis:**
  - Selected area electron diffraction, SAED (1 µm)
  - Electron diffraction (area <100 nm)
- **Elemental compositional analysis:**
  - EDX (energy-dispersive X-ray spectroscopy)
  - EELS (electron energy-loss spectroscopy)
  - Compositional mapping for both EDX and EELS

- **Electron holography of magnetic materials**
- **3D tomography**

The cryo mode is available for the techniques listed above.

CHARACTERISTICS

- Accelerating voltage from 30 to 200kV
- High brightness C-FEG with Flash &Go technology
- Dual CETCOR/ASCOR corrector, of spherical aberration up to the 5^{th} order
- Resolution 72pm
- EDS detector with SDD technology
- Gatan® Imaging Filter (GIF) type "Continuum ER," with CMOS detector, 2048 x 2048 pixels
- Gatan® Rio16 digital CMOS camera, 16 MP (4,096 x 4,096)
- Gatan® K3 IS basic digital camera, 14.2 MP (3,456 x 4,092)

Resolution[*1]	*STEM HAADF image 70pm (200 kV), 100 pm (80 kV), 160 pm (30 kV)* *TEM information limit 100 pm (200 kV), 110 pm (80 kV), 250 pm (30 kV)*
Electron gun	*Cold field emission gun (Cold FEG): standard*
Aberration corrector	*STEM: NEO ASCOR HOAC* [*2] *TEM: CETCOR with DSS*[*3]
Corrector auto tuning system	*NEO JEOL COSMO* [TM] *Auto tuning system Ad-hoc tune (SIAM) built-in*
Accelerating voltage	*30 to 200 kV (30, 80, 200 kV: standard, 60, 120 kV: optional)*
Magnetic field free mode	Lorentz lens settings (x50 to 80 k on screen): standard
Specimen movement system	X, Y and Z super-fine mechanical drive, ultra-fine piezo device drives: standard
Operation type	RDS [*4] operation

**1 UHR (UHR with STEM/TEM Cs corrector configured)*

**2 HOAC (Higher order aberration corrector)*

**3 DSS (DeScan system)*

**4 RDS (Room divided style)*

SUPPORTING TOOLS

The facility will be upgraded by the following stations:

- FIB/SEM cryo and related-sample preparation laboratory dedicated to CRYO EM of biological samples
- SEM-EDS
- Single cell flow cytometry and sub 100 nm imaging
- Real time deformability cytometry with tailored set-up for microfluidic device
- Biomedical accelerator mass spectrometry (BAMS) as a powerful bioanalytical method for human studies in pharmacology and toxicology fields.

It will also be possible to characterize materials with supporting physico-chemical techniques, as optical Spectroscopy, X-ray Diffraction, and Ion Beam analysis with nuclear techniques (PIXE-PIGE-RBS-proton microprobe), both in vacuum and air.

ACCESS TO THE FACILITY: To date, the facility allows preparation and observation of inorganic samples, or previously prepared by external users, through the new electron microscope. Starting from 2024, biological samples will also be prepared and analyzed by users.

A previous agreement by the contact persons is always required.

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