

Ultrafast electron microscopy station

Ultrafast electron microscopy station enables studies of structural dynamics in solid-state and biological systems with nanometer- and sub-picosecond spatiotemporal resolution. UEM facilities (ultrafast TEM and SEM) integrate the cutting-edge technologies of ultrashort laser and electron microscopy to provide ultrafast imaging, diffraction, energy spectroscopy, and photon-induced near-field electron microscopy with high spatiotemporal resolution. The main focus of ultrafast electron microscopy station is the development and innovation of UEM instrumentations and methodologies, thereby providing world-class service to both national and international users, and enabling discoveries of new non-equilibrium physical phenomena and mechanisms in various fields of research in matter science through unprecedented space-time-energy-momentum -resolved experiments.

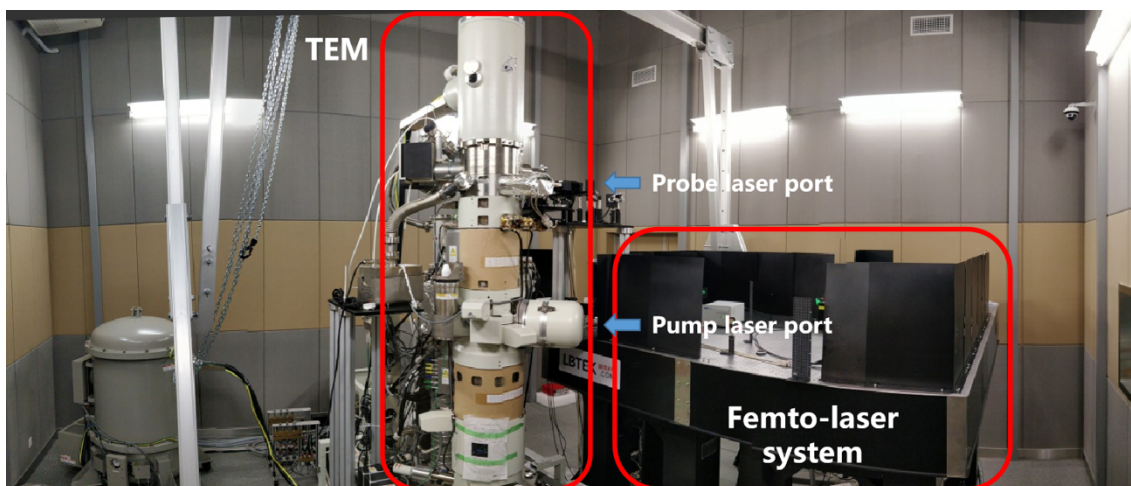


Photo of the station

The instrument developed in this station has demonstrated the following properties: high temporal resolution (< 320 fs FWHM), high spatial resolution (< 2 Å), and wide *in-situ* temperature range (14-1200 K). The current specifications are provided in the

tables below:

Instrument models @ ultrafast electron microscopy station

Instrument	Model
TEM	JEOL JEM-ARM200F equipped with OneView high speed camera and Gatan Model 1069 energy filter system
Femto-laser	LIGHT CONVERSION-PHAROS femtosecond laser (PH2-1mJ-SP)
Focused ion beam system	JEOL JIB-4700 equipped with EDX, EBSD and nano-manipulator
<i>In-situ</i> specimen holders	<i>In-situ</i> heating holder (300-1200 K), <i>In-situ</i> liquid nitrogen cooling holder (90-300 K), <i>In-situ</i> liquid helium cooling holder (14-300 K), <i>In-situ</i> cryo-biasing holder (100-300 K, -60 to 60 V)
Ion beam slicer system	JEOL IB-09060CIS Cryo ion slicer

Instrument parameters @ ultrafast electron microscopy station

Parameter	Value
In-situ specimen temperature range	14.3-1200 K
Spatial resolution	1.977 Å
Temporal resolution	312.30 fs
Electron pulse duration	260.01 fs
Energy resolution	1.5 eV
Spatial resolution at 20 K	20 K-2.356 Å-0.34×10 ⁻³ nm

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