OPERATING INSTRUCTIONS OF THE

LABORATORY AND TECHNICAL ROOMS FOR THE OPERATION OF ELECTRON MICROSCOPES

EDITION MARCH 2023

Building 05.2S	Instrument		Telephone
Room 1000	Corridor	René Borowski	6700
Room 1007	FIB FEI Helios NanoLab460F1	Max Kruth / Lidia Kibkalo	3605 / 3910
Room 1008	TEM Zeiss Libra 120	Drs. Johan Buitenhuis / Wiebke Sager	3146 / 4237
Room 2000	Corridor	René Borowski	6700
Room 2002	FIB FEI Helios NanoLab 400S	Lidia Kibkalo / Max Kruth	3910 / 3605
Room 2003a	TEM FEI Titan T	Drs. Andras Kovacs / Juri Barthel	9276 / 9277
Room 2003b	TEM FEI Titan T – Technik	Drs. Andras Kovacs / Juri Barthel	9276 / 9277
Room 2004a	TEM Hitachi HF 5000	Drs. Paul Paciok./ Janghyun Jo	9338 / 85115
Room 2003b	For TEM Hitachi HF 5000 – Technik	Drs. Paul Paciok./ Janghyun Jo	9338 / 85115
Room 2005	TEM FEI Titan 60-300 PICO	Drs. Juri Barthel / Hongchu Du / Lei Jin	9277/85176/2413
Room 2006	TEM FEI Titan 60-300 PICO – T.	Drs. Juri Barthel / Hongchu Du / Lei Jin	9277/85176/2413
Room 2009	TEM FEI Titan 60-300 HOLO – T.	Drs. Amir Tavabi / Thibaud Denneulin	85233 / 6644
Room 2010	TEM FEI Titan 60-300 HOLO	Drs. Amir Tavabi/ Thibaud Denneulin	85233 / 6644

Building 05.2W	Instrument	Instrument Officer / Deputy	Telephone
Room 1000	Corridor	René Borowski	6700
Room 1065	SEM TFS Apreo VS	Dr. Beate Förster / S. Ehlert	85112/85752
Room 1066	SEM JEOL 840A and 7400F	Drs. Mik Feuerbacher / Michael Faley	2409/ 4366
Room 1067	TEM JEOL 200 FS – Technik	Dr. Beate Förster / S. Ehlert	85112/85752
Room 1068	TEM JEOL 200 FS	Dr. Beate Förster / S. Ehlert	85112/85752
Room 1071	TEM FEI Tecnai F20	Drs Marc Heggen / M.Feuerbacher	9479 / 2409
Room 1072	TEM FEI Tecnai F20 – Technik	Drs. Marc Heggen / M. Feuerbacher	9479 / 2409
Room 1074	TEM Philips CM200 (Ausstellung)	Dr. M.Feuerbacher / René Borowski	2409 /6700
Room 2084a	TEM FEI Titan 80-200 ChemiSTEM	Drs. Kovacs / P.Lu /R.Schierholz	9276/85121/1686
Room 2084b	TEM FEI Titan 80-200 ChemiSTEM–Technik	Drs. Kovacs / P.Lu/R.Schierholz	9276/85121/1686
Room 2000	Corridor	René Borowski	6700
Room 2087a	TEM FEI Spectra 300	Drs. Juri Barthel / Lei	9277 / 2413
Room 2087b	Jin		9277 / 2413
Room 2092b	TEM FEI Spectra 300 - Technik	Drs. Juri Barthel / Lei	6691
Room 2092c	Jin		6691
Room 2092e	TEM FEI Krios G4 – Technik	Dr. Thomas Heidler	9479

Room 2090a	TEM FEI Krios G4	Dr. Thomas Heidler	6691
Room 2090b	TEM FEI Titan 80-300 STEM	Dr. Marc Heggen	6691
Room 2091a	TEM TFS Talos 200 Arctica	Dr. Thomas Heidler	6691 /
	TEM TFS Talos 200 Arctica-Technik	Dr. Thomas Heidler	6691
Room 2093c	FIB FEI Helios NanoLab Aquilos	Pia Sundermeyer / Dr. Thomas Heidler	6691 / 6691
	TEM TFS Talos 120	Pia Sundermeyer / Dr. Thomas Heidler	

Area Representative	**Telephone**
René Borowski	6700

HAZARDS FOR PEOPLE AND THE ENVIRONMENT

- Contact with high-voltage components.
- Improper handling when filling liquid nitrogen.
- Leakage or creep loss of SF6 from the high-voltage tanks of electron microscopes.
- Handling of chemicals, sample materials and nanoparticles.
- Improper handling of ladders or stepladders.

PROTECTIVE MEASURES AND RULES OF BEHAVIOUR

- The operating instructions for all unit components and accessories must be observed. These are available in the laboratory room either in printed or electronic form, e.g. in the form of "online" manuals accessible via the software of the associated control computers.
- Electron microscopes are strong sources of X-ray radiation; they are equipped with radiation protection devices and are only type-approved for operation with these as interference sources. The X-ray radiation shielding must not be removed. This applies in particular to test operation during repair or service.
- The charges stored or supplied in capacitors, in the voltage generation and transformation system as well as in other high-voltage components in electron microscopes can have a lethal effect. Work on high-voltage cables or high-voltage components is therefore strictly prohibited.
- Switchgear and electronics cabinets must always be kept locked. Only authorized personnel are permitted to open the switchgear and electronics cabinets. This also applies to all peripheral equipment in the laboratory room.
- Components containing beryllium are installed in electron microscopes. This applies to the X-ray analysis system, in particular the X-ray detector, and the object retainer of the specimen holder. Gloves must be worn when handling these components. Due to the toxicity of beryllium dust, mechanical handling of the surfaces of the aforementioned components is prohibited without exception.
- Opening the instrument and peripheral equipment, e.g. for fault diagnosis and repair, is not permitted.
- Any modifications of a technical nature to the electron microscopes may only be carried out with the consent of the person responsible for the room and the departmental representative and the managing director of ER-C.
- In the event of a failure of the accelerating voltage of an electron microscope, the SF6 pressure of the high-voltage tank must be checked immediately. If the SF6 pressure is below the minimum value marked on the pressure gauge (between 2.5 and 5.0 bar, depending on the equipment), there is a theoretical health hazard due to leakage or creep of SF6 gas in the microscope room and in the basement rooms below. In this case, the person responsible for the equipment (see above) or the area representative (see above) must be informed immediately.
- In the event of accidental mechanical stress on peripheral equipment, coolant leaks in the vicinity of electrical equipment, tripping over electrical equipment, etc., the building must be evacuated.
- In the event of accidental mechanical stress on peripheral equipment, coolant leaks in the vicinity of electrical installations, tripping over electrical cables or other incidents of a similar nature, a high hazard potential may arise due to damage and effects that may not be directly recognizable. If necessary, inform the person responsible for the unit (see above) or the area representative (see above) and disconnect the unit from the mains in his presence.
- Safety goggles must be worn when handling transportable nitrogen dewars and when decanting liquid nitrogen in general. Transferring larger quantities of nitro-

gen (more than 10 litres) is prohibited in the microscope rooms.

- Against the background of potential nanoparticle-induced health and environmental risks, action guidelines for handling nanomaterials, which are deposited at:www.baua.de/de/Themen-von-A-Z/Gefahrstoffe/Nanotechnologie/Links-Beispiele.html, must be considered.
- Keep the instrument clean and tidy.
- Eating and drinking is prohibited in the electron microscopy laboratories.
- When using ladders or stepladders, ensure that they are stable.
- The general operating instructions of Forschungszentrum Jülich GmbH for handling power-operated work equipment must be observed.
- Report any safety deficiencies you notice to the person responsible for the equipment (see above) or the area representative (see above).

BEHAVIOR IN THE EVENT OF MALFUNCTIONS

- Switch off the system in the presence of a second person, ideally the person responsible for the equipment (see above) or the area representative (see above).
- Leave the laboratory immediately.
- Report any malfunction to the person responsible for the equipment (see above) or the area representative (see above).

CONDUCT IN THE EVENT OF AN ACCIDENT OR FIRST AID

Emergency: 77

- Press the "Emergency stop" switch.
- Remove injured persons from the danger area.
- Give first aid and call in the company physician EMERGENCY CALL 77
- Report accident to the safety center EMERGENCY CALL 77
- Inform the person responsible for the equipment (see above) or the area representative (see above).

MAINTENANCE OR DISPOSAL

- Keep the electron microscope including peripheral equipment in a clear condition.
- Clear supply cables and hoses from the path of traffic.
- Secure unnecessary objects lying around or, ideally, store them in laboratory cabinets.
- Immediately report any faults in the equipment to the person responsible for the equipment (see above).
- Maintenance and extension work may only be carried out by persons authorized to do so.

CONSEQUENCES OF NON-COMPLIANCE

Jülich, March 1st 2023