Advanced Microscopy and Spectroscopy 2026

Course programme · 2–4 December 2026

Wednesday 2 December 2026

Lectures and ultramicrotome demonstration

Time	Session	Speaker
9:00–9:10	Welcome and introduction to the laboratory	Kamila Hrubanová ISI CAS Brno
9:10–9:55	Fundamentals of electron microscopy	Vladislav Krzyžánek ISI CAS Brno
9:55–10:40	Preparation of biological samples for electron microscopy	Jana Nebesářová BC CAS České Budějovice
10:40–11:10	*Coffee break*	
11:10–11:30	When Microbiology Meets Materials Science: Bacteria Encapsulated in Hydrogels	Anna Havlíčková ISI CAS Brno
11:30–12:00	SBF-SEM and Array Tomography	Jiří Týč BC CAS České Budějovice
12:00–12:20	Cryo-volume EM for high-resolution 3D imaging and in situ structural analysis of cells and tissues	Pavel Křepelka CEITEC MUNI Brno
12:20–13:20	*Lunch*	
13:20–13:40	Raman spectroscopy: seeing chemistry with light	Martin Kizovský ISI CAS Brno
13:40–14:00	Hyperspectral Image Analysis	Ondřej Vaculík ISI CAS
14:00–14:20	Software for 3D EM Image Processing	František Kitzberger BC CAS České Budějovice
14:20–14:40	STEM ptychography	Radim Skoupý EPFL, Lausanne
14:40–15:30	*Coffee break and discussion*	

Thursday 3 December 2026

Practical sessions

Two parallel tracks run in the morning. After lunch, all participants join the laboratory rotations.

Sessions and instructors

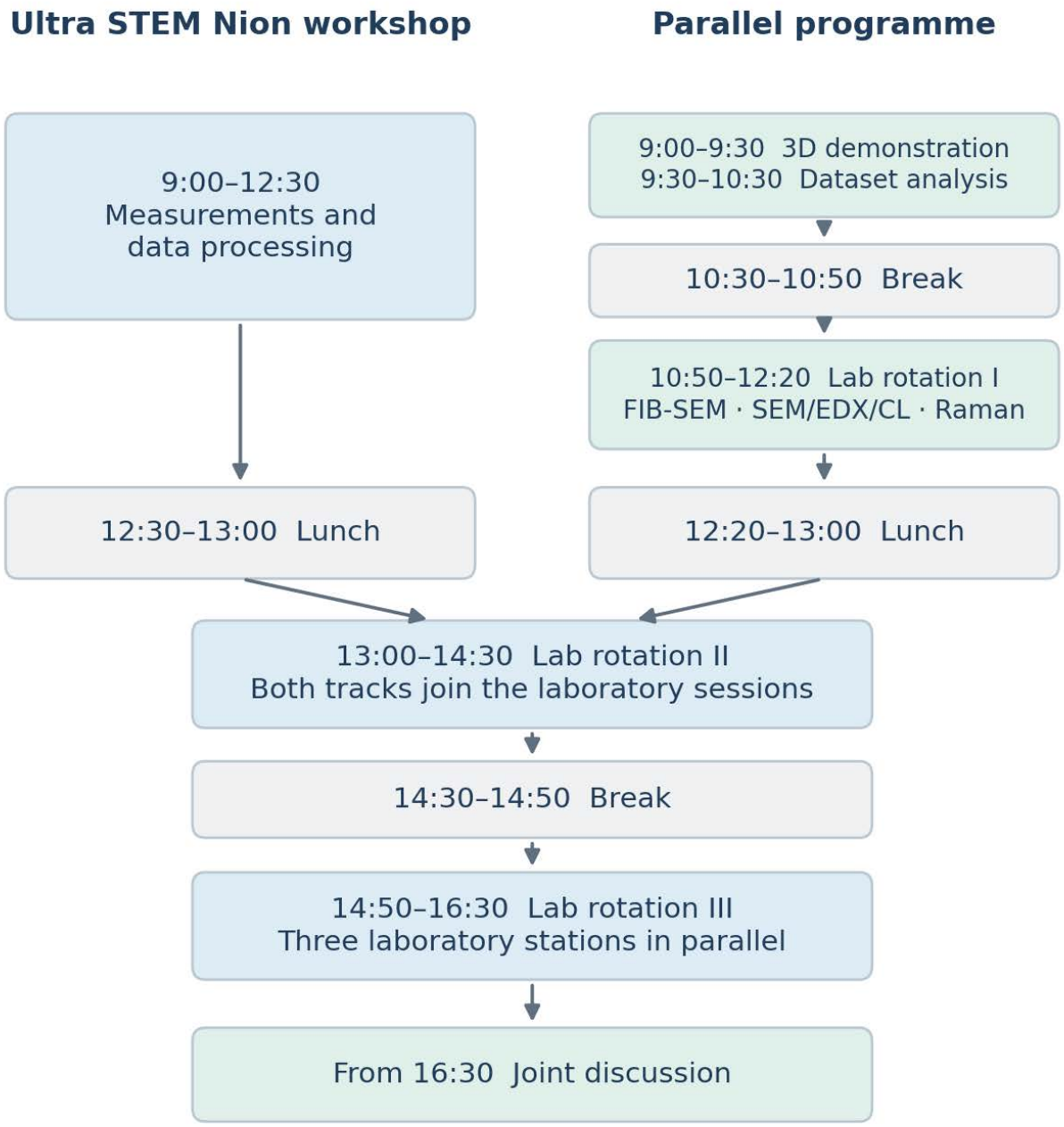
Session	Instructors
Ultra STEM Nion workshop	Radim Skoupý, Pavlína Sikorová
AI for 3D EM Image Analysis / Volume EM data processing – demonstration and work with datasets	Jiří Týč, František Kitzberger
FIB-SEM / SEM-STEM	Pavel Křepelka, Tereza Motlová, Kamila Hrubanová
SEM / EDX / CL	Zuzana Pokorná, Filip Mika
Raman spectroscopy	Martin Kizovský, Soňa Cabalová

Schedule

Time	Ultra STEM Nion workshop	Parallel programme
9:00–9:30	Measurements and data processing	Practical demonstration of 3D data processing
9:30–10:30	Measurements and data processing	Independent work with prepared datasets
10:30–10:50	Workshop continues	Break
10:50–12:20	Workshop continues	Laboratory rotation I
12:20–12:30	Workshop continues	Lunch
12:30–13:00	Lunch	Lunch
13:00–14:30	Laboratory rotation II	Laboratory rotation II
14:30–14:50	Break	Break
14:50–16:30	Laboratory rotation III	Laboratory rotation III
From 16:30	Joint discussion	Joint discussion

Thursday programme overview

3 December 2026 · The two morning tracks join after lunch. Laboratory sessions run in parallel at the FIB-SEM / SEM-STEM, SEM / EDX / CL and Raman stations.



Friday 4 December 2026

Practical sessions

Two groups rotate between both teaching stations. A laboratory tour and joint discussion follow in the afternoon**. In the registration form, select the hands-on sessions that interest you most. Each session is limited to a small group of 4–6 participants, with places allocated on a first-come, first-served basis.**

Sessions and instructors

Session	Instructors
HPF and cryo-preparation of samples + demonstration of 4D STEM in SEM	Kamila Hrubanová, Anna Havlíčková / Tomáš Láznička, Vladislav Krzyžánek
Hyperspectral analysis	Ondřej Vaculík, Tomáš Plichta
Tour of additional laboratories	Tomáš Láznička, Anna Havlíčková
Final discussion and feedback	Kamila Hrubanová, Vladislav Krzyžánek

Schedule

Time	Group A · maximum 6 participants	Group B · maximum 6 participants
9:00–9:15	Joint introduction and transfer	Joint introduction and transfer to laboratories
9:15–11:15	HPF and cryo-preparation + demonstration of 4D STEM in SEM	Hyperspectral analysis
11:15–12:00	Lunch and informal discussion	Lunch and informal discussion
12:00–14:00	Hyperspectral analysis	HPF and cryo-preparation + demonstration of 4D STEM in SEM
14:00–14:15	Break	Break
14:15–15:15	Tour of additional laboratories	Tour of additional laboratories
15:15–16:00	Joint discussion and feedback	Feedback with refreshments

Friday programme overview

4 December 2026 · Groups A and B swap teaching stations after lunch. The laboratory tour, discussion and feedback are shared by all participants. **In the registration form, select the hands-on sessions that interest you most. Each session is limited to a small group of 4–6 participants, with places allocated on a first-come, first-served basis.**

