16th Multinational Congress on Microscopy

16MCM

04–09 September 2022

Brno, Czech Republic

FINAL PROGRAMME

16th Multinational
Congress on Microscopy

16MCM

04–09 September 2022

Brno, Czech Republic

#16MCM

Bringing together leading academic scientists, researchers, students and the commercial sphere to exchange and share experiences and research results on all aspects of microscopy.

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Content

Welcome Message

Dear colleagues,

It is a great pleasure to welcome you to the **16th Multinational Congress on Microscopy** (16MCM). Due to exceptional circumstances, the congress is being held already on September 4th–9th 2022 in Brno, the Czech Republic.

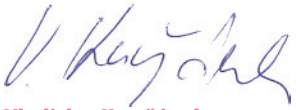
Brno is a beautiful city in Central Europe offering modern facilities for international congresses, one of which is the congress venue – the Best Western Premier Hotel International Brno. The city of Brno is an ideal place for electron microscopy events not only because of its long tradition in development and production of microscopic instruments, but also thanks to the numerous universities and research centres performing great science, usually in close connection with microscopic companies. This unique, direct and intensive network of collaborations between the commercial sphere and academia has resulted in a highly efficient and worldwide successful electron microscopic ecosystem we would like to introduce you to through workshops and excursions.

Moreover, Brno is not only the worldwide recognized microscopic center, but also an old city with fascinating history. Among other things, we cannot forget this year's celebration of the bicentenary of the birth of the father of genetics, Gregor Johann Mendel, who spent a significant part of his life here and laid the foundations of genetics.

The scientific quality of 16MCM will be ensured by leading scientists from the MCM consortium, but also from Europe and overseas. We believe that the 16MCM in Brno becomes a key microscopy event in the Central European region and offers an excellent opportunity to present new scientific results, ideas and products in all fields of microscopy. Last but not least, we hope that the enjoyable atmosphere of the microscopy-rich city with numerous historical monuments and vibrant nightlife will also stimulate less formal personal meetings and collaborations.

Even though the times are still difficult, our wish for the 16MCM is, after series of COVID online meetings, to be one of the first events where we will finally meet in person again!

On behalf of the Organizing Committee,



Vladislav Krzyžánek
congress chair & CSMS president

Local Organizing Comittee

Jana Nebesářová
CSMS Board member, Biology Centre of the CAS, České Budějovice

Kamila Hrubanová
Congress Secretary
CSMS Board member, Institute of Scientific Instruments of the CAS, Brno

Tereza Zdražilová
Institute of Scientific Instruments of the CAS, Brno

Dana Černošková
Professional Conference Organiser, Scientifika, Brno

Congress Chairs

Vladislav Krzyžánek
Congress Chair and CSMS President, Institute of Scientific Instruments of the CAS, Brno

Pavel Hozák
co-chair for Life Sciences
Institute of Molecular Genetics of the CAS, Prague

Ilona Müllerová
co-chair for Instrumentation and Methods Czech Academy of Science, Prague

Miroslav Šlouf
co-chair for Material Sciences
Institute of Macromolecular Chemistry of the CAS, Prague

Hosting Societies

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Vienna, Austria (IM)

Miroslav Šlouf
Prague, Czech Republic (MS)

Igor Weber
Zagreb, Croatia (LS)

General Information

BADGES

All registered participants are requested to wear their name badges at all times. Only delegates who are wearing their name badges will be admitted to the congress venues.
Name badges have been colour-coded as follows:

EXHIBITOR
PARTICIPANT
STAFF
ONE-DAY VISITOR

BOOK OF ABSTRACTS

The abstracts will be available on the event website.

CAR PARKING

Congress venue parking – Parking for hotel guests is available in the underground garage – 500 CZK incl VAT/day or in front of the hotel 450 CZK incl VAT/day.
The other option is Domini park house next to the congress venue. Parking fees are not included in the registration fee.

06:00 – 22:00	40 CZK/hour
22:00 – 06:00	30 CZK/hour

CLOAKROOM

A cloakroom is located on the first floor and it is free of charge to all registered participants.
Cloakroom Opening Hours:

04/09 Sunday:	14:00 – 19:00
05/09 Monday:	07:30 – 16:45
06/09 Tuesday:	07:30 – 16:45
07/09 Wednesday:	07:30 – 16:45
08/09 Thursday:	08:00 – 18:00

COFFEE BREAKS

During the core program breaks, Coffee breaks will be served free of charge to all participants wearing their name badges. They will be served in the Exhibition Area and Poster Area in the Museum of Applied Arts.

CONGRESS VENUES

Best Western Premier Hotel International, Husova 200 / 16, 602 00 Brno
(Congress, Exhibition)

Museum of Applied Arts, Husova 14, 602 00, Brno
(Welcome reception, poster session)

Hotel Passage, Lidická 2, 602 00, Brno
(Farewell Dinner)

Kobližná street (small square close to Malinovského nám.)
Microscopic micrographs competition

CONGRESS PROGRAM

The final congress program is available on the congress website https://www.16mcm.cz/programme/. The organizers cannot assume liability for any changes in the program due to external or unforeseen circumstances.

CONGRESS STAFF

If you have any questions, please contact members of the congress staff who can be easily recognized by their blue T-shirts.

COVID-19

The meeting is taking place face-to-face. No COVID-19 measures are currently mandated by law in the Czech Republic. Please fellow the official website of the Ministry of Health of the Czech Republic on the website: https://covid.gov.cz/en/measures.

Disinfectants will be available at the congress site, the spacing will be observed. Face masks are not currently mandatory, but the organizing team calls for your own health responsibility and recommends wearing respirators.

CURRENCY & BANKING

The currency in the Czech Republic is the Czech crown/Czech koruna (CZK).
1 EUR = 25 CZK. The credit card is accepted in most shops and restaurants.
The cash can be exchanged in the bank or exchange booths which are located in the city center.
The official exchange rates are available on the website of the Czech National Bank (www.cnb.cz).

ELECTRICITY
The Czech Republic uses a 230 volt 50 Hz system, sockets have the European standard and plugs are three-prong grounded.

EXHIBITION
An exhibition is located on the first floor and will be open Monday 5 September – Thursday 9 September.

FIRST AID
Please contact any staff member if you need assistance.

IMPORTANT TELEPHONE NUMBERS
150: Fire Rescue Service, **155**: Ambulance, **158**: Police, **112**: General Emergency for Europe

INSURANCE
The organizers of the congress do not accept liability for any injury, loss or damage, arising from accidents or other situations during the congress. Participants are therefore advised to arrange insurance for health and accident prior to traveling to the congress.

INTERNET CONNECTION
There will be a dedicated WiFi: 16MCM with the password: CRYTUR2022

LANGUAGE
The official language of the 16MCM is English. Simultaneous interpretation will not be provided.

LOST & FOUND
Lost & Found service is available at the Information Desk on the first floor in the hotel lobby.

LUNCHES
During the core program there will be lunch workshops sponsored by companies with separate registration. There are plenty of different kinds of restaurants and fast foods around the area within walking distance.

MOBILE APPLICATION
To download please go to App Store and Google Play and search "16mcm".
Sponsored by Thermo Fisher Scientific.

MOBILE PHONES
Participants are kindly requested to keep their mobile phones in the OFF position in the meeting rooms while scientific sessions are being held.

PHOTOGRAPHY
We will be taking photos and videos throughout the congress. The images will be used in communication materials and may be published on the congress website and Twitter. If you prefer not to be photographed, please contact us at the registration desk and let the photographer know.

POSTER SESSION
Poster session is located next to the Hotel International in the Museum of Applied Arts.
On-site assistance for installation will be available in the room. The pins for the installation poster will be ready on the board. Any poster covers cannot be stored in the poster session room, there will be a designated place for them. The collection of materials at the end of the session is the author's responsibility. Any posters remaining after the congress ends will be destroyed. Authors are expected to be by their posters during the session to answer questions from the attendees.

Monday 5 September: Poster session A (LS1–2, MS1–3, IM1–2)
Installation: 12:30 – 16:30
Poster presentation: 16:30 – 18:00

Tuesday 6 September: Poster session B (LS3–4, MS4, IM3–5)
Poster presentation: 16:30 – 18:00

Wednesday 7 September: Poster session C (LS5–7, MS5–7, IM6–7, Late)
Poster presentation: 16:30 – 18:00

PUBLIC TRANSPORTATION
Brno visitors can purchase tickets in the yellow machines located at the most of the stops or pay by credit card directly inside the vehicle at yellow terminal. One way costs 25 CZK (1 EUR, 15 minutes).

Useful Links:
Brno Airport http://www.brno-airport.cz/en/
Czech Train Ways https://www.cd.cz/en/default.htm
Liftago is available via mobile app
Public Transport – time tables https://idos.idnes.cz/en/vlakyautobusymhdvse/spojeni/
RegioJet – bus & train https://regiojet.com/
TAXI information https://www.citytaxibrno.cz/

REGISTRATION AND INFORMATION DESK

The registration desk will be open daily for the whole duration of the congress programme. Participants must register, sign the attendance sheet and collect badges before entering any part of the congress program.

Sunday 4 September:
14:00 – 19:00 Registration for all participants

Monday 5 September – Thursday 9 September:
07:30 – 16:30 Registration for all participants

SMOKING POLICY

For the comfort and health of all participants, smoking is not permitted at any official function. This includes scientific sessions, business and similar meetings, meal functions and also registration area and foyers.

SLIDE ROOM

Slide room for speakers is located on the first floor in the hotel lobby. Speakers are asked to bring the presentation on USB Memory stick to the SLIDE ROOM at least one hour before the start of the session or send it to an email https://16mcm.filemail.com/ in advance.

TIME ZONE

The Czech Republic is on Central European Time – Greenwich Mean Time (GMT) plus 1 hour. From April to October is summer time, i.e. GMT + 2 hours

TOURIST INFORMATION

There will be a table in the hotel lobby with leaflets about tourist attractions in Brno and the South Moravian Region.

TRAVEL INFORMATION

Participants can comfortably get to and from Brno by plane, bus, train or car.

BY PLANE

Visitors to Brno can use the International Airport Brno-Tuřany, which provides flights to London/Stansted and other charter destinations. The visitors can use the International Prague Airport and Brno is also well connected to the international airport in Vienna (Austria).

Brno – Tuřany Airport
Brno 904/1, Tuřany, Czech Republic, Phone: +420 545 521 111
Website: www.brno-airport.cz/en
Airport is located 12 km/20 minutes from the city center and you can easily take a taxi or the express bus, which is directly located outside the entrance to the airport terminal.

Vienna International Airport
Einfahrtsstrasse, Schwechat 1300, Republic of Austria, Phone: +43-1-7007-0
Website: www.viennaairport.com/en/passengers

The easiest transportation from Vienna airport to Brno is with bus operator RegioJet offering 8 connections daily from Vienna to Brno from 13 EUR one way. Duration of the trip is approximately 2,5 hours. Tickets are available to purchase online at the website https://regiojet.com.

Václav Havel Airport Prague
K Letišti 6/1019, 160 08, Prague 6, Phone: +420 220 111 888
Website: www.prg.aero/en

Easiest transportation from Prague is with bus operator RegioJet offering 36 connections daily from Prague to Brno from 8 EUR one way. Duration of the trip is approximately 2,5 hours. Tickets are available online with German and English versions.

BY BUS OR TRAIN

RegioJet is a reliable bus and train company https://regiojet.com.
From Vienna and Prague, we also recommend the RailJet train category to Prague and Vienna
www.idos.cz – universal bus/train search engine and public transport planner.

BY CAR

Brno is located on the main Czech highway D1 and D2. For highways and some bigger roads it is compulsory to purchase an electronic vignette. The options are 10 days (440 CZK) and 30 days (310 CZK). The purchase is available online https://edalnice.cz/.

ACCOMMODATION

Each participant is responsible for arranging their own accommodation. All participants are reminded to settle their hotel bills for extras prior to departure with a hotel reception.

Best Western premier Hotel International 4*
Congress Venue
(Husova 16)
www.hotelinternational.cz

Other recommended hotels:
Hotel Passage 4*
Congress Dinner Place
(Lidická 23) 12 min walk from congress venue

Hotel Continental 4*
(Kounicova 680/6) 8 min walk from the congress venue

Hotel Avanti 3*
(Střední 61) 15 min by public transport from the congress venue

Social Activities

Welcome reception – 4 September
Welcome reception will take place Sunday 4 September from 7pm at MUSEUM of Applied Arts (welcome dinner place) recently opened reconstructed place with an exhibitions of fine arts with outdoor installations.

Address: Husova 14, Brno (next to congress venue).
The welcome reception is included in the conference package.
Sponsored by Thermo Fisher Scientific.

Microscopic micrographs competition 4 – 9 September
Competition of microscopic micrographs – The selected micrographs will be part of the exhibition „Microscopic gallery – the best of 16MCM in Brno" which will take place on the square in the city center of Brno (Kobližná). In collaboration with partners we are also planning interesting prizes for the winners, the authors of the exhibited photographs will receive a diploma.

The goal of this international competition is to identify and showcase scientific micrographs. While there should be scientific content in the images, winning entries will also exhibit exceptional composition and other esthetic qualities. The competition is open to all types of microscopy, coloring of micrographs is allowed.

Museum of Applied Arts (Moravian Gallery) 7 – 8 September
Participants can visit permanent exhibition for free on the 1st and 2nd floor on Wednesday and Thursday (10:00 – 18:00). The conference badge has to be provided at the entrance.

Charity Run – 8 September
Don't forget to take your running shoes & support good cause! TESCAN, as the general partner of the 16MCM charity run, prepared a challenge for you: 4,3 km run/walk to Špilberk Castle, the most famous landmark in Brno. Help with us by donating to ParaCENTRUM Fenix, organization which helps people who survived a spinal cord injury.

Farewell Dinner – 8 September
will take place from 19:00 in the boutique Hotel Passage 4* (10 minutes walking distance from conference venue).

Address: Lidická 23, Brno.

Dinner programme will include:
Best Posters awards
Best microscopic micrographs awards
Fine dining buffet dinner (local and international cuisine)
Live music (jazz and local traditional)

Excursions – 9 September
Brno microscopic companies open their doors to the laboratories, you can working on the best microscopes in the world or you can look into the production areas. Those of you who don't make Sunday excursions will have the opportunity to visit Brno research institutions on this day.
More information available soon.

Excursions to Brno Microscopy Ecosystem

Friday 9 September
Brno microscopic companies and research institutes/universities open doors to their laboratories, you can try your hand at working on the best microscopes in the world or you can look into the production areas.
Excursions will take place in two blocks, only two locations will be possible to visit. The number of participants is limited. Excursions and transportation will be provided free of charge.

FACTORY VISITS

Delong Instruments

Laboratory of Low Voltage Electron Microscopy. Enjoy LVEM for daily use: introduction of the world's smallest TEMs, including hands-on demonstration on material and life science samples.
The participants will have the opportunity to work with the devices in different analytical modes (TEM /STEM including darkfield, SEM (BSE), electron diffraction and EDS) and enjoy the small size and naturally high contrast of low voltage electron microscopes.

NenoVision

Live demonstration of correlative AFM-in-SEM measurements.
Presentation of the principles & possibilities of the AFM-in-SEM correlative microscopy. Informative & discussion panel about the applications & future of the technology in the principal research areas (Battery research, Life Science, Semiconductors, Material Science, etc.). Overview of collaboration with scientific institutions

TESCAN ORSAY HOLDING

Excursion to the place where the invisible becomes visible.
We warmly welcome you to our background, where all of our top instruments are made and demonstrated. See what innovations we have and come and chat with us. Just 20 mins drive from the hotel to visit our Factory where all the production takes place and Demolab which is something like our Showroom. Look forward to an interesting demo on some of our instruments.

Thermo Fisher Scientific

Visit hi-tech company Thermo Fisher Scientific in Brno, one of the largest producers of electron microscopes in the world. You can look forward to interesting DEMO on various topics for users according to their focus, e.g. Life Science, Semiconductor Sample Preparation Automation Laboratory Session. You can also join us for a factory tour directly to the clean rooms and learn more about company where we cross the boundaries of human knowledge.

VISITS TO RESEARCH INSTITUTES/UNIVERSITIES

Biophysical Institute CAS

The Institute of Biophysics focuses on the research of the structure, function, and evolution of diverse biological systems, and material science. We are going to show several advanced microscopic methods which can be applied in molecular biology, biochemistry, nanomaterials and medicine.
Following techniques will be presented to participants: FLIM-FRET – the excellent methodology to study molecular interactions. Atomic Force Microscopy – from nanomaterials to nucleic acids and protein structure.

CEITEC Brno University of Technology

The CEITEC Nano Research Infrastructure is the largest clean room in the Czech Republic and provides expertise for nanotechnology and advanced materials R&D. The facility enables to carry out complete fabrication of nanostructures and nanodevices and their characterization down to the sub-nanometre level in an entirely clean environment. The users typically access the infrastructure via open access model. During the tour, we will show the core laboratories and explain the access procedure.

CEITEC Masaryk University

Cellular Imaging Core Facility
The CELLIM Core Facility aims to provide comprehensive microscopy services by providing access across the entire spectrum of light microscopes from simple stereomicroscopes and macroscopes to classical widefield and confocal microscopes to cutting-edge super-resolution microscopes and specialized light-sheet microscopes. You can enjoy the laboratory tour, find out more about the offered services and technologies.

CEITEC Masaryk University

Cryo-Electron Microscopy Core Facilityy

The CryoEM Core Facility provides access to state-of-the-art electron microscopy instrumentation for structural and cellular biology research. The laboratory manages and operates three transmission electron cryo-microscopes, two FIB-SEM microscopes, a wide-field cryo-fluorescence microscope, and a variety of instruments for sample preparation.You can enjoy a tour of the newly renovated lab and find out more about the offered services.

CEITEC Masaryk University

NanoBiotechnology Core Facility (BioAFM)

A variety of microscopic and biophysical techniques: Atomic Force Microscopy, Nanoindentation, Optical microscopes, Raman microscopes, Electrophysiology (MEA) – for correlative studies of bio-samples in size from single biomolecules to tissue slices will be presented. The Core Facility personnel will present the equipment during selected experiments. Demo measurements and hands-on-session can be organized on your demand.

Institute of Material Physics CAS

The aim of the Institute of Physics of Materials is to elucidate the relation between the behavior and properties of materials and their structural and microstructural characteristics. Following laboratories will be shown during the excursion: Mechanical properties such as tensile, fatigue or creep laboratories. Electron microscopy facility. Modeling of microstructure at various scales.

Institute of Scientific Instruments CAS

You have an opportunity to visit a research institute of the Czech Academy of Sciences with a rich history in the field of electron and light optics. At least four laboratories open their doors, you can see electron microscopes, electron welder, Raman microscopy and a laboratory of Optical Micro-manipulation Techniques.

Media & Other Partners

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B R N O

Research Institutes

Institute of Scientific Instruments of the CAS Brno, CZ

Biology Centre of the CAS Ceske Budejovice, CZ

Institute of Molecular Genetics of the CAS Prague, CZ

Institute of Macromolecular Chemistry CAS Prague, CZ

Institute of Biophysics of the CAS Brno, CZ

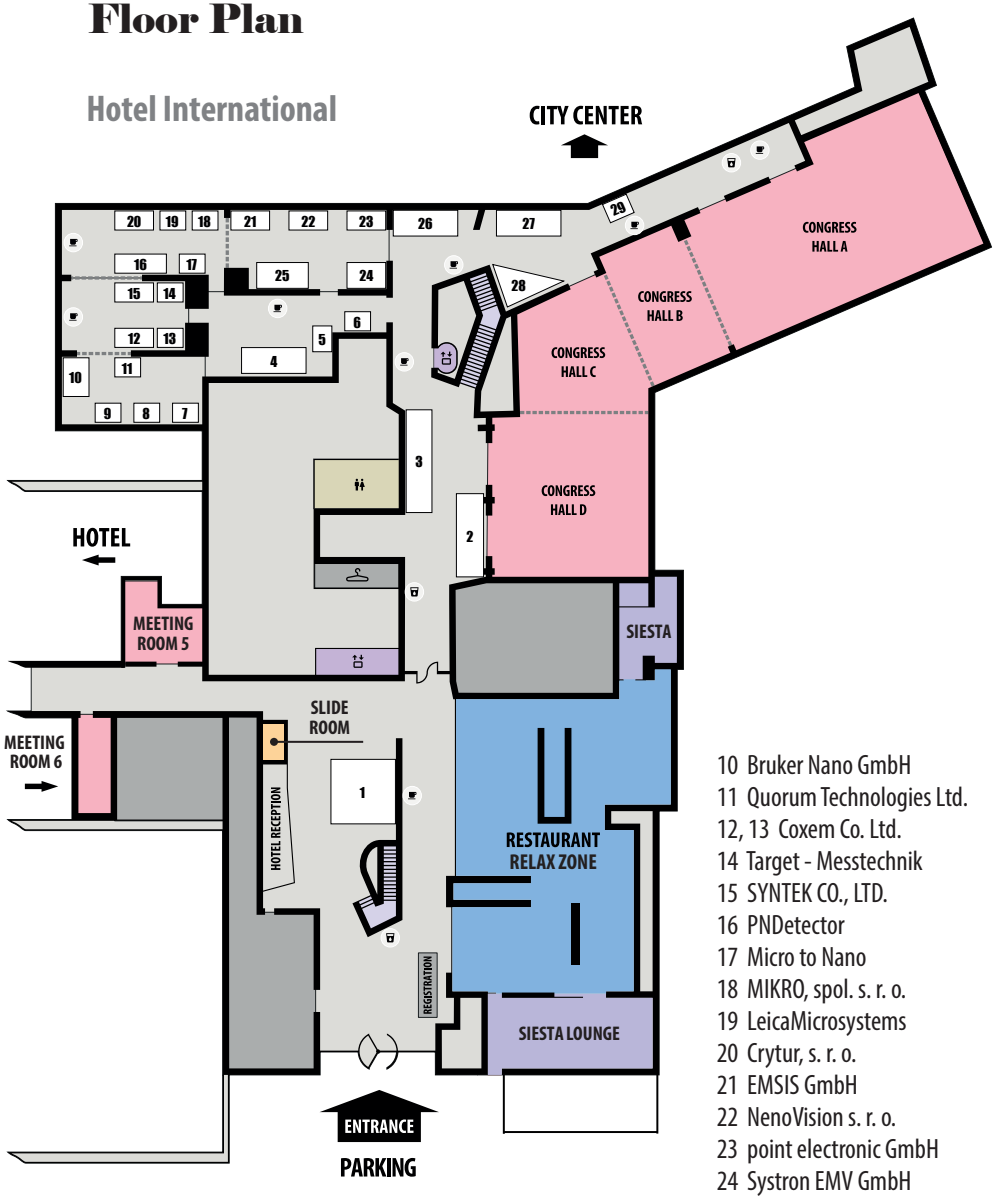
Charles University Prague, CZ

Institute of Physics of Materials of the CAS Brno, CZ

CEITEC, Brno, CZ

Floor Plan

Hotel International



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23 point electronic GmbH
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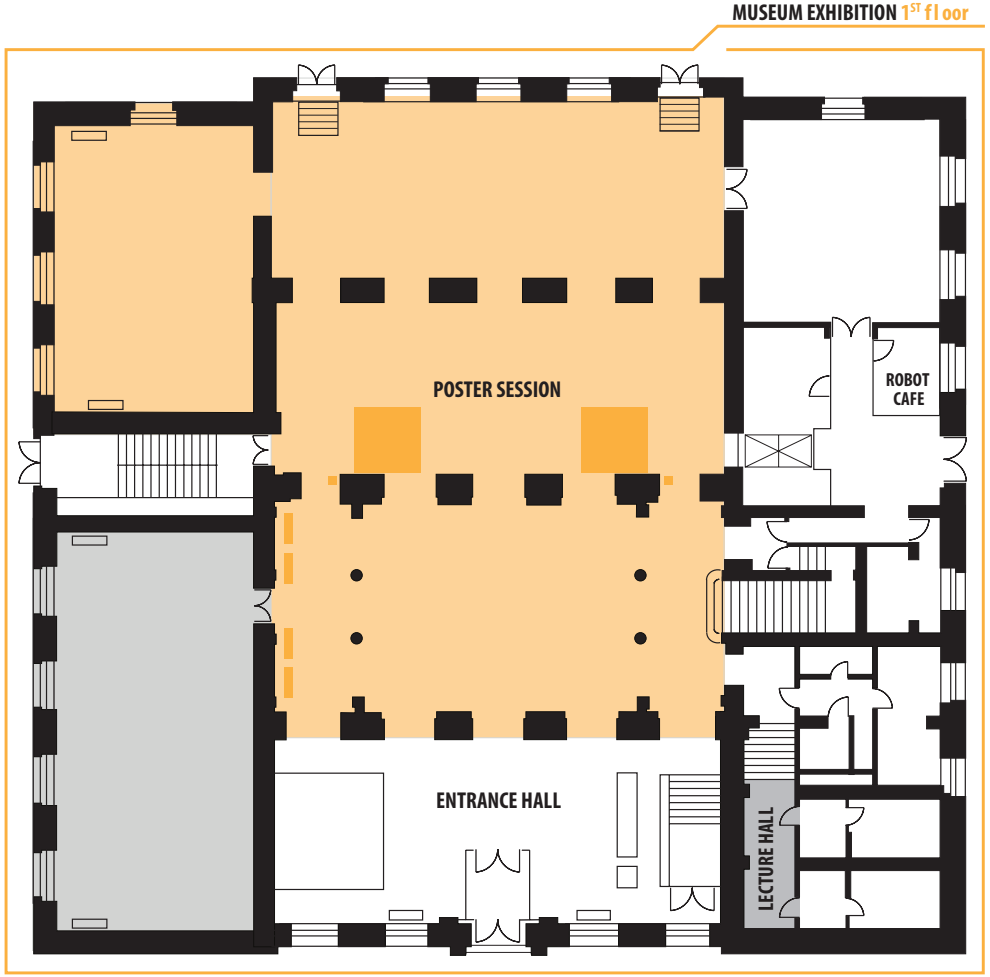
26 JEOL
27 Oxford Instruments
28 DELONG INSTRUMENTS a. s.
29 EMS

Museum of Applied Arts



Programme

Sunday 04/09/2022	Monday 05/09/2022	Tuesday 06/09/2022		Wednesday 07/09/2022	Thursday 08/09/2022	Friday 09/09/2022
	Registration	**Registration**		**Registration**	**Charity Run 16MCM**	**Bus Departure**
	07:30	07:30		07:30	07:30 – 09:50	08:00 – 08:30
	Plennary lecture	**Plennary lecture**		**Plennary lecture**		
	08:30 – 09:50	08:30 – 09:50		08:30 – 09:50		**Excursions I**
Workshops I – III	**Coffee break / Exhibition**	**Coffee break / Exhibition**		**Coffee break / Exhibition**	**Coffee break / Exhibition**	09:00 – 11:00
10:00 – 16:00	09:50 – 10:30	09:50 – 10:30		09:50 – 10:30	09:50 – 10:30	
	Regular talks	**Regular talks**		**Regular talks**	**Regular talks**	
	(LS1, MS1, IM1)	**(LS2, MS2, IM2)**		**(LS4, MS4, IM4, IM2)**	**(LS6, MS6, IM6)**	**Lunch break and transport**
	10:30 – 12:30	10:30 – 12:30		10:30 – 12:30	10:30 – 12:30	11:00–12:30
	Lunch workshops	**Lunch workshops**		**EMS member meeting**	**Lunch workshops**	**Excursions II**
	12:45 – 13:45	12:45 – 13:45		12:45 – 13:45	12:45 – 13:45	12:30–14:30
		Regular talks		**Regular talks**	**Regular talks**	
Registration		**(LS3, MS3, IM3)**		**(LS5, MS5, IM5, MS4)**	**(LS7, MS7, IM7)**	
14:00 – 17:30	**Exhibitor's presentations**	14:00 – 16:00		14:00 – 16:00	14:00 – 16:00	**Arrival**
	14:30 – 16:15					14:30 – 15:30
	Coffee break / Exhibition	**Coffee break / Exhibition**		**Coffee break / Exhibition**	**Coffee break / Exhibition**	
	16:15 – 16:30	16:00 – 16:30		16:00 – 16:30	16:00 – 16:30	
	Poster session A	**Poster session B**		**Poster session C**	**Panel discussion**	
	(LS1–2, MS1–3, IM1–2)	**(LS3–4, MS4, IM3–5)**		**(LS5–7, MS5–7, IM6–7)**	Microscopy challenges for scientists and manufacturers	
	16:30 – 18:00	16:30 – 18:00		16:30 – 18:00 (Late posters)		
		Meeting of CSMS members		**Panel discussion**	16:30 – 18:00	
Opening ceremony		17:00 – 18:00		Beauty in Micrographs		
17:30 – 18:00				17:00 – 18:00		
Keynote lecture						
18:00 – 19:00						
Welcome reception					**Congress Farewell Dinner and Closing Ceremony**	
19:00 – 22:00					19:00 – 23:00	

Keynote & Plenary Speakers

Richard Henderson
Scottish molecular biologist and biophysicist and pioneer in the field of electron microscopy of biological molecules, UK

Ute Kaiser
Head of the Materials Science Electron Microscopy Facility at Ulm University, Germany

Quentin Ramasse
Director of SuperSTEM Laboratory, SciTech Daresbury Campus, United Kingdom

Attila Losonczy
Professor of Neuroscience at Kavli Institute for Brain Science, Columbia University, New York, USA

Lukáš Palatinus
Head of the laboratory of electron crystallography, Institute of Physics of the Czech Academy of Sciences, Prague, Czech Republic

Radim Chmelík
Head of Experimental Biophotonics, CEITEC – Central European Institute of Technology, Brno University of Technology, Czech Republic

Detailed Programme

Sunday 04/09/2022			
Workshop I (ISI CAS Brno)	**Workshop II (Hotel International)**		**Workshop III (IPM CAS, Brno)**
10:00–16:00 Electron diffraction for everyone: Process your powder diffractograms from TEM and SEM	10:00–16:00 Macro programming with ImageJ		10:00–16:00 Basic TEM techniques in materials science
14:00 Registration (Hotel International)			
17:30 Opening ceremony (Congress hall A–D)			
18:00–18:45 Keynote lecture: Henderson R.: Plenary–3051 The electron cryomicroscopy revolution in structural biology			
19:00–22:00 Welcome reception (Museum of Applied Arts)			

Monday 05/09/2022			
07:30 Registration (Hotel International)			
08:30 Plenary lecture (Congress hall A–D)			
Chair: Ilona Müllerová			
08:30–09:10 Ramasse Q. M.: Plenary–2901 Recent Progress in High-Resolution Electron Energy Loss Spectroscopy in the Scanning Transmission Electron Microscope			
09:10–09:40 Announcement of CSMS awards			
09:40–10:30 Coffee break			
MS1 (Congress Hall A)	**LS1 (Congress Hall B–C)**		**IM1 (Congress Hall D)**
Metals, alloys and intermetallics	Electron microscopy in health, diagnostics, nanomaterials and regenerative medicine		Multi-dimensional image processing: Facing the data interpretation challenge
Chairs: Dragan Rajnović / Novi Sad, Serbia Alena Michalcová / Prague, Czechia	Stefania Meschini / Roma, Italy Nela Puškaš / Belgrade, Serbia		Jo Verbeeck / Antwerp, Belgium Michal Kozubek / Brno, Czechia
10:30–11:00 Dlouhý A.: MS1–IN–2503 Quantitative STEM in the diffraction contrast regime	10:30–11:00 Carton F.: LS1–IN–2535 Hyaluronic acid based nanoparticles are suitable carriers to muscle cells: the ultrastructural evidence		10:30–11:00 Nord M.: IM1–IN–2973 Writing and sustaining analysis tools for large and complex microscopy data

MS1 (Congress Hall A)	LS1 (Congress Hall B–C)	IM1 (Congress Hall D)
11:00–11:30 Knaislová A.: MS1–IN–2915 Titanium-aluminide-silicide based alloys	11:00–11:15 Kaczmarczyk O.: LS1–O–2543 Antimicrobial photodynamic therapy effects on Gram-negative and Gram-positive bacteria observed using light-induced in-situ TEM	11:00–11:15 JP Peters J.: IM1–O–2569 Making Every Electron Count: Improving STEM Quantification, Speed, and Data Throughput with Solid State Detectors and Pulse Counting Hardware
11:30–11:45 Ahmadian A.: MS1–O–2601 Co-segregation of zinc, carbon and boron in a Σ5 iron grain boundary resolved by correlating atomic resolution STEM, APT and first-principles calculations	11:15–11:30 Ploszczanski L.: LS1–O–2655 Why do Schwann cells like spider silk?	11:15–11:30 Ganeeva G.: IM1–O–2853 4D-STEM Imaging for 3D Stereo Reconstruction by Deep Learning Neural Networks
11:45–12:00 Akbari E.: MS1–O–2796 An in-depth investigation of liquid metal embrittlement sensitive grain boundaries in TBF steels	11:30–12:00 Labudović Borović M. M.: LS1–IN–3008 Transmission electron microscopy in research and diagnostics-new challenges in the omics era	11:30–11:45 Hemmleb M.: IM1–O–2679 Integrated topographic SEM imaging for software assisted fractography
12:00–12:15 Jelen A.: MS1–O–2857 Correlative electron microscopy and magnetism of CoCrFeNiZr high-entropy allos	12:00–12:15 Leitinger G.: LS1–O–2804 Neurons and glial cells appear to store and release human brain ferritin at different rates	11:45–12:15 Ünay D.: IM1–IN–2752 Image Analysis Workflow for Phase-Contrast Optical Microscopy Images
12:15–12:30 Ivanov Y. P.: MS1–O–2765 Rejuvenation/relaxation in bulk metallic glasses: high-resolution transmission electron microscopy study	12:15–12:30 Doulab R. A.: LS1–O–2870 Evaluation of elements impurities in drugs according to pharmacopoeia by use FESEM-EDS technique	12:15–12:30 Ederer M.: IM1–O–2681 Precipitate size estimation using image feature detection
12:45–13:30 Lunch workshop TESCAN Gain the maximum throughput with artifact-free surfaces for sample characterization by using high current plasma FIB-SEM. **Speaker:** Martin Sláma	**Lunch workshop Ametek** Taking microanalysis to a new level **Speakers:** René de Kloe, Julia Mausz	**Lunch workshop Dectris** Fast 4D STEM with ARINA Hybrid-Pixel Detector **Speaker:** Daniel Stroppa
14:30–16:15 Exhibitor's presentations (Congress Hall t)		
14:30–14:45 Thermo Fisher Scientific Thermo Fisher Scientific: Making the world a healthier, cleaner and safer place **Speaker:** Kornelia Weidemann		**14:45–15:00 TESCAN** TESCAN – our Heritage in Electron Microscopy **Speaker:** Vratislav Košťál
15:00–15:15 JEOL JEOL News **Speaker:** Guillaume Brunetti		**15:15–15:30 NenoVision** Advanced correlative material characterization by AFM-in-SEM LiteScope **Speaker:** Jan Neuman

15:30–15:45 Delong Instruments
All in One EM
Speaker: Radka Martínková

15:45–16:00 Ametek
Setting new standards in Electron Microscopy by Gatan and EDAX
Speaker: Rudolf Krentik

16:00–16:15 NanoMEGAS
Precession enhanced Electron Diffraction applications in TEM for nano crystals
Speaker: Thanos Galanis

16:15–16:30 Coffee break

16:30–17:15 Poster session A (Museum of Applied Arts)

LS1–2, MS1–3, IM1–2

Tuesday 06/09/2022

07:30 Registration (Museum of Applied Arts)

08:30 Plenary lectures (Congress Hall A–D)

Chair: Miroslav Šlouf

08:30–09:10 Kaiser U. A.: Plenary–3038 Determining and modifying properties of two-dimensional inorganic and organic materials using low-voltage TEM - challenges and solutions

09:10–09:50 Palatinus L.: Plenary–2891 When microscopy meets crystallography: Crystal structure analysis by 3D electron diffraction

09:50–10:30 Coffee break

MS2 (Congress Hall A)	LS2 (Congress Hall B–C)	IM2 (Congress Hall D)
Ceramics, rocks and minerals	Microscopy for healthier environment: Microorganisms, plants, and Host-Pathogen Interactions	Multi-modal and correlative microscopy
Chairs: Katalin Balazsi / Budapest, Hungary Mariana Klementová / Prague, Czechia	Aleš Kladnik / Ljubljana, Slovenia Zoltán Kristóf / Érd, Hungary	Michael Stöger-Pollach / Vienna, Austria Thomas Heuser / Vienna, Austria
10:30–11:00 Kaya P.: MS2–IN–2596 A key to develop novel ceramics: Microstructural design	10:30–11:00 Malinska K.: LS2–IN–2966 Shedding new light on plant biology – automated long-term vertical-stage microscopy at high resolution	10:30–11:00 Winkler R.: IM2–IN–2637 Combining AFM with FIB/SEM in Nanofabrication

MS2 (Congress Hall A)	LS2 (Congress Hall B–C)	IM2 (Congress Hall D)
11:00–11:15 Lammer J.: MS2–O–2843 Quantifying Ordering Phenomena at the Atomic Scale in Rare Earth Oxide Ceramics via EELS Elemental Mapping	11:00–11:30 Ovečka M.: LS2–IN–2688 Recent advances in plant development and plant-microbe interactions employing lightsheet and super-resolution microscopy	11:00–11:15 Ďurinová E.: IM2–O–2571 Combining Light, Raman, and Electron Microscopy in Imaging Viral Factories of Avian Reovirus
11:15–11:30 Borštnar P.: MS2–O–2578 Atomic-scale characterization of polytypic defects in Li0.33La0.56TiO3		11:15–11:30 Moldovan G.: IM2–O–2520 In-situ electrical analysis with EBIC STEM: developments and applications
11:30–11:45 Huang Y.: MS2–O–2789 Stacking faults dominant strengthening mechanism behind the anomalous hardness variation of TaN/TiN multilayer films	11:30–11:45 Strnad M.: LS2–O–2638 Borrelia – host interactions: zoom in on the big picture	11:30–11:45 Fernandez-Rodriguez J.: IM2–O–2612 Proof-of-Concept study for high-resolution correlative multimodal imaging and big data of a mouse brain
11:45–12:00 Šimek D.: MS2–O–2667 High resolution CT study of microstructure defects behaviour in deformed NiTi prepared by spark plasma sintering	11:45–12:00 Komazec B.: LS2–O–2661 Surface Coating-Modulated Phytotoxic Responses of Silver Nanoparticles in Chlorella vulgaris	11:45–12:00 Brugger-Hatzl M.: IM2–O–2635 3D-Nanoprinting of Magnetic Force Microscopy Tips
12:00–12:30 Steciuk G.: MS2–IN–3034 Nano crystallography from 3-dimensional electron diffraction: a powerful tool to uncover supergene minerals	12:00–12:15 Hreščak J.: LS2–O–2690 The use of SEM imaging and elemental mapping in the research of artificial bacterial aggregates	12:00-12:15 Franek M.: IM2-O-2791 Correlative super-resolution and electron microscopy in plant samples
	12:15–12:30 Rattenberger J.: LS2–O–2684 Pyroplastics: A new Approach	12:15–12:30 Michalička J.: IM2 O-2695 Atomically Sharp Domain Walls in an Antiferromagnet
12:45–13:30 Lunch workshop Thermo Fisher Scientific Towards high-resolution and high-throughput in-situ structural biology **Speaker:** Abhay Kotecha	**Lunch workshop JEOL** JEOL new TEM developments for biology and material sciences **Speakers:** G. Brunetti, R. Ravelle-Chapuis	**Lunch workshop Leica microsystems** Latest developments in high-end sample preparation techniques for EM **Speaker:** Andreas Nowak
MS3 (Congress Hall A)	**LS3 (Congress Hall B–C)**	**IM3 (Congress Hall D)**
Polymers, biomaterials and soft materials	Structural studies from macromolecules to tissues	Diffraction-based techniques and spectroscopy in electron microscopy
Chairs: Cristiano Alboneti / Bologna, Italy Miroslav Šlouf / Prague, Czechia	Milica Markelić / Belgrade, Serbia Melek Ozturk / Istanbul, Turkey	Giovanni Bertoni / Modena, Italy János L. Lábár / Budapest, Hungary

MS3 (Congress Hall A)	LS3 (Congress Hall B–C)		IM3 (Congress Hall D)
14:00–14:30 Parisse P.: MS3–IN–2878 Extracellular Vesicles and biomimetic membranes: an Atomic Force Microscopy point of view	14:00–14:30 Bozkurt E.: LS3–IN–2605 Time-lapse microscopy reveals induction of entosis by TRAIL signalling		14:00 –14:30 Nellist P. D.: IM3–IN–3015 Pushing at the limits of low-dose in 4D-STEM and electron ptychography
14:30–15:00 Dušková-Smrčková M.: MS3–IN–2935 Synergy of Scanning Electron and Light Microscopies in Visualization of Swollen Hydrogels and Effect of Hydrogel Parameters on the Image: Artifacts and Reality	14:30–15:00 Raskovic B.: LS3–IN–2769 Spheroids: in vitro 3D cell cultures of brown trout liver as a model for ecotoxicology research		14:30–14:45 Slouf M.: IM3–O–2671 High-resolution Powder Nano-Beam Diffraction in Scanning Electron Microscopy
			14:45–15:00 Mostaed A.: IM3–O–2896 A New Approach for 3D Quantitative STEM Using Defocus Corrected Electron Ptychography
15:00–15:15 Sedlacek P.: MS3–O–2798 Ultrastructural analysis of hydrogels and its contribution to understanding their mechanical and transport performance	15:00–15:15 Plevka P.: LS3–O–2732 Endosome disruption enables enteroviruses to reach cell cytoplasm		15:00–15:30 Knez D.: IM3–IN–2626 Challenges in the characterization of complex nanomaterials with analytical STEM
15:15–15:30 Janda P.: MS3–O–2810 Nanobubble-assisted nanostructuring of water-immersed solid surfaces	15:15–15:30 Gardian Z.: LS3–O–2608 Bacteriophage φ8 protein P4, an RNA binding molecular motor, studied by Cryo-EM		
15:30–15:45 Qi H.: MS3–O–2846 Sub-Ångstrom resolution imaging of 2D conjugated metal-organic frameworks enabled by unconventional resilience against electron radiation	15:30–15:45 Němeček D.: LS3–O–2821 Extending Capabilities of 120 kV LaB6 TEMs to Cryo-EM Reconstructions at Subnanometer Resolution		15:30–15:45 Stöger-Pollach M.: IM3–O–2824 The choice of the right beam energy for analytical (scanning) transmission electron microscopy
15:45–16:00 Sui X. M.: MS3–O–2538 Extreme scale-dependent tensile properties of epoxy fibers and a polarized micro-Raman study	15:45–16:00 Nováková Z.: LS3–O–2746 Exploring the unseen: quantitative phase imaging in cancer research		15:45–16:00 Haberfehlner G.: IM3–O–2555 Tomography of surface phonon polarition fields by electron energy loss spectroscopy
16:00–16:30 Coffee break			
16:30–18:10 Poster session B (Museum of Applied Arts)			
LS3–4, MS4, IM3–5			
17:00–18:00 Meeting of CSMS members (Congress Hall A–D)			

Wednesday 07/09/2022

07:30 Registration

08:30 Plenary lectures (Congress Hall A–D)

Chair: Pavel Hozák

08:30–09:10 Losonczy A.: Plenary–2872 Watching and shaping memories in the brain with optical methods

09:10–09:50 Chmelík R.: Plenary–3049 Mature Holographic Microscopy

09:50–10:30 Coffee break

MS4 (Congress Hall A)	LS4 (Congress Hall B–C)	IM4 (Congress Hall D)	IM2 (Lecture Hall Museum)
2D-materials, thin films, coatings, surfaces and interfaces	Advances in fluorescence and super-resolution microscopy	Advances in electron optics and beam shaping for electron microscopy	Multi-modal and correlative microscopy (continuing 2nd block)
Chairs: Eliška Materna Mikmeková / Brno, Czechia Miroslav Kolíbal / Brno, Czechia	Marek Cebecauer / Prague, Czechia Christian Schöfer / Vienna, Austria	Roberto Balboni / Bologna, Italy Tomáš Radlička / Brno, Czechia	Michael Stöger-Pollach / Vienna, Austria Thomas Heuser / Vienna, Austria
10:30–11:00 Werner W. S.: MS4–IN–2994 Low energy electron emission from surfaces and 2D-Materials and 2-D electron cascade in the scanning field electron microscope	10:30–11:00 Sevcsik E.: LS4–IN–2948 A DNA origami-based biointerface for probing the spatial requirements of cell surface receptor triggering	10:30–11:00 Juffmann T.: IM4–IN–2573 Electrons and Light: Ponderomotive Beam Shaping and Optical Near-field Electron Microscopy	10:30–10:45 Fitzek H.: IM2–O–2563 Correlative Raman microscopy, SEM and EDS – The combined evaluation of a whole sample mapping of a Chelyabinsk meteorite fragment
			10:45–11:00 Skoupy R.: IM2–O–2719 Integrated light-4D-STEM: from fluorescence microscopy and sample thickness mapping to powder diffraction analysis
11:00–11:15 Kinyanjui M. K.: MS4–O–2647 Ordered electronic states in 2D quantum materials: Imaging effects of hydrostatic pressure at the atomic scale.	11:00–11:30 Grussmayer K. S.: LS4–IN–3001 Combining Super-resolution Optical Fluctuation Imaging (SOFI) With Structure Illumination and 3D Imaging	11:00–11:30 Grillo V.: IM4–IN–2672 Advanced measuring schemes using new electron optics ideas	11:00–11:15 Schumann J.: IM2–O–2528 Analysis of sampled airborne particles by correlative microscopy
11:15–11:30 Joudi W.: MS4–O–2807 Correlated AFM/STEM study on the Mechanical Stiffness of Defect-Engineered Graphene			11:15–11:30 Löffler M.: IM2–O–2693 Micro X-ray computed tomography as an extension to light microscopy and FIB/SEM
11:30–11:45 Liang B.: MS4–O–2837 Optimal acceleration voltage for near-atomic resolution imaging of layer-stacked 2D polymer thin films	11:30–11:45 Shav-Tal Y.: LS4–O–2712 RNA export through the nuclear pore complex is directional	11:30–11:45 McBean P.: IM4–O–2570 A User Adjustable Pole-piece Gap as a Route to Improve the Sustainability of TEM Infrastructure	11:30–11:45 Bosch C.: IM2–O–2938 From mammalian neuronal circuits to synapses: correlative multimodal imaging using hard X-rays

MS4 (Congress Hall A)	LS4 (Congress Hall B–C)		IM4 (Congress Hall D)	IM2 (Lecture Hall Museum)
11:45–12:00 Zhang Z.: MS4–O–2859 Atomic insights into the structures and properties of nitride thin films	11:45–12:00 Uhlířová H.: LS4–O–2597 High-resolution structural and functional deep brain imaging using holographic endo-microsocpy		11:45–12:00 Bertoni G.: IM4–O–2506 Measurement and Correction of Phase Aberrations in Scanning Transmission Microscopy by Artificial Neural Networks	11:45–12:00 Nachtnebel M.: IM2–O–2629 Automated and correlative SEM-EDX-Raman particle analysis on fine dust filters of extreme events: New Year's Eve and Sahara dust
12:00–12:15 Oberaigner M.: MS4–O–2594 Orbital mapping of the LaAlO3-TiO2 interface by STEM-EELS	12:00–12:15 Dadosh T.: LS4–O–2587 Localization of Bacteria in Tumor Cells using Correlative Light and Electron Microscopy		12:00–12:15 Bačovský J.: IM4–O–2867 Concept of Aberration Corrected Low-Voltage Transmission Electron Microscope	
12:15–12:30 Rajak P.: MS4–O–2619 Aberration-Corrected STEM Characterisation of Mn-ion Structural Displacements in La0.7Sr0.3MnO3 Interfacial Dead-Layers	12:15–12:30 Pala J.: LS4–O–2854 Time resolved spectral detection for autofluorescence studies		12:15–12:30 Viani L.: IM4–O–2591 Enhancing Electron Computational Ghost Imaging Using Artificial Neural Networks	

12:45–13:45 EMS General Assembly in form of lunch workshop

MS5 (Congress Hall A)	LS5 (Congress Hall B–C)		IM5 (Congress Hall D)	MS4 (Lecture Hall Museum)
1D-materials (nanowires, nanotubes, nanorods etc.), nanoparticles and nanostructures	Advances in probes and sample preparation in microscopy		Cryogenic, in situ and environmental electron microscopy	2D-materials, thin films, coatings, surfaces and interfaces (continuing 2nd block)
Chairs: Andreja Gajović / Zagreb, Croatia Harald Plank / Graz, Austria	Vlada Philimonenko / Prague, Czechia Marco Biggiogera / Pavia, Italy		Sašo Šturm / Ljubljana, Slovenia Kamila Hrubanová / Brno, Czechia	Eliška Materna Mikmeková / Brno, Czechia Miroslav Kolíbal / Brno, Czechia
14:00–14:30 Spiecker E.: MS5–IN–3044 In situ microscopy of nanowires: From fundamental properties to functional applications	14:00–14:30 Giepmans B. N.: LS5–IN–3002 Multimodal microscopy in Type 1 diabetes research		14:00–14:30 Grogger W.: IM5–IN–2617 Do you know the relevant conditions for in situ heating experiments in the TEM?	14:00–14:30 Kotakoski J.: MS4–IN–2613 In and ex situ (S)TEM manipulation of 2D materials without air exposure
14:30–15:00 Žagar Soderžnik K.: MS5–IN–3031 Application of electron microscopy in development of sensor elements for detection of toxic organic compounds	14:30–15:00 Hoboth P.: LS5–IN–3045 Quantitative super-resolution microscopy of nuclear antigens in cells and tissues		14:30–14:45 Batra N.: IM5–O–2894 Graphene liquid cell for electron microscopy analysis of nanoparticle interaction with solutions: the case of titanium oxide nanoparticles and phosphates	14:30–14:45 Bondarev A.: MS4–O–2792 Insights into tribology of TMD-based coatings from TEM experiments
			14:45–15:00 Donoghue J. M.: IM5–O–2649 Integration of EBSD acquisition into fully automated in-situ thermo-mechanical testing for high temporal and spatial resolution	14:45–15:00 Lotnyk A.: MS4–O–2580 Nanoscale characterization of van der Waals-bonded GeTe/Sb2Te3 phase-change memory superlattices grown by pulsed laser deposition

MS5 (Congress Hall A)	LS5 (Congress Hall B–C)	IM5 (Congress Hall D)	MS4 (Lecture Hall Museum)
15:00–15:15 Seewald L. M.: MS5–O–2636 Expanded Design Flexibility in 3D-Nanoprinting via Focused Electron Beam Induced Deposition	15:00–15:15 Kitzberger F.: LS5–O–2521 Novel method for simultaneous visualization and distinguishing Au nanoparticles on both sides of the ultrathin sections using low-energy STEM and BSE in HRSEM	15:00–15:30 Burg T. P.: IM5–IN–2999 Microsystems for in situ cryofixation and correlative cryomicroscopy	15:00–15:15 Pecz B.: MS4-0-2511 Microscopy of CVD grown MoS2 layers compared to layers obtained by the sulphurization of Mo
15:15–15:30 Horák M.: MS5–O–2501 Plasmon resonances in biocompatible nanoparticles	15:15–15:30 Veselá K.: LS5–O–2697 Methods of leaf preparations for microscopic measurements of stomata and other epidermal cells		15:15–15:30 Mücke D.: MS4–O–2842 Thickness dependency of critical dose for extremely beam-sensitive two-dimensional polymer
15:30–15:45 Pelaez Fernandez M.: MS5–O–2808 Towards Laser-Induced Tuning of Plasmonic Response in High Aspect-Ratio Au Nanowires: A STEM/EELS study	15:30–15:45 Vancová M.: LS5–O–2715 Correlative cathodoluminescence scanning electron microscopy for identification of cellular structures within vitrified samples at low electron beam energies	15:30–15:45 Vařeka K.: IM5–O–2703 In-situ Microscopy of Catalytic Oxidation of CO to CO2 over Platinum Surfaces.	
15:45–16:00 Cieslar M.: MS5–O–2567 Ni-Ti Nanoparticles for Self-Propagating Reactions		15:45–16:00 Żak A. M.: IM5–O–2542 Transmission electron microscope modification for light-induced in situ imaging of specimens in liquid on example of photodynamic therapy	
16:00–16:30 Coffee break			
16:30–18:00 Poster session C (Museum of Applied Arts)			
LS5–7, MS5–7, IM6–7			
17:00–18:00 Panel discussion – Beauty in micrographs (Congress Hall D)			

Thursday 08/09/2022			
07:30 Charity run (sponsored by TESCAN)			
07:30 Registration			
08:00 Start			
08:40 Announcement of winners			
09:45–10:30 Coffee break			
MS6 (Congress Hall A)	**LS6 (Congress Hall B–C)**		**IM6 (Congress Hall D)**
Materials for energy related applications	Multi-parametric and functional imaging in life sciences		Low energy electrons related science and technology
Chairs: Elena Tchernychova/Ljubljana, Slovenia Vittorio Morandi/Bologna, Italy	 Aleš Benda/Vestec, Czechia Maja Herak Bosnar/Zagreb, Croatia		 Nerad Tomašić/Zagreb, Croatia Šárka Mikmeková/Brno, Czechia
10:30–11:00 Bencan Golob A.: MS6–IN–2562 In situ Scanning Transmission Electron Microscopy of Lead-Free Ferroelectrics with Atomic Resolution	10:30–11:00 Rossy J.: LS6–IN–3013 Quantitative visualisation of membrane dynamics through photoactivation of fluorescent proteins		10:30–11:00 Aoyama T.: IM6–IN–2513 Contrast mechanism and its application at landing energy near 0 eV in super low energy SEM
11:00–11:15 Abdellaoui L.: MS6–O–2514 Correlative Microscopy Techniques for Defect-Property-Correlation of Thermoelectric Materials	11:00–11:15 Weber I.: LS6–O–2622 Oscillatory intracellular patterns of the small GTPase Rac1		11:00–11:30 Paták A.: IM6–IN–2598 Ab initio study of angle-resolved electron spectroscopy of graphene
11:15–11:30 YADAV N. G.: MS6–O–2577 Study of failure modes in two sulphide-based solid electrolyte all-solid-state batteries via in-situ SEM	11:15–11:30 Depciuch J.: LS6–O–2627 In-situ observations of metal nanoparticles interactions with living cells, in liquid environments directly in the Nanolive 3D CX-A microscope		
11:30–12:00 Radmilovic V. V.: MS6–IN–2913 Can the Wet Win the Bet? The case of Energy Harvesting and Storage	11:30–12:00 Pavone Francesco: LS6–IN–2950 Large Area Brain Imaging		11:30–11:45 Quigley F.: IM6–O–2572 The Retrofittable Photoelectron Source: A Potential Improvement to Low Voltage SEM Imaging
			11:45–12:00 Konvalina I.: IM6–O–2820 Time-of-Flight Spectrometer for Low Landing Energies
12:00–12:15 Radovanović-Perić F.: MS6–O–2793 Morphology related energy losses in small molecule organic solar cells	12:00–12:15 Axer M.: LS6–O–2615 The BUILD project: A multi-modal cross-scale approach to reveal characteristics of the human brain's nested connectome		12:00–12:15 Juffmann T.: IM6–O–2496 Imaging optical near-fields using a low energy electron microscope

MS6 (Congress Hall A)	LS6 (Congress Hall B–C)		IM6 (Congress Hall D)
12:15–12:30 Sui T.: MS6–O–2505 Multi-scale, high-resolution, time-resolved residual stress in laser-welded Eurofer97 using plasma focused ion beam-digital image correlation method	12:15–12:30 Lawson M. J.: LS6–O–2639 Correlative 3D imaging workflow using X-ray micro-computed tomography and laser plasma focussed ion beam electron microscopy on biological soft tissues		12:15–12:30 Kolařík V.: IM6–O–2862 Delta – Detector for Scanning Electron Mirror Microscopy
12:45–13:30 Lunch workshop JEOL New SEM analytical breakthrough **Speakers:** N. Ravier, Y. Uetake	**Lunch workshop TESCAN** Apply optimized TESCAN Cryo FIB workflows for effortless cryo TEM lamella preparation from your biological samples. **Speaker:** Ondřej Šulák		**Lunch workshop Thermo Fisher Scientific** Spectra Ultra: high throughput, accurate and high resolution multimodal materials characterization **Speaker:** Mauro Porcu
MS7 (Congress Hall A)	**LS7 (Congress Hall B–C)**		**IM7 (Congress Hall D)**
Micro- and nanomechanical characterization of materials	Advances in volume electron microscopy and image processing		Advances in sample preparation techniques for material and life sciences
Chairs: Daniel Kiener / Leoben, Austria František Lofaj / Košice, Slovakia	Marie Vancová / České Budějovice, Czechia Agnes Kittel / Budapest, Hungary		Zoran Samardžija / Ljubljana, Slovenia Jana Nebesářová / České Budějovice, Czechia
14:00–14:30 Michler J.: MS7–IN–2666 Recent advances in in-situ SEM nanomechanical testing: extreme temperatures, ultra-high strain rates, in-situ electron diffraction and digital image correlation	14:00–14:30 Belevich I.: LS7–IN–3024 Chasing for efficacy: from manual and semi-automatic tools to convolutional neural networks in segmentation of microscopy datasets		14:00–14:30 Dienstleder M.: IM7–IN–2701 Rise to the occasion – high quality sample preparation for high resolution TEM
14:30–14:45 Smith A. D.: MS7–O–2644 Automated In-Situ Mechanical Testing of heavily textured Ti 6Al 4V to Obtain High Spatial and Temporal Resolution Strain Maps	14:30–15:00 Francolini M.: LS7–IN–2525 Moving from two- to three- dimensional electron microscopy in the study of the synapse: a lesson from neurodevelopmental disorder models		14:30–15:00 Tůmová P.: IM7–IN–2978 CLEM for FIB/SEM: A workflow for characterization of low-abundant samples on example of a parasitic flagellate Giardia intestinalis.
14:45–15:00 Masenelli-Varlot K.: MS7–O–2700 Analysis of dislocation evolution in cerium oxide nanocubes using in situ transmission electron microscopy			
15:00–15:30 Burtscher M.: MS7–IN–2739 Fracture behavior of distinct interfaces of two intermetallic TiAl alloys	15:00–15:15 Hudoklin S.: LS7–O–2860 Volume electron microscopy and automatic segmentation of intracellular compartments in the urinary bladder umbrella cells		15:00–15:15 Pinkas D.: IM7–O–2668 Faster Cryo TEM lamella preparation using optimised conditions and advanced workflows

MS7 (Congress Hall A)	LS7 (Congress Hall B–C)	IM7 (Congress Hall D)
	15:15–15:30 Týč J.: LS7–O–2632 What does SARS-CoV-2 do to the lungs – what can 3D electron microscopy tell us	15:15–15:30 Krause M.: IM7–O–2593 High-Throughput TEM Sample Preparation with iNotch Technique
15:30–15:45 Bajtošová L.: MS7–O–2565 Al nanocrystalline thin film deformation by in situ TEM and molecular dynamics	15:30–15:45 Saghi Z.: LS7–O–2827 Deep learning approaches for electron tomography under limited data acquisition conditions	15:30–15:45 Park J.: IM7–O–2590 FIB-based lamella preparation for in-situ TEM gas experiment
15:45–16:00 Parlinska-Wojtan M.: MS7–O–2694 Liquid cell TEM electrodeposition of PtNi alloy nanoparticle film	15:45–16:00 Lebas L.: LS7–O–2698 3D reconstruction of hydrated samples at the sub-micrometer scale using Liquid-Phase STEM at low voltage	15:45–16:00 Upadhyay A.: IM7–O–2888 Imaging the Hard-Soft Bone Interface in near native conditions using Cryo FIB/SEM

16:00–16:30 Coffee break

16:30 Panel discussion (Congress Hall A–D)

Moderator: Daniel Stach

Microscopy challenges for scientists and manufacturers

Discussing: Richard Henderson, Ute Kaiser and Quentin Ramasse – scientific community representatives, Petr Strelec and Jaroslav Klima – company representatives

19:00 Congress Farewell Dinner and Closing Ceremony

Friday 09/09/2022
08:00 Excursions to Brno Microscopy Ecosystem
08:00–09:00 Departure of buses from the congress venue to companies/institutions
09:00–11:00 First block of excursions
11:00–12:30 Transport of participants, including lunch break
12:30–14:30 Second block of excursions
14:30 Transport back to the congress venue

Workshops

Workshop I

Date: 04/09/2022, from 10:00–16:00

Location: Institute of Scientific Instruments of the CAS, Královopolská 147, Brno

Registration Fee: 20 EUR

Contact E-mail: slouf@imc.cas.cz

Title: Electron diffraction for everyone: Process your powder electron diffractograms from TEM and SEM

Lecturers: Miroslav Slouf, Radim Skoupy, Janos Labar, Vladislav Krzyzanek

A hands-on course focused on the fast and easy processing of powder electron diffraction patterns by means of freeware programs. We will briefly show that powder electron diffraction is quite a useful method in both Materials and Life Sciences. Moreover, the method is now available not only on TEM, but also on modern SEM microscopes that are equipped with pixelated STEM detectors. The workshop is a gentle introduction for everyone who wants to expand his/her knowledge and enter the realm of electron diffraction in a user-friendly way. After finishing, you will understand the basic principles of electron diffraction in both TEM and SEM, you will be able to process powder electron diffraction patterns, and you will be ready to expand your knowledge towards monocrystal diffraction patterns, if necessary. All you will need is your notebook and optimism. Lecturers: Miroslav Slouf, Radim Skoupy and Vladislav Krzyzanek (Czech Republic; authors of STEMDIFF = the software package for processing of powder diffractograms from SEM), Janos Labar (Hungary; author of ProcessDiffraction = the program for processing powder diffractograms from TEM).

Workshop II

Date: 04/09/2022, from 10:00–16:00

Location: Institute of Scientific Instruments of the CAS, Královopolská 147, Brno

Registration Fee: 20 EUR

Contact E-mail: burdika@natur.cuni.cz

Title: Macro Programming with ImageJ

Lecturers: Martin Schatz, Robert Haase, Zuzana Burdikova, Zdenek Svindrych, Jakub Soukup

In this workshop, you will learn how to write and use macros for the automation of image analysis tasks with the public domain software ImageJ. Ideally, you have already used ImageJ before but you know nothing or very little about programming. If this is not the case you might still find parts of the workshop interesting. If necessary you can discover ImageJ at the same time that you learn the macro programming and if you are already a skilled programmer you can still find information on how to work with ImageJ specific objects. In order to be able to write macros will install ImageJ". FIJI is a distribution of ImageJ that comes with a number of extensions (plugins and macros) for biological-image analysis.

Workshop III

Date: 04/09/2022

Location: Institute of Physics of Materials of the CAS, Žižkova 22, Brno

Registration Fee: 20 EUR

Contact E-mail: podstr@ipm.cz

Title: Basic TEM techniques in materials science

Lecturers: Ivo Kuběna, Jiří Buršík, Tomáš Kruml, Antonín Dlouhý

The following basic TEM techniques, frequently used in materials sciences, will be discussed: conventional TEM (diffraction contrast, bright field, dark field, dark field weak-beam); diffraction patterns and Kikuchi lines, high resolution TEM (phase contrast); STEM (bright field, dark field, high angle angular dark field), HR STEM (Z contrast); EDS (chemical mapping). Theoretical bases of each technique will be explained first. Practical manipulation with the TEM will be shown either directly at the microscope room or (in the case of large number of participants) in the lecture room via remote control. The typical examples of tasks for each techniques will be discussed, as well as the interpretation of data, possibility or necessity of image simulations, limitations of each technique and possible artefacts.

International Meeting Phase in Brno
Date: 09/09/2022
Location: CEITEC BUT, Purkyňova 656/123, 61200 Brno
Registration Fee: Standard Fee 90 EUR, Student Fee 50 EUR (please register via the meeting website – see the line below)
Web site: https://phaseinbrno.ceitec.cz/ (click on this panel)
Contact E-mail: alena.vojkuvkova@ceitec.vutbr.cz
Title: 3rd International Meeting Phase in Brno
Lecturers: Jochen Guck, Pierre Marquet, Alan Boyde, Jan Balvan, Petr Bouchal, Miroslav Ďuriš, Tomáš Grousl
Organising Committee: Radim Chmelík, Pavel Veselý, Daniel Zicha
This traditional meeting will focus on scientific research and developments of emerging quantitative phase imaging techniques and their applications, particularly in live-cell biology and biomedicine. Generous time will be given for discussions.

Poster Presentation

Monday 05/09/2022
16:30–18:00 Posters (Renaissance Hall Museum)
Poster
Kovařík M.: IM2-P-2816 KPFM in SEM - Simultaneous Kelvin Probe Force Microscopy and Scanning Electron Microscopy, Brno, Czech Republic
Hlavenkova Z.: LS1-P-2817 Tundra TEM: tool 'easy of use' for new commers to Cryo EM, Brno, Czech Republic
Hadraba D.: IM2-P-2691 IPHYS Bioimaging Facility, Prague, Czech Republic
Švec P.: MS1-P-2689 Thermal stability of hydro-extruded aluminum: Judging the distribution of amorphous and crystalline aluminum-oxide via plasmon mapping., Bratislava, Slovak Republic
Pinkas D.: IM1-P-2696 Project „Pattern" – an online tool for spatial analysis of immunolabeling in electron microscopy, Prague, Czech Republic
Mikmeková Š.: MS1-P-2826 Deep learning powered optical microscopy for steel research, Brno, Czech Republic
Laznicka T.: IM2-P-2699 Assembly for Cryo-SEM/Raman Microspectroscopy sample analysis, Brno, Czech Republic
Trudicova M.: MS3-P-2828 Visualization of internal morphology of hydrogels based on polyvinyl alcohol in comparison with the indirect method of structural characterization, Brno, Czech Republic
Siedlaczek P.: MS3-P-2829 Characterization of particle-filled polymer composites, Vienna, Austria
Švec P.: MS1-P-2702 Phase evolution clarification in Al86Ni8Gd6 amorphous alloy: A spotlight on Al20Ni6Gd4 phase and its peculiarities Bratislava, Slovakia
Brinek A.: MS2-P-2706 Multimodal and multi-resolution approach for defects analysis on the example of Additively Manufactured healable aluminium alloy, Brno, Czech Republic
Valencia L. M.: MS3-P-2819 STEM damage of Acrylic-based Materials for Stereolithography: Degradation Mechanism, Puerto Real (Cádiz), Spain
Wu M.: MS3-P-2592 Advanced microstructure analysis of tire polymer materials using cutting edge multi scale electron microscopy technologies, Eindhoven, Netherlands
Kević N.: LS2-P-2585 Expression of the enzyme myrosinase type 1 in the root, the stem and the leaves of the plant nasturtium (Tropaeolum majus L.), Split, Croatia
Dürr S.: IM2-P-2850 Imidazole-osmium reduces elution of lipids from cryofixed rat hepatic tissue for correlative TEM/NanoSIMS analysis, Vienna, Austria
Piňos J.: MS1-P-2588 Real Time Observation of strain in the SEM copper sample, Brno, Czech Republic
Rajnovic D.: MS1-P-2856 Characterization of oil pipe weld localized corrosion and perforation, Novi Sad, Serbia
Orovčík L.: MS1-P-2589 Microstructural characterization of sintered Iron and observation of oxides reduction after different conditions of sintering process, Trnava, Slovakia
Obořilová R.: MS3-P-2990 BioAFM imaging and mechanics tracking, Brno, Czech Republic
Pongrácz J.: IM2-P-2544 High-resolution electron beam induced current study of AlN epitaxial layer, Cambridge, United Kingdom
Janáček J.: IM1-P-2611 Estimation of Pancreatic Islets Volume from Single Projection., Prague, Czech Republic
Sever T.: MS1-P-2852 Influence of melting and AM-SLM processing on microtexture of Fe-Si soft magnetic materials – Is one-step manufacturing of electrical steels possible?, Ljubljana, Slovenia
Šlapáková M.: MS1-P-2490 In-situ heating of twin-roll cast Al-steel clad strip, Prague, Czech Republic
Rajnovic D.: MS1-P-2855 Morphological characterization of mill scales iron oxides products by SEM, Novi Sad, Serbia
Kopeček J.: MS1-P-2623 Aluminothermally reduced deep-sea concretion and its phase structure, Praha, Czech Republic
Křivská B.: MS1-P-2602 Phase Identification in Twin-Roll Cast Al-Steel Clad Composite, Prague, Czech Republic
Nagy Trembošová V.: MS1-P-2624 Modification of native oxide on magnesium powders for enhanced corrosion resistance, Trnava, Slovakia
Faul N. A.: IM2-P-2604 Towards correlating light and electron microscopy with immersion objectives at cryogenic temperatures, Darmstadt, Germany
Horák M.: IM2-P-2502 Magnetic field imaging with electron energy loss spectroscopy based on Babinet's principle, Brno, Czech Republic
Casares A.: IM2-P-2633 Multimodal Microscopy for very large 2D & 3D Imaging, Oberkochen, Germany
Kuběna I.: MS1-P-2722 Microstructural changes in DLMS IN939 due to low cycle fatigue investigated by advanced electron microscopy., Brno, Czech Republic

Bílý T.: LS2-P-2665 3D organization of photosynthetic membranes in cells of photosynthetic bacterium Sediminicoccus rosea, České Budějovice, Czech Republic

Gatti M.: LS1-P-2518 Ultrastructure analysis in the male reproductive system of different mammals exposed to ionizing radiation after the Fukushima accident: a comparative study, Rome, Italy

Jozefovič P.: MS1-P-2794 Phase determination of dual phase steel using backscattered electron images and image analysis techniques, Brno, Czech republic

Meschini S.: LS1-P-2519 Electron microscopy in the study of nanomaterial-cell interaction: involvement of autophagy, Rome, Italy

Pelaez-Fernandez M.: MS3-P-2834 Low Dose Transmission Electron Microscopy Imaging on Sensitive Colloidal Covalent-Organic Frameworks, Zaragoza, Spain

Gajdosova V.: MS3-P-2653 Simple, fast and reliable method of UHMWPE accelerated aging, Prague, Czech Republic

Pavlova E.: MS3-P-2814 Commonly used vs novel embedding resins for 3D-SEM microscopy with higher resistance to e-beam damage.Prague, Czech Republic

Neuman J.: IM2-P-2527 AFM-in-SEM solution for correlative microscopy in material sciences, Brno, Czech Republic

Švec Sr P.: MS1-P-2803 Modification of local ordering in Fe-B based metallic glasses during long-term room temperature ageing, Bratislava, Slovakia

Klimša L.: MS1-P-2656 The Use of Titanothermic Reduction for Processing of Deep-Sea Nodules, Prague Czech Republic

Sahin H.: LS1-P-2811 Histopathological and ultrastructural effects of chronic administrated high dose dehydroepiandrosterone on liver and kidney of male rats, Istanbul, Turkey

Klementová M.: MS1-P-2657 Incommensurate structure of τ phase in the Al-Cu-Zn systém, Brno, Czechia

Chorvát D.: IM1-P-2686 Deep-learning model for automatic detection of cells in microscopy images, Bratislava, Slovakia

Guerra G. S.: LS2-P-2658 Preliminary morphological characterization of Schmallenberg Virus using cryo-TEM techniques, Derio, Spain

Radlinger T.: MS1-P-2531 Exploring the magnetic microstructure of spinodal alloys with differential phase contrast scanning transmission electron microscopy (DPC-STEM), Graz, Austria

Keresztes Á.: LS2-P-2532 Utilization of haematite nanoparticles by a flavin mediated iron uptake of roots, Budapest, Hungary

Mrazova K.: LS2-P-2663 Ultrastructural changes in prokaryotic microorganisms caused by long-term exposure to high salt and copper ion concentrations, Brno, Czech Republic

de Kloe R.: MS1-P-2923 Reconstructing parent microstructures from EBSD based orientation measurements, Pleasanton, USA

Petrinec D.: IM2-P-2800 Microscopy and in vivo imaging in aid for visualization of dynamic processes - example of brain damage evolution after ischemic brain stroke, Zagreb, Croatia

Schroettner H.: IM2-P-2545 Extensive material characterization for series production of 3D printer components, Graz, Austria

Novák J.: IM2-P-2677 Miro proteins and their role in horizontal transfer of mitochondria via tunneling nanotubes in cancer cells, Prague, Czech Republic

Zobačová J.: MS1-P-2813 Microanalyses for a better understanding of active soldering processes, Brno Czech Republic

Tuesday 06/09/2022

16:30–18:00 Posters (Renaissance Hall Museum)

Poster

Propst D.: MS4-P-2823 STEM analysis of freestanding monolayer h-BN irradiated with slow highly charged ions, Vienna, Austria

Krutil V: IM5-P-2833 Cryogenic Sample Holder with Electrical Contacts for UHV SEM/SPM, Brno, Czech Republic

Griesi A.: IM3-P-2579 3D Electron Diffraction on Ferroelectric Perovskites, Parma, Italy

Urban P.: IM5-P-2838 Effect of thermal radiation on the measurement of the sample holder temperature over the cryogenic range for various types of temperature sensor installations, Brno, Czech Republic

Bačovský V.1: LS4-P-2839 Comparison of CLMS and super-resolution techniques to study meiotic proteins in plants, Brno, Czech Republic

Urban P.: IM5-P-2845 Low conductive thermal insulation pad with high mechanical stiffness, Brno, Czech Republic

Manjeshwar Sathyanath S. K.: MS4-P-2861 Electron tomography for measurement of buried interface roughness in thin films, Uppsala, Sweden

Novák L.: IM5-P-2864 Batteries in situ testing in SEM, Brno, Czech Republic

Herak Bosnar M.: LS3-P-2654 NME6, a member of the NME/NDPK family resides in complexes at the interface of mitochondrial inner membrane and matrix, Zagreb, Croatia

Vaňatka M.: IM3-P-2825 Improved mapping algorithms: combating data sparsity in SEM EDS, Brno, Czech Republic

Huntosova V.: LS4-P-2498 Targeted photobiomodulation of cancer cells at 808 nm may improve efficacy of photodynamic therapy, Kosice, Slovakia

Zakopal P.: IM3-P-2831 New possibilities enabled by correlative low-kV STEM-in-SEM imaging and Transmission Electron Diffraction, Brno, Czech Republic

Pevna V.: LS4-P-2499 Imaging of autophagic and mitochondrial proteins in 3D spheroids of U87 MG cancer cells during photodynamic therapy mediated with hypericin, Kosice, Slovakia

Ozturk M.: LS3-P-2704 Vitamin-D combined with resveratrol regulates islets hemostasis, β-cell regeneration, ER-stress and inflammation in fructose-fed diet/STZ-induced diabetic rats, Istanbul, Turkey

Birinji A.: LS3-P-2504 Effect of arsenic(III) oxide on reproductive organs of female mices, Novi Sad,Serbia

Schachinger T.: IM4-P-2584 Simplified electron vortex generator with aberration correction, Vienna, Austria

Taylor M. S.: IM5-P-2634 Cryo-SEM to access the Microstructure of Colloidal Dispersions, Laughton, United Kingdom

Ozturk M.: LS3-P-2756 Differentiation of DDR1+ progenitor cells into β cells in neonatal rat diabetes, Istanbul, Turkey

Šimić N.: IM3-P-2510 Phase Analysis of (Li)FePO4 by Selected Area Electron Diffraction in Transmission Electron Microscopy, Graz, Austria

Kolíbal M.: MS4-P-2750 In-situ observation of 2D materials growth on liquid substrates, Brno, Czech Republic

Längle M.: MS4-P-2660 Noble gas clusters in a graphene sandwich, Vienna, Austria

Zouhar M.: MS4-P-2669 Energy-based calibration for quantitative STEM measurements and comparison with 2D-PAD, Brno, Czech Republic

Brontvein O.: IM3-P-2650 Investigation the origin of TiO2 nanoparticles in human pancreas using different TEM techniques, Rehovot, Israel

Nagy Š.: MS4-P-2595 Native surface oxide characterization with S/TEM on PM metal powders, Bratislava, Slovakia

Kunčič K.: LS3-P-2652 Formation of cell junctions during integument morphogenesis in crustacean Porcellio scaber, Ljubljana, Slovenia

Tučková T.: LS4-P-2606 Fluorescence confocal imaging via holographic endo-microscopy, Brno, Czech Republic

Lábár J. L.: IM3-P-2781 Application of the DiffMap program to PtSi thin films, Budapest, Hungary

Jurmanová J.: MS4-P-2609 Imaging of structural deformations of gas-phase synthesized graphene by intermediate energy electrons, Brno, Czech Republic

Rechav K.: IM5-P-2782 Cryo Volume Imaging: from cell nucleus to extracellular structure, Rehovot, Israel

Martínez K.: MS4-P-2610 In situ TEM annealing: comparison of thin GeSn layers grown by MBE and CVD, Linz, Austria

Krauß S.: IM5-P-2530 In situ deformation observation via EBSD and EDS during high temperature tensile testing, Oberkochen, Germany

Neděla V.: IM5-P-3010 New TDS software for computer-based optimisation of thermodynamic conditions in Advanced Environmental Scanning Electron Microscopy, Brno, Czech Republic

Hassan A. H.: LS3-P-2916 Translation initiation stages of coupled transcription-translation, Brno, Czech Republic

Knez D.: IM5-P-2628 Field induced oxygen vacancy migration in anatase thin films studied by in situ biasing TEM, Graz, Austria

Groiss H.: IM5-P-2664 Efficient preparation of MEMS carriers with plan-view specimens: a case study of in situ TEM experiments with thin epitaxial layers, Linz, Austria

Brozyniak A.: IM3-P-2631 Precession Electron Diffraction and its Applications in Semiconductor Heterostructures, Linz, Austria

Hiriyur Nagaraj P.: LS3-P-2924 Active transcription-translation coupling at the early translation elongation stages, Brno, Czech Republic

Semsari Parapari S.: MS4-P-2640 Transmission electron microscopy characterization of quasicrystal approximants in SrTi03 thin films grown on Pt(111)/Al2O3(0001), Ljubljana, Slovenia

Chen Z.: IM5-P-2797 Real-time atomic-resolution observation of coherent twin boundary migration in rocksalt transition metal nitride, Leoben, Austria

Kormilina T. K.: IM3-P-2642 Analytical electron tomography of CuNiFe magnetic spinodal alloys, Graz, Austria

Vrbovská V.: LS4-P-2673 Integrated Fluorescent Light Microscope (iFLM) - Applications Workflows, Brno, Czech Republic

Žnidaršič N.: LS3-P-2643 Insect midgut epithelium architecture – focus on gut stem cells in larvae and adults, Ljubljana, Slovenia

Sehadova H.: LS4-P-2932 An Efficient Method for Quantifying the Degree of Neurodegeneration in an Insect Brain, Ceske Budejovice, Czech Republic

Paciu I.: LS4-P-2645 High-stability stage for cryo-light microscopy with immersion objectives, Darmstadt, Germany

Preimesberger A.: IM3-P-2678 Temporal correlations in coherent cathodoluminescence, Vienna, Austria

Fisslthaler E.: IM5-P-2651 The power of speed: DED EELS for analytical in situ TEM, Graz, Austria

Markelić M. B.: LS3-P-2812 Beneficial effects of ferroptosis inhibitor ferrostatin-1 in diabetes-induced liver damage, Belgrade, Serbia

Lalinský O.: MS4-P-2670 Graphene-coated scintillators for low-energy electron detection, Brno, Czech Republic

Stroppa D. G.: IM3-P-2815 Hybrid-pixel detectors for TEM, Baden-Daettwil, Switzerland

Markelić M. B.: LS3-P-2799 Beneficial effects of ferroptosis inhibitor ferrostatin-1 on pancreatic islets in streptozotocin-induced diabetes , Belgrade, Serbia

Leist C.: MS4-P-2835 Deep learning pipeline for statistical quantification of amorphous two-dimensional materials, Ulm, Germany

Ezati M.: LS3-P-2805 Mitochondria activity evaluation under osmotic conditions, Brno, Czech Republic

Vacek P.: IM3-P-2683 Scanning electron diffraction study of TiFeAl alloy microstructure, Cambridge, United Kingdom

Wednesday 07/09/2022

16:30–18:00 Posters (Renaissance Hall Museum)

Poster

Nebesarova J.: IM7-P-2818 Distribution of staining agents in samples of mice soft tissues prepared for Serial Block Face SEM., České Budějovice, Czech Republic

Drev S.: IM7-P-2822 Conventional TEM preparation of thin films by the method of "cross-section", Ljubljana, Slovenia

Varsano N.: LS7-P-2625 Characterization of the Growth Plate-Bone Interphase Region Using Cryo-FIB SEM 3D Volume Imaging, Rehovot, Israel

Olivier E. J.: MS5-P-2832 Exploring the role of fuel on the microstructure of V0x/MgO powders prepared using solution combustion synthesis, Port Elizabeth, South Africa

García-Fernández J.: MS5-P-2568 Structural and optical investigation of Fe-ZnO nanoarchitectures: from inversion domain boundaries to ZnO/ZnFe2O4 heterostructures, Oslo, Norway

Kinyanjui M. K.: MS5-P-2648 Imaging the atomic-scale effects of electron irradiation on charge density waves in 1D O-TaS3, Ulm, Germany

Colbea C.: MS6-P-2963 Self-sustained oscillatory dynamics of ethylene to syngas by operando SEM and XPS, Zürich, Switzerland

Slamkova D.: LS7-P-2582 Plasma FIB applications in Life Science: from large volumes to cryo-lamella preparation, Brno, Czech Republic

Václavik R.: MS7-P-2840 Characterization of Mechanical and Topographical Properties of Nanocomposite Thin Films with Plasma Polymer Structure, Brno, Czech Republic

Pelaez-Fernandez M.: MS5-P-2844 In-situ Carbon Nanoribbon Formation by TEM Manipulation of a C59N Derivative, Zaragoza, Spain

Divitini G.: MS6-P-2847 Are FIB-prepared hybrid perovskite cross-sections still luminescent?, Cambridge, UK

Mitchels J. M.: IM7-P-2848 High-Throughput Cryo-Electron Tomography with a next generation platform, Brno, Czech Republic

Zumberg I.: LS6-P-2849 Monitoring the endothelial cell behavior during flow stress induction using digital holographic microscopy., Brno, Czech Republic

Zouhar M.: IM6-P-2599 Effective IMFP of thin samples via the time-of-flight method, Brno, Czech Republic

Buršík J.: MS5-P-2851 Effect of Nanoparticle Size on Phase Stability in ZrO2 Systém, Brno, Czech Republic

Michalcová A.: MS6-P-2600 Description of Ageing of Soldering Materials by Means of Electron Microscopy, Prague, Czech Republic

Spilarewicz-Stanek K.: MS6-P-2566 The implementation of microscopic and spectroscopic techniques in characterisation of the spinel ferrite for photocatalytic reduction of C02, Krakow, Poland

Peters T.: MS5-P-2524 Quantification and morphological analysis of nanofibers for exposure control and material characterization purposes using electron microscopy and advanced image, Berlin, Germany

Dearg M.: MS5-P-2982 Classification of Metal Nanoclusters Using Convolutional Neural Networks, Cardiff, UK

Werner W. S.: IM6-P-2879 Determination of the inelastic mean free path of electrons in selected Polymers, indenpent from optical data, considering surface excitations, Vienna, Austria

Gajović A.: MS5-P-2858 Study of barium titanate on transparent titania nanotubes arrays, Zagreb, Croatia

Adamski Z.: LS6-P-2881 A beetle that was a flea. Comparison of morphological adaptations in external parasites among Coleoptera and Siphonaptera, using light and scanning electron mic, Poland

Lofaj F.: MS7-P-2603 Nanohardness and toughness of multicomponent TiNbVTaZrHf-N coatings deposited by reactive DC magnetron sputtering and High Target Utilization Sputtering, Slovakia

Mangler C.: IM7-P-2755 CANVAS: A System for Controlled Alteration of Nanomaterials in Vacuum Down to the Atomic Scale, Vienna, Austria

Boese M.: IM7-P-2607 Imaging of uncoated samples with secondary electrons using in lens detection under optimum conditions – 'sweet spot' imaging, Oberkochen, Germany

Hošek J.: Late-P-3026 In-situ analysis of graphene and its derivatives by combined SEM/AFM method, Olomouc, Czechia

Bártová B.: MS5-P-2618 Uranium reduction by magnetite – mechanism of UO2 formation monitored by STEM, SAED and STEM-EELS,Lausanne, Switzerland

Javurek J.: LS7-P-2659 Modern SEM allows high-throughput 2D and 3D analyses on a single platform, Brno, Czech Republic

Průcha L.: IM6-P-2620 Combining Low Energy Electron Microscopy and Thermal Raman Spectroscopy for Graphene Analysis, Brno, Czech Republic

Pospíšil J.: IM7-P-2790 Nanopatterned Surface for Super-resolution Microscopy localization of Cell Interactions, Brno, Czech Republic

Drazic G.: MS6-P-2621 Influence of sample tilt on measurement of atomic column position, Ljubljana, Slovenia

Mayrhofer C.: IM7-P-2537 The Hidden Power of Coffee – An Exceptional Replacement for Uranyl Acetate for Staining Biological Specimens in Transmission Electron Microscopy, Graz, Austria

Neumüller D.: MS6-P-2630 Combined Microstructural and Electrochemical Studies of Sputtered Ni Thin Layers as Catalysts for Hydrogen Evolution Reaction, Leoben, Austria

Bukvisova K.: MS5-P-2539 Real-time observation of vapor transport synthesis in the scanning electron microscope, Brno, Czech Republic

Ražnjević S.: Late-P-3032 Electron beam irradiation induced Brownmillerite – perovskite phase transition in La_{0.6} Sr_{0.4} CoO_{3-ð}, Leoben, Austria

Žiberna K.: MS7-P-2540 Mechanical response of domain walls in lead-free ferroelectrics, Ljubljana, Slovenia

Ledwig P.: Late-P-3036 Microstructural analysis of Inconel 625 superalloy manufactured by laser powder bed fusion with remelting, Kraków, Poland

Přibyl J.: LS6-P-2898 Correlation of Atomic Force Microscopy with other techniques: application on biosamples, Brno, Czech Republic

Vlcak E.: IM7-P-2662 Solutions for preparation and visualization of vitrified biological samples at IMG Electron Microscopy Core Facility, Prague, Czech Republic

Trebichalská Z.: LS6-P-2802 In situ cryo-electron tomography of enterovirus cell entry, Brno, Czech Republic

Turan S.: Late-P-3047 An Alternative Approach For The EELS Analysis Of Noble Gases, Eskişehir, Turkey

Raabová H.: IM7-P-2676 IMG Electron Microscopy Core Facility, Prague, Czech Republic

Turan S.: Late-P-3048 Effect of in-situ Conductive TiB2 3D-Network Structure on the Thermoelectric Properties of SiC, Eskisehir, Turkey

Medlín R.: MS5-P-2680 Latest TEM investigation of nanostructured CoS2 and Co2CuS4 based films with Fenton catalytic properties, Pilsen, Czech Republic

Hamer D.: IM7-P-2801 Washing brains or how to see things more clearly - Fluorescence microscopy can be used for visualization of blood vessels and neurons in the cleared mouse brain, Zagreb, Croatia

Ruiz-Zepeda F.: MS6-P-2682 Studying electrochemical degradation in nanocatalysts with identical location STEM, Ljubljana, Slovenia

Tchernychova E.: MS6-P-2806 Advanced STEM insights into atomic and electronic structure evolution of corncob-derived hard carbon anode materials for sustainable sodium-ion batteries, Ljubljana, Slovenia

Pizúrová N.: MS5-P-2685 CeO2 Morphology Study – Nanoparticles Prepared by Electron Beam Evaporation, Brno, Czech Republic

Daniel J.: MS7-P-2687 Impact behaviour of the industrially sputtered AlCrN coatings prepared using cathodic arc glow discharge, Brno, Czech Republic

Tarter S.: late-P-3052 From a clinical case to a general methodology to analyze prosthetic joint failure by Micro- and nano-characterization of Intra-Tissue wear debris, Trento, Italy

Horák T.: late-P-3058 Indentification of Tumor Cells Behavior Changes by Holographic Incoherent Quantitative Phase Imaging Focuses on Migrastatics, Brno, Czech Republic

Šuráňová M.: late-P-3055 Non-Invasive Imaging Method for Evaluating Effect of Migrastatics on Tumor Cells in Vitro based on Coherence - Controlled Holographic Microscopy, Brno, Czech Republic

Regular Talks

Instrumentation and Methods – chair: Ilona Müllerová

IM1 – Multi-dimensional image processing: Facing the data interpretation challenge

This session covers advances in handling the ever increasing data size in image processing for electron and light microscopy. As data size increases, the common method of visual data interpretation is no longer feasible and automated data handling techniques are required. This session covers all methods that help to quantitatively extract information from such large datasets in both materials science and life science imaging, including e.g. ptychographic reconstruction algorithms, phase retrieval methods, machine learning methods, tomographic and holographic reconstruction, automated alignment and denoising procedures, automated detection and segmentation methods, automated object tracking in live cell imaging, quantification of spectral data (including EDS + EELS), real time handling of (event based) data streams, storage and retrieval of large datasets. The topic could also include attempts to unify data formats and the creation of software tools that help researchers to bridge the gap between method/algorithm development and its widespread use in the community.

Chairs	**Jo Verbeeck** / Antwerp, Belgium **Michal Kozubek** / Brno, Czechia
Invited speakers	**Magnus Nord** / Gløshaugen, Norway **Devrim Ünay** / İzmir, Turkey

IM2 – Multi-modal and correlative microscopy

This session covers latest developments in correlative and multi-modal microscopy in the fields of materials sciences as well as life sciences. Innovative combinations of multiple microscopy techniques, such as AFM-SEM, cryo-CLEM, Xray microscopy and electron microscopy or any other are warmly welcome. This session will therefore be a multidisciplinary discussion and networking platform.

Chairs	**Michael Stöger-Pollach** / Vienna, Austria **Thomas Heuser** / Vienna, Austria
Invited speakers	**Robert Winkler** / Graz, Austria

IM3 – Diffraction-based techniques and spectroscopy in electron microscopy

The session covers advances in electron diffraction-based techniques for characterization of ordered and/or disordered structures (such as EBSD, 4D-ED, e-PDF etc.) together with analytical and spectroscopic techniques in electron microscopy (such as EELS, EDS, CL) towards high spatial and energy resolution. Novel applications of hybrid direct electron detectors, pixelated detectors in these techniques are also included.

Chairs	**Giovanni Bertoni** / Modena, Italy **János L. Lábár** / Budapest, Hungary
Invited speakers	**Peter Nellist** / Oxford, UK **Daniel Knez** / Graz, Austria

IM4 – Advances in electron optics and beam shaping for electron microscopy

Electron optics and electron beam formation are the central topics of electron microscopy. Recently, studies on the possibilities of designing and controlling the electron beam shape inside electron microscopes, in both amplitude and phase, have also gained considerable attention. This session will welcome contributions addressing the above topics. That includes theory, design, and application of sources, lenses, and correctors, beam shaping by passive and active devices, as well as hardware and software for their measurement, setup, and management.

Chairs	**Roberto Balboni** / Bologna, Italy **Tomáš Radlička** / Brno, Czechia
Invited speakers	**Vincenzo Grillo** / Modena, Italy **Thomas Juffmann** / Vienna, Austria

IM5 – Cryogenic, in situ and environmental electron microscopy

In situ electron microscopy and cryogenic electron microscopy gained a significant rate of instrumental and methodological advancement over the last decade, being a subject of increasing impact in materials and life sciences. The symposium aims to bring together scientists from materials science, chemistry, physics, and biology to discuss current trends and future directions of in situ electron microscopy research. Topics will include nanoscale and dynamic studies of biological samples and functional materials under realistic or near realistic conditions. The symposium will consist of a broad range of applications spanning from the fields of energy, engineering, microfluidics, health, biomedicine, materials, and devices.

Chairs	**Sašo Šturm** / Ljubljana, Slovenia **Kamila Hrubanová** / Brno, Czechia
Invited speakers	**Werner Grogger** / Graz, Austria **Thomas P. Burg** / Darmstadt, Germany

IM6 – Low energy electrons related science and technology

Low-energy electrons (LEEs) play an essential role in many phenomena concerning biology, chemistry, engineering and physics, and consequently modern-day technology. The session covers recent research topics in the field of LEE science including fundamentals of LEE interaction with solids, advanced LEE related technologies, and applications of LEE microscopy/spectroscopy techniques in materials science. Contributions on new instrumentation, technologies and methods that advance all fields of LEE microscopy are welcomed.

Chairs	**Nenad Tomašić** / Zagreb, Croatia **Šárka Mikmeková** / Brno, Czechia
Invited speakers	**Aleš Paták** / Brno Czechia **Tomohiro Aoyama** / Hiroshima, Japan

IM7 – Advances in sample preparation techniques for material and life sciences

Sample preparation techniques have an essential role in any form of microscopy. Recent preparation techniques often rely on high-tech instrumentation, however equally important are the improvements in classical preparation methods and their application for high-resolution, analytical and in-situ electron microscopy. The symposium will focus on these aspects with the presentations of novel, emerging techniques of specimen preparation in the fields of materials science and life science. Particular attention will be given to methods that allow observation of specimens as close as possible to their native state and correlative studies across a wide range of magnification scales.

Chairs	**Zoran Samardžija** / Ljubljana, Slovenia **Jana Nebesářová** / České Budějovice, Czechia
Invited speakers	**Martina Dienstleder** / Graz, Austria **Pavla Tůmová** / Prague, Czechia

Life Sciences – chair: Pavel Hozák

LS1 – Electron microscopy in health, diagnostics, nanomaterials and regenerative medicine

The session is open to a wide range of topics directed towards the application of EM in the biomedical field, such as new protocols, methodological novelties, imaging and quantification, and toxicology with special reference to innovative nanomaterials and regenerative medicine. The importance of the analysis of engineered nanomaterials in EM is due to the fact that such materials should only be attracted to diseased cells and not to normal ones for the optimization of drug therapies. In the case of regenerative medicine, the study of biomaterial/cell interaction is important. One of the most challenging tasks in the field of microscopic sciences is to visualize and identify the complex interaction of materials with biological material and correlate them with specific cellular functions in physiology and pathology. All scientists engaged in research on nanomaterials and regenerative medicine are cordially invited to participate and present their results.

Chairs	**Stefania Meschini** / Roma, Italy **Nela Puškaš** / Belgrade, Serbia
Invited speakers	**Flavia Carton** / Novara, Italy **Milica Labudović Borović** / Belgrade, Serbia

LS2 – Microscopy for healthier environment: Microorganisms, plants, and Host-Pathogen Interactions

This session covers structural and connecting functional, molecular research on plants, fungi, microorganisms, and even viruses, in particular their interactions with their environment or other organisms (symbioses, host-pathogen interactions etc). This session also includes the advances in food research.

Chairs	**Aleš Kladnik** / Ljubljana, Slovenia **Zoltán Kristóf** / Érd, Hungary
Invited speakers	**Miroslav Ovečka** / Olomouc, Czechia **Kateřina Malínská** / Prague, Czechia

LS3 – Structural studies from macromolecules to tissues

This session covers research on structural and functional aspects of the (re)organization of cells and tissues, from intracellular and extracellular molecules to tissues, by the use of various imaging techniques, including multidisciplinary approaches in biological and medical fields. Special emphasis will be placed on the current issues and innovative approaches that examine cellular behaviours, signaling mechanisms and cellular responses in physiological or pathological conditions using microscopy techniques and different modeling methods. All researchers working in the fields of biology, including structural biology, cell biology, molecular biology, histology, genetics, microbiology, (bio)chemistry, biomedicine etc. are invited to contribute to this session.

Chairs	**Milica Markelić** / Belgrade, Serbia **Melek Ozturk** / Istanbul, Turkey
Invited speakers	**Božidar Rašković** / Belgrade, Serbia **Emir Bozkurt** / İzmir, Turkey

LS4 – Advances in fluorescence and super-resolution microscopy

Recently, a rapid development of light microscopy enabled understanding of diverse biological and environmental processes to an unprecedented detail. And still more options are to come and will be discussed in this session; new technologies to study, for example, nanoscopic cellular structures, highly dynamic processes, or large-scale tissue rearrangements in a living organism.

Chairs	**Marek Cebecauer** / Prague, Czechia **Christian Schöfer** / Vienna, Austria
Invited speakers	**Eva Sevcsik** / Vienna, Austria **Kristin Grußmayer** / Delft, Netherlands

LS5 – Advances in probes and sample preparation in microscopy

The session covers latest developments of specialized probes and sample preparation methods for targeting molecules or structures of interest in the field of life sciences. Contributions from various microscopy modes including light and electron microscopy, AFM, mass-spectrometry imaging, and any others are welcome.

Chairs	**Vlada Philimonenko** / Prague, Czechia **Marco Biggiogera** / Pavia, Italy
Invited speakers	**Ben Giepmans** / Groningen, Netherlands

LS6 – Multi-parametric and functional imaging in life sciences

The session shall cover various applications of multi-parametric data acquisition and functional imaging, which provide extended information about the biological specimen. The richness of parameters can be obtained by multimodal microscopy combining two or more imaging methods applied to the same specimen or by multi-dimensional acquisitions gathering information not only from all three spatial dimensions of the specimen, but also from its temporal dynamics, spectral and lifetime characteristics, chemical composition and other properties.

Chairs	**Aleš Benda** / Vestec, Czechia **Maja Herak Bosnar** / Zagreb, Croatia
Invited speakers	**Jérémie Rossy** / Konstanz, Germany **Francesco Saverio Pavone** / Florence, Italy

LS7 – Advances in volume electron microscopy and image processing

Volume electron microscopy techniques (electron tomography, array tomography, focus-ion beam scanning electron microscopy, and serial block-face electron microscopy) have already become standard imaging techniques in both connectomics and cellular research. Also, various software tools have been developed to manipulate large-image datasets, to speed up image analysis and high-throughput data processing. This session covers these specific challenges of volume electron microscopy workflows as well as how to address them. All researchers interested in volume electron microscopy techniques are cordially welcome to join.

Chairs	**Marie Vancová** / České Budějovice, Czechia **Agnes Kittel** / Budapest, Hungary
Invited speakers	**Maura Francolini** / Milano, Italy **Ilya Belevich** / Helsinki, Finland

Material Sciences – chair: Miroslav Šlouf

MS1 – Metals, alloys and intermetallics

This session aims on microscopic studies of metals, alloys, intermetallics and metal matrix composites. The unique and novel advanced engineering metallic materials are attracting ever increasing attantion and development for their exceptional combination of properties such as ultra high strength combined with lightweight, improved fatigue, corrosion resistance, biocompatibility and catalytic properties. To achieve this, the most important step is to determine microstructure - properties relationship, by measuring of the data obtained by microscopic examinations (LM, TEM, SEM, SPM, EDS, EBDS, diffraction patterns etc.) and their carefull interpretation. Additionally, in the session, special cases of metal sample preparation might be also presented.

Chairs	**Dragan Rajnović** / Novi Sad, Serbia **Alena Michalcová** / Prague, Czechia
Invited speakers	**Antonín Dlouhý** / Brno, Czechia **Anna Knaislová** / Ústí nad Labem, Czechia

MS2 – Ceramics, rocks and minerals

The session covers the impact of the microstructural study by means of different microscopical methods and tools on understanding the characteristics of ceramics, rocks and minerals. The development of new ceramic materials with unique properties and detailed study of rocks and minerals through the predictive power of simulations (e.g. FT calculations, phase field simulation) combined with experimental studies will be the main focus. This session also invites discussion of various sample preparation, as one of the crucial steps for microscopy observations.

Chairs	**Katalin Balazsi** / Budapest, Hungary **Mariana Klementová** / Prague, Czechia
Invited speakers	**Gwladys Steciuk** / Prague, Czechia **Pinar Kaya** / Aalen, Germany

MS3 – Polymers, biomaterials and soft materials

The session invites contributions on both fundamental and applied aspects of polymers, biomaterials and other soft materials including polymer blends, composites and nanocomposites, self-assembled micro- and nanoparticles in solution, foams, hydrogels and liquid crystals. These materials are expected to be investigated by state-of-the-art microscopy techniques (namely light, electron and scanning probe microscopy), but other characterization methods such as (micro/nano)spectroscopy and (micro/nano) mechanical characterizations are welcome as well.

Chairs	**Cristiano Alboneti** / Bologna, Italy **Miroslav Šlouf** / Prague, Czechia
Invited speakers	**Pietro Parisse** / Trieste, Italy **Miroslava Dušková** / Prague, Czechia

MS4 – 2D-materials, thin films, coatings, surfaces and interfaces

The aim of this session is to provide information on the relationship between the microstructural features, functional properties and processing of 2D-materials, thin films, coatings, and interfaces. Regardless of the application field, contributions from all fields where 2D-materials, thin films, coatings, and interfaces play a vital role are welcome. It should be noted that not only the interfaces in thin film and coating systems but also the interfaces between different phases and grains are also covered by the session.

Chairs	**Eliška Materna Mikmeková** / Brno, Czechia **Miroslav Kolíba**l / Brno, Czechia
Invited speakers	**Wolfgang Werner** / Vienna, Austria **Jani Kotakoski** / Vienna, Austria

MS5 – 1D-materials (nanowires, nanotubes, nanorods etc.), nanoparticles and nanostructures

With the expansion of nanoscience, various electron microscopy (EM) and scanning probe microscopy (SPM) techniques became essential in structural, chemical and functional characterization of nanomaterials. EM and SPM techniques are widely applied to study of nanoparticles, 1-D materials (nanowires, nanotubes, nanorods etc) and nanostructures, together with core-shell and hetero-structural nanomaterials. This session is focused on the application of EM and SPM, including correlative, in-situ and in-operando methods, in characterisation of materials on nanoscale and atomic scale.

Chairs	**Andreja Gajović** / Zagreb, Croatia **Harald Plank** / Graz, Austria
Invited speakers	**Erdmann Spiecker** / Erlangen, Germany **Kristina Žagar Soderžnik** / Ljubljana, Slovenia

MS6 – Materials for energy related applications

The session will be focused around the latest progresses in morphological, structural, compositional, electronic and other advanced microscopic characterization approaches for studying functional materials for energy generation, harvesting and storage applications. Among the post mortem characterization techniques, it will cover developments and applications under in situ and in operando conditions and approaches. The contributions are welcomed from, but not restricted to the following areas: materials for Li- and other ion batteries applications, electro- and photo-catalysis, supercapacitors photovoltaics, thermoelectric materials, CO2 capture and H2 production and storage, etc. From the techniques point of view, the contributions from all aspects of SEM, FIB, TEM, STEM, EELS, EDXS, in-operando electrochemistry, etc. as welcomed.

Chairs	**Elena Tchernychova** / Ljubljana, Slovenia **Vittorio Morandi** / Bologna, Italy
Invited speakers	**Andreja Bencan Golob** / Ljubljana, Slovenia **Vuk Radmilović** / Belgrade, Serbia

MS7 – Micro- and nanomechanical characterization of materials

This newly introduced session couples experimental investigations of the micro- and nanomechanical behaviour of materials with microscopy observations. It focusses on the insights enabled by in-situ and in-operando experiments conducted in scanning or transmission electron microscopes. Nanoindentation testing and related miniaturized deformation experiments serve to derive a better understanding of microstructural stability, deformation, phase transformation and failure processes of metallic and ceramic materials and composites.

Chairs	**Daniel Kiener** / Leoben, Austria **František Lofaj** / Košice, Slovakia
Invited speakers	**Michael Burtscher** / Leoben, Austria **Johann Michler** / Thun, Switzerland

Lunch Workshops

Monday, 5 September 2022

TESCAN ORSAY HOLDING (CONGRESS HALL A)

Gain the maximum throughput with artifact-free surfaces for sample characterization by using high current plasma FIB-SEM.

Speaker: Martin Sláma, TESCAN Product Marketing Manager - Materials Science

Abstract: The standard procedure for preparing cross sections using the FIB-SEM technique is to use high currents to remove material quickly, then reduce the FIB current to obtain a better beam profile and consequently, better quality for the final surface.

AMETEK (CONGRESS HALL B–C)

Taking microanalysis to a new level

Speaker: Dr. René de Kloe , M.Sc. Julia Mausz

Abstract: The latest software and hardware developments are providing exciting new capabilities in EBSD and EDS analysis. The EDS FSQ quantification method enables the use of standards without measuring the beam current and Spherical Indexing for EBSD offers high precision indexing and pseudosymmetry differentiation. Combined with the Velocity and Clarity EBSD detectors that enable extreme acquisition speeds of 6500pps and EBSD mapping below 5 kV comprehensive materials analysis has never been easier.

DECTRIS (CONGRESS HALL D)

Fast 4D STEM with ARINA Hybrid-Pixel Detector

Speaker: Dr. Daniel Stroppa, Application Scientists EM

Abstract: 4D STEM is one of the most exciting STEM techniques today, as it allows the extraction of a great deal of samples' information by the analysis of local electron scattering (C. Ophus et al., Microscopy and Microanalysis 25, 563-582 (2019)). In our talk, we will present results obtained with the latest DECTRIS development, a new hybrid-pixel detector for fast 4D STEM experiments. Given the possibilities of extremely high frame rates and single electron counting, applications from virtual STEM imaging to crystal phase/orientation map are explored, and further experiments such as electron ptychography and strain mapping are discussed.

Tuesday, 6 September 2022

Thermo Fisher Scientific (CONGRESS HALL A)

Towards high-resolution and high-throughput in-situ structural biology

Speaker: Kotecha, Abhay

Abstract: Cryo-electro tomography (cryo-ET) allows protein structure determination both in vitro and in its native cellular context. Through sub-tomogram averaging (STA), the recurring structures in cryo-ET data can be resolved to sub nanometer resolutions. Recently, an increasing number of sub 5 Å maps achieved by STA demonstrates that the high resolution information in cryo-ET data can be harvested for in situ structural biology. Here we will show that the high quality cryo-ET data acquired by Krios G4 equipped with Selectris energy filter and Falcon 4i detector enable us to resolve apoferritin at 1.9 Å with STA and yeast ribosome at 5 Å, with large subunit resolved to 3.5 Å from lamella by cryo-FIB milling. We will also show high throughput cryoFIB milling with our new PlasmaFIB system and data collection and assessment with Tomography 5 and Tomo live.

JEOL (CONGRESS HALL B–C)

JEOL new TEM developments for biology and material sciences

Speaker: G. Brunetti & R. Ravelle-Chapuis

Abstract: Since 1949, JEOL's legacy has been one of the most remarkable innovations in the development of instruments used to advance scientific research and technology. JEOL has 70 years of expertise in the field of electron microscopy, more than 60 years in mass spectrometry and NMR, and more than 40 years of e-beam lithography leadership.
This presentation is focused on the new JEOL developments of high resolution instruments. We will introduce cutting edge TEM: CRYO ARMTM & NEOARM with innovative applications

Leica Microsystems (CONGRESS HALL D)

Latest developments in high-end sample preparation techniques for EM

Speaker: Andreas Nowak, Sales & Product Manager – Nanotechnology

Abstract: Appropriate sample preparation is key to obtaining the best results with advanced techniques like TEM, SEM, cryoET and CLEM, all of which have specific preparation requirements. To achieve maximum accuracy in investigation and analysis, it is also crucial to minimize the artifacts introduced by the preparation process. This workshop presents the latest workflow solutions for a range of sample preparation methods such as sample sectioning, array tomography, as well as cryo and live cell imaging.

Thursday, 8 September 2022

JEOL (CONGRESS HALL A)

New SEM analytical breakthrough

Speaker: N. Ravier & Y. Uetake

Abstract: Since 1949, JEOL's legacy has been one of the most remarkable innovations in the development of instruments used to advance scientific research and technology. JEOL has 70 years of expertise in the field of electron microscopy, more than 60 years in mass spectrometry and NMR, and more than 40 years of e-beam lithography leadership.
This presentation is focused on the new JEOL developments of high resolution instruments. We will introduce cutting edge SEM: IT510 & IT800 with innovative applications.

TESCAN ORSAY HOLDING (CONGRESS HALL B–C)

Apply optimized TESCAN Cryo FIB workflows for effortless cryo TEM lamella preparation from your biological samples.

Speaker: Ondřej Šulák, TESCAN Product Marketing Director - Life Sciences

Abstract: Low-temperature electron microscopy (cryo-EM) has become an established technique for capturing and observing beam-sensitive samples in their close-to-natural state. Cryo-sectioning is a standard method used for thinning and slicing such samples. However, the integrity of the specimens can be easily degraded by common artifacts caused by knife marks, compression, or crevasses.

Thermo Fisher Scientific (CONGRESS HALL D)

Spectra Ultra: high throughput, accurate and high resolution multimodal materials characterization

Speaker: Porcu, Mauro

Abstract: The presentation will highlight how users can benefit from the latest technology recently introduced by Thermo Scientific: the most sensitive EDX detector featuring a 4.45 srad solid angle and a newly designed octagon that allows live HT Switch. - Key Learnings: 1) the possibilities offered by the improved EDX detector such as in situ dynamic EDX and EDX tomography 2) how the live HT switch can be beneficial in optimizing experiments 3) the latest news on Thermo Scientific's technology.

Panel Discussion

Wednesday 07/09/2022, 17:00–18:00
Beauty in micrographs
Moderator: Jana Nebesářová

Invited experts will be discussing how to discover artistic qualities in microscope images and how to enhance them. Participants will have the opportunity to actively participate in the discussion. Among the invited speakers will be **Jan Martinek**, a young plant cell biologist at Charles University in Prague. He spends many hours looking at plants under a microscope. His images are presented in scientific papers as well as on social media for the enjoyment of the scientific community. Last year, he won Olympus Image of the Year Awards 2021. **Viktor Sýkora** works at the 1st Faculty of Medicine of Charles University as a researcher and since 2006 has specialized in scientific photography and microphotography. In addition, he participates in several exhibitions at home and abroad, and he also received numerous recognitions and awards. **Stefan Diller** started photographing with electron microscopy in 1984. In 2006 he founded a more modern lab and started with scientific photography with his own SEMs and TEMs. Since 2013 he has worked with a new visualizing tool in the scanning electron microscope: nanoflight.creator, a hardware and software solution to make camera-flights around microscopic structures.

Thursday 08/09/2022, 16:30–18:00
Microscopy challenges for scientists and manufacturers
Moderator: Daniel Stach (Czech TV)

Will we live in a nanoworld soon? What is the real power of correlative and multidimensional microscopy or will future microscopes function without the need of a human operator? This panel discussion of world-renowned microscopists will try to answer questions about the current focus and trends of the electron microscopy field. Since the congress is located in Brno, a city with a unique electron-microscopy ecosystem, the panel discussion will be joined also by directors of two of the world-leading companies manufacturing electron microscopes, who can provide the manufactures point of view on the topic. The challenges and possibilities of how to overcome the barriers in collaboration between scientists and EM manufacturers will take a significant place in the debate. Join the discussion about the future of the electron microscopy field!
In the panel discussion, you will see some of the 16MCM plenary speakers, such as **Richard Henderson**, 2017 Nobel Laureate in Chemistry; head of the Materials Science Electron Microscopy Facility at Ulm University – **Ute Kaiser**; director of SuperSTEM Laboratory, SciTech Daresbury Campus – **Quentin Ramasse**. Directors of electron microscopy companies in Brno also accepted the challenge **Jaroslav Klíma** (TESCAN) and **Petr Střelec** (Thermo Fisher Scientific).

DECTRIS
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DECTRIS ARINA

Fast hybrid-pixel electron-counting detector for 4D STEM applications