In this edition of the Topical Days on Imaging and Image Analysis, a special focus is on the applications of different imaging modalities for **bio and life science problems** and for **biomedical research topics**. It entails different **multi-dimensional** imaging methodologies ranging from microscopy by visible light to waves, **X-rays**, **neutrons** and **electrons**. High-resolution imaging of the 3D morphology of soft tissues, biological samples, down to the cell levels, remains a very challenging problem of high importance especially with the ever-growing interest for precision medicine applications and in many life science fields. Combined 3D morphological, elemental and functional analysis of such samples in -vivo is still beyond reach. Nevertheless, novel imaging and analytical methods and especially their clever combination opens up a plethora of new opportunities to get closer the above goal. In line with this we also included in the program other non-direct imaging analytical methods (XRD, MassSpec) that in combination with direct imaging method allow intriguing approaches to be taken.

In both the morning and afternoon sessions, we will have a talk dedicated to scientific image analysis and image processing using ML methods. These are very important methods that can help us to make more out of imaging data and utilize them more efficiently especially in the life science realm. The program is organized to have a balanced distributions of talks of external speakers and talks highlighting Empa internal imaging research in the field of focus topic.

General Information

Location Online event

Costs The event is sponsored by Empa and is free of charge.

Registration www.empa-akademie.ch/imaging
You will receive a confirmation by e-mail.

Deadline April 25, 2021

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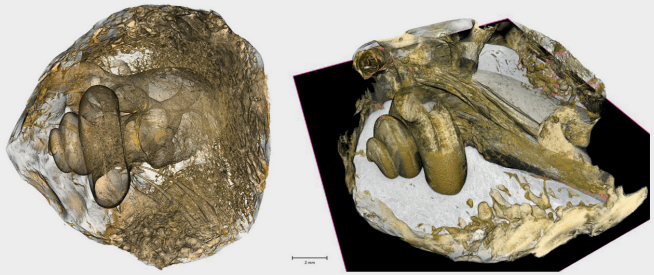
Empa
Akademie

TOPICAL DAY

Imaging and Image Analysis XII



Online event
Monday, May 17, 2021, from 8:30 to 16:50

Online registration:
www.empa-akademie.ch/imaging

Topics

Imaging, from electron microscopy, optical imaging to X-ray/neutron radiography and tomography, MRI and more, as well as different methods and techniques used for performing image analysis.

Target audience

Scientists, Ph.D.'s and post-docs working with different imaging techniques and image analysis procedures. Anyone who is interested in learning about the latest developments in imaging and image analyses.

Objectives

The series of Empa Topical Days on Imaging and Image Analysis offers scientists, both from the ETH domain and from other public/private institutions, a platform for keeping abreast of the latest developments and for sharing experience in the fields of imaging/image analysis.

In this **12th edition**, the focus is **on imaging applications for life, bio and medical sciences** by different imaging modalities and image analyzes techniques.

Program

08:30 **Welcome**
Robert Zboray, Center for X-ray Analytics,
Swiss Federal Laboratories for Materials Science and Technology (Empa), Dübendorf (Switzerland)

08:40 **Opening Remarks**
Alex Dommann, Department Materials Meet Life,
Center for X-ray Analytics,
Swiss Federal Laboratories for Materials Science and Technology (Empa), Dübendorf (Switzerland)

MORNING SESSION

09:00 **3D structural analysis of folliculogenesis**
Annapaola Parrilli, Center for X-ray Analytics,
Swiss Federal Laboratories for Materials Science and Technology (Empa), Dübendorf (Switzerland)

09:40 **Towards trustworthy ML for medical image computing**
Ender Konukoglu, Computer Vision Laboratory,
Department of Information Technology and Electrical Engineering, ETH Zurich (Switzerland)

10:20 **Virtual coffee break**

10:40 **Scale-bridging correlative 3D imaging using phase contrast laboratory Nano-CT and electron tomography**
Erdmann Spiecker, Center for Nanoanalysis and Electron Microscopy (CENEM), Department Werkstoffwissenschaften, Interdisziplinäres Zentrum für Nanostrukturierte Filme (IZNF), Friedrich-Alexander-Universität Erlangen-Nürnberg (Germany)

11:20 **Deciphering the dynamics of cerebral ischemia and brain diseases using multiscale imaging**
Jan Klohs, Department of Information Technology and Electrical Engineering, Institute for Biomedical Engineering, ETH Zurich (Switzerland)

12:00 **Lunch break**

AFTERNOON SESSION

13:00 **Neutron Imaging in Life Sciences**
Markus Strobl, Neutron Imaging and Activation Group,
Laboratory for Neutron Scattering and Imaging,
Paul Scherrer Institute, Villigen (Switzerland)

13:40 **All-in-Voxel: Analysis and Visualization of Scientific CT Data with VGSTUDIO MAX**
Holger Bohn, Volume Graphics GmbH,
Heidelberg (Germany)

14:20 **Decoding hierarchical structure of mineralized turkey leg tendon:**
A Multiscale Analytical approach
Anjani K. Maurya, Center for X-ray Analytics,
Swiss Federal Laboratories for Materials Science and Technology (Empa), Dübendorf (Switzerland)

15:00 **Virtual coffee break**

15:30 **Towards full capacity of high resolution X-ray tomography in characterization of biological tissues**
Somayeh Saghamanesh, Center for X-ray Analytics,
Swiss Federal Laboratories for Materials Science and Technology (Empa), Dübendorf (Switzerland)

16:10 **Laser based mass spectrometry for spatially resolved chemical analysis of solid materials**
Valentine Riedo, Space Research & Planetary Sciences,
Physics Institute, University of Bern, (Switzerland)

16:50 **Closing**