In this edition of the Topical Days on Imaging and Image Analysis, a special focus is on the rapidly increasing availability and impact of **multi-dimensional** imaging methodologies with a broad variety of radiation types. The **multi-dimensionality** feature is, in this case, intended as the possibility of producing surface or 3D spatial maps of more than a single physical or chemical variable, in many cases even by using the same experimental setup. Other dimensions include also **time** and, with it, variables of **experiments** which can be performed, most of the time, **synchronously** to the imaging. Along with new possibilities, this increasing availability of multi-dimensional imaging capabilities opens up new challenges for the following image analysis objectives and tasks.

Experimental methodologies and analysis software along with their applications are presented in this Topical Day by researchers of the ETH domain and by private companies.
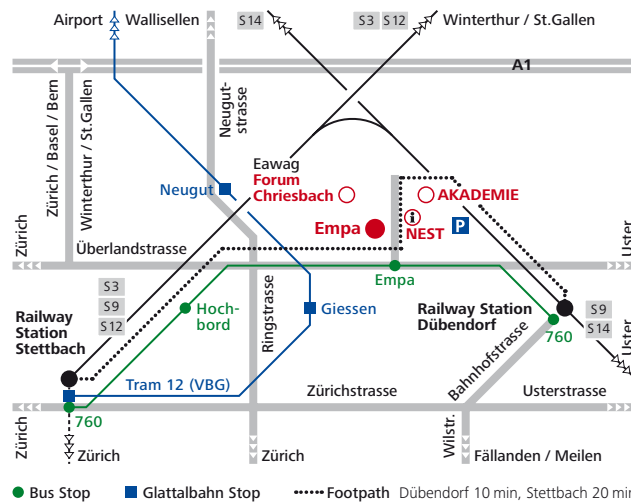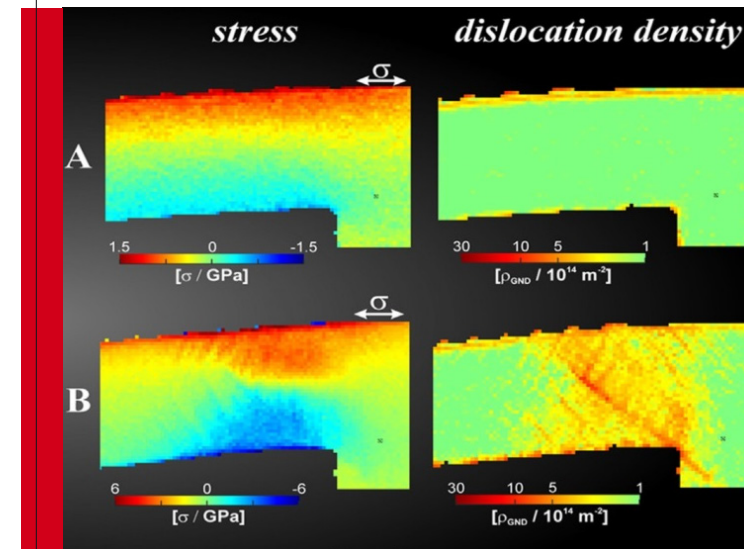
Image on the cover:
Adaptation from J. Ast, B. Mohanty, Y. Guo, J. Michler, X. Maeder, Materials and Design 117, 265−266 (2017).

GENERAL INFORMATION

Location	Empa, Dübendorf Überlandstrasse 129 AKADEMIE
Costs	The event is sponsored by Empa and free of charge.
Registration	www.empa-akademie.ch/imaging You will receive a confirmation by e-mail.
Deadline	March 18, 2018
Contact	Michele Griffa Phone +41 58 765 43 60 michele.griffa@empa.ch Rolf Kaufmann Phone +41 58 765 60 95 rolf.kaufmann@empa.ch www.empa.ch/x-ray
How to get here	Please do use public transport. There is only very limited parking available.

● Bus Stop   ■ Glattalbahn Stop   ┄┄┄Footpath Dübendorf 10 min, Stettbach 20 min

TOPICAL DAY

Imaging and Image Analysis X

Empa, Dübendorf, Überlandstrasse 129
Monday, April 9, 2018, from 8:30 to 17:30

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

TOPICS

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

TARGET AUDIENCE

Scientists, PhDs and post-docs working with different imaging techniques and image analysis procedures.

OBJECTIVES

The series of Topical Days on Imaging and Image Analysis offers to scientists, both of the ETH domain and of 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 10th edition, a special focus is given to the rapidly increasing availability and impact/relevance of multi-dimensional imaging methodologies with a broad variety of radiation types. The multi-dimensionality feature is, in this case, intended as the possibility of producing surface or 3D spatial maps of more than a single physical or chemical variable, in many cases even by using the same experimental setup. Other dimensions include also time and, with it, variables associated with experiments which can be performed synchronously to the imaging. Along with new possibilities, this increasing availability of multi-dimensional imaging capabilities opens up new challenges for the following image analysis objectives and tasks.

PROGRAM

8:30 Welcome Coffee, Registration

8:50 Opening Remarks
Rolf Kaufmann, Center for X-ray Analytics
Michele Griffa, Concrete/Construction Chemistry Laboratory
Swiss Federal Laboratories for Materials Science and Technology (Empa), Dübendorf (Switzerland)

MORNING SESSION

9:00 Chemical imaging: visualizing chemistry in space and time
Daniel Grolimund, microXAS Beamline Project,
Swiss Light Source,
Paul Scherrer Institute, Villigen (Switzerland)

9:30 Advanced microstructure, defect, stress and chemical imaging using FIB-SEM techniques
Xavier Maeder, Laboratory for Mechanics of Materials and Nanostructures,
Swiss Federal Laboratories for Materials Science and Technology (Empa), Thun (Switzerland)

10:00 Coffee break

10:30 Real-time chemical imaging of functional materials under operating conditions
Simon Jaques, Finden Ltd.,
Abingdon (United Kingdom)

11:00 Multimodal imaging at neutron research facilities
Anders Kaestner, Neutron Imaging and Activation Group, Laboratory for Neutron Scattering and Imaging,
Paul Scherrer Institute, Villigen (Switzerland)

11:30 The making of microscopic 3D movies of materials in action: a look behind the scenes of the time-resolved tomography program at the TOMCAT beamline
Christian M. Schlepütz, Swiss Light Source,
Paul Scherrer Institute, Villigen (Switzerland)

12:00 Lunch

AFTERNOON SESSION

13:00 Medical imaging across scale: The importance of the ultrastructure and its context
Inge Herrmann, Laboratory for Particles-Biology Interactions,
Swiss Federal Laboratories for Materials Science and Technology (Empa), St. Gallen (Switzerland)

13:30 Sub-µCT for the validation of computer-generated models of electrospun fibre networks
Alexander Ehret, Laboratory for Mechanical Integrity of Energy Systems,
Swiss Federal Laboratories for Materials Science and Technology (Empa), Dübendorf (Switzerland)

14:00 KNIME Image Processing: integrating and enhancing open source bioimaging software
Christian Dietz, KNIME GmbH, Konstanz (Germany)

14:30 Coffee break

15:00 Observing air pollutants and greenhouse gases with hyperspectral imaging spectrometers on-board aircraft and satellites
Gerrit Kuhlmann, Laboratory for Air Pollution/Environmental Technology,
Swiss Federal Laboratories for Materials Science and Technology (Empa), Dübendorf (Switzerland)

15:30 Terahertz ptychography
Lorenzo Valzania, Laboratory for Transport at Nanoscale Interfaces,
Swiss Federal Laboratories for Materials Science and Technology (Empa), Dübendorf (Switzerland)

16:00 X-ray imaging for security applications
Selina Kolokytha, Center for X-ray Analytics,
Swiss Federal Laboratories for Materials Science and Technology (Empa), Dübendorf (Switzerland)

16:30 Image enhancement of ToF-SIMS data by a combination with scanning probe microscopy
Olivier Scholder, Laboratory for Nanoscale Materials Science,
Swiss Federal Laboratories for Materials Science and Technology (Empa), Dübendorf (Switzerland)

17:00 Applications of VGSTUDIO MAX 3.1 for the analysis and visualization of voxel data
Sandra Engels, Volume Graphics GmbH,
Heidelberg (Germany)

17:30 Closing