For more information visit
www.scopem.ethz.ch →
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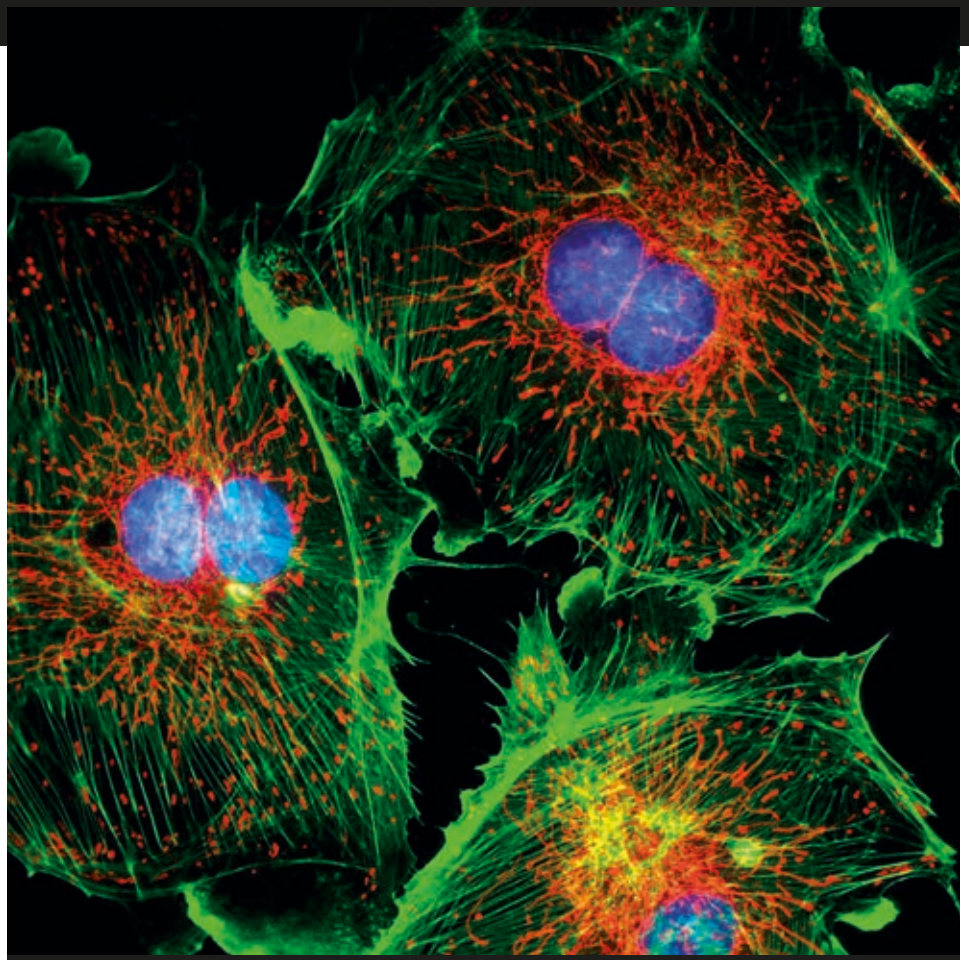
The image on the front page shows fluorescent cells with stained mitochondria and cytoskeletons (acquired with a confocal laser scanning microscope).

Photo on page 2 by Florian Bachmann

ETH zürich



Scientific Center for Optical and Electron Microscopy

Your partner in microscopy, from millimeter to the atomic scale

ScopeM

The Scientific Center for Optical and Electron Microscopy (ScopeM), a central scientific technology platform at ETH Zurich, provides expertise, resources and services in light and electron microscopy as well as related fields. Users can also be trained to get direct access to state-of-the-art microscopy and sample-preparation equipment.

ScopeM was established in 2014 through the merger of ETH Zurich's electron (EMEZ) and light microscopy and screening (LMSC) facilities. Its mission is to provide world-class know-how and services in electron-, light-microscopy and spectroscopy that allow researchers to push their projects beyond current frontiers.

ScopeM maintains and develops state-of-the-art equipment and infrastructure – including high-throughput screening, spectroscopy and focused ion beam microscopy – for a wide ETH Zurich user base. Users from other academic institutions, research labs and industry are also highly welcome.

ScopeM actively supports interdisciplinary research and training programs. ScopeM also organizes courses, manages microscopy curriculum and performs methodological research in microscopy.

ScopeM has highly qualified technical and scientific personnel operating and maintaining all instruments.

By the numbers
500+ users (from 200 groups) per year
700+ projects per year
30 staff members
40 microscopes, ranging from basic to advanced and state-of-the-art frontiers instruments

The Atom Probe Tomograph can be used to reproduce 3D structures with atomic resolution.

How we can support your research

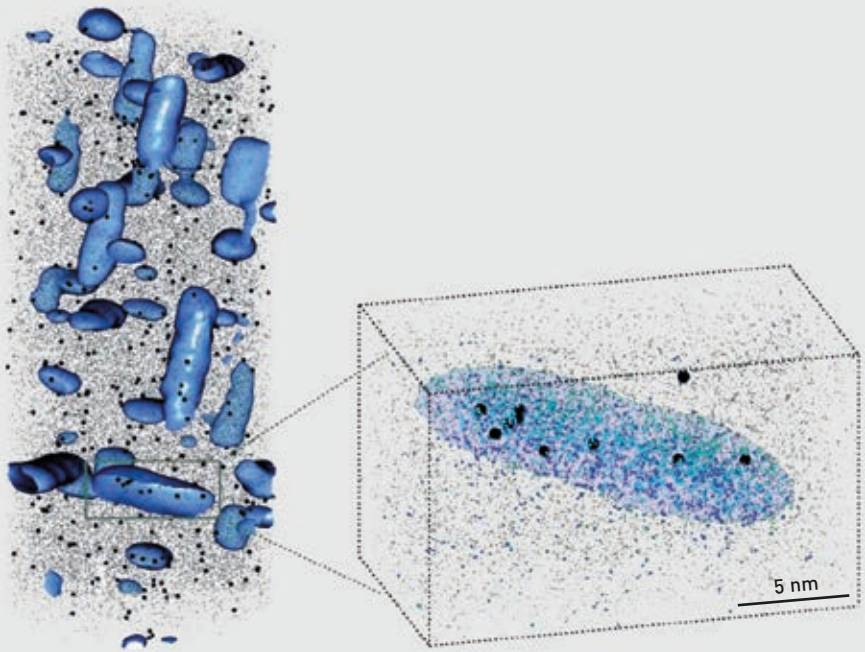
- Training users who wish to work independently on ScopeM light and electron microscopes, including related tools and methods such as data processing and analysis
- Training and supporting users in methods for artifact-free sample preparation
- Performing services, including sample preparation, data acquisition (imaging and analytical studies, such as EDX, EELS and, in future, Raman spectroscopy), as well as data processing and analysis.
- Carrying out focused research and development projects
- Providing consulting services and experimental support to users
- Providing advanced image and data analysis solutions, including teaching, supervision and collaborations
- Consulting for imaging methods and instrument selection, evaluation and acquisition

Our equipment

The electron and ion microscopes encompass numerous TEMs and SEMs – including cryo- and high-resolution analytical instruments – as well as a Cs-corrected cryo-STEM and an Atom Probe Tomograph. The optical microscopes cover the full spectrum of wide-field and confocal (scanning and spinning disk) microscopes as well as multi-photon, laser-micro dissection, TIRF and super-resolution instruments. The high content screening and the histology units offer equipment for both routine work and more sophisticated techniques and automated processes including screening campaigns of various sizes.

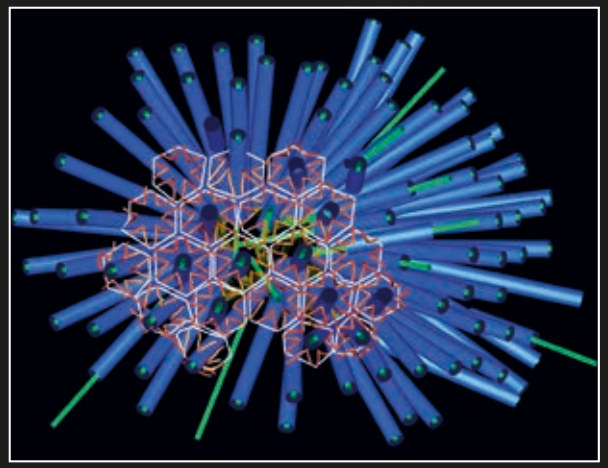
You can find detailed information on all instruments at
www.scopem.ethz.ch/instruments-services →

Artificially aged Sn-doped Al-Mg-Si alloy, with a close-up on one Mg-Si precipitate. The blue shapes are surfaces of equal Mg and Si content, and the black dots are Sn atoms (Atom Probe Tomograph). [Stefan Pogatscher et al., Phys. Rev. Lett. 112 225701 (2014)].

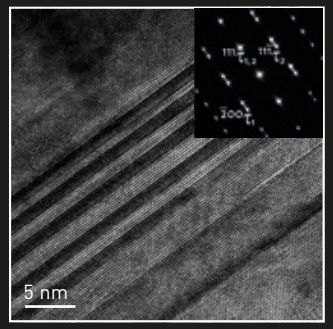


Petals of the flower nigella damascena
(Scanning Electron Microscope in SE mode @ 3kV)

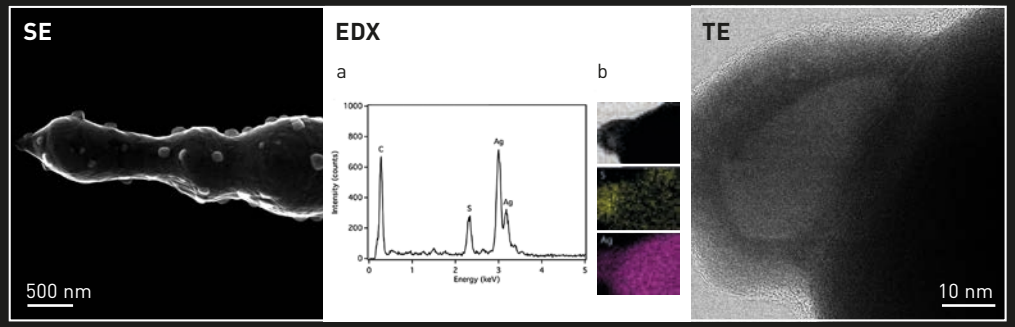
Application examples in electron microscopy



Array of contractile structures used by marine bacteria to induce the metamorphosis of tubeworm larvae (cryo-TEM @ 300kV); group of Prof. M. Pilhofer.

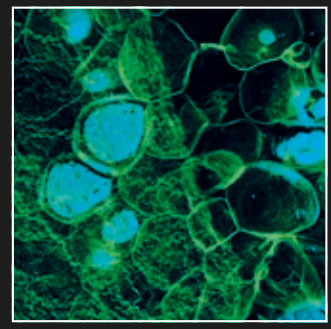


High-resolution TEM micrograph and electron diffraction pattern of a metastable ferromagnetic tau-phase (Mn-Al-C) in a permanent magnet (HR-TEM @ 300kV); group of Prof. R. Spolenak.

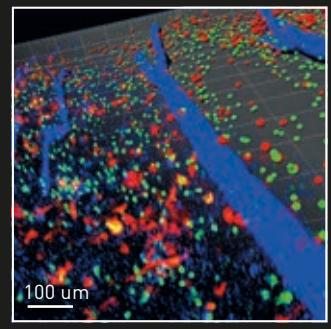


TEM analyses of tarnished Ag-tips showing the formation of Ag_2S nanoparticles on the surface using a combination of TE- and SE- micrographs with EDX elemental analyses in STEM mode (cs-corrected STEM @ 200kV); group of Prof. R. Zenobi.

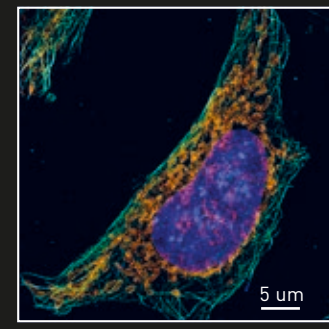
Application examples of light microscopy, screening, histology and data analysis



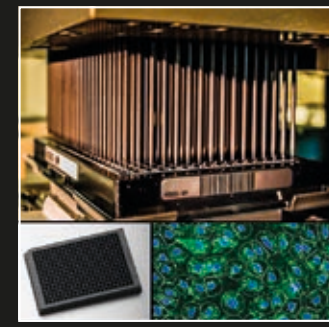
Mouse adipose tissue imaged using Second and Third Harmonic Generation. Image created without the need of fluorescence staining combined with two-photon Fluorescence acquisition of the cell membrane protein immuno-stained with Alexa 598 (multi-photon microscope); group of Prof. M. Detmar.



Bone marrow of a mouse illustrating blood vessels (blue), memory T-cells (green), and helper T-cells (red). The composite image shows a gradient transition (lower left to upper right) from raw 3D confocal data to fully reconstructed (detected, classified, and measured) objects; project with Dr. C. Nombela-Arrieta, University Hospital Zurich.



3D view of HeLa cells acquired by structured illumination (SIM): blue: cell nucleus (DAPI), green: microtubules, red: mitochondria (Tom20).



Screening & Image Analysis: A 384-well plate containing cells of choice (bottom left) is processed by the 384-well head installed on the robotic platform (top). Consecutively, images from individual wells are analyzed (bottom right).