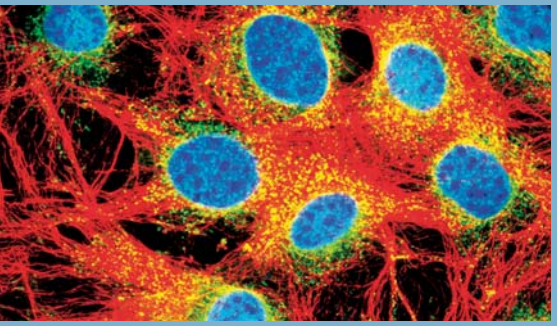


IMAGING TECHNOLOGIES FROM SWITZERLAND

Imaging technologies in the biomedical area allow for representations of structures and processes in living organisms in many ways. Methods that are able to non-destructively characterize tissues in a biological environment are of particular interest. Progress in the field of biomedical research – and in the application of its results – depends strongly on these technological possibilities.

In order for progress to be made key technologies must be identified. It will be important to exploit their potential across the disciplines, thereby applying production and automation processes developed by industry to biomedical imaging in biological research and vice versa.

ETH BOARD

Promoting the transfer of knowledge and technology, and encouraging the dialog between the research and business worlds is one of the strategic goals of the ETH Board. The realization is done locally by ETH Zurich and EPF Lausanne, and by the four Research Institutions PSI, WSL, Empa und Eawag.

Your contact:
Klara Sekanina, PhD
ETH Board
Häldeliweg 15
8092 Zurich, Switzerland
Phone +41 44 632 20 64
sekanina@ethrat.ch
www.ethrat.ch

NATIONAL CENTER FOR BIOMEDICAL IMAGING (NCBI)

The National Center for Biomedical Imaging (NCBI) is a network between EPF Lausanne, ETH Zurich, and PSI. The departments of medicine and biology of the Universities of Basle, Berne, Fribourg, Geneva, Lausanne, and Zurich are strongly involved in the network. One of its goals is the coordination of activities in the field of outstanding imaging technologies for biomedical research.

The network aims at improving our understanding of complex biological systems, and of pathological and non-pathological processes. Its main emphasis is placed on the development of novel instruments and methods.

Your contacts:
Prof. Dr. Rolf Grütter, Director
Centre d'Imagerie BioMedicale (CIBM)
Universités de Lausanne, Genève & EPFL
1015 Lausanne, Switzerland
Phone +41 21 693 44 67
rolf.gruetter@epfl.ch
www.cibm.ch

Prof. Dr. Markus Rudin
Institute for Biomedical Engineering
University of Zurich and ETH Zurich
8044 Zürich, Switzerland
Phone +41 44 633 76 04
rudin@biomed.ee.ethz.ch
www.cibm.ch

ETH BOARD

rsem technologies for innovation

heliotis

SystemsX The Swiss Initiative in Systems Biology

ETH Eidgenössische Technische Hochschule Zürich Swiss Federal Institute of Technology Zurich

EPFL ÉCOLE POLYTECHNIQUE FÉDÉRALE DE LAUSANNE

PAUL SCHERRER INSTITUT PSI

EMPA Materials Science & Technology

eawag aquatic research

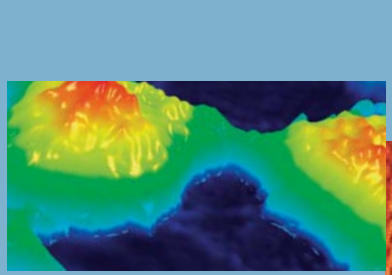
WSL

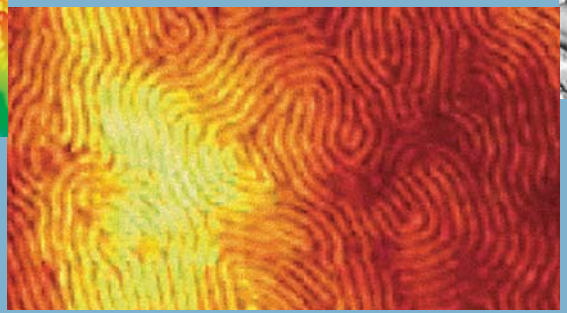
ETH BOARD

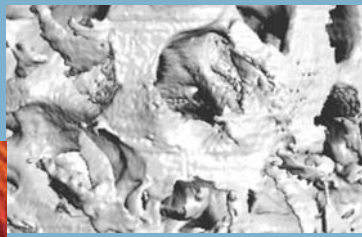
IMAGING TECHNOLOGIES FROM SWITZERLAND

THE ETH DOMAIN AT THE HANNOVER FAIR 2006

APRIL 24 – 28, 2006
HALL 2, STAND A 28







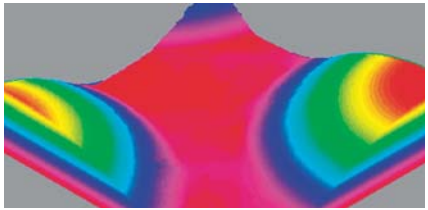
ETH ZURICH

3D Eyes for the Invisible

To make the invisible visible is the mission of the Computer Vision Laboratory at ETH Zurich. We are developing technologies for a broad range of applications for computer-based interpretation of 2D and 3D image data sets from different sources.
We are proud to present at the Hannover Fair 2006 examples of our interdisciplinary research strategy, which combines the skills and the know-how of ETH Zurich in mechanical engineering, virtual and augmented reality as well as in imaging technologies. Our eyes for the invisible are ready for you to use as well.

Your contact:
Matthias Harders, PhD
Computer Vision Laboratory
Sternwartestrasse 7
ETH Zurich
8092 Zurich, Switzerland
Phone +41 44 632 52 79
matthias.harders@vision.ee.ethz.ch
www.vision.ee.ethz.ch

EPF LAUSANNE

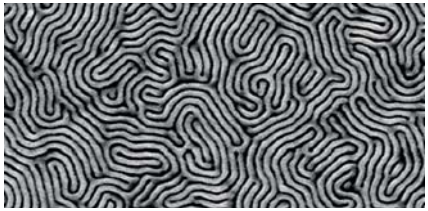


Nanovision

An ever increasing number of companies and universities are dealing with Nanotechnologies. New tools are needed to support this accelerated growth, especially vision techniques performing at the nanoscale. Optical Digital Holographic Microscopy (DHM) is an imaging technique developed by researchers at the EPF Lausanne. It appears as very attractive because it is fast, contact-free and user-friendly. It does not require any sample preparation and therefore can be implemented without delay. A bright future is promised to such an imaging technology applied to nanotechnology development, material research and life sciences, in particular. DHM technology has been licenced to the company Lyncee Tec SA, which is commercialising an innovative microscope.

Your contact:
Prof. Christian Depeursinge
Laboratory of Applied Optics
Microvision and Microdiagnostics Group
EPF Lausanne
1015 Lausanne, Switzerland
Phone +41 21 693 61 77
christian.depeursinge@epfl.ch
http://apl.epfl.ch/page12232.html

PAUL SCHERRER INSTITUTE (PSI)

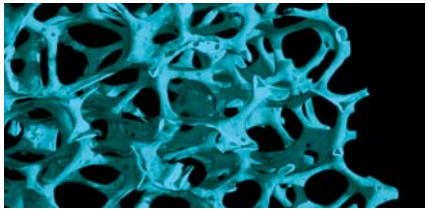


A giant microscope to resolve the micro and nano world

Time resolved X-ray radiographic and tomographic imaging at micron and submicron resolution in both absorption and phase-contrast regimes, are an important asset of PSI's Synchrotron Light Source (SLS) to investigate biomaterials, biopsy of hard and soft tissue as well as a broad variety of inorganic materials.
X-ray (EUV) interference lithography is a new technology developed at the PSI that has produced nanostructures with record-breaking resolution going down to 15 nm in size. Its potential applications include high-density data storage devices and nano-optical components such as polarizers and filters.

Your contact:
Alfred Waser, Dipl. Ing. FH
Paul Scherrer Institute (PSI)
Technology Transfer Office
5232 Villigen PSI, Switzerland
Phone +41 56 310 52 40
alfred.waser@psi.ch
www.psi.ch

EMPA

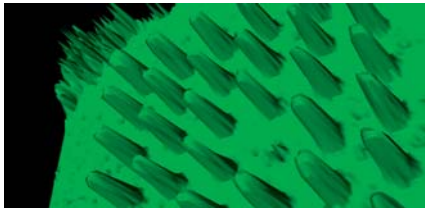


The world seen three-dimensional

Computer tomography allows to image objects non-destructively, non-contacting and in all three dimensions. The images can be used e.g. for failure analysis, geometric comparisons or controls of the actual state. The method also allows to investigate processes with mechanical, thermal or chemical interactions. With suited instrumentations this can be done directly on the tomograph and allows an immediate image comparison. As an institution for applied materials research, Empa runs different beam-lines with several energies and spatial resolutions.

Your contact:
Empa, Materials Science and Technology
NDT, Non-Destructive Testing
Thomas Lüthi, PhD
8600 Dübendorf, Switzerland
Phone +41 44 823 43 22
thomas.luethi@empa.ch
www.empa.ch

CSEM

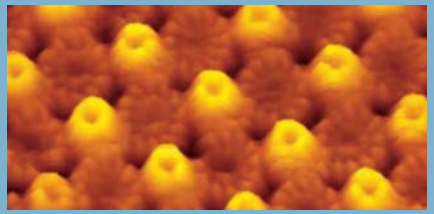


3D microscope for production control and medicine

An innovative camera developed by CSEM can look into low-scattering materials such as skin, eyes and teeth in real time. Used as a measuring instrument the camera can be applied in manufacturing and as a real-time quality control system – for example in die bonding or lab automation. Tiniest volumes – also of transparent media – can be measured ultra-fast with highest precision, and thus detect the smallest material defects. The new camera is based on parallel optical low-coherence tomography (pOCT), and uses a sensor array of 144 x 90 "smart pixels", that are able to carry out preliminary processing of the image data independently. The CSEM start-up company Heliotis (established in September 2005) is developing and commercializing this technology.

Your contact:
Ruedi Frey, PhD and CEO
Heliotis Inc. (spin-off CSEM)
Badenerstr. 569
8048 Zürich, Switzerland
Phone +41 44 497 14 98
rf@heliotis.ch
www.heliotis.ch

SYSTEMSX



Systems Biology: Holistic view on entire biological systems

"SystemsX" is a national Swiss research alliance, building on the expertise of the ETH Zurich, and the Universities of Zurich and Basel. The network aims at becoming a worldwide leader in Systems Biology. Further Universities are planning to join. In addition, the Basel transnational pharmaceutical companies Roche and Novartis also contribute to SystemsX. The creation of SystemsX is based on the conviction that in the field of biology, novel insight is possible only by a holistic approach - Systems Biology. Mathematical, computer-assisted modelling of entire biological systems, plays an important role for learning more about metabolic pathways, cells, and tissues. Another important field will be the imaging of single cells and their constituents at nanometer resolution.

Your contact:
Prof. Dr. Rudolf Aebersold
Institute for Molecular Systems Biology (IMSB)
8093 ETH Zurich, Switzerland
Phone +41 44 633 31 70
aebersold@imsb.biol.ethz.ch
www.systemsx.ch