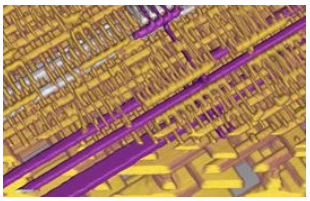
PAUL SCHERRER INSTITUT

PSI facilities newsletter

https://www.psi.ch/science/facility-newsletter
https://synchrotron-analysis.ch/

INDUSTRIAL USE OF THE PSI PHOTON SCIENCE FACILITIES



SLS Techno Trans AG provides industry customers with straightforward access to synchrotron analysis at the Swiss Light
(SLS), high performance cleanrooms, and SwissFEL, all located at the Paul Scherrer Institute, Switzerland. These world class research facilities are regularly used by industry to solve problems in materials science, medicine, food science, energy supply and the environment. An impressive series of application examples that include typical SLS experiments to solve industrial and social issues are published on our website: *https://synchrotron-analysis.ch/application-examples*.
SMEs can benefit from light source capabilities thanks to the European project LEAPS-INNOV which is supporting industrial projects in an easy, agile and simple procedure: *https://www.leaps-innov.eu/post/new-opportunities-for-smes-fundet-access-to-european-light-sources*

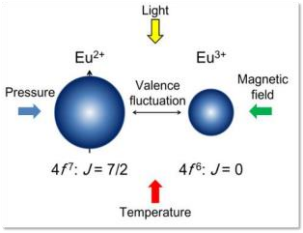
X-RAY MICROSCOPY WITH 1000 TOMOGRAMS PER SECOND

Tomoscopy is an imaging method in which three-dimensional images of the inside of materials are reconstructed in rapid succession. A new world record has now been set at the Swiss Light Source at the Paul Scherrer Institute: with 1000 tomograms per second, it is now possible to non-destructively capture very fast processes and structural changes in materials on the micrometre scale, such as the burning of a sparkler or the foaming of a metal alloy for the production of stable lightweight materials.

Read the full story: *https://www.psi.ch/en/media/our-research/x-ray-microscopy-with-1000-tomograms-per-second*

F. García-Moreno et al., Advanced Materials 23 September 2021 (online)
https://doi.org/10.1002/adma.202104659

ULTRAFAST ELECTRON LOCALIZATION



When exciting a material with a fs intense laser pulse, it is well known that electrons are ejected from atoms during the exposure time, which is e.g. important for photodissociation processes. For X-rays this process is known as “diffract before destroy” and is extensively employed to solve protein crystal structures at XFELs. However, how and how fast electrons can be localized in a correlated metal, i.e. adding electrons in a localized atomic shell, taking them out of an electron gas, is completely unclear.
Read the full story: *https://www.psi.ch/en/micmag/scientific-highlights/ultrafast-electron-localization*

Jose R. L. Mardegan et al., Phys. Rev. Research 3, 033211 – Published 3 September 2021/
https://doi.org/10.1103/PhysRevResearch.3.033211

GROUND-BREAKING TECHNOLOGY DEVELOPMENT RECOGNISED

Two PSI researchers have won the 2021 Innovation Award on Synchrotron Radiation for 3D mapping of nanoscopic details in macroscopic specimens, such as bone. Marianne Liebi and Manuel Guizar-Sicairos were awarded the international prize today by the Friends of Helmholtz-Zentrum Berlin (HZB).

Read the full story: *https://www.psi.ch/en/psd/scientific-highlights/psi-scientists-win-innovation-award-on-synchrotron-radiation-2021*

M. Liebi et al.,Nature 19 November 2015 / https://doi.org/10.1038/nature16056