Record-fast neutron tomography tracks water pathways into plants
NeXT-Grenoble has the most intense cold neutron flux for imaging purposes. For the first time, researchers have captured neutron tomography images in about a second, nearly an order of magnitude faster than previously reported attempts. The ability to acquire images so quickly allowed scientists from the University of Potsdam and the ILL to capture, with unprecedented detail, the fast processes involved when roots absorb water and other nutrients from the soil. A better understanding of these root-soil interactions could help optimise water-use efficiency and crop production, which could help meet higher demands from an increasing world population with limited resources.

Read more

New understanding of magnetic monopoles could signal new technologies
Researchers at Kent University applied a combination of quantum and classic physics to investigate how magnetic atoms interact with each other to form composite objects known as ‘magnetic monopoles’. Basing the study on materials known as spin ices, the team showed how the ‘hop’ of a monopole from one site in the crystal lattice of spin ice to the next can be achieved by flipping the direction of a single magnetic atom. Although in theory at low temperatures the magnetic atoms do not have enough energy to do this, the team found that as a monopole arrives in a lattice site, it induces changes in the fields acting on the magnetic atoms surrounding it, which enable them to ‘tunnel’ through the energy barrier.

Read more

Neutrons shining light on the structure of silk-derived biomaterials
Silk may well be the oldest biomaterial humans have exploited. The primary protein comprising silk is fibroin and, in the last century, it has been intensely studied for a variety of advanced applications beyond luxurious fabrics. Some of the most exciting current research is exploring the potential of this protein in a range of applications using neutrons. Research is taking place at the ILL, where a number of instruments and techniques are ideally suited to the study of biological material and sensitive organic structures like proteins.

Read more

MORE HIGHLIGHTS HERE!
**Green light for the first InnovaXN projects**

The ILL and ESRF have obtained a EU grant to support a PhD programme called "InnovaXN". The programme will support 40 fully-funded PhD projects (*which must involve an industrial partner*), with two recruitment waves, each with 20 students (hired either by ESRF or ILL) in September 2020 and September 2021. The InnovaXN committee has recently selected 20 projects from 60 expressions of interest from European industry and their academic partners. The approved projects cover a wide range of research fields such as chemistry, catalysis, aerospace, automotive and consumer products. The projects will be advertised for prospective students in early 2020.

[Read more](#)

**Free "gold open access" publications**

As part of the *FILL2030* project, the ILL will be financing about 40 publications with "gold open access" status by the end of 2020. Please fill out this short [form](#) to request an open-access grant. The funding will run on a ‘first come, first served’ basis. Check out the remainder on requirements for ILL publications: *What you need to know.*

**New procedure for accessing the ILL reactor building (Level C)**

From now on, all persons wishing to access the reactor building must undergo a security screening process (known as ‘criblage’ in French) which could take up to about three weeks. This means that visitor access requests involving access to instruments or equipment inside the reactor building must be submitted more than three weeks in advance. The procedure will be fully-operational by the end of 2019.

[Read more](#)