

Consult our [web site](#) and follow us on [Twitter](#) !

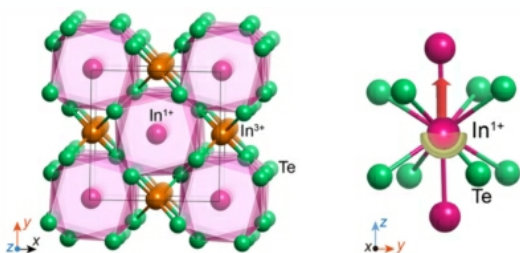
## After restarting in February, normal reactor operation foreseen end March

### REACTOR RESTART



As planned, the ILL reactor restarted on 27 February thanks to the completion of key maintenance and major upgrade work during 16 months. Modifications made to allow the reactor to restart after such a long shutdown prevent it from operating at nominal power to deliver the science programme. The reactor is therefore stopping with a view to resuming normal operation by the end of March. The 16-month shutdown has seen the successful completion of a major work programme - one of the most challenging and complex that the ILL has ever seen, both for the reactor and for the experimental infrastructure. This achievement will underpin cutting edge science and innovation at the ILL for the decade to come! [Read more](#)

### HIGHLIGHTS AND SCIENCE NEWS



#### The microscopic origin of ultra-low thermal conductivity in Indium Tellurium

Approximately 70% of all energy produced by humanity currently ends up as waste heat. As the world witnesses the accelerating and intensifying impact of climate change, the huge potential of this unused energy has come into sharp focus. Thermoelectric technologies enable a direct conversion of heat into electricity; wider deployment of these technologies, however, requires the development of more efficient materials. Though rattling atoms and lone pair electrons have been associated with low thermal conductivity – a key parameter for the achievement of high-performance thermoelectric materials – the detailed explanation remained, until recently, long-unresolved. A comprehensive study combining theoretical and experimental techniques has now revealed the microscopic origin of ultra-low thermal conductivity in indium tellurium (InTe), providing valuable information to guide the design of more efficient materials. [Read more](#)



#### Dynamics of the *E. coli* proteome at cell death temperature

What exactly happens inside a cell during thermal death was, until recently, a hotly debated question. Collaborative research between Italian and French scientists combined state-of-the-art neutron scattering at ILL with multiscale Molecular Dynamics (MD) simulations to reveal that only a minor fraction of the *E. coli* proteome unfolds at cell death provoking a striking dynamic slowdown and demonstrating the strong association between protein dynamics and bacterial metabolism and death. [Read more](#)

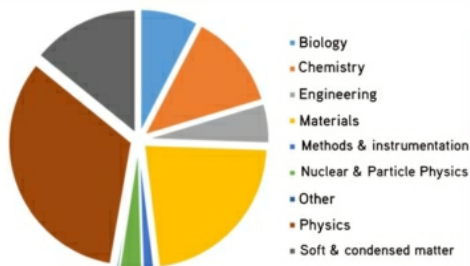


#### Secrets of a silky cotton shirt

Naturally occurring plant cellulose, our most abundant renewable resource, consists of fibers of long polymer chains that are tightly packed in parallel arrays in either of two crystal phases collectively referred to as cellulose I. During mercerisation, a process that involves treatment with sodium hydroxide, cellulose goes through a conversion to another crystal form called cellulose II, within which every other chain has remarkably changed direction. In order to understand how this change of cellulose chain direction is possible, a neutron diffraction experiment with deuterium labelling was performed at the ILL. It showed that during mercerisation of bacterial cellulose, chains fold back on themselves in a zigzag pattern to form crystalline anti-parallel domains. This result provides a molecular level understanding of one of the most widely used industrial processes for improving cellulosic materials. [Read more](#)

[MORE HIGHLIGHTS HERE !](#)

[A SELECTION OF RECENT ILL PUBLICATIONS](#)



**614 proposals were submitted** by the latest deadline. They will be reviewed during the panels meeting on 18-19 April, and scheduled between June and October 2023. In 2024, three reactor cycles are foreseen in the second semester. There will be no proposal round in September, and **next proposal deadline will be in February 2024**.

**Easy Access** requests for short measurements and **DDT requests** for full experiments to be performed as soon as possible can be submitted at any time.

The reactor operation schedule for 2023 is available on the ILL [website](#). The figure shows the research area distribution of submitted proposals.

### Important information for users coming to the ILL

You will now be able to access to the ILL main building and experimental halls after your site entrance badge has been programmed to allow access to the ZAC (controlled access zone: *zone à accès contrôlé*) on the ground floor reception in the new ILL50 building. Your dosimeter will also be distributed at this stage.

**The reception at the ZAC entrance is open Monday to Saturday from 7am until 7pm, but closed on Sundays.**

It will still be possible to enter the site at night and on Sundays and access the Guesthouse, for example, but not to enter the ZAC.

### New rules for access to radiation protection areas

To comply with French regulations regarding the protection of workers against the risks of ionising radiation, the ILL must implement new rules for users working in controlled areas. These rules are being applied from the first reactor cycle of 2023. Users coming for an experiment and working in the ILL's experimental areas should now comply with these new rules.

Read all the necessary information [here](#).



### ReMade@ARI is happy to announce its first call for proposals for 2023!

As a hub dedicated to developing **new materials for a circular economy**, ReMade@ARI provides scientists exploring the properties and structures of recyclable materials with coordinated access to more than **50 European analytical research infrastructures**. Users can now submit proposals for access to these infrastructures via a unified procedure on a dedicated [online portal](#).

Applicants are also welcome to submit a **pre-proposal** to receive [support](#) from the scientific network of ReMade@ARI to develop their idea into a **full proposal**.

**THE DEADLINE FOR PROPOSAL SUBMISSION IS 30 APRIL 2023.**

[Previous issues of the ILL newsletter](#)

Consult our [web site](#) and follow us on [Twitter](#) !



[www.ill.eu](http://www.ill.eu)  
[communication@ill.eu](mailto:communication@ill.eu)  
 To unsubscribe follow instructions [here](#).