

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

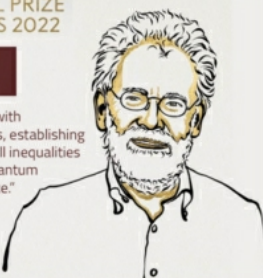
## HIGHLIGHTS AND SCIENCE NEWS

### THE NOBEL PRIZE IN PHYSICS 2022

Anton  
Zeilinger

"for experiments with entangled photons, establishing the violation of Bell inequalities and pioneering quantum information science."

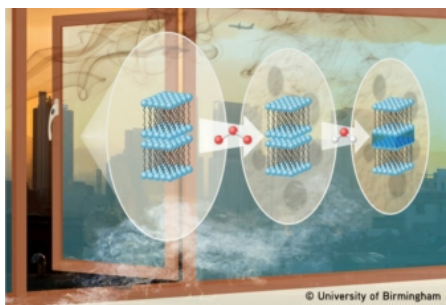
Illustration: Nicklas Elmehed



### Congratulations to Anton Zeilinger for the Nobel Prize in Physics 2022

The Royal Swedish Academy of Sciences awarded the Nobel Prize in Physics 2022 jointly to Alain Aspect, John F. Clauser and Anton Zeilinger "for experiments with entangled photons, establishing the violation of Bell inequalities and pioneering quantum information science". One of the laureates, Anton Zeilinger, started his scientific career with neutron experiments at the Atominstitut (Vienna, Austria) and the ILL.

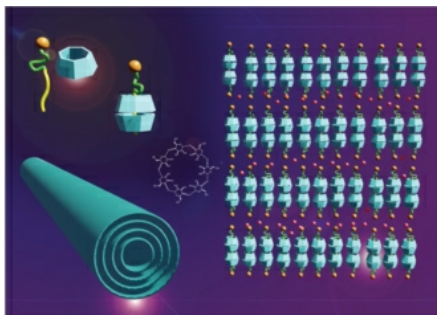
[Read more](#)



© University of Birmingham

### Grimy windows could be harbouring toxic pollutants

Dirty windows can harbour potentially harmful pollutants under protective films of fatty acids from cooking emissions – and these can hang around over long periods of time. According to a new study, led by researchers at the University of Birmingham and which used both neutrons and X-rays, the fatty acids contained within cooking emissions are highly stable and not easily broken down in the atmosphere. That means that when they hit a solid surface, like a window, they form a self-organised thin film which builds up over time and will only be broken down very slowly by other chemicals in the atmosphere. [Read more](#)



### Hierarchical assembly of pH-responsive surfactant-cyclodextrin

Surfactants, the amphiphilic molecules which provide the cleaning power of detergents, and cyclodextrins – small cyclic oligosaccharides – spontaneously form inclusion complexes, where one surfactant molecule is treaded by one or more cyclodextrin unit. In this work, a thermodynamic and structural approach was used to characterize the morphology of these assemblies. Small-angle neutron scattering (SANS) experiments allowed us to probe the structure of the aggregates with a resolution of the nanometer. The experiments were complemented with optical and electron microscopy and revealed a spontaneous assembly of the inclusion complexes into highly ordered structures. The pH-driven changes in structure of the supramolecular assemblies are very relevant, which can be exploited, for instance, for delivery applications. From a fundamental science perspective, this work highlights the importance of short and long-range interactions involved in controlling the assembly process. This work was featured on the back cover of *Soft Matter*. [Read more](#)

*Photo: soft matter, 2022, 18, 6771*

[MORE HIGHLIGHTS HERE !](#)

[A SELECTION OF RECENT ILL PUBLICATIONS](#)

## GENERAL NEWS



© R. Eriksson

### ILL and ESS brought together 320 neutron researchers in Lund

The ILL and ESS facilities held their 3rd joint ILL User meeting in Lund on 5-7 October. This major conference for European neutron researchers showcased the latest developments made possible by neutrons across a diverse range of research areas, provided status updates about the facilities and looked ahead to future opportunities for neutron science. For the first time the conference took place in Lund, allowing the scientists and future users of ESS to visit the next-generation research facility and see the progress in technical installations and high-performance instrumentation first-hand.

A large number of science talks in a wide range of research fields were held during the conference, highlighting for example the mRNA delivery, such as that used for the Covid-19 vaccines, the function of proteins in the SARS-CoV-2 virus, cutting-edge research relating to carbon capture, superconducting materials, batteries and fuel cells, as well as insights into Martian meteorites. The ESS-ILL User meetings provide an important platform for collaboration, exchanging ideas about science and experimental techniques, enabling consolidation of Europe's world-leading role and shaping the future for neutron science.



### Neutron Mag2Pol - new version and online courses

We are pleased to announce the new version of Mag2Pol (v5.1) and the associated online introductory courses. Mag2Pol is a software for the analysis of single-crystal and powder diffraction data, both for X-rays and neutrons. Nuclear and magnetic structures including structural twin and magnetic domain populations can be refined from spherical polarimetry and flipping ratio data as well as from integrated intensities and powder patterns. The upgrade to Mag2Pol version 5.1 comes along with many crystallographic features including magnetic space groups and magnetic superspace groups. The transformation tools allow the user to convert any structure to a different setting and to adapt magnetic (super)space groups to their parent space group symmetry. The structural and magnetic degrees of freedom can be previewed including the deformation of bonds and polyhedra. Mag2Pol is available for Windows, macOS and Linux and can be obtained together with examples, tutorials and more documentation on [www.ill.eu/mag2pol](http://www.ill.eu/mag2pol).

A series of online introductory courses took place in October and covered the general use and specific features. The recordings and example files can be obtained on the website. Upon request, other sessions will be organised in the future. Subscribe to the newsletter on the Mag2Pol website in order to follow the latest developments. The detailed programme can be consulted on the Mag2Pol website.

### Reactor operation in 2023

The provisional reactor operating schedule for 2023 is now available on the ILL website. Please note that this schedule is not yet final as there are still too many uncertainties to be addressed. Equipment that has been out of service since October 2021 will not necessarily restart without a hitch. As for the new Endurance instruments on H24, they must successfully undergo commissioning testing. Several stages still need to be completed before we can set definite restart dates, although the schedule for the remaining work and testing does include a small time buffer for unexpected delays. Anyway, the reactor is scheduled to deliver 3 full cycles by October 2023. We are all looking forward to the return of our neutrons and the resumption of the scientific programme. Everyone here at the ILL is doing their very best to meet these objectives. The dates of the next proposals deadline and panel meeting will be announced [here](#).

[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](#).