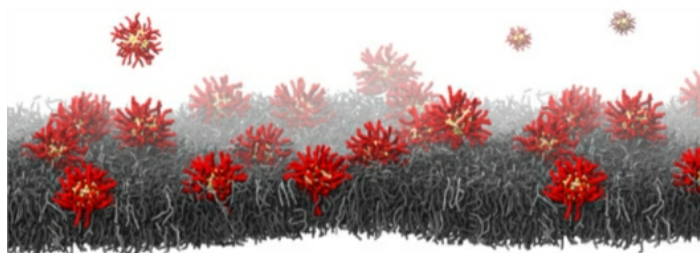




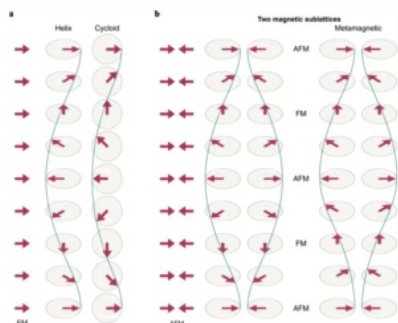
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## SPOTLIGHTS ON SCIENCE



### Scientists explore the unknown behaviour of gold nanoparticles with neutrons

Nanoparticles, particles of less than 100 nm in size, are used to engineer new materials and in other forms of "nanotechnology" across a variety of sectors. They are found in sun creams and cosmetics as well as inside our bodies, serving as drug delivery vehicles and contrast agents for pharmaceuticals. Nanomaterials also pose a potential risk, however, as their interactions with living matter and the environment are not fully understood; in other words, it is possible that they might not perform as expected. Neutron experiments combined with molecular dynamics computation have highlighted phenomena which will help scientists better predict how nanoparticles behave inside the human body. [Read more](#)



### Antiferromagnetism, with a twist

A variety of magnetic structures based around ferromagnetic spin spirals have been the topic of intense study over the past decade. A particularly relevant example concerns magnetic spiral structures: although formally antiferromagnetic, with the total magnetization in the sample summing to zero, such helices can be thought of and described mathematically as twisted ferromagnetic structures. Small-angle neutron scattering allowed the observation of spiral magnetic order arising from an antiferromagnetic state instead. [Read more](#)



### Precise measurements of beta asymmetry at the ILL rule out neutron decay into exotic dark matter particles

Measuring the neutron lifetime accurately is important for several reasons. Crucially, it is needed to account for the evolution of matter in the Universe just after the Big Bang (in particular, the amount of helium created), and to explain the development of galaxies and stars. In addition, it provides subtle clues, important in particle physics theory, for untangling the subtle interactions between quarks – the fundamental particles constituting neutrons and protons. One important parameter in particle physics (and for neutron lifetimes) is so-called "beta asymmetry". To know more about measurements of beta asymmetry at the ILL, and how these can shed light on the neutron lifetime mystery. [Read more](#)

[MORE HIGHLIGHTS HERE !](#)

## NEWS FOR USERS



### Proposal Round

579 proposals were submitted to the ILL at the last round, for a total request of 3473 beam days. 357 proposals were accepted for a total of 1554 days; these will be scheduled during the last 1.5 cycles in 2019. The next proposal deadline is 17 September 2019. The reactor operating schedule can be: <https://www.ill.eu/reactor-and-safety/high-flux-reactor/cycles/>



#### Food on site

If you are an ILL user coming for an experiment you use your site entrance badge to pay for meals at the restaurant and take-away counter. If you are a reimbursed user, your badge will now be pre-loaded with a meal allowance, covering all the meals paid for by the ILL during your experiment. If you are a non-reimbursed user, you must load your badge at the restaurant cash desk before your first meal, as it will not be pre-paid.

[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 reminder note on requirements for ILL publications: [what you need to know](#).

[Previous issues of the ILL newsletter](#)



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