ILL news

JUNE 2016 - NUMBER 64

In brief

• Prof. Helmut Schober has been appointed Director of the ILL with effect on 1st October 2016. More on p.2.

• At the end of 2015 our Associates and Scientific members formally approved the next stage of our instrument upgrade programme – Endurance. It will provide a suite of novel instruments, infrastructure and technical upgrades to help maintain the ILL's leading position in neutron science for another 20 years. More on p. 8.

• In a day-long event on 2 May the ILL paid homage to the first French director of the ILL, the late Bernard Jacrot. Bernard Jacrot played an important role in bringing neutron scattering to condensed matter physics in the nineteen-fifties and to structural biology in the seventies and eighties. More on p. 12.

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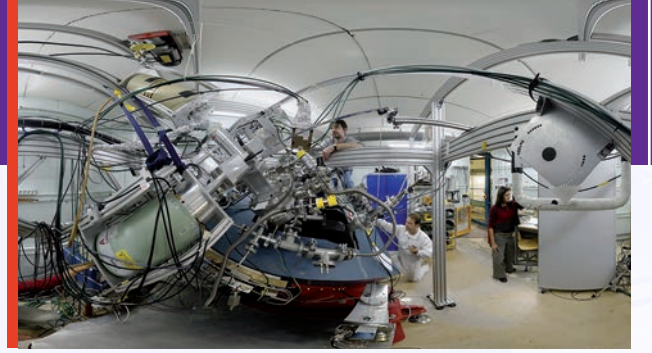
NEUTRONS FOR SCIENCE



Helmut Schober, the ILL's next Director

Helmut Schober has been appointed Director of the ILL as of 1 October 2016, taking over the reins from Bill Stirling, who will be leaving the ILL at the end of September. Helmut Schober joined the ILL in 1994. He led the Institute's Time-of Flight High Resolution group from 2001 to 2011, before being appointed Director for Science and German Associate Director of the ILL.

Helmut is from Bavaria in Germany, where he studied physics at the University of Regensburg, before going on to the University of Colorado in Boulder (USA) and specialising in the spectroscopy of molecular systems. He later carried out research at the University of Mainz and the Forschungszentrum Karlsruhe before joining the ILL. His research has focused on fullerenes, the dynamics of liquids and glasses and on neutron instrumentation.

Helmut is also currently an Associate Professor at Grenoble Alpes University, having previously taught as visiting professor at the Technical University of Munich. He is a former chair of the German Committee for Research with Neutrons (KFN) and was the coordinator of the European Neutron and Muon Integrated Infrastructure Initiative (NMI-II).

As we announced in ILL News 63, the new Head of the ILL Science Division will be Mark Johnson, who has been appointed as the ILL's new UK Associate Director with effect from 1 October 2016.

Mark Johnson and Helmut Schober

Mark joined the ILL in 1995, to work in the Time-of-Flight group on the backscattering spectrometers IN10 and IN16. In 1999 Mark Johnson became Head of the Computing for Science group in the Science Division. The group has developed a coherent approach to data treatment across a wide range of instruments and deployed simulation methods to help optimise instrument performance and provide atomistic models to give detailed insight into neutron scattering data. Since 2012 Mark has led the European NMI3-II project, including the consortium's successful bid for further funding with the SINE2020 project in the Horizon 2020 Framework Programme.

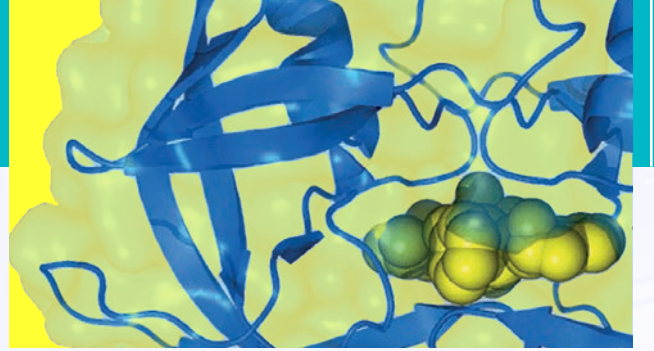
Former ILL student wins the SFN's 2016 PhD award

P. Fouquet (ILL) and A. Desmedt (CNRS, Bordeaux)

The French Neutron Society's 24th neutron diffusion meeting "*Journées de la Diffusion Neutronique*" was held on 2-4 May 2016 in Carqueiranne on the Côte d'Azur. One of the meeting highlights was the award of the SFN's annual PhD Award to Laura Chaix, well known to us at the ILL. Laura presented her brilliant work on "Dynamical Magnetoelectric Coupling in Multiferroic Compounds". Laura studied for her PhD at Grenoble's Université Joseph Fourier and at the ILL from 2011 to 2014. She is currently a post-doctoral science fellow at the University of Stanford in California. The SFN jury was chaired by Liliane Léger (LPS, Orsay, France), who presented a fascinating review entitled "Dynamics of formation, structure and properties of grafted polymer layers: contributions of neutron techniques".

From left to right: Sophie Combet (SFN prize organiser), Arnaud Desmedt (SFN chairman), Laura Chaix (2016 SFN PhD Prize winner) and Liliane Léger (chair of the 2016 SFN PhD Award jury).

The meeting was organised by M. Plazanet (LIPhy, University of Grenoble), E. Dubois and N. Jouault (Phenix, University Pierre et Marie Curie, Paris), F. Damay (LLB, Saclay), and P. Fouquet (ILL) for the Société Française de la Neutronique's scientific committee.
More information is available on:
http://jdn-conference.net or
http://www.sfn.asso.fr.

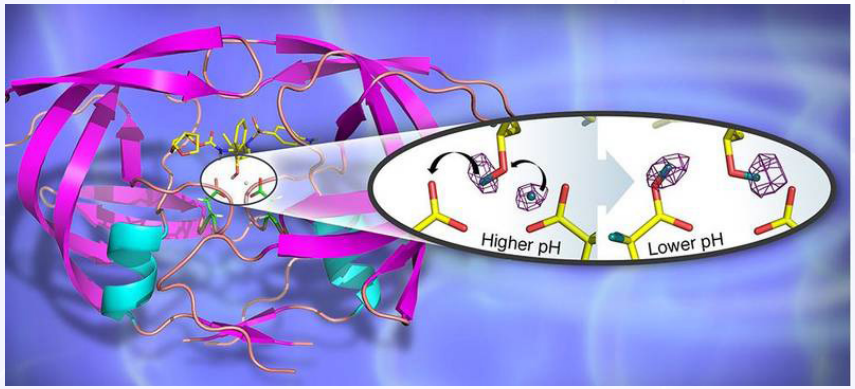


Could neutrons provide the key to next-generation HIV drugs?

HIV-1 protease is an enzyme which is essential for the replication of HIV, the retrovirus that causes AIDS. The enzyme is a key target for HIV/AIDS drugs. Neutrons can play a key role in understanding its structure and function at the atomic level, including the location and movement of hydrogen atoms, which is vital for understanding drug resistance and guiding rational drug design.

HIV treatment involves medication to prevent and treat the opportunistic infections occurring when the immune system is compromised; it also involves the use of antiretroviral therapy (ART) to attack the virus itself, with the aim of halting the development of AIDS. HIV-1 protease is an enzyme responsible for the maturation of virus particles into infectious HIV virions, the process which ultimately leads to the development of AIDS. Without effective HIV-1 protease activity, HIV virions remain non-infectious. Given the essential role of HIV-1 protease in HIV replication, its disruption is the key objective of successful ART drugs.

The design of effective ART drugs has been led by work on the structures of HIV-1 protease/drug complexes. These are determined using X-ray crystallography and has led to the development of commercial drugs. A limitation of the method is that the positions of mobile hydrogen atoms and protons cannot be determined using X-rays. Knowledge of their location and movement is vital, however, for guiding the design of more effective drug therapies, since hydrogen-bonding interactions play a key role in how effectively a drug binds to its target.



HIV-1 protease in cartoon representation with bound clinical drug darunavir.
© J. Hemman and A. Kovalevsky (Oak Ridge National Laboratory)

Recently however, a collaboration between the ILL and the USA's Georgia State University and Oak Ridge National Laboratory has used neutron crystallography to probe the structure of HIV-1 protease in complex with the clinical inhibitor darunavir. Neutron data were collected on LADI (ILL) and IMAGINE (Oak Ridge National Laboratory) instruments. This has allowed details of the hydrogen-bonding interactions in the active site to be determined and revealed ways to enhance drug binding and reduce drug resistance. The group was also able to shed light on the sensitivity to pH of the enzyme's catalytic activity.

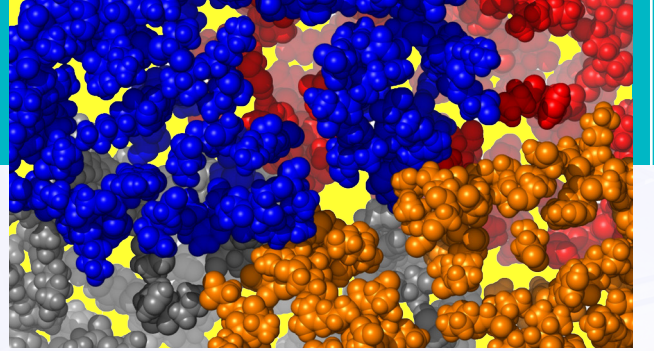
By determining structures at different pHs, the group was able to directly observe the positions of hydrogen atoms before and after a pH-induced two-proton transfer between the drug and the enzyme. The low-pH proton configuration in the catalytic site, critical for the catalytic action of this enzyme, was shown to be triggered by electrostatic effects arising from protonation state changes of surface residues far from the active site.

These details can help assist in the design of new more effective ART drugs and were only possible through the use of neutron crystallography.

Direct observation of proton transfer in chemical and biological systems is challenging; macromolecular neutron crystallography has been pivotal in providing the key details required regarding hydrogen, in order to answer long-standing questions about the enzyme mechanism of this important HIV drug target. Moreover, the observation that changes in amino acid protonation states distant from the active site can trigger a change in hydrogen configuration in the active site may apply to other aspartic proteases, and perhaps to enzymes more generally. With the recent improvements that have been made, the field of macromolecular neutron crystallography is expanding. Studies are now addressing a variety of important biological processes, from protein folding to antibiotic resistance and proton transport across biological membranes.

Contact: Matthew Blakeley

A. Kovalevsky *et al*., Angewandte Chemie International Edition 55 (2016) 4924, DOI:10.1002/ange.201509989



Observation of magnetic fragmentation in spin ice

Spin ice is an unusual magnetic material, in which the combination of strong local Ising anisotropy and ferromagnetic interactions imposes a local constraint on the magnetic moments, following the "ice rule" (see figure 1a). The magnetic state thus remains disordered but with specific local correlations. It belongs to the class of Coulomb phases, an original state of matter where the ground state is disordered, and the local constraint can be interpreted by the flux conservation law of electromagnetism.

Classical excitations in spin ice, called magnetic monopoles, are defects that locally violate the ice rule by reversing the orientation of a moment (see figure 1b). They thus induce a magnetic charge in the electromagnetic field. When the density of monopoles is high enough, an outstanding effect can be predicted: the emergent charged field can fractionalize into two parts, through the so-called "magnetic fragmentation" mechanism.

This "magnetic fragmentation" has been observed in a recently discovered material, the spin ice candidate $Nd_2Zr_2O_7$, by means of neutron scattering measurements. This fragmentation (see figure 1c) manifests itself as a striking coexistence between an antiferromagnetic ordered state and a Coulomb phase with ferromagnetic-like correlations. Experimentally, it manifests as the superposition of magnetic Bragg peaks, characteristic of the ordered phase, and a pinch point pattern, characteristic of the Coulomb phase (see figure 2). The experiments further showed that these two fragmented parts of the magnetic moment field behave independently.

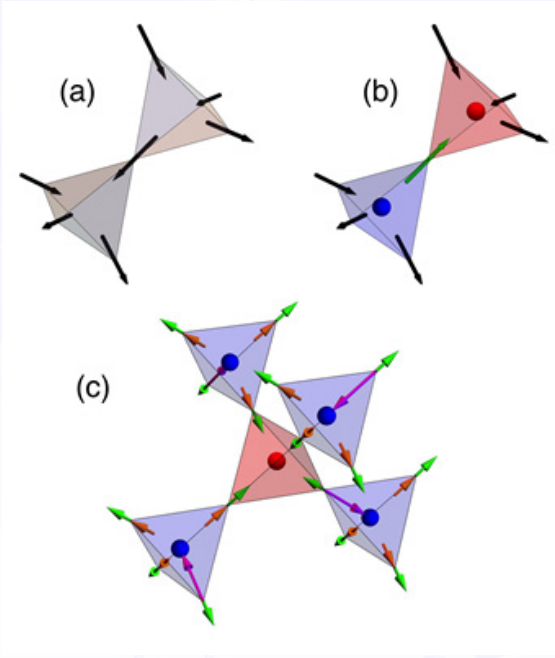


Figure 1: **(a)** The spin-ice "two-in two-out" configuration of the spins (arrows). **(b)** A spin flip (green arrow) creates 2 magnetic monopoles in the centre of the tetrahedra (red and blue dots).
(c) The fragmented moments superimposed on the lattice. They are composed of "all-in all-out" (green arrows) moments from the crystallized monopoles and of the fluctuating (orange and purple arrows) spins from the (spin-liquid) Coulomb phase.

Through these observations, the experiments demonstrate that the electromagnetic field is "real" in these magnetic materials; they highlight the relevance of quantum effects.

They open a new route for the study of frustrated magnets.

These results could only be achieved through a series of neutron scattering techniques performed on ILL instruments: neutron diffraction on the D23-CEA-CRG diffractometer to observe the ordered fragment; polarised diffuse scattering and inelastic scattering on the D7 and IN5 spectrometers respectively, to observe the fluctuating part and the inelastic process.

Contact: Jacques Ollivier, Hannu Mutka, Andrew Wildes

S. Petit *et al.*, Nature Physics (2016)
DOI: 10.1038/NPHYS3710

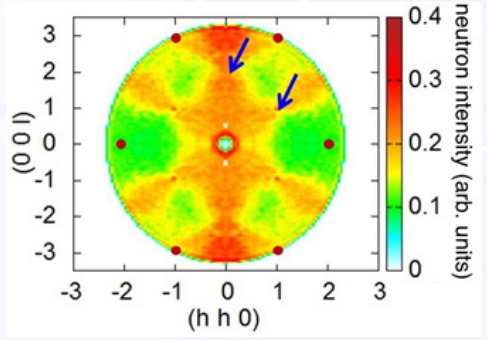


Figure 2: Iso-energy inelastic intensity (E = 50 μeV) showing the pinch points, characteristic of the fluctuating fragment.

Endurance: Phase 1 is launched!

The ILL has led neutron science for almost 50 years, a remarkable record, essentially due to our capacity to offer outstanding instruments fed by the brightest continuous neutron source in the world. This high pedigree has been perpetuated by attracting the most talented scientists and technical staff, and via the continuous development of instrumentation and neutron technology. The most recent development programme - Millennium - is coming to an end: commissioning of the majority of the instruments in the ILL22 guide hall is now complete, and the wide-angle spin-echo spectrometer WASP is under construction.

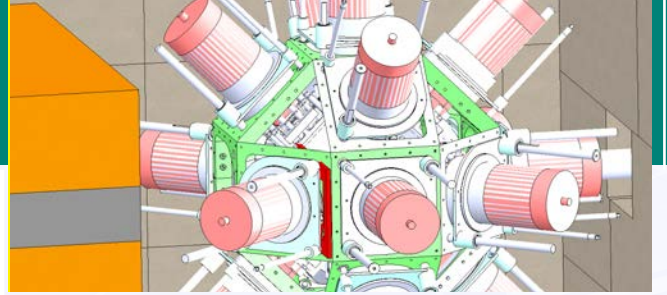
At the end of 2015 our Associates and Scientific members formally approved the next stage of our instrument upgrade programme – Endurance.

Endurance will provide a suite of novel instruments, infrastructure and technical upgrades to help maintain the ILL's leading position in neutron science in the future. The construction and delivery of Endurance instruments and infrastructure will be split into two phases: Phase 1 (2016-2019) and Phase 2 (2019-2023) (see table).

The infrastructure projects are NESSE and BASTILLE

The aims of the NESSE project are to provide new capabilities and an increased efficiency in sample environment provision. Driven by the Advanced Neutron Environment team, NESSE covers a broad range of areas established from statistics and feedbacks of users and instrument teams. NESSE also takes advantage of the fruitful collaborations established with European facilities.
To begin, much faster cryostats producing less background and novel hydrostatic high-pressure devices for the study of samples in solutions are appearing. Next-generation humidity chambers, stopped-flow observation heads and SANS pressure cells are also progressively being introduced. Soon, an instrumentation engineer and a PLC expert will temporarily reinforce the team to develop next-generation adsorption and Langmuir troughs, implement dynamic light scattering on SANS and automate the operation of our dilution inserts.

BASTILLE is a project to provide state-of-the-art software for data reduction and analysis for the next decade and beyond, pursuing, as far as possible, a community approach with other neutron scattering facilities. In this context, the Computing for Science group has recruited 3 software engineers for 3 years and a software consultant from the company Tessella in order to join the MANTID project alongside ISIS, SNS and ESS and deploy the MANTID software on a wide range of instruments at ILL. The new team started in May and is working initially on data reduction for time-of-flight and backscattering spectrometers. This ILL software initiative is closely linked to a major European software collaboration in the SINE2020 project (see www.sine2020.eu).



	Project	Description
Phases 1 & 2 (2016 -2023)		
	Nesse	A suite of new and upgraded sample environments for all scientific disciplines, soft, hard and bio.
	Bastille	Modern data analysis software to complement a modern ILL instrument suite.
Phase 1 (2016-2019)		
	XtremeD D10+ IN13+	New, high intensity powder and single crystal diffractometer optimised for extreme sample environments. This instrument will be operated as a Spanish CRG.
		Upgraded, more intense, single crystal diffractometer. Better adapted monochromators and non-magnetic sample stage for high magnetic field capability.
		Re-positioning of IN13 on the renewed H24 guide allows this CRG instrument to be upgraded to fully optimise the primary spectrometer.
	H24 (Guide)	Renewal of H24 thermal guide with m = 2 multi-branch guide serving the above instruments. Partial renovation of H23 for relocation of Laue and technical beamlines.
	Panther	New thermal spectrometer for studying dynamics in complex solids. Replaces and enhances the IN4 instrument with improved monochromators and position sensitive detector for single crystal studies (phase 1, new position sensitive detector).
Guide Independent	Rainbows	Upgrade option to the D17 and FIGARO reflectometers. Wavelength encoding using prisms allows white beam specular reflectivity measurements with more than one order magnitude flux gains.
	SuperSUN	New, world-beating source of ultra-cold neutrons for experiments in fundamental physics.
	Fipps	New, high-resolution fission fragment spectrometer for studying exotic nuclei (phase 1 germanium detectors and casemate).
	H1 / H2 (In-Pile Guides)	Necessary periodic renewal of the in-pile neutron guide extraction from the heart of the ILL reactor.
Phase 2 (2019-2023)		
	Ramses D7+ IN5+	New cold spectrometer for studying dynamics of advanced materials in extreme environments. Replaces and enhances the IN6 instrument.
		Upgraded primary spectrometer, monochromator, polariser and relocated on new H15 guide promises intensity gains on this diffuse scattering instrument with polarisation-analysis and TOF capabilities.
		An upgrade to the already outstanding IN5 cold spectrometer. Increased neutron flux due to guide renovation and extension of the energy range and resolution with a new chopper system.
	H15 / H16 (Guide)	Renewal of the H15 and H16 cold guides with m = 2 multi-branch guide serving the above instruments.
Guide Independant	Panther (pt 2)	New thermal spectrometer for studying dynamics in complex solids. Replaces and enhances the IN4 instrument with improved monochromators and position sensitive detector for single crystal studies (phase 2, new primary spectrometer).
	Fipps (pt 2)	New, high-resolution fission fragment spectrometer for studying exotic nuclei (phase 2 selector).

Table: list and timescale of Endurance projects.

ADD2016, 3rd edition of the joint ILL-ESRF School and Conference on Analysis of Diffraction Data in Real Space

EPN Campus 7-9 March (School) and 9-11 March (Conference) 2016

The ADD2016 Organisers (M. Brunelli, G. Cuello, B. Dubouloz, H. Fischer (ILL) and G. Vaughan (ESRF))

Featuring over a dozen invited speakers and over 110 participants, ADD2016 focused on the structure of disordered systems, and on nano-structured materials in particular, for which traditional structural refinement methods in X-ray and neutron diffraction can be ineffective. To investigate these systems, one needs to Fourier transform the reciprocal-space diffraction data into real space using the techniques of PDF analysis, liquids/glasses diffraction, or single-crystal diffuse scattering, depending on the system under study. The resulting pair-distribution function (PDF) gives a real-space picture of the sample's atomic structure up to several nanometers.

ADD2016 expanded upon the previous ADD2013 edition, to include single-crystal diffuse scattering in the scientific programme. In addition to the tutorials organised during ADD2013 on PDFgui, RMCprofile, DISCUS and EPSR, the two-day School proposed a 5th hands-on tutorial on the use of the Yell software. Each student was able to follow two hands-on tutorials after the introductory lectures on liquid/glass diffraction, PDF-analysis and single-crystal diffuse scattering.

The ADD2016 Conference agenda covered a total of 23 oral presentations on liquid/glass diffraction, PDF analysis, single-crystal diffuse scattering and their associated modelling/simulation techniques. Special topics were also presented, including polarised neutron diffraction to suppress incoherent scattering, coherent X-ray diffraction for the study of atomic dynamics in glasses, and new real-space approaches to the analysis of short-range magnetism in strongly correlated materials using magnetic pair-distribution function (mPDF) analysis. The 36 posters remained on display in the coffee area during the full 2 days of the Conference. Three poster prizes were awarded at the conference dinner at the *Corne d'Or* restaurant in the Chartreuse mountains overlooking Grenoble.

Since the first edition in 2011 these ADD meetings have brought together users who, although using different techniques for studying disorder/structure at the nano-scale (liquid/glasses diffraction, PDF analysis and single-crystal diffuse scattering), employ the same concepts and similar methods to analyse the data. More important still, the organisers feel that ADD2016 has made clear progress in establishing the ADD meetings as an international reference point, creating a new community of scientists interested in (dis)order at the nano-scale using diverse but complementary diffraction techniques.

More information can be found at
http://www.ill.eu/press-and-news/past-events/2016/analysis-of-diffraction-data-in-real-space/

A group photo of the conference participants.

Louis-Pierre Regnault and Neutron Spectroscopy in Condensed Matter Physics

ILL, 30-31 March 2016

S. Raymond, J.E. Lorenzo and L. Tellier (ILL)

The aim of the workshop on "Neutron Spectroscopy in Condensed Matter Physics" was to provide a review of state-of-the-art inelastic neutron scattering studies and demonstrate the lasting legacy of Louis-Pierre Regnault. About 100 participants attended the twenty talks on topics in condensed matter physics to which Louis-Pierre has made his impressive contribution.

As highlights of the workshop we could mention talks by I. Zalyzniak (BNL) and K. Kakurai (JAEA) on quantum spin systems, and on Haldane's conjecture by M. Verdaguer (IPMC). P. Bourges (LLB) and P. Dai (Rice University) gave a review of unconventional superconductivity, from the discovery of the resonance peak in the cuprates to recent research on Fe-based compounds. Y. Su (JCNS) covered the field of frustrated magnetism, and M. Braden (Köln University) that of multiferroics, including the most recent time-resolved experiments. These latter talks particularly highlighted the importance of polarized neutron scattering, and both J.E. Lorenzo (CNRS) and H. Ronnow (EPFL) described their quests for exotic magnetic correlation functions using such techniques. The workshop made perfectly clear that the answer to forefront scientific questions often calls for new and original advanced instrumentation - E. Lelièvre-Berna (ILL) contributed a report in this respect on spherical polarimetry, as did N. Martin (LLB) on non-resonant spin echo on TAS instruments. Finally, the state of the art in neutron experiments under 40T pulsed magnetic fields was described by F. Duc (LNCMI-Toulouse).

The workshop was punctuated by a number of crispy anecdotes by some of Louis-Pierre's collaborators, including present and former ILL directors, Bill Stirling, Helmut Schober and Christian Vettier, together with members of his family.

Louis-Pierre has now chosen to end his scientific career, but his pioneering work and the instrumentation he helped to develop will remain part of his legacy, part of the incredible story of triple-axis spectrometry.

For those of us who have had the pleasure to work with Louis-Pierre, his determination to perform the best possible experiment, together with that contagious smile, will stay in our minds for ever.

Many thanks, Louis-Pierre !!!

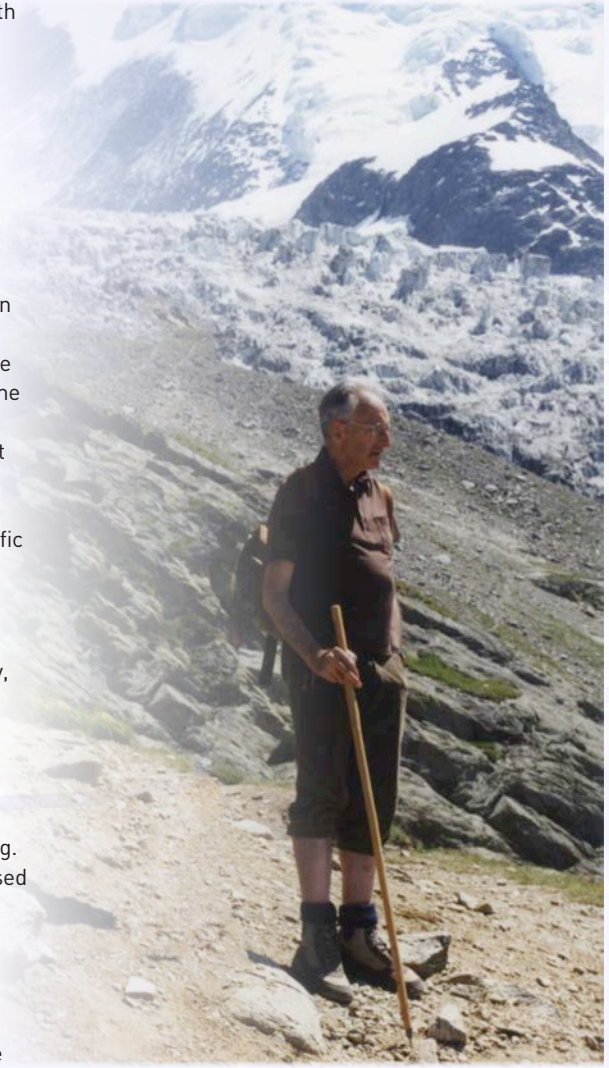
A group photo of the workshop participants.

Homage to Bernard Jacrot

ILL, 2 May 2016

J. Zaccai (ILL)

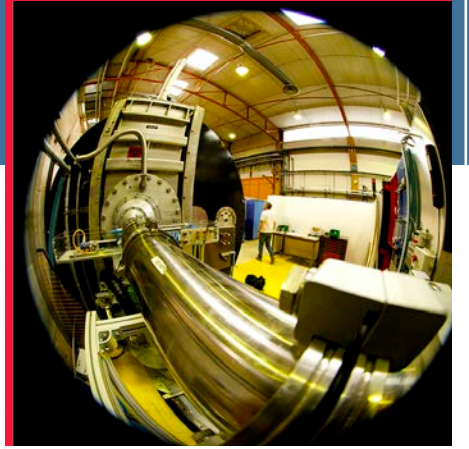
Bernard Jacrot died peacefully in his ninetieth year on the 21 January. On 2 May the ILL organised a commemoration in his honour in the presence of his family, friends and colleagues. It was a fitting occasion for all to be reminded of the wealth of personal and professional relationships and friendship shared with Bernard Jacrot, in the broader context of anecdotes about life in the early days of the ILL. Bernard Jacrot, who was the first French director of the ILL, also played an important role in the beginnings of neutron scattering in condensed matter physics in the nineteen-fifties and of structural biology in the seventies and eighties. Bernard was always reluctant to speak about himself. When I met him he had already switched to biology but I learnt a lot about his early career from his colleagues, who stressed not only his scientific and technical achievements but also his profound humanism.



Jacrot entered École Polytechnique in 1947. After graduation, he joined the CEA in Saclay, where a small reactor had just been built. He was among the few who initiated the application of inelastic neutron scattering to the then revolutionary science of condensed matter physics and is considered among the founding fathers of French neutron scattering. Jacrot was part of the group that first proposed the ILL at the Geneva conference in 1964. German physicists and in particular Maier-Leibnitz, who became the first director of ILL, saw in the project a concrete political act, encouraged by Adenauer and de Gaulle. French and German neutron scatterers were fascinated by the achievements promised by the joint technical and scientific adventure.

Maier-Leibnitz and Jacrot recruited the young German and French scientists and engineers who designed and built a new generation of instruments and set up the policy that opened up the ILL to other than neutron specialists. After his term as associate director, Jacrot left Grenoble in 1973 to spend a year in Cambridge to 'learn' biology, convinced that there were great discoveries to be made by applying the full breadth of physical methods to biological structure analysis.

He returned to ILL as senior scientist for biology, determined to introduce the interdisciplinary physics/biology approach that also paved the way for neutron scattering in soft condensed matter. It was not an easy task but Jacrot patiently imposed structural biology on the site, first as ILL senior scientist then as director of the European Molecular Biology Laboratory outstation. He established a group in structural virology and published extensively in the field. He wrote a review of small-angle scattering in biology whose clarity ensures it is still consulted today, and he visited labs to introduce neutrons to biologists in a language they could understand. He was appointed to the management team of the Life Sciences at CNRS where he contributed significantly to the development of structural biology in France. He wrote books about the relations between physics and biology and on the history of ILL. In 1980, he was awarded the Felix Robin prize of the French Physical Society for his lifetime achievement in physics.



Reimbursement claim

Please note that claim forms MUST be submitted no later than **six months** after the final day of your visit to ILL.
To ensure you complete the claim forms correctly, please refer to: http://www.ill.eu/about/travelling-to-the-ill/ and http://www.ill.eu/users/user-guide/reimbursement-procedures/.
If you need help with the form and cannot find the answer on our web pages, please contact the User Office: sco@ill.eu.

Next PhD proposal call

The deadline for submitting a PhD proposal is **7 November 2016.**
More information can be found at:
http://www.ill.eu/science-technology/phd-students/phd-recruitment/applying/

Celebration of 50 years of neutron backscattering in Garching

50 years ago, in 1966 Heinz Maier-Leibnitz proposed the idea of neutron backscattering for achieving high energy resolution in neutron spectroscopy. To celebrate the achievements and to demonstrate the potential of this technique an international workshop is being held at the research Campus of Garching, near Munich, on 2-3 September. Anton Heidemann (who brought the technique at the ILL by building IN10, commissioned in 1974) and Manfred Birr, the authors of the very first paper on neutron backscattering spectroscopy (along with Bert Alefeld), will be present at the event. Please note that the **abstract submission will be closed on 1 July**.
Detailed information on the preliminary program is available on
https://webapps.frm2.tum.de/indico/event/30/

Next proposal round

The next deadline for the submission of proposals and long-term proposals (LTP) is **Thursday, 15 September 2016, midnight (Central Europe).** The web system will **open on 1 July 2016**. Proposals will be reviewed over October/November and the Subcommittee will meet to assess them on **22-23 November 2016.**

Proposals must be submitted via the Electronic proposal submission system (EPS) on our new User Club portal (https://userclub.ill.eu/userclub/). Log in with your username and password. The detailed guidelines for the submission of a proposal at the ILL can be found on the website: http://www.ill.eu/users/applying-for-beamtime/electronic-proposal-system/.

You can find the rules for LTP submission at http://www.ill.eu/users/applying-for-beamtime/long-term-proposal/. **Please note that the LTP requirements and evaluation procedure have changed.**

If you have any problems, you will receive full support from the User Club team. Please allow sufficient time for any unforeseen computing hitches. If you have any difficulties at all, please contact our web support (club@ill.eu). For other queries, contact the User Office (sco@ill.eu).

Updated list of environment codes

We have appended new codes for the environment equipment available at the ILL. In particular, a wider choice is now available for those experiments to be performed close to ambient conditions. We would appreciate very much that you take the time to check this list to identify the codes which best match your needs.

Instruments available

The following instruments will be available for the forthcoming round. Note that PN3 GAMS will not be available this round.

- powder diffractometers: D2B, D20, SALSA, D1B*
- disordered materials diffractometer: D4
- single-crystal diffractometers: D3, D9, D10, D23*
- large scale structure diffractometers: D19, LADI, D16
- small-angle scattering: D11, D22, D33
- reflectometers: D17, FIGARO, SuperADAM*
- diffuse-scattering and polarisation analysis spectrometer: D7
- three-axis spectrometers: IN1-LAGRANGE, ThALES, IN8, IN20, IN12*, IN22*
- time-of-flight spectrometers: IN4, IN5, IN6, BRISP*
- backscattering and spin-echo spectrometers: IN11, IN15, IN16B, IN13*
- nuclear-physics instruments: PN1
- fundamental-physics instruments: PF1B, PF2, S18*
- fission product prompt gamma-ray spectrometer: FIPPS

* Instruments marked with an asterisk are CRG instruments, where a smaller amount of beamtime is available than on ILL-funded instruments, but we encourage applications for these.

The list of **operating CRGs** is as follows (status June 2016):

CRG-A: D1B, IN13
CRG-B: BRISP, D23, SuperADAM, IN12, IN22, S18
CRG-C: CRYO-EDM (no public beamtime available)
GRANIT jointly funded with LPSC (UJF, CNRS)

You will find details of the instruments on our website at
http://www.ill.eu/instruments-support/instruments-groups/

Scheduling period

The proposals accepted at this round will be scheduled in the first cycle of 2017.

College Secretaries

College 1 - Applied metallurgy, instrumentation and techniques: *Emmanuel Fahri*
College 2 - Theory: *Marie-Bernadette Lepetit*
College 3 - Nuclear and particle physics: *Tobias Jenke*
College 4 - Magnetic excitations: *Jacques Ollivier*
College 5A - Crystallography: *Estelle Mossou*
College 5B - Magnetism: *Navid Qureshi, Thomas Saerbeck (vice secretary)*
College 6 - Structure and dynamics of liquids and glasses: *Gabriel Cuello*
College 7 - Spectroscopy in solid state physics and chemistry: *Andrea Piovano*
College 8 - Structure and dynamics of biological systems: *Anne Martel*
College 9 - Structure and dynamics of soft-condensed matter: *Orsolya Czakkel, Yuri Gerelli (vice secretary)*

Calendar

Important dates:

Autumn 2016 council
Proposal deadline: 15 September 2016 (midnight Central Europe)
Subcommittee meetings: 22-23 November 2016
Scientific Council: 24-25 November 2016

Spring 2017 council
Proposal deadline: 14 February 2017 (midnight Central Europe)
Subcommittee meetings: 4-5 April 2017
Scientific Council: 6-7 April 2017

2017 provisional reactor operating schedule

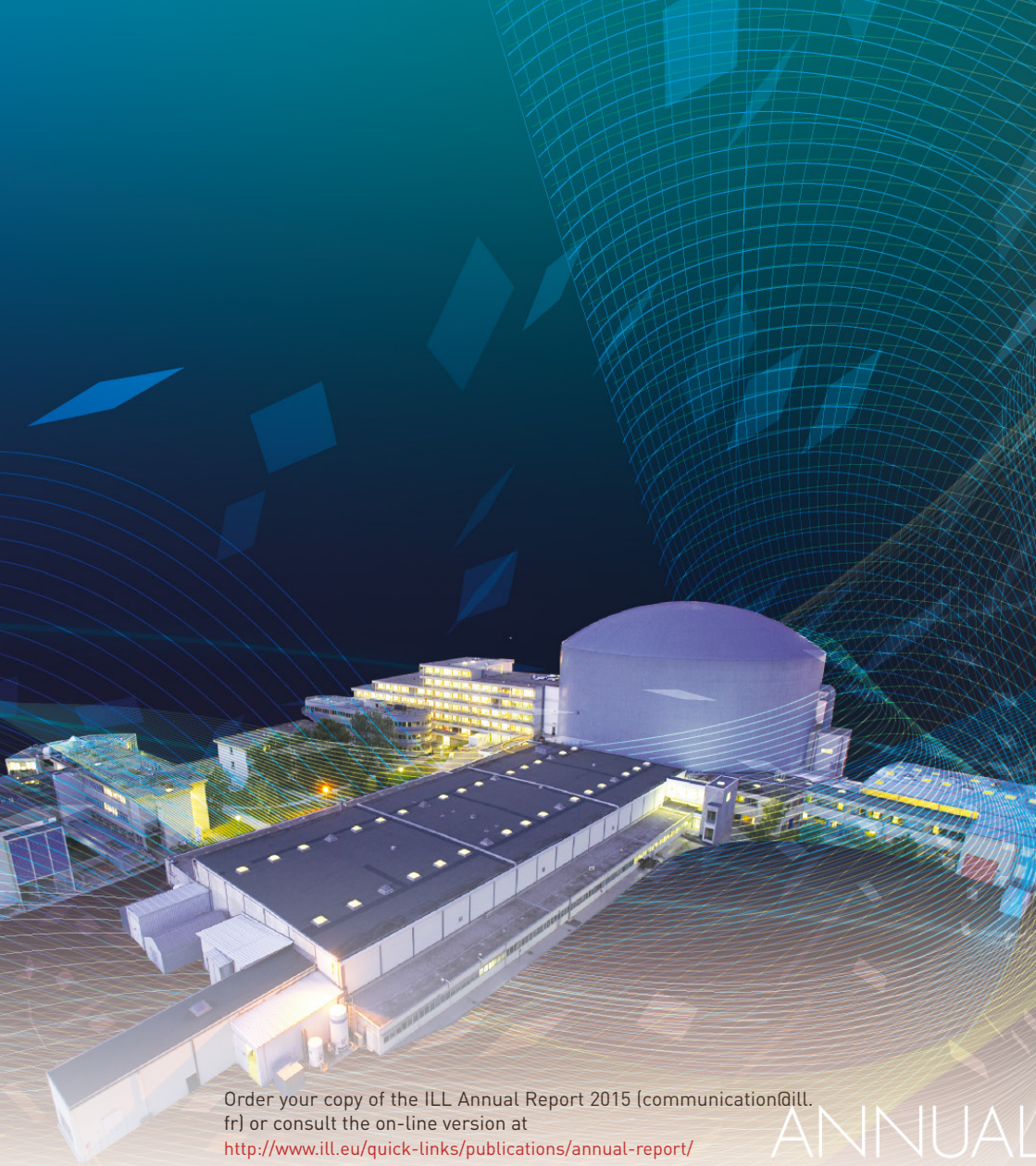
Cycle n° 181	from to	17/01/17 08/03/17	50 days 52,5 MW
Cycle n° 182	from to	28/08/17 15/10/17	48 days 56 MW
Cycle n° 183	from to	02/11/17 22/12/17	50 days 52,5 MW

Provisional dates for future reactor operations can be found at
http://www.ill.eu/reactor-environment-safety/high-flux-reactor/cycles/projected-operation/

Forthcoming Workshops

• RheoSAS 2016 (ILL, 19-21 September 2016)
https://indico.ill.fr/indico/event/28/

• 4th International Soft Matter Conference, ISMC 2016 (Grenoble, 12-16 September 2016)
http://www.ismc2016.org/



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ANNUAL REPORT

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