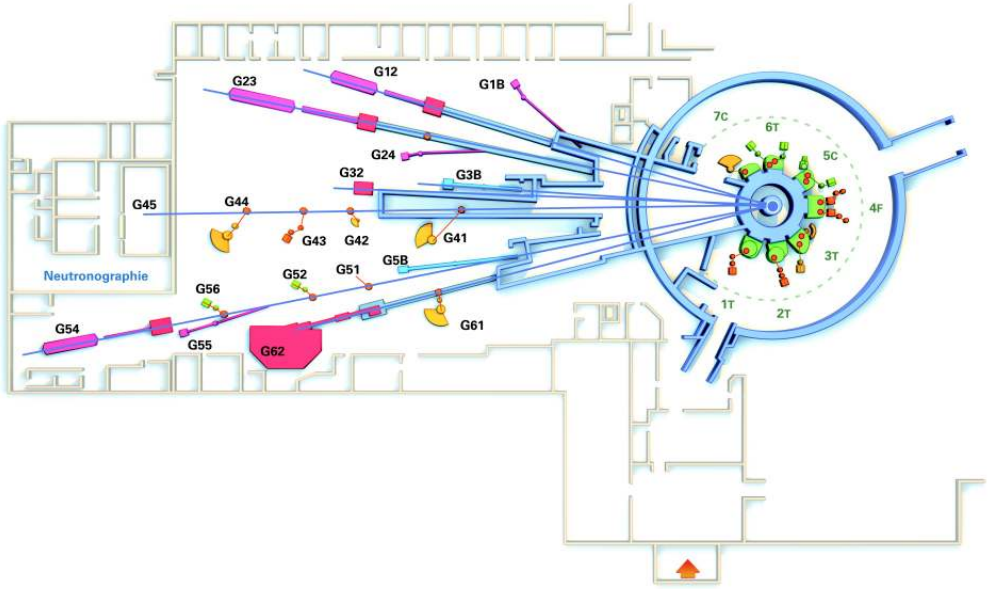
# GENERAL LAYOUT OF THE SPECTROMETERS




| | SPECTROMETERS OPEN TO USERS | CONTACTS |
|---|---|---|
| | **Powder diffractometers** | |
| **3T2** | Florence Porcher | florence.porcher@cea.fr |
| **G4.1** | Gilles André | gilles.andre@cea.fr |
| **G6.1** | Isabelle Mirebeau | isabelle.mirebeau@cea.fr |
| | **Single crystal diffractometers** | |
| **5C1** | Béatrice Gillon | beatrice.gillon@cea.fr |
| **5C1** | Alain Cousson | alain-f.cousson@cea.fr |
| **6T2** | Arsen Goukassov | arsen.goukassov@cea.fr |
| | **Diffuse scattering instrument** | |
| **7C2** | Brigitte Beuneu | brigitte.beuneu@cea.fr |
| | **Small-angle scattering instruments** | |
| **G1.2** | Didier Lairez | didier.lairez@cea.fr |
| **G2.3** | Alain Lapp | alain.lapp@cea.fr |
| **G5.4** | José Teixeira | jose.teixeira@cea.fr |
| **G5bis** | Sylvain Désert | sylvain.desert@cea.fr |
| **G5.5** | Grégory Chaboussant | gregory.chaboussant@cea.fr |
| | **Diffractometers for material science studies** | |
| **6T1** | Marie-Hélène Mathon | marie-helene.mathon@cea.fr |
| **G5.2** | Vincent Klosek | vincent.klosek@cea.fr |
| | **Reflectometers** | |
| **G3bis** | Fabrice Cousin | fabrice.cousin@cea.fr |
| **G2.4** | Frédéric Ott | frederic.ott@cea.fr |
| | **Triple-axis instruments** | |
| **1T** | Daniel Lamago / Yvan Sidis (CRG Instrument Karlsruhe/LLB) | daniel.lamago@cea.fr / yvan.sidis@cea.fr |
| **2T** | Philippe Bourges | philippe.bourges@cea.fr |
| **4F1** | Sylvain Petit | sylvain.petit@cea.fr |
| **4F2** | Daniel Petitgrand | daniel.petitgrand@cea.cr |
| | **Quasi-elastic instruments** | |
| **G6.2** | Jean-Marc Zanotti | jean-marc.zanotti@cea.fr |
| **G1bis** | Stéphane Longeville | stephane.longeville@cea.fr |
| | **Neutron radiography** | |
| **G4.5** | Guy Bayon | guy.bayon@cea.fr |

## THE LLB-ORPHEE NEUTRON SCATTERING AND IMAGING INSTRUMENTS

**Powder diffractometers**

**3T2** "Thermal neutrons" 2-axis (50 detectors) high resolution, mainly for nuclear structure determination.

**G4.1** "Cold neutrons" 2-axis (multidetector 800 cells) high flux, mainly for magnetic structure determination

**G6.1** "Cold neutrons" 2-axis (multidetector 400 cells) with long wavelength (~5Å) and high flux, for the study of very small powder samples (<1mm$^3$). Very high pressure cell available (40 GPa).

**Single crystal diffractometers**

**5C1** "Hot neutrons" 2-axis with lifting arm, polarized neutrons, magnetic field (8 Tesla) for spin-density maps determination

**5C2** "Hot neutrons" 4-circle for nuclear structure determination.

**6T2** "Thermal neutrons" 2-axis, lifting arm and 4-circle, mainly for magnetic structure determination. 12 Tesla magnetic field available, 2D detector.

**Diffuse scattering instruments**

**7C2** "Hot neutrons" 2-axis (multidetector 640 cells) for local order studies in liquid or amorphous systems. Cryostat and furnace available (1.2K to 1300°C).

**Small-angle scattering instruments**

**G1.2** "Cold neutrons" (annular detector, 30 rings) for study of large scale structures in isotropic systems (mainly polymers and colloids).

**G2.3** "Cold neutrons" (X-Y detector, 128x128 cells) for study of large scale structures (10 to 500 Å) in anisotropic systems (polymers under stress, metallurgical samples, vortex in superconductors).

**G5.4** "Cold neutrons" (X-Y detector, 64x64 cells) for multipurpose studies of large scale structures.

**G5bis** Very Small Angle Neutrons Scattering spectrometer

**G5.5** "Cold neutrons" (X-Y detector, 64x64 cells) ; polarized beam ; large scale magnetic structures ; contrast variation by nuclear polarization of protons.

**Diffractometers for material science studies**

**6T1** "Thermal neutrons" 4-circle for texture determination.

**G5.2** "Cold neutrons" 2-axis for internal strain determination in bulk samples with spatial resolution ~ 1mm$^3$.

**Reflectometers**

**G3bis** "Cold neutrons" reflectometer operating in time-of-flight mode for multipurpose surface studies.

**G 2.4** "Cold neutrons" reflectometer with polarized neutrons and polarization analysis for the study of magnetic layers.

**Triple-axis instruments**

**1T** "Thermal neutrons" high-flux 3-axis instrument with focussing monochromator and analyser, mainly devoted to phonon dispersion curves measurements. Very high pressure cell (100 Kbar) available.
CRG Instrument operated in collaboration between the INFP Karlsruhe and the L.L.B

**2T** "Thermal neutrons" high-flux spectrometer with focussing monochromator and analyser, mainly devoted to spin-waves and magnetic excitations studies (1.5 to 80 meV).

**4F1**
**4F2** "Cold neutrons" high flux 3-axis instruments with double monochromator and analyzer, mainly devoted to the study of low-energy (15µeV to 4meV) magnetic excitations. Polarized neutrons and polarization analysis option available.

**Quasi-elastic instruments**

**G62** "Cold neutrons" high resolution (~15µeV at 10Å) time-of-flight instrument for the study of low energy excitations, mainly in disordered systems.

**G1bis** "Cold neutrons", high resolution and high flux spin-echo instrument. It can study, in a large Q range, slow dynamics of large molecules in biology or long relaxation times like in glassy transition (Fourier times ~ 20ns)

**Neutron Radiography**

**G4.5** Imaging technique : white beam facility for non-destructive control or dynamics imaging.

***http://www-llb.cea.fr/fr-en/spectros_p.php***

## AUXILLIARY SERVICES AVAILABLE

Laboratories for sample preparation:

- Chemistry laboratory
- Biological laboratory

Technical help for:

- Vacuum/Cryogenics
- Cryostat, Furnace (0.1 – 2000 K)
- High pressures (up to 10 GPa)
- High magnetic fields (up to 10 T)
- Mechanics

# ACCESS TO BEAMTIME

**LLB has been selected in the frame of the European Community – Access activities of the Neutron scattering and Muon spectroscopy Integrated Infrastructure Initiative (NMI3) which supports access to neutron beams for the selected user teams, travel and subsistence fees of visiting scientists. The program is opened to E.C. users and to scientists of the associated states.**

**http://idb.neutron-eu.net/facilities.php**

***Beamtime access is free of charge for any experimentalist from the French Scientific community. LLB takes in charge the expenses (travel and stay) of 2 people during the experiment.***

***Beamtime on the 23 open-access spectrometers can be requested by submission of:***

- ***An experimental application to a Selection Committee (Normal Procedure)***

***This procedure is open to any public/industrial researcher that is interested in using neutron scattering for his research. Results should be free to be totally or partially published in a Scientific Review.***

***DEADLINE FOR APPLICATION: May 1st and November 1st***
***http://www-llb.cea.fr/en/fr-en/proposal.php***

- ***An experimental application to the Directors (Exceptionnal)***

***This special procedure should only be used exceptionally for hot topics, confidentiality reasons or if an anomaly in the review procedure is suspected. The delay between the acceptation decision and the realization of the experiment is shortened to the minimum.***
***There is no deadline for such propositions, which are examined all along the year.***
***http://www-llb.cea.fr/en/fr-en/proposal.php***

- ***A fast access application***

***This procedure allows a rapid access (1 to 2 months delay) to the spectrometers in order to perform a short experiment (1 day max.). It can be used for feasibility tests, sample characterization, obtaining complementary results…***
***There is no deadline for such propositions, which are examined all along the year.***
***http://www-llb.cea.fr/en/fr-en/prop-rap.php***

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# SELECTION COMMITEES

Proposals are examined by 5 Selection Committees. Each is composed of 10 to 12 senior scientists that are nominated by the management of LLB for 3 years. At least half of them do not belong to the LLB and 2 or 3 are coming from foreign institutes.

For each spectrometer, LLB gives a beam-time available which is shared out by the committee; each proposal gets a grade A or B or C.

A : The experiment must be done and the committee allocates a beam-time

B : The experiment might be done if there is some extra beam-time,

C : The experiment is refused on scientific arguments.

Selection Committees are asked to take care of the educationnal duty of the LLB when proposal comes from new young searcher.

## SELECTION COMMITEES: SCIENTIFIC FOCUS AND SUB-FOCUS

**Theme I Chemical physics, biological systems**

- I.01 Polymers and Supramolecular Structures
- I.02 Water, aqueous solutions, polyelectrolytes, surfactants
- I.03 System of biological interest, Biophysics
- I.04 Colloids, nanostructures
- I.05 Gels, composite materials
- I.06 Other...

**Theme II Crystallographic and magnetic structures**

- II.01 Crystalline structures
- II.02 Phases transitions
- II.03 Magnetic Structures
- II.04 High pressures (on powders)
- II.05 Other...

**Theme III Magnetism: Single-crystal systems and thin layers**

- III.01 Magnetic thin layers
- III.02 Spin density
- III.03 Systems with strong quantum correlations
- III.04 Extreme conditions (strong fields, high pressures)
- III.05 Magnetic nanosystems
- III.06 Other...

**Theme IV Disordered Systems, nanostructured materials and materials**

- IV.01 Liquid and amorphous structures
- IV.02 Dynamics of disordered systems
- IV.03 Thin film materials
- IV.04 Nanostructured materials, precipitation, cavities,…
- IV.05 Crystallographic textures
- IV.06 Strains and residual stresses
- IV.07 Other...

**Theme V Excitations**

- V.01 Magnons
- V.02 Supraconductivity
- V.03 Coupling spin-network
- V.04 Dynamics in frustrated systems
- V.05 Polarized neutrons with polarization analysis
- V.06 Phonons
- V.07 Other…

# LLB Reviewing committees (Automn 2009)

## COLLEGE 1 : Physico-Chemistry, Biological systems

*Organisers : G. Carrot, N. Malikova*

| LLB representatives | French users | European users |
|---|---|---|
| J. Jestin | C. Chassenieux | W. Hauessler |
| D. Lairez | E. Dubois | R. V. Klitzing |
| | P. Fontaine | P. Stepanek [Chairman] |
| | R Schweins | M. Sferrazza |
| | | M. Weik |

## COLLEGE 2 : Magnetic and nuclear structures

*Organisers : F. Porcher, F. Damay*

| LLB representatives | French users | European users |
|---|---|---|
| J.-M. Kiat | M.-H. Lemée-Cailleau | G. Heger [Chairman] |
| I. Mirebeau | G. Rousse | J. Alonso |
| | M. Josse | L. Chapon |

## COLLEGE 3 : Magnetism : Single crystals and thin films

*Organisers : A. Bataille, J. Robert*

| LLB representatives | French users | European users |
|---|---|---|
| B. Gillon | K. Dumesnil | J. Campo [Chairman] |
| | E. Janod | K. Temst |
| | O. Mentré | |

## COLLEGE 4 : Disordered systems and Materials

*Organisers : V. Klosek, M.H. Mathon*

| LLB representatives | French users | European users |
|---|---|---|
| F. Audonnet | J.-L. Bechade [Chairman] | B. Frick |
| | D. Morineau | M. Fitzpatrick |
| | P. Vajda | |

## COLLEGE 5 : Excitations

*Organisers : P. Bourges, D. Petitgrand*

| LLB representatives | French users | European users |
|---|---|---|
| S. Petit | M. Boehm | P. Link [Chairman] |
| H. Moudden | L.-P. Regnault | J. Hlinka, |
| | P. Foury | D. Reznik |