

Report of for NMI3 of the School “Crystallography and Neutrons”

Ile d’Oléron 21-24 September 2014

The annual thematic school of the French Neutron Society (SFN) was dedicated this year to “Crystallography and Neutrons” to connect with the International Year of Crystallography. It took place in Oléron, a small island close to the Atlantic French coast, from September 21–24, 2014 during the 22nd “Journées de la Diffusion Neutronique” (JDN22). The CNRS conference centre was the venue for the school gathering 24 students, 12 teachers and 7 people from the organization.

The school focused on the specific strengths of neutron scattering (magnetism, light elements, contrast methods) for the study of various kinds of materials, with regards to other investigative techniques. The school began on Sunday afternoon with two lectures on the fundamentals of crystallography (O. Perez, CRISMAT) and the bases of diffraction (P. Becker, ECP), followed by an after-dinner lecture on Neutron Sources and Neutron Optics (P. Courtois, ILL). The two next days were devoted to lectures and training on nuclear and magnetic structure determinations from experimental neutron diffraction data by two eminent experts, V. Petricek (Prague), author of the JANA program and J. Rodriguez- Carvajal (ILL) who created the world-known FULLPROF suite.

Each one of these two main sections consisted of a two-hour lecture in the morning followed by two-hour of practical training in the afternoon where the necessary software was distributed to the students.

The characteristics of neutron diffractometers for powder and single crystal diffraction were described by N. Qureshi (ILL) with a very didactic approach before the first tutorial. In addition to classical structure determination, A.Gukasov (LLB) gave an overview of the applications of neutron diffraction under extreme conditions and polarised neutron diffraction for spin density determinations and studies of magnetic anisotropy. Introductory lectures were also provided on diffuse scattering (I. Mirebeau, LLB), inelastic scattering (S. Petit, LLB) and reflectometry (E. Kentsinger, Jülich). All this gave a rather complete overview of the relevant neutron techniques for material science.

The last half-day of the school was common with the Rossat-Mignod meeting (September 24–26) and began with a session dedicated to crystallography, followed by the SFN prize session. The first session was introduced by an invited talk on “Crystallography in Superspace” by B. Toudic (Rennes) followed by oral communications.

The pleasant place and the wonderful weather gave a great opportunity for fruitful exchanges between all the participants in the school.

A book gathering the lectures of the school will be published in the collection SFN/EDP Sciences and will be open access on <http://www.neutron-sciences.org> in the year 2015.

This international school (September 21–24) was mainly supported by the CNRS (“Centre National de la Recherche Scientifique”), the SFN, the Laboratoire Léon Brillouin (LLB), the Institut Laue-Langevin (ILL) and (we hope) NMI3 (Neutron and Muon Initiative), with contributions from the “Ecole Centrale de Paris” and the “Triangle de la Physique.”

The Organisers: M.T. Fernandez-Diaz, B. Gillon, P.E. Janolin, J.M. Kiat and F. Porcher