

SCHOOL REPORT

School:	Berlin School on Neutron Scattering
Specific	Title: 34th Berlin School on Neutron Scattering
Dates:	13th – 21st March 2014
Venue:	Helmholtz Zentrum Berlin für Materialien und Energie, Lise Meitner Campus, Hahn-Meitner-Platz 1, 14109 Berlin, Germany
Organizer's Name:	Bella Lake
Organizer's Affiliation:	Helmholtz Zentrum Berlin für Materialien und Energie
Total budget:	17.750,58 EUR
Maximum NMI3-II support:	9.500,00 EUR

Scope

The aim of the school is to provide an introduction to neutron scattering with an emphasis on hands-on, practical experience. The school combines a lecture course on specific neutron scattering techniques with a series of hands-on practicals on seven different instruments which the students perform in small groups. We also show how a large scale facility runs with tours of the beam halls and an introduction to neutron user service. Furthermore there are also lectures on how neutrons are used to tackle problems in specific subject areas e.g. biology, energy etc., and a poster session where the students present their own research and can discuss how neutrons can be used to solve their problems. The aim of the school is to give a broad overview of what can be achieved by neutron scattering rather than specializing on a particular technique. We hope that the students are able to identify how neutron scattering can help them in their current research and also develop an appreciation of the scope of neutron scattering and how it may be useful to them in the future.

Students

29 students were chosen to attend the school from a total of 94 applicants. They came from 15 different countries; 10 were from German institutions and 16 from other European institutes. Furthermore there were 3 additional overseas students funded by the IAEA, from Japan, Egypt and Argentina. The vast majority of the students (23 people) were studying for their PhD, we also had 4 diploma/master's students, 1 postdoc and 1 senior scientist. The students came from a wide range of scientific backgrounds including biology, chemistry, engineering, materials science, medicine, geology and physics. Finally, of the students 10 were women and 19 were men giving a gender ratio of ~1:2.

Organisation

The first 2 days of the school (Thursday and Friday) consisted of lectures on the principles and techniques of neutron scattering. There were also tours of the neutron beam halls and the sample environment to help the students familiarise themselves with the layout of the instruments. Saturday morning was devoted to specialist guest lectures, Dr Paul Henry gave an inspiring talk about the ESS project, Dr Ralf Feyerherm spoke about how the combined use of x-ray and neutron scattering can be used to explore materials and Dr Andrea Denker described how neutron auto-radiography provides information about works of art. The rest of the weekend was free. The remaining technique lectures were given on the next Monday

morning. After this the practical part started. The students were divided into 7 groups of ~4 people according to subject area and performed a total of 7 experiments (triple-axis spectroscopy, powder diffraction, small angle scattering, reflectometry, time-of-flight diffraction, tomography and residual stress diffraction). The experiments lasted 3 hours each and took place during the next 3.5 days. Unfortunately, the reactor was off during the neutron school, this was unforeseen at the time of the neutron school announcement (in September 2013). Because of this the practical sessions were adjusted so that while the students still had a tour of each instrument and were able to control and move it, they also did more data analysis than in previous years. On the last evening of the school there was a poster session where the students presented their work and discussed with the lecturers which neutron techniques could be used to answer their research questions. This was followed by the neutron school dinner. The last morning of the school consisted of lectures on how to use neutron scattering as a tool for research in the subject areas of biology, geosciences and physics. There was also a lecture on how to design a neutron instrument and finally the students were shown how to apply for beamtime. At the end of the school a certificate was issued and the students were asked to complete a questionnaire.

Results

The school was very successful as reflected in the positive feedback we received from the students in their questionnaire. For example, 81% of the students said that the lectures were at the right level. Concerning the practical part, the majority of students were satisfied, with 95% saying that the introductions to the instruments were very helpful or sufficient and 87% saying that their own involvement in the practical exercise was sufficient. We were also pleased with the response to the poster session, 88% rated this as very or fairly helpful. This was the first time we had a poster session and we will definitely continue it in the future although as suggested by the students we will probably hold it close to the beginning of the school rather than the end. Some of the students asked for a problem sheet to make the lectures more interactive and we intend to address this issue in the next school.

Organizer's E-mail: bella.lake@helmholtz-berlin.de