

SCHOOL REPORT

NMI3 event N°: S-11-I/173

Title: Application of Neutrons and Synchrotron Radiation in Engineering Materials Science

Dates: 07.10.2013 – 11.10.2013

Location: 'Haus am Schüberg', Ammersbek (near Hamburg), Germany

Organizers: Prof. Dr. Andreas Schreyer

Affiliation: Helmholtz-Zentrum Geesthacht

Total budget: 20 K€

Maximum support granted: 10 K€

Agreement date:

Scope

The school provided a systematic overview of the use of neutrons and photons in the field of engineering materials science. The program touched all "state-of-the-art" scattering and imaging techniques using the two probes in a focused three days course complemented by a two days practical at DESY. The school was the continuation of four very successful autumn schools with the same title in 2005, 2007, 2009 and 2011.

Student

54 participants with 15 nationalities from 11 different countries from all over Europe participated in the school.



13 students from 6 different European countries applied for NMI3 financial support with a total amount of 7,628.20 €.

Organisation

The school took place from 7th to 11th of October 2013 in Ammersbek near Hamburg. Organizers of the school were HZG, CAU Kiel, University Göttingen, HZB, TU Berlin and MU Leoben with financial support of the EU program NMI3 and the "Gesellschaft zur Förderung des Helmholtz-Zentrums Geesthacht e.V.". The language of the school was English. The three days theoretical course was given at the conference centre "Haus am Schüberg" in Ammersbek which is located about 20 km from Hamburg city centre. "Haus am Schüberg" offers a good infrastructure for all participants. The program of the theoretical course included 19 talks given by internationally renowned experts. The

speakers provided their lectures which were compiled into a handout book. In addition the book "Neutrons and Synchrotron Radiation in Engineering Materials Science", which has resulted from previous autumn schools, was provided for all participants. As social event a boat trip on the river Alster in Hamburg with dinner on the ship was organised.

The two days practical on neutron and X-ray methods took place at the instruments of the German Engineering Materials Science (GEMS) Centre at the HZG outstation at DESY. A Bus transfer was organized to shuttle the students to the Hotel in Hamburg.

Results

The 19 talks of the theoretical course were given by internationally renowned experts with topics in the fields "materials and processes", "sources" and "methods" (scattering, imaging). The last part "advances techniques" contained a view into current research and neighbouring fields using photons and neutrons like single-grain diffraction methodologies, nanodiffraction in materials science, X-ray microscopy setups and in operando neutron scattering studies on Li-ion batteries. In a students' presentation session about 20 Ph.D. students presented the concept of their work in 3 minutes talks.

In the following two day practical at the HZG outstation at DESY the students were introduced to the instruments of the German Engineering Materials Science (GEMS) Centre at DESY. At the HEMS and IBL beamlines and other instruments (diffractometer, tomography and small-angle scattering instruments) as well as at several data evaluation stations (neutron and X-ray data) the students were taught in measuring and evaluation procedures in the fields of texture and residual stress analysis as well as microtomography, small-angle scattering and the fabrication of X-ray lenses.

Enough time was reserved in the program for scientific discussions between participants and lecturers. The feedback of the students in a questionnaire and a feedback session was very positive. It is planned to organise the next school in 2015.

E-mail organiser: andreas.schreyer@hzg.de