Report on 3rd AONSA Neutron School at BARC in India

BARC operate a National Facility for Neutron Beam Research at the Dhruva reactor. The National Facility is regularly utilized in collaboration with about 200 users from various universities and other academic institutions. At present there are over 25 active projects under the universities (UGC-DAE-CSR) collaboration program. During last five years, over 300 papers have been published in peer-reviewed international journals.

BARC has been regularly organizing Schools on neutron scattering in cooperation with UGC-DAE-CSR. So far 14 such Schools have been organized which involved training in basic principles and various applications in physics, chemistry, biology and materials science, often including hands-on experiments at Dhruva.

The '3rd AONSA Neutron School' was held during 4-9 October 2010. This follows the previous AONSA Neutron Schools at Korea (2008) and Australia (2009).

The present School is sponsored by Board of Research in Nuclear Sciences, Department of Atomic Energy, Government of India. It is being organized in association with Indian Neutron Scattering Society and in cooperation with IAEA. Travel expenses of some of the students from developing countries were supported by IAEA.

The distribution of the student participants was: Australia and New Zealand (5), India (19), Japan (2), Indonesia (3), Korea (3), Taiwan (5), Malaysia (1). Theory lectures were delivered by 7 Indian and 6 foreign scientists, and hands-on experiments were conducted for 10 groups of students by the respective instrument scientists at the Dhruva reactor at BARC. In addition, 14 students made oral presentations of their research work.

The following lectures were delivered:

1. *Soft Matter Kinetics and Structure by Controlling Contrast in Neutron Scattering* (John W White)
2. *J-PARC and the prospective Neutron Sciences (*Masatoshi Arai)
3. *Small Angle Neutron Scattering: Key Concepts and Scientific Applications* (Sung-Min Choi)
4. *Probing Mesoscopic Structures in Hierarchically Structured Materials and Porous Media by Small-Angle Scattering (*Debasis Sen)
5. *Contrast Variation in SANS and its Application to Soft Matter (*Vinod K. Aswal)
6. *Complementary use of pulsed and steady neutrons -Every neutron is good neutron (*Kazuyoshi Yamada)
7. *Polarized Neutron Reflectometry* (Saibal Basu)
8. *Inelastic Neutron Scattering-I (*Naoto Metoki)
9. *Inelastic Neutron Scattering-II (*Mala N. Rao)
10. *Molecular Motions in Condensed Matter: Quasielastic Neutron Scattering Studies (*Subhankur Mitra)
11. *Introduction to Neutron Diffraction* (D. J. Goossens)
12. *Neutron diffraction – Instrument and Experiment (*Vasudeva Siruguri)
13. *Applications of Neutron Powder Diffraction in Structural and Magnetic Studies (*S. M. Yusuf)

The following Experiments were performed. Each student performed two experiments.

E1 Powder Diffraction-Crystalline

E2 Powder Diffraction-NonCrystralline

E3 Magnetic Diffraction-I

E4 Magnetic Diffraction-II

E5 Single Crystal Diffraction

E6 SANS-I

E7 SANS-II

E8 Reflectometry

E9 Inelastic scattering

E10 Quasielastic scattering

The programme included a conducted city-tour on one afternoon, a welcome reception-cum-dinner, and the School banquette and another dinner in nearby hotels. The last one was special with some cultural activity by the students.

During the feedback session the students expressed their satisfaction and thanked all the contributors.
Generally the students appreciated the broad introduction to various techniques that would be useful if they need to pursue any of them in future and the interactions during the experiments. Some did feel they should have had more time to get deeper though it was clear that the time was too short.

We warmly thank all the invitees from the EC for their visit to Mumbai and kind contribution in making the 3rd AONSA Neutron School a very satisfying event. We are also grateful to all the teachers for the very useful lectures we had. My colleagues and I would like to especially thank AONSA for the opportunity to organize the School.

With my best regards,
Samrath Chaplot

Group Photograph on Oct 4, 2010 at Training School Hostel, Anushaktinagar, Mumbai


Group Photograph on Oct 7, 2010 at Dhruva Reactor lobby, BARC, Mumbai