Bragg Peaks
> for neutron users
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OPAL news

The situation remains that OPAL will resume operations once there is regulatory approval from ARPANSA. At the time of writing, we are optimistic about getting this in the very near future.

Once ARPANSA approval is given, we hope to return to full power within a couple of weeks. This long shutdown, while highly undesirable, has allowed a significant amount of catch-up work both on our instruments and on the reactor itself. For instance, we discovered a very minor air leak into the helium-cryogenic system for the cold-neutron source, and this has recently been rectified by installing better seals on the main compressors. In addition, analysis of the neutron flux and spectral measurements made prior to August 2007 indicate neutron fluxes in the thermal and cold guides of 2.8 x 10^9 and 6.4 x 10^9 $ncm^{-2}s^{-1}$, respectively. These figures are comparable with published numbers from both the Institut Laue Langevin in Grenoble, France, and the new FRM-II reactor in Munich, Germany, and indicate that our guides are working very well. We have yet to measure neutron fluxes at any of the instrument sample positions, but we expect these figures to be highly competitive by international standards.

We are very grateful to our user community for their patience during this long intermission, and we look forward to serving you again in the very near future.

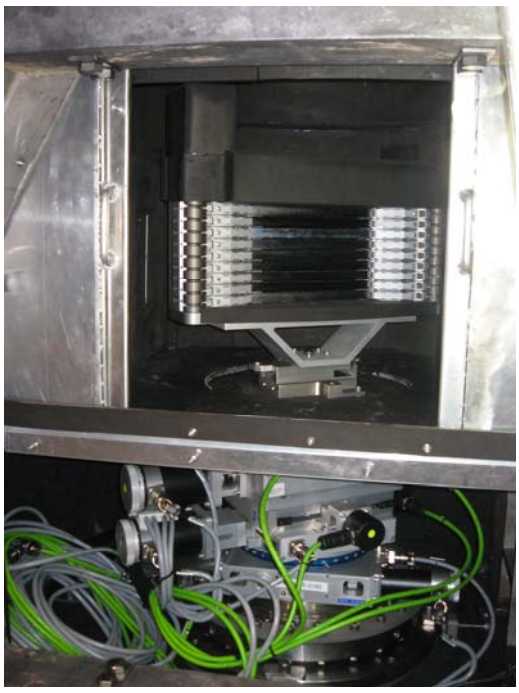
Around the instruments

Echidna *(high-resolution powder diffractometer) and* ***Wombat*** *(high-intensity powder diffractometer)*

A 4-axis pick-and-place robot has been purchased for use on Wombat and Echidna. A tray containing up to 50 samples is located on a trolley near the robot. This remotely controlled robot then takes samples to and from the beam one by one. If required the samples can be rotated in the beam or moved vertically through the beam. Specially designed lids allow the samples to be sealed inside the Vanadium sample cans (see photo below) whilst being moved by the robot.

Kowari *(strain scanner)*

At the beginning of 2008 the last remaining piece of hardware of Kowari arrived - the double-focusing Si monochromator (see photo below). After "hiding" most of the aluminium parts with boroflex in order to reduce any unwanted scattered neutrons the monochromator was mounted inside the monochromator shielding drum. We are looking forward to using it soon.



A load frame for tension, compression and fatigue testing of samples on Kowari has recently been tested, see photo below, at the manufacturer Instron (High Wycombe, UK) and will be shipped at the end of the April. This

100kN load frame can fatigue-test samples at up to 10 Hz and can be operated on or off the strain scanner. In June, the load frame will be tested and installed at the Bragg Institute.

Koala *(quasi-Laue diffractometer)*

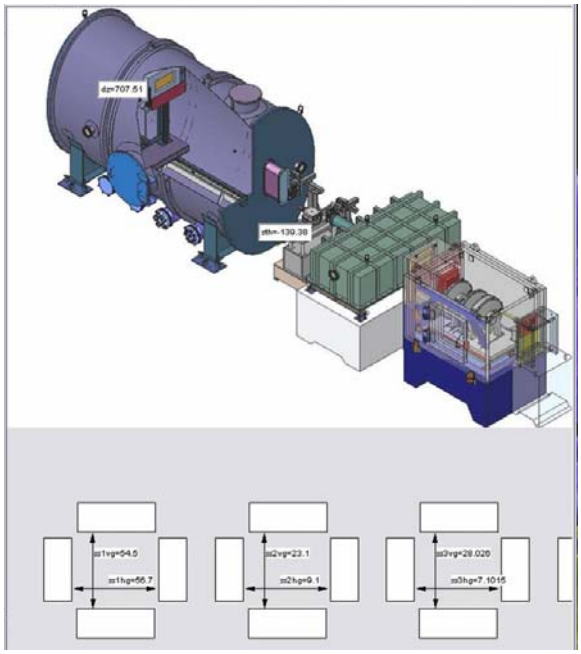
Below is a picture of the Koala image-plate drum with an aluminium sample pin in room-temperature mode. Commissioning is continuing on Koala.

Quokka *(small-angle neutron scattering, SANS)*

The final touches have been made so that Quokka's 1m^2 Ordela 21000N area detector can be placed on its carriage within the vacuum vessel. Once in place, we will be vibration testing the driven carriage, since the high voltages and long wires in the detector make it in effect a very sensitive microphone in which resonant oscillations can cause damaging arcing. To further reduce the chance of damage the software team has written code to lower the detector voltage during motion.

Platypus *(reflectometer)*

Over the past few months we have been readying Platypus for the restart of hot-commissioning. One of the areas in which we have been concentrating is the instrument control panel, which is obviously an integral part of the experiment. We have developed an initial version of "Fizzy" GUI (graphical user interface) control program, which communicates with the SICS command line. This enables the user to get to grips with the instrument (and more importantly the science being done) much faster.



Fizzy is still at an early stage, but is already proving useful in developing instrument alignment scans. We have concentrated on the generic nature of the program so far, but will be developing instrument-specific reduction procedures as soon as we have some data.

Announcements

Commissioning of instruments

We are confident that all 4 thermal-beam diffractometers, Echidna, Koala, Kowari and Koala, are ready to run as soon as there are neutrons from OPAL. However, all instruments will need operating licences from ARPANSA, the nuclear regulator, before we can schedule experiments. Quokka, Platypus and Taipan are all ready to take beam, but all three await full software integration, and some cabling remains to be done on Taipan.

ANSTO – AINSE Neutron School on Materials, 20-25 July 2008

This school will provide training for newcomers to neutron scattering focussing on important classes of structural and functional materials, e.g. concrete and geopolymers, magnetic materials, soft matter and biomaterials, and metals. Apart from lectures we will have practical sessions with hands-on experiments and data analysis on all neutron techniques available at ANSTO, i.e. powder diffraction, single-crystal diffraction, strain scanning, small-angle scattering, reflectometry, and inelastic scattering using three-axis spectrometers.
We selected 31 participants. For further details about the school, see www.ansto.gov.au/bragg/science/conferences_and_workshops/neutron_school_08.html.

Barcoded labels and Material Safety Data Sheets for users' samples at the Bragg Institute

The Bragg Institute has introduced a barcode-labelling system for the identification of samples and management of chemical hazards at the neutron-beam facility.

Why we use barcoded labels?
Barcoded labels allow us to keep a register and track the location of samples measured on an instrument and other chemicals present in the facility. These labels are used on any sample that has been measured on an instrument and on the containers of chemicals under our control. The use of barcoded labels also streamlines the radiation clearance process that is required for all samples to leave the facility.

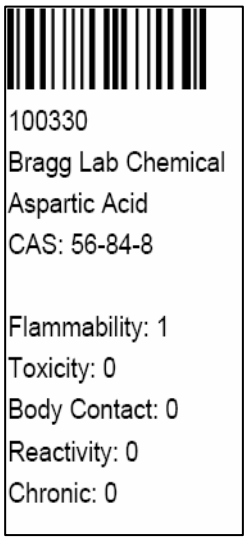
Material Safety Data Sheets (MSDSs) for samples and chemicals
An MSDS details the hazards associated with a chemical, how those hazards must be managed and other information including shipping and disposal. The Bragg Institute requires an MSDS for your sample or alternatively an MSDS for each component within your sample. Federal and state legislations require us to keep a register of chemicals and their MSDSs to provide staff and users with information on the chemicals held and used.

How we collect information about samples and their hazards
The Bragg Institute Customer Portal (rainbow.nbi.ansto.gov.au/Bragg/proposal/index.jsp) is designed to facilitate easy access to safety information regarding the hazards associated with users' samples and includes a database of over 380,000 chemicals. When applying for beam time using the Customer Portal, you need to provide details of the samples you wish to investigate and you are expected to upload the MSDSs for your samples, and any chemicals you are bringing, if they are not already in the system. ANSTO uses the ChemWatch format for their MSDSs which has a simple hazard rating system for determining the hazards associated with a chemical. If the MSDS you provide is not in the ChemWatch format we will have the MSDS converted to the ChemWatch format. If you do not have an MSDS for your sample we will arrange for an MSDS to be created.

How we use barcoded labels
A barcoded label must be attached to a sample or its container prior to, or immediately after measurement on an instrument. The information printed on the label is generated using the sample information provided on the proposal submitted in the Bragg Institute Customer Portal. All laboratory chemicals are barcoded (lab chemicals available for users can be found under "Lab Chemicals" in the Customer Portal). On arrival at ANSTO the barcode-labelling system is demonstrated as part of your induction training. The barcode-labelling system will not only give information on the hazards, but also help prevent samples getting lost, because the

barcoded labels allow us to track and monitor samples after they have been measured.

What information is on the label?
The Bragg Institute has different labels for samples and laboratory chemicals and the labels differ slightly for each type. For both types the barcoded label lists the owner, information about the chemical or chemicals within the sample including names, the CAS number (a number unique to that chemical, eg. Aspartic acid always has a CAS number of 56-84-8), and the ChemWatch hazard ratings. The ChemWatch hazard ratings give a basic indication of the type and severity of the hazards the chemical poses on a scale of 0 to 4 where a hazard rating of 0 poses no risk and 4 very high risk. We consider that a chemical with hazard rating greater than 2 is potentially hazardous and that special precautions, as listed in the MSDS, must be taken. Below is an example of a laboratory chemical barcoded label.



For more information or assistance please visit our website (www.ansto.gov.au/bragg) or contact our lab manager Rachel White (rachel.white@ansto.gov.au).

Joint appointments

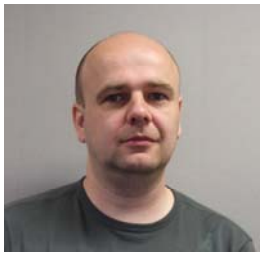
A number of joint positions are being made available:

- ANSTO-CSIRO Joint Postdoctoral Fellowship - protein scattering / crystallography;
- Joint Faculty Position in experimental condensed-matter physics with University of New South Wales;
- Joint Appointment - Postgraduate Research Scholarship (withUNSW@ADFA) – condensed-matter science – magnetism;
- Open PhD Position (with Curtin University) - Investigation of multiferroic materials with neutron scattering techniques;
- Open PhD Position (with University of Western Australia) - Investigation of spintronic materials with neutron scattering techniques.

For more details see www.ansto.gov.au/bragg/home/vacancies.html.

Faces

Newcomers
Recently, the Bragg Institute welcomed Ulf Garbe (left) as a postdoc; he is working with Klaus-Dieter Liss. Ulf comes from Germany, studied mineralogy and worked at the Munich reactor FRM-II before coming to ANSTO.



Andre Heinemann (right) has also joined us as a postdoc, working for the Collaborating Research Centre for Polymers between the Institute for Materials Engineering and the Bragg Institute. Andre also comes from Germany and previously worked at the Hahn-Meitner Institute in Berlin.

Contact us
Bragg Institute – User Office, Building 87
ANSTO
PMB 1, Menai, NSW 2234, Australia
T +61 2 9717 7232, F +61 2 9717 3606
E bragg-user-office@ansto.gov.au
www.ansto.gov.au/bragg