

OPAL news

As we write, OPAL is operating well at 20 MW; five instruments are taking data either for users or as part of hot commissioning, and the cold-neutron source continues to run without any glitches.

Since OPAL's return to full power on May 23rd, we have operated for 56 days, ~60% of the scheduled days. This availability is not as high as we would have liked and it largely reflects a series of unrelated operational teething problems, all of which are now resolved. In the next 3 months, OPAL's inventory of heavy water will be replaced during a shutdown in October/November, and we anticipate steady operation from then on.

Around the instruments

The Bragg Institute and Reactor Operations celebrated having obtained the four operating licences for the diffractometers - ECHIDNA, KOALA, KOWARI and WOMBAT. The picture shows the versatility of the scientists in high-temperature experimental preparations. We can also report that data taken on Echidna and Wombat resulted in one published paper, two more are submitted and a few are in preparation.

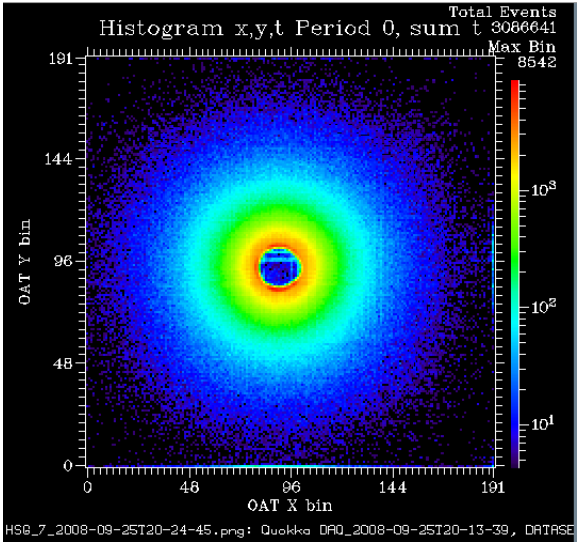


Platypus and Quokka are in hot commissioning, whereas Taipan will start its hot commissioning in October. We have also made great progress with our suite of sample-environment apparatus, much of which has now operated in the neutron beam.

We call for proposals on 5 instruments: ECHIDNA, KOALA, KOWARI, PLATYPUS and WOMBAT, with a deadline of October 15th, and for experiments to run in the first half of 2009, see page 3 for more details.

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

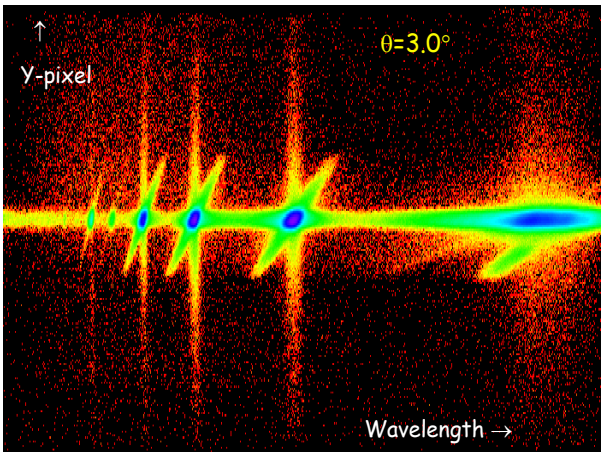
Quokka has just taken its first scattering pattern (below) of a natural opal; data were collected in 20 minutes. Further characterisation studies of the instrument are underway.



The application for an operating licence is expected to be submitted in October. We anticipate a joint proposal call for Quokka and the National Deuteration Facility at the end of this year or the beginning of next year.

Platypus (*reflectometer*)

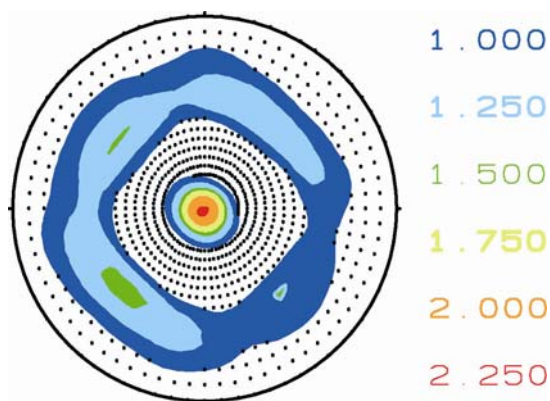
Platypus took its first reflectivity data and continues in hot commissioning. To date the reflectivity of several thin films (polymers, metallic multilayers and gold) have been measured.



Data from a Ni/Ti multilayer “Bragg Mirror” of 25 bilayers (Ni: 113.4 Å / Ti: 79.9 Å) were collected at ($\Delta\lambda/\lambda \sim 1.3\%$). This multilayer film produces some spectacular off-specular features, see above. First measurements on a free-liquid surface of D₂O were also successful.

Kowari (strain scanner)

Our first pole figure (111) of a standard copper sample was measured on Kowari and calculated with "2Diffcalc" as shown in the figure below. At this stage of commissioning the texture option on Kowari leads to comparable results with other pole figure measurements at different neutron and synchrotron beamlines. With some further testing of different samples and instrument set-ups routine texture measurements will be feasible for users very soon.



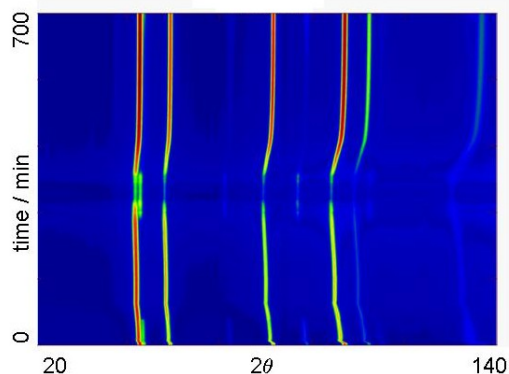
Wombat (high-intensity powder diffractometer)

On Wombat, the focus is on commissioning sample-environment apparatus and running real-time experiments.

Ross Whitfield (below), an honours student with Darren Goossens at the Australian National University in Canberra, looked at sintering processes of steel using the vacuum furnace.



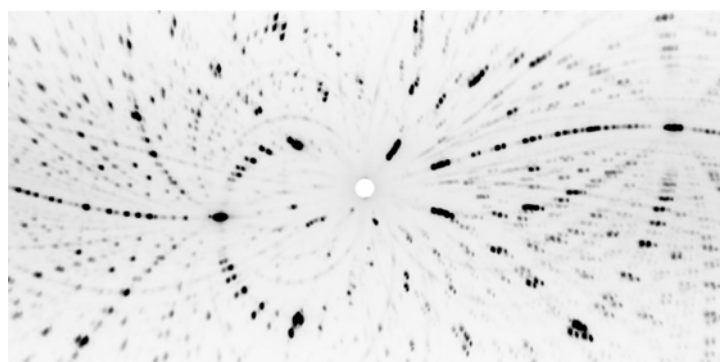
The data (below) show clearly the appearance and disappearance of various phases over a ramp/hold/cooling cycle of several hours, with data taken at one minute intervals.



In addition, Wombat took its first magnetic diffraction data on Pr_{1-x}Lu_xMn₂Ge₂, a sample provided by Stewart Campbell, University of New South Wales at the Australian Defence Force Academy.

Koala (Laue diffractometer)

The utility of Koala for the rapid assessment of very large crystals has been demonstrated in the case of the important room-temperature oxide ion conductor Sr₂Fe₂O₅ (thanks to Chris Ling, University Sydney). The pattern below was collected in a 1 minute exposure from the entire width of a 6 mm diameter rod, and confirms that we have grown the first ever large single crystal of this compound by the floating-zone method. The same pattern was reproduced along 25 mm of the rod, i.e., this crystal has a volume of ~ 500 mm³.



Echidna (high-resolution powder diffractometer)

The Echidna team continues running calibration and friendly user experiments. Several low-temperature experiments were successfully

carried out using closed-cycle cryofurnaces and a liquid-He cryostat (see below).



In addition, the robotic sample changer (see below) is now routinely operated for room-temperature experiments (for more details see Bragg Peaks 6).



The new focussing Ge monochromator has been assembled and is expected to be available for operation during the next cycle; it will significantly expand the range of accessible wavelengths.

Taipan (thermal three-axis spectrometer)

At the beginning of October, radiation surveys will continue on the instrument. Preliminary radiation checks performed earlier show the expected performance of the instrument shielding, but additional tests are needed before applying for the operational licence. At present, calibration and tests of the monochromator assembly are being finalised: it will then be installed, the monochromator shielding drum will be assembled, and radiation surveys will be continued.

The first powder run is expected early in the next cycle, with basic instrument checks and

calibration (including instrument control software) complete in December.

Announcements

Call for proposals: deadline 15 October

We have **called for proposals** for the following neutron-beam instruments:

- ECHIDNA (high-resolution powder diffractometer),
- WOMBAT (high-intensity powder diffractometer),
- KOALA (Laue diffractometer),
- KOWARI (strain scanner),
- PLATYPUS (reflectometer).

Proposals should be submitted using our on-line system (choose round October 2008) <http://rainbow.nbi.ansto.gov.au/Bragg/proposal/index.jsp>. Deadline will be 15 October 2008.

We encourage you to discuss your proposal with one of the instrument scientists before submission; we are happy to assist you in establishing contact with our scientists as necessary, please contact the Bragg User Office, see last page for details.

The application is for beam time and *does not automatically include travel or accommodation support*. However, successful applications from researchers from AINSE member institutions will automatically be forwarded to AINSE for consideration of travel/accommodation support.

15 Oct. 2008: Deadline for proposals.

Oct./Nov. 2008: On-line review of proposals by up to 5 expert reviewers.

10-11 Dec. 2008: Programme Advisory Committee assesses proposals.

Jan. 2009: Scheduling of first beam-time allocations - subject to reactor operation schedule. Initial scheduling will likely be fairly "loose", with ~ 50% of the beam time made available for the formal user programme.

After the commissioning phase, all instruments will have friendly user experiments for 2-3 months before they will be officially scheduled.

Neutron Science Symposium, 8-10 Dec 2008

The 7th ANBUG/AINSE symposium (AANSS) will be held in December. **For abstracts and registration** look under

http://www.ainse.edu.au/_data/assets/pdf_file/0/007/37762/AANSS2008_REGO_FINAL.pdf.

Change of web address

You might have noticed that ANSTO's web has changed look and the Bragg Institute has changed address to www.ansto.gov.au/research/bragg_institute.html
Your feedback on the new web is welcome.

First users at OPAL

The participants of the "ANSTO/AINSE Neutron School on Materials 20-25 July 2008" were the first external scientists using our neutron-beam instrumentation. 30 PhD students and postdocs, coming from Australia, Argentina, New Zealand and Taiwan, enjoyed their introduction to neutron scattering.

The first day was not only to obtain an overview of the instrumentation and techniques, but also to become acquainted with each other. Our clip session really was the ice-breaker: each participant gave a clip of 2 minutes (sharp) presenting their project and advertising their poster; and the follow-on poster session provided an opportunity to discuss research in more detail.

The following days were a mixture of lectures and instrument sessions including data analysis. On the last day, each instrument group presented and discussed their results, and we were all impressed with what was achieved, see also

http://www.ansto.gov.au/research/bragg_institute/science/conferences_etc/july_2008_neutron_school_briefing.html.

Faces

Newcomers

Kun Yan (below left) is a joint PhD student between the Bragg Institute and the University of Wollongong, studying the development of metallic microstructures during thermo-mechanical processes.



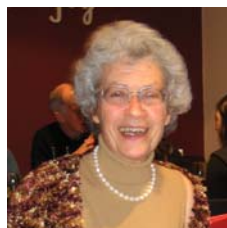
Rachael Barnett (above right) is working on neutron reflectometry of biomembranes as a joint PhD student between the Bragg Institute and the James Cook University in Townsville.



Thomas Saerbeck (above left) is a joint PhD student between the Bragg Institute and the University of Western Australia, working in condensed-matter physics.

Since July, *Luis Abuel* (above right) has joined our Computing and Electronics Group. His main responsibilities as an Electronics Technician are to provide operational support to the existing neutron-beam instruments, as well as to assist in the installation and commissioning of new detector and data-acquisition systems.

After more than 40 years service at ANSTO Margaret Elcombe and Dave Penny have retired.



Margaret's research career is strongly linked with HIFAR, whereas Dave joined the Neutron Scattering Group in July 2001 and supervised the technicians supporting the user programme at HIFAR and then OPAL. We wish them all the best for the future.

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