

Australian Synchrotron Access Model – Post 1 July 2016

Background

The Australian Synchrotron (the Synchrotron) is one of Australia's most significant investments in landmark scientific infrastructure. Since commencing operations in 2007, the facility has enabled more than 20,000 researcher visits across more than 4000 individual experiments resulting in discoveries reported in over 2,300 refereed publications. These discoveries contribute materially to the wellbeing and economic strength of the region, for instance through the development of new drugs that are improving patient outcomes in leukaemia and other diseases, as well as generating millions of dollars for the research institutions involved.

Contributions from government and institutional funders provided for the initial build and operation of the facility. Contributions from the State of Victoria have been essential, reflecting its interest as the initiating investor as well as the geographical location of the facility. Commensurate with the regional impact of the facility funding for operations has, increasingly, been provided by the Australian Government and New Zealand. As part of the National Innovation and Science Agenda announced in December 2015, the Australian Government has committed \$520 million to operate the Synchrotron over the 10 years to 2025-2026 on the condition that the Australian Nuclear Science and Technology Organisation (ANSTO) assumes sole ownership of the facility from July 2016.

The access model is designed to enable science for the benefit of the community, by providing world-class synchrotron expertise and facilities and to be the catalyst for the best scientific research and innovation in Australia and New Zealand.

The key principles of the access model are:

- a balance between open merit-based access and targeted access;
- for merit-based access:
 - a peer-review system consistent with international best practice to ensure the Synchrotron catalyses the best scientific research and innovation;
 - the judgment of scientific merit will produce an appropriate balance between discovery and applied research to encourage science for the benefit of the community;
 - continuation of the practice of providing travel support, for non-Victorian based, and accommodation support, for non-metropolitan Melbourne based, research teams;
 - recognition of the requirements of the operating funders.
- that targeted access includes facility time for paid/proprietary access, continued development of world-class synchrotron expertise and facilities, educational access, and discretionary access. In the case of newly constructed beamlines, targeted access will also include time for funders; and
- transparency.

These principles are discussed in more detail below. The access model from 30 June 2016, which will commence at the start of the third cycle of beamtime operations in 2016, will be:

	Merit	Targeted	
		Facility	Funders
Existing Beamlines	80%	20%	0 ¹
New Beamlines	50% minimum ²	20%	30%

Balance between merit and Targeted Access

For the beamlines existing as at 30 June 2016, the Synchrotron will provide 80% of the available time for merit access. Available time is the remaining time, while there is stored beam, after allowing for planned commissioning, maintenance and repair activities. For beamlines built after 30 June 2016, 50% of the available time will be provided for merit access. This represents the underlying capital investment in the facility and ongoing operations costs that enables a new beamline to run. A Targeted Access share of 30% of available time will be offered to the parties providing capital funding for new beamlines. These balances of merit and targeted time are consistent with international practice. Different funding arrangements, for instance with international or state partners, will also be considered and may change the targeted share for funders, but the model described here is the baseline.

International best practice for merit access

Synchrotron light source user facilities world-wide operate on the principle of free access for non-proprietary research, with access determined by a peer-reviewed system based on merit. The principles of access to major user facilities were codified and endorsed in 1996 by the International Union of Pure and Applied Physics (IUPAP)³. They include that:

- the criteria to be used in selecting experiments and determining their priority are scientific merit, technical feasibility, the capability of the experimental group and the availability of the required resource;
- the institutional, regional or national affiliations of the experimental teams should not influence the selection of an experiment nor the priority accorded to it; and
- host facilities should not normally require experimental groups to contribute to the running costs of the facilities.

This system has endured for over 30 years including outlasting several failed experiments in user-pays access. Its primary advantage is that it ensures that only high quality science is performed on what are expensive and limited large scale research facilities such as synchrotron light sources. Australia's synchrotron (and neutron beam) user programs have always conformed to these IUPAP access principles, from the beginning of the program on the Australian beamline in Japan, throughout the Australian Synchrotron Research Program (ASRP), and now in the merit access program at the Synchrotron

¹ An agreed condition for the transfer to Commonwealth ownership and operation is that there will be no targeted access after 2016 based on prior contributions to operations or capital.

² Merit time may increase above this minimum level where a funder allocates its share to the merit program.

³ See <http://www.iupap.org/ga/ga22/maifacil.html>

Also consistent with international practice is the principle of informal reciprocal international access. The Synchrotron will accept beamtime proposals from researchers at organisations outside Australia and New Zealand. Such proposals will form part of the merit process set out in Appendix 1. Time for international proposals will be awarded free of charge, although, travel and accommodation support will not be provided. Historically, international access to the Facility has been relatively low, comprising about 4% of the current merit access scheme. There are four justifications for continuing to offer free access to the Facility for international users and for including such access in the merit access program:

1. International synchrotron facilities have played an essential and indispensable role in the development of the Australian synchrotron user community via providing free access to their facilities for Australian scientists via the ASRP, the Australian beamline in Japan, and other programs over the last two decades.
2. Australians continue to enjoy free access to overseas synchrotron facilities, primarily for capabilities not yet offered by the Facility, via schemes such as the International Synchrotron Access Program administered by the Facility. This continuing overseas access for Australian users will therefore offset international users accessing the Facility.
3. Australia has obligations in relation to international research collaboration and the Facility will be operated in a manner consistent with these.
4. Competition with international proposals within the merit scheme provides a strong benchmark indicator to Australian and New Zealand of the relative performance of local applications judged against international competitors and may serve to encourage higher quality applications.

An appropriate balance between discovery and applied research

Program Advisory Committees have been established for each beamline to oversee the peer review assessment of proposals for beamtime and to produce recommendations for allocation of beamtime. The facility will work with these committees to manage an appropriate balance between discovery and applied research, to allow industry-relevant research to compete with more fundamental science. This will be done by defining assessment criteria that give weight to outcomes from research as set out in Appendix 1.

Recognition of impacts and national research priorities in merit access

To enhance benefit to the community the criteria used in selecting experiments and determining their priority also includes the degree to which the experiment broadly supports Australian or New Zealand (as appropriate) national research priorities and is likely to result in beneficial impact to society. National benefit will include economic, health, social and cultural benefits.

A beneficial impact for society is also recognised in continuing to facilitate access to the Australian Synchrotron by novice synchrotron users. Accordingly, a factor in assessing track record of applicants will be to take into account the career opportunities of the individuals.

Recognition of the requirements of funding partners

The specific requirements of the parties providing operational funding to the facility during 2016/17 are incorporated into the access model. This includes the right for the New Zealand Synchrotron Group (NZSG) to determine access for all New Zealand researchers capped in accordance with the funding contribution from NZSG, and for New Zealand researchers to have access on a no less favourable basis than Australian researchers.

The State of Victoria will make a significant contribution to the operating costs of the Synchrotron in 2016-17. Consequently the access model, for the 2016-17 financial year only, includes a right for the State of Victoria to nominate users. This right will normally be exercised by Victoria defining the users that may be denoted as Victorian users and allowing them to compete in the merit program, along with a guarantee of minimum access for Victorian researchers, in accordance with the operating funding contribution from the State of Victoria. These

requirements will be allocated from within the merit component of the Access Model and will be conducted, as much as possible, in accordance with the merit selection process as outlined in Appendix 1.

The merit access process, which uses these principles, is set out in Appendix 1. Modifications to this model, such as the introduction of quotas for early career, international or industry-related researchers, may be considered should the facility assess that the access process is not allocating beamtime in a way that is aligned with these principles for access.

Targeted Access

For all beamlines, the Australian Synchrotron will provide 20% of the available time for targeted access. Such targeted access, is for:

- **Paid/proprietary access**

Part of the business case for funding the Australian Synchrotron is the benefit that research undertaken at the Facility provides for industry. Enabling direct access to world-class technology, such as the Synchrotron, enables improved outcomes for industry. Accordingly, the Synchrotron will continue to operate a paid/proprietary access system, where beamtime and support services can be purchased under a proprietary user agreement. A nominal 10% of the available time will be allocated to facilitate paid/proprietary access. If requests for paid/proprietary access exceed this limit, more time may be allocated from either remaining Targeted Access Time or merit time, at the director's discretion. The paid access rate will be based on a full cost recovery basis.

It is also recognised that a significant amount of benefit is delivered to Australian and New Zealand industry through research partnerships that access the Australian Synchrotron through the merit program. This is expected to continue and will be encouraged by the facility. A major determinant as to whether industry relevant research should access the facility via the merit or proprietary access channel will be whether the research will be published in the peer-reviewed open literature.

- **Development of world-class synchrotron expertise**

It is an internationally accepted expectation that synchrotron beamline staff be active researchers. Independent research by staff will primarily be supported via the merit access proposal system, capped at 10% of the merit access allocation. The training and development of facility staff benefits the whole user community and will be supported so that, where beamline scientists are unable to win merit time they may obtain targeted access, subject to approval by the Director. This class of access will be capped so that no one beamline scientist obtains more than six shifts per operating cycle through this mechanism and so that, overall, time awarded to staff does not exceed 10% of the available time.

- **Development of world-class synchrotron facilities and maintenance and repair**

Where necessary, Targeted Access will be used for commissioning new beamline capability, and for calibrating, maintaining and repairing beamline equipment.

- **Educational access**

The Synchrotron supports promotion and education of science, technology and mathematical skills. Targeted access may be used to support these outcomes.

- **Discretionary access**

In a small number of cases there are circumstances where it may benefit the Synchrotron or the nation to award access other than under the merit scheme or the other forms of targeted access. In such cases, the Australian Synchrotron Director has discretion to award access from Targeted Access time.

Targeted Access – For New Beamline Funders

For new beamlines – those built after 30 June 2016 – and subject to the final details of any capital funding contracts, funders of capital and/or operating funds will receive a return on investment that provides them with access to the specific new beamline(s) to be used at their discretion, subject to safety review by the Synchrotron. Funding the full capital cost of a beamline will entitle funders to 30% of the available time for a period of six years after commissioning⁴. Pro rata entitlements for part funding may be negotiated. In addition funders will be able to compete in the merit time for access to new beamlines.

Transparency

The outcomes of the merit proposal review process will be monitored each cycle, to determine stakeholder application rates and merit process outcomes. The results will be reported at least annually to stakeholders (e.g. by publishing on a website).

⁴ This is the same return on investment that was provided to the original Foundation Investors

Appendix 1: Merit Process

The merit selection of proposals for access to the Australian Synchrotron will operate as follows:

- (a) The Australian Synchrotron will publish dates for proposal submission corresponding to each operating cycle.
- (b) Beamtime proposals are peer reviewed by external scientific reviewers in accordance with the following criteria:
 - A. Quality of the Scientific Proposal – 40% of total score
 - B. National Benefit & Applications of the Proposed Research – 30% of total score
 - C. Track Record (relative to opportunity) – 30% of total score
 - D. Need for Synchrotron Light – no score (“yes” or “no” decision)

Additionally, proposals must be reviewed as safe and technically feasible by Synchrotron staff.

- (c) The proposals and referee scores and comments are reviewed by a Proposal Advisory Committee (PAC) which adjusts the scoring (if needed) to a common scale, and recommends a specific beamtime allocation. The PAC produces a list of proposals in priority order for each beamline as a recommendation to the Synchrotron Director.
- (d) After review and approval by the Synchrotron Director (or delegate), the approved proposal lists are forwarded to each beamline for scheduling. Beamline staff allocate time to the proposals in order of priority until the available beamtime is filled. Any approved proposals that cannot be scheduled must re-apply for time unless notified otherwise by the facility.
- (e) The User Support Office notifies the applicants of the outcome of their proposal and coordinates the administration and regulatory steps (safety training, experimental authorisation, travel support, etc.) required before an experiment can begin.