Australian Synchrotron

The National Science Case for the Initial Suite of Beamlines

Presented by
the Australian Synchrotron National Scientific Advisory Committee
on behalf of the Australian Science Community

DECEMBER 2003

This document has been prepared for submission to the Australian Government.

It was refined after consultation with Australian synchrotron users and after review by the National and International Scientific Advisory Committees.

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www.synchrotron.vic.gov.au

Information about the Australian Synchrotron Research Program, administered by ANSTO, can be found at the website:
www.ansto.gov.au/natfac/index.html

Information about the Access to Major Research Facilities Program, administered by ANSTO, can be found at the website:
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Cover: Detail of a synchrotron-generated x-ray diffraction pattern.

X-ray diffraction is the most widely used technique for 'imaging' molecules at atomic resolution and elucidating molecular structures ranging from several atoms to macromolecular assemblies. Particularly when illuminated by synchrotron light, x-ray diffraction is the method of choice for determining the three-dimensional crystal structure of metals and alloys, chemical compounds, minerals and complex molecules such as protein complexes, nucleic acids and viruses, essential for a wide range of applications in medical and other biological sciences.

Chairman's Statement

AUSTRALIAN SYNCHROTRON – NATIONAL SCIENCE CASE FOR BEAMLINES

On behalf of the National Scientific Advisory Committee (NSAC) to the Australian Synchrotron, I am pleased to present a proposal entitled Australian Synchrotron: The National Science Case for the Initial Suite of Beamlines.

This proposal flows from extensive consultation with many members of the Australian and New Zealand synchrotron user community, whose contributions have been coordinated and evaluated by NSAC. Many helpful comments were received on the consultative draft that was issued in October 2003. This feedback was most useful in finalising the proposal. We are also grateful for advice and assistance provided by the Victorian Government, particularly in facilitating consultation through workshops for current and potential users.

We seek support for, and investment in, a balanced suite of beamlines to meet 95% of the anticipated needs of the Australian synchrotron research community for the first few years after the facility is commissioned in 2007. These initial beamlines represent vital enabling infrastructure for internationally competitive scientific and industrial research that will boost innovation. Convenient access to a synchrotron light source will promote frontier science in Australia and our region.

This National Science Case provides a framework to assist governments, research institutions and industries in deciding to help create the Australian Synchrotron as a truly national facility.

Yours faithfully

Frank P Larkins

Chair
National Scientific Advisory Committee
Australian Synchrotron Project

From the Minister for Innovation, State Government of Victoria

AUSTRALIAN SYNCHROTRON – NATIONAL SCIENCE CASE FOR BEAMLINES

To compete in the global innovation economy Australia needs world class science infrastructure. The Australian Synchrotron is an essential tool for new science. It will accelerate the innovations that create wealth and jobs for Australians.

Victoria is deeply committed to promoting Australian excellence in research and development. We are very proud to have provided $157 million – three-quarters of the capital cost – for the Australian Synchrotron. Although this is the largest ever investment by an Australian State Government in innovation infrastructure, we are determined that the Australian Synchrotron will serve universities, research organisations and industry throughout this nation.

The Australian Synchrotron will provide a world-leading technical capability, and the nucleus around which new science and industry networks will form as researchers interact at their own national facility. The synchrotron will deliver better and faster experimental techniques that will not only enhance current fundamental and applied research, but also open up new avenues of investigation to Australian science. This facility will promote the international collaboration now so important to leading-edge R&D, becoming a hub for research that will greatly benefit Australia and our regional neighbours.

Australia already punches above its weight in science, and the Australian Synchrotron will further enhance this nation's global competitiveness. Accelerating development of the intellectual property that drives commercial spinoffs, this powerful new tool will help deliver innovations that create the industries of the future.

The Victorian Government is therefore proud to endorse the National Science Case for the Initial Suite of Beamlines, and urges universities, governments and industry to commit to partnership in developing the Australian Synchrotron.

JOHN BRUMBY MP
Minister for Innovation

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