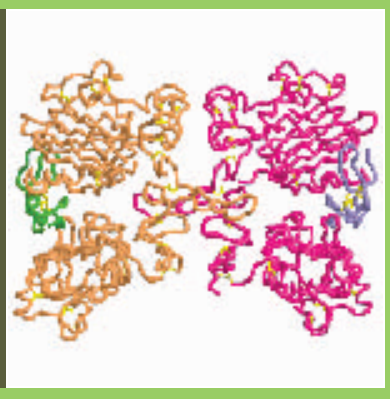
05



# User communities and the beamlines of interest to them

IMAGE: Crystal structure of a epidermal receptor bound to a transforming growth factor.

This receptor/ligand complex is involved in the growth of many cancers and was determined by collaboration between the WEHI, LICR and CSIRO. From T. Garrett et al. Cell. 2002 Sep 20; 110(6):763-73.

# Chapter 05

## User communities and the beamlines of interest to them

Over the past 10 years a rapidly growing group of Australian researchers has been carrying out experiments on overseas synchrotrons, initially through a national consortium managed by ANSTO, with the assistance of the federally funded Access to Major Research Facilities Program, and from 1996 by the Australian Synchrotron Research Program (ASRP), which incorporated the original consortium. Figure 5.1 shows the growth in the number of spokespersons for ASRP experiments from 1996 to 2002. In 2002 there were 140 research groups participating in this scheme.

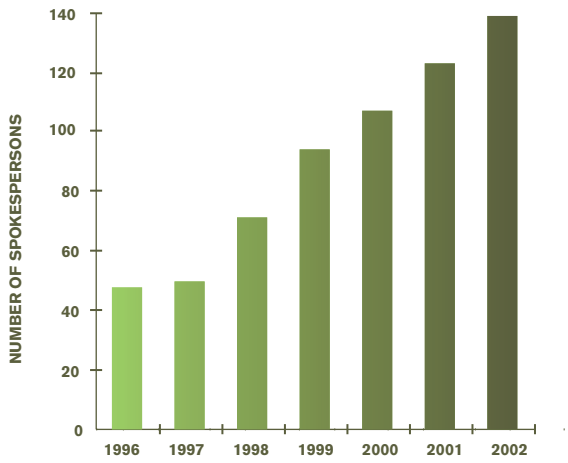



***Figure 5.1.*** *Number of spokespersons for experiments funded by the Australian Synchrotron Research Program. Each of these typically speak on behalf of three or four researchers.*

Many disciplines have been involved (see figure 5.2). If anything, the biotechnology and medical research community is under-represented at present because of the great difficulty in taking biological samples overseas. However this gives an indication of the broad scientific and industry user group that will develop for the Australian Synchrotron.

It is important to note that an experienced synchrotron user will usually need access to several techniques, in some cases with the techniques being performed simultaneously, to obtain the greatest benefit. Thus it is imperative that the full complement of beamlines envisaged in this proposal is constructed to service user needs properly. As an indication of this, the beamlines that will be of primary interest to researchers in the various fields are listed in table 5.1.

Several beamlines will be developed to be easy to use by occasional or inexperienced users, and others are likely to offer high throughput and remote access, primarily to service industry needs.

While the beamline descriptions in chapter 10 provide details about the user communities currently associated with each beamline technique, the key features of each group are summarised here. A list of known key principal investigators is provided in Volume 2, appendix 2, although a summary of their organisations is given in table 5.2. A sample of the most recent work conducted by Australian researchers at overseas synchrotron facilities is provided in table 5.3.

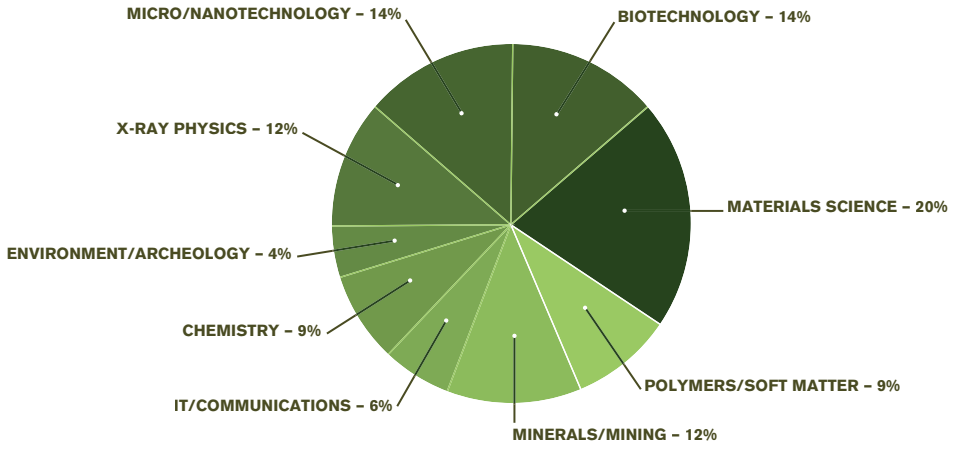



***Figure 5.2.*** *Research disciplines for experiments funded by the Australian Synchrotron Research Program.*

**Table 5.1 The research fields that will be enhanced by the synchrotron, with the beamlines primarily needed for each field indicated by shading.**

| RESEARCH FIELDS | BL 1 Protein crystallography | BL 2 Protein microcrystals and small molecules | BL 3 Powder diffraction | BL 4 Small & wide angle scattering | BL 5 X-ray absorption spectroscopy | BL 6 Soft X-ray spectroscopy | BL 7 Vacuum UV | BL 8 Infrared spectroscopy | BL 9 Microfocus spectroscopies | BL 10 Imaging & medical therapy | BL 11 Microdiffraction and fluorescence probe | BL 12 Circular dichroism | BL 13 Lithography |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Life Sciences** | | | | | | | | | | | | | |
| Biological research & drug design | ■ | ■ | ■ | ■ | ■ | | ■ | ■ | | ■ | | ■ | |
| Biotechnology & bio-sensors | ■ | ■ | | | ■ | ■ | | ■ | ■ | | | | ■ |
| Biomedical & medical imaging | | | | | | | | ■ | ■ | ■ | | | |
| Medical therapy | | | | | | | | | | ■ | | | |
| Plants & crops | ■ | | ■ | | ■ | | ■ | | | ■ | | ■ | |
| **Physical Sciences** | | | | | | | | | | | | | |
| Sustainable environment | | ■ | ■ | | ■ | | | ■ | ■ | | | | |
| Forensics | | | ■ | ■ | ■ | ■ | | ■ | ■ | ■ | | | |
| Advanced materials: | | | | | | | | | | | | | |
| – functional polymers | | ■ | | ■ | | ■ | | ■ | | ■ | | ■ | |
| – ceramics | | | ■ | ■ | ■ | ■ | | ■ | ■ | ■ | ■ | | |
| – nanomaterials & composites | | ■ | ■ | ■ | | ■ | ■ | ■ | ■ | ■ | ■ | | ■ |
| – metals & alloys | | | ■ | | | ■ | ■ | | ■ | ■ | ■ | | |
| – micro-electronic & magnetic materials | | | | | ■ | ■ | ■ | ■ | | ■ | | | ■ |
| – biomaterials | | ■ | ■ | | ■ | ■ | ■ | ■ | | ■ | ■ | ■ | |
| Engineering | | | ■ | | | | | | | ■ | | | ■ |
| Mineral exploration & beneficiation | | | ■ | | ■ | ■ | | | ■ | ■ | ■ | | |
| Earth sciences | | ■ | ■ | ■ | ■ | ■ | | ■ | ■ | | ■ | | |
| Oil & gas production and distribution | | ■ | | ■ | ■ | | | ■ | ■ | ■ | ■ | | |
| Agricultural technology | ■ | | ■ | ■ | ■ | ■ | | | | ■ | | ■ | ■ |
| Food technology | ■ | ■ | ■ | ■ | | | | ■ | | | | ■ | ■ |
| Chemical reactions & catalysts | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | ■ | | ■ |
| **Advanced manufacturing** | | | | | | | | | | | | | |
| Production and testing of micro-devices | | | | | ■ | ■ | | | | ■ | ■ | | ■ |

■ Small animal imaging

## Beamline User Communities

### Beamlines 1 and 2

A survey in early 2003 of the Australian protein crystallography community indicated that there are about 42 protein crystallography users or user groups interested in national synchrotron facilities. On current usage, total synchrotron beam time requirements have been estimated at 216 days per year. If the number of protein crystallographers continues to grow at the current rate to 2007, demand will saturate available beam time, particularly if the likely interest of New Zealand and other regional scientists is included. The small molecule community in Australia currently using single-crystal x-ray diffraction (XRD) for molecular structure determinations is estimated to be at least 100 members. Awareness of synchrotron capabilities in this area is low at present, but is expected to rise dramatically when the local facility is commissioned. The dedicated single crystal facility at SRS in the United Kingdom is over-subscribed by more than a factor of two.

### Beamline 3

The synchrotron powder diffraction community exceeds 23 independent research groups from thirteen Australian institutions at present, due to rapid growth in the use of synchrotron powder diffraction in the past decade. Demand of existing users is estimated to utilise all beamtime on beamline 3 already.

### Beamline 4

There is currently an active SAXS (small angle x-ray scattering) community in Australia, using several laboratory-based SAXS instruments and the recently commissioned ChemMatCARS instrument at the Advanced Photon Source in Chicago, through the ASRP. Demand for this instrument already exceeds supply.

### Beamline 5

The Australian x-ray absorption spectroscopy (XAS) user community exceeds 70 practitioners at present, estimated to increase to 150 with a local synchrotron. In spite of flux limitations with the ANBF beamline at the Photon Factory, Japan, XAS measurements comprised 42% of all experiments performed (2001, ASRP). It is estimated that total current Australian XAS demand will utilise all available beamtime on a wiggler-based XAS beamline.

### Beamline 6

The current Australian synchrotron soft x-ray user community comprises approximately fifteen research groups. Worldwide, all overseas synchrotron soft x-ray beamlines are oversubscribed, which limits the access of Australian researchers. With access to a dedicated soft x-ray beamline, purpose-built for the Australian community at a local facility, it is estimated that 30 groups from eighteen research institutions have the potential to use all available beamtime.

### Beamline 7

There are at least eight Australian synchrotron vacuum ultraviolet (VUV) research groups at present with extensive experience and advanced capabilities. Access to VUV beamlines has not been available through the ASRP. Because of the nature of the experimental techniques, VUV experiments take 2–3 weeks at a time, so using overseas facilities is costly and difficult to obtain. Taking usage rates at the German VUV beamline as a guide, the existing Australian VUV community will fully utilise a VUV beamline from the outset.

### Beamline 8

Worldwide, the demand for infrared spectroscopy (IR) beamline time has been heavy, which has limited the access of Australian researchers to overseas synchrotron IR facilities. The ASRP has recently provided access to an IR beamline on the Taiwan synchrotron, in response to rapidly increasing requirements from the local user community. Combined with strong interest from New Zealand researchers, it is expected that the user community will grow to 200 members in 2007.

### Beamline 9

Australian researchers have been international leaders in the development of microprobe techniques for two decades. There are currently 64 known potential Australian users or teams, from nineteen universities and research organisations including government institutions and industry.

### Beamline 10

Most of the potential medical and biomedical users of the imaging and medical therapy beamline will be new, because the types of live animal and patient studies envisaged cannot currently be addressed at overseas synchrotron facilities. There are at least fifteen biomedical research institutions, five CRCs and several private enterprises that have indicated interest as potential users. Materials imaging is expected to attract direct or collaborative research interest from manufacturing (including automotive), aerospace and defence industries.

### Beamline 11

The combination of simultaneous micro-XRD and x-ray fluorescence is particularly attractive to industry, through either direct or collaborative research projects. It will also provide a high level resource for fundamental research. A significant number of industry sectors have expressed interest and support, in particular the minerals industry and manufacturing research sectors. In addition, a strong collaborative venture is under way with a similar beamline on the Canadian synchrotron.

### Beamline 12

Synchrotron circular dichroism (CD) is a recent development and Australian CD users have had no access to a CD beamline to date. However, 32 users or user groups have expressed interest in synchrotron CD techniques. Extrapolating from the rate of expansion of biomedical and structural biology research in Australia, it is estimated that the number of users would exceed 100 within two years of local access to a CD beamline, which would fully utilise available beamtime.

### Beamline 13

An industrially focussed, high volume production Australian LIGA beamline has already attracted substantial local industry interest. It is planned to operate the beamline in tandem with the nearby MiniFAB facility, making it an attractive option for international users. The beamline is also strongly supported by the CRC for Microtechnology and there are possibilities for international partnerships.

**Table 5.2 Number of key principal investigators and research team leaders from major institutions, with their beamlines of interest**

| ORGANISATION | BL 1 Protein Crystallography | BL 2 Protein Microcrystal & Small Molecules | BL 3 Powder Diffraction | BL 4 Small and Wide Angle Scattering | BL 5 X-ray Absorption Spectroscopy | BL 6 Soft X-ray Spectroscopy | BL 7 Vacuum Ultraviolet | BL 8 Infrared Spectroscopy | BL 9 Microspectroscopy | BL 10 Imaging and Medical Therapy | BL 11 Microdiffraction/Fluorescence Probe | BL 12 Circular Dichroism | BL 13 Lithography |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ANSTO ASRP | | | 1 | | | | | | | | 1 | | |
| ANSTO Bragg Institute | | 2 | 6 | 5 | 3 | 2 | 1 | | 4 | | | 1 | |
| ANSTO Environment | | | | 1 | 1 | | | | 6 | | | | |
| ANSTO Materials and Engineering Science | | | 3 | 2 | 4 | 1 | | | 3 | | | | |
| ANSTO Radiopharmaceuticals Division | | | | | 1 | | | | | | | | |
| Applied Sorting Technologies P/L | | | | | | | | | | 1 | | | |
| Austin Health Centre for Positron Emission Tomography | | | | | | | | | | | | 1 | |
| Austin Health Radiation Oncology | | | | | | | | | | 1 | | | |
| Austin Research Institute Inflammatory Diseases | | | | | | | | | | | | 1 | |
| Austin Research Institute Structural Immunology | | 1 | 1 | | | | | | | | | | 1 |
| Australian Minerals Industry Research Association | | | | | | | | | | | | 1 | |
| Berthold Aust. P/L | | | | | | | | | | 1 | | | |
| BHP Billiton Minerals Technology | | | | | | | | | | | 1 | | |
| Boeing/ASTA Components Advanced Manufacturing Research and Development | | | | | | | | | | 1 | | | |
| Canesis Network Ltd, New Zealand Corporate Research | | | | | | | 1 | | | | | | |
| Central Queensland University Department of Biology | | | | | | | | | 2 | | | | |
| Ceramic Fuel Cells Limited Manufacturing | | | | | | | | | | 1 | | | |
| Cetec Pty Ltd | | | | | | | | | | 1 | | | |
| CRC for Microtechnology | | | | | | | | | | | | | 3 |
| CSIRO Energy Technology | | | 1 | 1 | 1 | 1 | | 1 | 1 | 1 | 1 | | |
| CSIRO Exploration and Mining | | | | | 2 | 1 | | | 1 | | | | |
| CSIRO Forestry and Forest Products | | | 1 | 1 | 1 | | | | 1 | 1 | 1 | | |
| CSIRO Health Sciences and Nutrition | 3 | 3 | | 2 | 2 | | | | | | 1 | 1 | |
| CSIRO Land and Water | | | 1 | | 1 | 2 | | 1 | 2 | | 1 | | |
| CSIRO Livestock Industries | | 1 | | | | | | | | | | | |
| CSIRO Manufacturing and Infrastructure Technology | | | 4 | 1 | | | | | 9 | 9 | 4 | | 2 |
| CSIRO Minerals | | | 2 | 2 | 4 | 2 | | | 2 | 1 | 3 | | |
| CSIRO Molecular Science | | | | 4 | | 5 | | 3 | 1 | | | | |
| CSIRO Petroleum Resources | | | | | | | | | | 1 | | | |
| CSIRO Telecommunications and Industrial Physics | | | | | | | | | 1 | | | | |
| CSIRO Textile and Fibre Technology | | | | | 1 | | | 1 | 1 | 1 | | | 1 |
| Curtin University of Technology Department of Applied Physics | | | 4 | 2 | | | | | | | | | |
| Curtin University of Technology Dept of Applied Science | | | 1 | | 1 | | | | | | | | |
| Curtin University of Technology School of Applied Chemistry | | 2 | 2 | 1 | 2 | 3 | | 1 | | | | | |
| Cyclotek (Aust) Pty Ltd | | | | | | | | | | 1 | | | |
| DSTO Air Vehicles Division | | | 1 | | | | | | 1 | 1 | 1 | | |
| DSTO Maritime Platforms | | | | | | | | | | | | | 1 |
| Edith Cowan University School of Engineering and Mathematics | | | | | | | | | 1 | | | | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Elbicon/Barco | | | | | | | | | | 1 | | | |
| Environmental Geochemistry International Pty Ltd | | | | | | | | | | | 1 | | |
| Flinders University School of Biological Sciences | 1 | 1 | | | | | | | | | | | |
| Flinders University School of Chemistry, Physics and Earth Sciences | | | | | | 3 | 1 | | | | 1 | | |
| Food Science Australia Ultrasonics | | | | 1 | | | | | | | | | |
| Geoscience Australia Petroleum & Marine Division | | | | 1 | | | | | | 1 | | | |
| Griffith University Institute for Glycomics | 1 | 1 | | | | | | | | | | | |
| Griffith University Natural Product Drug Discovery, The Erskitis Institute | 1 | 1 | | | | | | | | | | | |
| Griffith University School of Science | | 2 | 1 | | | 1 | 1 | 1 | 1 | | | | |
| Ian Potter Conservation Centre | | | | | | | | | | 1 | | | |
| Industrial Research Limited, New Zealand Materials Performance Technologies | | 1 | | | 1 | | | | | | | | |
| Industrial Research Limited, New Zealand Materials Technologies Group | | 1 | | | 2 | | | 1 | | | | | |
| Industrial Research Limited, New Zealand Measurement Standards Laboratory | | | | | 1 | | | 1 | | | | | |
| Institute of Geological and Nuclear Sciences | | | | | 1 | | | | | | | | |
| James Cook University Biochemistry & Molecular Biology | 1 | 1 | | | | | | | | | | | |
| James Cook University School of Pharmacy and Molecular Sciences | | 1 | | | | | | | | | | | |
| La Trobe University Department of Chemistry | | | | | | 1 | 1 | | | | | | |
| La Trobe University Department of Physics | | | | | | 6 | 4 | | | | | | |
| Macquarie University Department of Chemistry | | | | | | | | 1 | | | | | |
| Magotteaux Australia Pty Ltd | | | | | | | | | | | 11 | | |
| Massey University Centre for Structural Biology, New Zealand | 1 | 1 | | | | | | | | | | | |
| Massey University Institute of Natural Resources, New Zealand | | | | | | | | 1 | | | | | |
| Massey University Institute of Technology and Engineering, New Zealand | | | | | 1 | | | | | | | | |
| Massey University Institute of Molecular Biosciences, New Zealand | 4 | 4 | | | | | | | | | | | |
| Medical Imaging Australia Group | | | | 1 | | | | | | | | | |
| Monash Medical Centre Urology | | | | 1 | | | | | | | | | |
| Monash University Department of Anatomy and Cell Biology, School of Biomedical Sciences | | | | | | | | | | 1 | | | |
| Monash University Department of Biochemistry and Molecular Biology | 2 | 2 | | | | | | | | | | 4 | |
| Monash University Department of Medicinal Chemistry, Victorian College of Pharmacy | 1 | 2 | | | | | | | | | | | |
| Monash University Department of Pharmaceutics, Victorian College of Pharmacy | | | | | | | | | | | | 2 | |
| Monash University Department of Physiology | | | | | | | | | | 1 | | | |
| Monash University Institute of Reproduction and Development | | | | | | | | | | 1 | | | |
| Monash University School of Applied Science | | | | 1 | | | | | | 1 | | | |
| Monash University School of Chemistry | | 6 | | | | 1 | | 2 | 1 | | | 2 | |
| Monash University School of Physics and Materials Engineering | | | 4 | 3 | | 1 | 1 | | | 1 | | | |
| Murdoch University CRC for Hydrometallurgy | | | | | 1 | | | | | | | | |
| Murdoch University Science and Engineering Division | | | | | | 1 | 1 | | | | | | |
| National Gallery of Victoria Conservation Department | | | | | | | | | | 1 | | | |
| New Zealand Institute for Crop and Food Research | | 1 | | | | | | | | | | | |
| Pacific Lithium NZ Limited ILiON Technology Corporation | | | | | 1 | | | | | | | | |
| Peter MacCallum Cancer Centre Diagnostic Imaging | | | | | | | | | | 1 | | | |
| Peter MacCallum Cancer Centre Radiation Oncology | | | | | | | | | | 5 | | | |
| Queensland University of Technology School of Physical and Chemical Sciences | | | | | | | | 2 | | | | | |
| Radiation Oncology Victoria Physics | | | | | | | | | | 1 | | | |
| Research Laboratories of Australia, South Australia | | | | | | | | | | | 1 | | |
| Rio Tinto Technology Support | | | | | | | | | | | 1 | | |
| RMIT Faculty of Applied Science | | | | 2 | 2 | | | | 1 | | | | |
| Robert Bosch (Aust) P/L | | | | | | | | | | 1 | | | |
| Shimadzu (Aust) P/L | | | | | | | | | | 2 | | | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SOLA International Holdings Ltd Research and Technology, South Australia | | | | | | | | | | | 1 | | |
| South Australian Museum Minerals | | | | | | | | | | | 1 | | |
| St Vincent's Hospital Melbourne Medical Engineering and Physics | | | | | | | | | | 1 | | | |
| St Vincents Institute of Medical Research Biota Structural Biology Laboratory | 2 | 2 | | | | | | | | | | 1 | |
| St Vincents Institute of Medical Research Pharmacogenomics | | | | | | | | | | 1 | | | |
| Swinburne University Industrial Research Institute/MiniFAB | | | | 1 | | 1 | | | 1 | | | | 3 |
| Swinburne University School of Engineering and Science | | | | 2 | | | | | | | | | |
| TGR Biosciences | | | | | | | | | | | 1 | | |
| The Alfred Radiation Oncology | | | | | | | | | | 2 | | | |
| The Alfred William Buckland Radiotherapy Centre | | | | | | | | | | 2 | | | |
| The Australian National University Geology, Faculty of Science | | | | | | | | | 1 | | | | |
| The Australian National University Chemistry, Faculty of Science | | 1 | | | | | | | | | | | |
| The Australian National University Research School of Chemistry | 2 | 3 | 1 | 2 | 2 | | | 1 | 1 | | | 1 | |
| The Australian National University Research School of Earth Sciences | | | | | 1 | 1 | | | 1 | | 1 | | |
| The Australian National University Research School of Physical Sciences and Engineering | | | 1 | 1 | 5 | 4 | 8 | 1 | 2 | 1 | | | 1 |
| The Royal Melbourne Hospital Department of Radiology | | | | | | | | | | 1 | | | |
| The University of Adelaide Department of Chemistry | | | | | | | | 2 | | | | | |
| The University of Adelaide Earth and Environmental Sciences | | | | | | | | | | | 1 | | |
| The University of Adelaide Geology and Geophysics | | | | | 1 | | | | 1 | | | | |
| The University of Adelaide School of Electrical & Electronic Engineering | | | | | | | | 1 | | | | | |
| The University of Adelaide School of Molecular and Biological Science | | | | | | | | | | | | 1 | |
| The University of Auckland Department of Chemical and Materials Engineering | | | | | 1 | | | | | | | | |
| The University of Auckland Department of Chemistry | 1 | 2 | | | 2 | 2 | | 2 | | | | | |
| The University of Auckland School of Biological Sciences | 4 | 4 | | | | | | | | | | | |
| The University of Melbourne Bionic Ear Institute | | | | | | | | | | 1 | | | |
| The University of Melbourne Department of Biochemistry and Molecular Biology | | | | | | | | | | 1 | | 4 | |
| The University of Melbourne Department of Genetics | | | | | | | | | 1 | | | | |
| The University of Melbourne Department of Microbiology & Immunology | | | | | | | | | | | | 1 | |
| The University of Melbourne Department of Pathology | | | | | | | | | | 1 | | | |
| The University of Melbourne Department of Physiology | | | | | | | | | | 1 | | | |
| The University of Melbourne Howard Florey Institute | | | | | | | | | | | | 1 | |
| The University of Melbourne School of Chemistry | | 1 | | 1 | 2 | 1 | | 2 | | | | 1 | |
| The University of Melbourne School of Dental Science | | | | | | | | | | 1 | | | |
| The University of Melbourne School of Physics | | | 2 | 1 | 1 | | | | 4 | 2 | | | 1 |
| The University of New England Chemistry | | | | | | | | | | 1 | | | |
| The University of New England Physics & Electronics | | | | | | | | 1 | | 1 | | | |
| The University of New England School of Biological, Biomedical and Molecular Sciences | | 1 | | | | | | | | | | | |
| The University of New South Wales Centre for Membrane Science and Technology | | | | 1 | | | | | | | | | |
| The University of New South Wales Centre for Photovoltaic Engineering | | | | | | 1 | | | | | | | |
| The University of New South Wales Department of Applied Physics | | | | 1 | | | | | | | | | |
| The University of New South Wales School of Biological, Earth and Environmental Sciences | | | | | | | | | 1 | | | | |
| The University of New South Wales School of Chemical Engineering and Industrial Chemistry | | | | 1 | | | | | | | | | |
| The University of New South Wales School of Chemical Sciences | | | | 1 | 3 | 6 | | | | | | | |
| The University of New South Wales School of Civil and Environmental Engineering | | | | | | | | | 1 | | | | |
| The University of New South Wales School of Physics | 1 | 1 | | | | | | | | | | 1 | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| The University of Newcastle Faculty of Engineering and Built Environment | | | 1 | | | | | | | | | | |
| The University of Newcastle School of Mathematical and Physical Sciences | | | | | 1 | 1 | 1 | | | | | | |
| The University of Queensland Centre for Magnetic Resonance | | | | | 1 | | | | | | | | |
| The University of Queensland Department of Biochemistry and Molecular Biology | 2 | 2 | | | | | | | | | | 2 | |
| The University of Queensland Department of Chemistry | | | | | 1 | | | | | | | | |
| The University of Queensland Division of Chemical Engineering | | | 1 | | | | | | | | | | |
| The University of Queensland Faculty of Biological and Chemical Sciences | | | | 1 | | 2 | | | | | | | |
| The University of Queensland Institute for Molecular Bioscience | 1 | 1 | | | | | | | | | | 3 | |
| The University of Queensland School of Molecular and Microbial Sciences | | | | | 1 | | | 1 | | | | | |
| The University of Sydney Department of Chemical Engineering | | | 1 | | 1 | | | | | | | | |
| The University of Sydney Electron Microscope Unit | | | | | | | | | 1 | | | | |
| The University of Sydney School of Chemistry | 1 | 7 | 4 | | 8 | 4 | | 2 | 4 | | | | |
| The University of Sydney School of Land, Water and Crop Sciences | | | 1 | | 1 | | | | | | | | |
| The University of Sydney School of Molecular & Microbial Biosciences | 3 | 2 | | | | | | | | | | 3 | |
| The University of Western Australia School of Medicine and Pharmacology | | | | | | | | | | | | 1 | |
| The University of Western Australia School of Physics | | | | 1 | | 1 | 2 | | | | | | |
| University of Canberra Corrosion and Spectrochemistry Lab | | | | | | | | 1 | | | | | |
| University of Canberra Heath Design and Science | | | | | | | | 1 | | | | | |
| University of Canterbury Department of Physics and Astronomy | | | | | | | | 1 | | | | | |
| University of Canterbury Electrical and Computer Engineering | | | | | 1 | | | | | | | | |
| University of Canterbury Department of Chemistry | | 3 | | | | | | | | | | | |
| University of Cape Town, South Africa, Mineral Processing Research Unit | | | | | | | | | | | 1 | | |
| University of Notre Dame MG Kailis Group | | | | | | | | | | 1 | | | |
| University of Otago Department of Biochemistry | 4 | 4 | | | | | | | | | | | |
| University of Otago Department of Chemistry | | 3 | | | | | | 1 | | | | | |
| University of Otago School of Chemistry | | 1 | | | | | | | | | | | |
| University of South Australia Ian Wark Research Institute | | | 1 | 3 | 2 | 2 | | | 2 | | 2 | 1 | |
| University of South Australia IT, Engineering and the Environment | | | | | | | | | | | 1 | | |
| University of South Australia Research Services | | | | | | 1 | | | | | | | |
| University of Tasmania School of Chemistry | | 3 | | | | | | | | | | | |
| University of Technology Sydney Department of Applied Physics | | 1 | | | | 1 | | | | | | | |
| University of Technology Sydney Department of Chemistry, Materials and Forensic Science | | | | | 1 | | | | | | 1 | | |
| University of Waikato Department of Materials and Process Engineering | | | | | 1 | | | | | | | | |
| University of Waikato School of Chemistry | | 1 | | | | | | | | | | | |
| University of Western Australia School of Biomedical and Chemical Sciences | 1 | 5 | 1 | | | | | | | | | 1 | |
| University of Western Sydney School of Science Food and Horticulture | | | | 1 | | | | | | | | | |
| University of Wollongong Centre for Medical Radiation Physics | | | | | | | | | 2 | 1 | | | |
| University of Wollongong Department of Chemistry | | 1 | | | | | | | | | | | |
| Victoria University of Wellington School of Chemical and Physical Sciences | | | | | 3 | | | 1 | | | | | |
| Victorian Department of Primary Industries Marsupial Genomics | | | | | | | | | | 1 | | | |
| Victorian Department of Primary Industries Tatura | | | | | | | | | | 1 | | | |
| Walter and Eliza Hall Institute Structural Biology | 1 | 1 | | | | | | | | | | 3 | |
| WMC Resources Technology | | | | | | | | | | | 1 | | |
| X-Ray Technologies Ltd | | | | | | | | | | 1 | | | |

**Table 5.3 Australian research at overseas synchrotrons, 2002–2004, supported by ASRP and AMRFP**

**Supported by ASRP 2003-04**

| Principal Investigator | Others | Institution | Topic |
|---|---|---|---|
| **Australian National Beamline Facility at Photon Factory, Tsukuba, Japan** | | | |
| Dr N Armstrong | W Kalceff, P Lynch | University of Technology, Sydney | Characterisation of Nanoparticles Using Bayesian/Maximum Entropy Methods Applied to Synchrotron Diffraction Data |
| Dr A Berry | H O'Neill, D Scott | The Australian National University | The Oxidation State of U in Basaltic Melt at 1400°C |
| Dr S Best | M Bondin, T Behrsing | The University of Melbourne | Redox Initiated Structural Change in Iron-Sulfur Compounds (continuation) |
| Prof S Bhargava | D Akolekar | RMIT University | Interaction Dispersion of Noble Metal Nanoparticles on the Catalytic Support Materials: An EXAFS Study |
| Dr A Buckley | S Goh | The University of New South Wales | Interfacial Characterisation of Electrochemically Oxidised Aluminium |
| Dr P Dastoor | L Thomsen, B Watts | The University of Newcastle | Molecular Alignment of Organosilanes on Surfaces Studied by X-ray Absorption Spectroscopy |
| A/Prof R De Marco | A van Riessen, G Parkinson, S Bailey, N Kirby, A Rohl | Curtin University of Technology | In Situ Electrode Kinetic and Grazing Incidence X-ray Diffraction Studies of Technologically Important Electrochemical Systems |
| Dr G Edward | J Ma, P Zhu | Monash University | Morphology and Orientation Resulting from Polymer Processing |
| Dr C Glover | R Albion, C Bullen | The Australian National University | Local Atomic Structures of Semiconductor Nanocrystals |
| Dr P Halley | P Sopade | The University of Queensland | Structural and Organisational Changes in Starch Granules During Heat-Moisture Treatment Under Isothermal Conditions: X-ray Diffraction Studies |
| Dr G Heath | A Edwards, S Best, M Bondin | The Australian National University | Redox State Modulation of Metal-Metal Bonding (continuation) |
| Dr B Kennedy | C Howard, Q Zhou, L Li | The University of Sydney | Structures and Phase Transitions in Metal Oxides and Halides |
| Dr C Kepert | K Chapman, C Weeks | The University of Sydney | Reversibility of Negative Thermal Expansion in the $MM'(CN)_6$ Family |
| Dr C Kepert | K Chapman | The University of Sydney | Negative Thermal Expansion in $Co^{III}$ Prussian Blue Analogues |
| Dr P Kluth | B Johannessen, M Ridgway | The Australian National University | Ion Irradiation Induced Preferential Amorphisation of Metallic Nanocrystals in Silica Measured with EXAFS |
| Prof P Lay | A Levina, H Harris, Ming-Chu Cheng, I Mulyani, J Aitken | The University of Sydney | XAFS Studies of Bioinorganic Systems |
| A/Prof I M Low | U Mahmood, M Tan | Curtin University of Technology | Depth Profiling of Phase Composition and Texture in Human Teeth |
| Dr A Nikulin | A Darahanau | Monash University | Non-Destructive Characterisation of Nanostructures Using PRXRD Technique |
| Dr J Overgaard | D Hibbs | The University of Sydney | Charge Density Studies of Drug Molecules and Their Metal Complexes |
| Dr A Peele | K Vora | The University of Melbourne | LIGA for Lobster and CXRL |
| Dr M Ridgway | S Kluth, Z Hussain | The Australian National University | Amorphous Compound Semiconductors – Formation and Relaxation |
| Dr M Riley | G Schenk, G Hanson, L Gahan | The University of Queensland | XAS of Binuclear Metalloenzymes and Model Complexes |
| Dr S Schmid | | The University of Sydney | Ceramic Materials with Modulated Structures |
| Dr A Stampfl | | ANSTO | Understanding Bio-Glue from an Electronic Perspective |
| Dr V Streltsov | J Varghese, K Barnham | CSIRO | X-ray Absorption Studies on Structural Consequences of Metal Binding to the Amyloid$\beta$-peptide |
| Dr N Tran | | The University of New South Wales | Structural Order of Residual Oxygen in GaN Films Grown by Single Source Chemical Vapour Deposition |
| Dr K Wallwork | M Chauvet | ANSTO | Protein-Mineral Interactions with Calcium Oxalate Crystals |
| Dr Z Zhang | C Howard, G Lumpkin | ANSTO | Phase Diagram for the Perovskite System $SrTiO_3$-$La_{2/3}TiO_3$ |

**BioCARS Beamline at Advanced Photon Source, Chicago, USA**

| | | | |
|---|---|---|---|
| Dr T Garrett | | Walter & Eliza Hall Institute | Structural Analysis of the Human Leukemia Inhibitory Factor Receptor (LIFR) |
| Dr L Guddat | | The University of Queensland | Branched Chain Amino Acid Biosynthesis or Acetohydroxyacid Synthase |
| Dr M Guss | | The University of Sydney | Structure of Human Purple Iron Phosphatase (Uteroferrin) |
| Dr M Parker | | St Vincents Med Res Inst | Inflammatory Protein A |
| Dr M Parker | | St Vincents Med Res Inst | Human Growth Hormone Receptor |
| Dr P Ramsland | W Farrugia | Austin Research Institute | Engineering Immune System Glycoproteins into Uniform Crystalline Lattices |
| Dr J Rossjohn | | Monash University | Coral Pigment |
| Dr J Whisstock | | Monash University | Serine Proteinase Inhibitors |

**ChemMat CARS at Advanced Photon Source, Chicago, USA**

| | | | |
|---|---|---|---|
| Dr J Cao | J Wright | Swinburne University | Seeking Correlation Between the SAXD Patterns of Human Hair Keratin and Donors' Biological Characteristics |
| Prof G Edward | P Zhu, R Knott | Monash University/ANSTO | The Influence of Processing on Polymer Morphology and the Consequent Solid State Material Behaviour |
| Dr C Garvey | R Knott | ANSTO | SAXS Study of the Structure of Polymaleic Acid Aggregates |
| A/Prof A Gerson | J Addai-Mensah, Huixin Li | University of South Australia | X-ray Scattering from Supersaturated Caustic Aluminate Solutions |
| Prof E Gray | T Blach | Griffith University | In-situ XRD Study of the Kinetics of the α-to-β, Phase Transformation in the $LaNi_5$.H System |
| Prof R Lamb | H Zhang, N Tran | The University of New South Wales | Investigation of the Fractal Structure of In Situ Silica/ Fumed Silica/PDMS3-Component System and Its Correlation with the Film Morphology |
| Dr A Neufeld | R Taylor | CSIRO Manufacturing & Infrastructure Technology | Critical Parameters which Influence the Kinetics of Controlled Electro-Wetting of Reactive and Noble Metals |
| Dr D Sutton | T Hanley, R Knott | ANSTO/University of New South Wales | A Study of the Nucleation Characteristics of Polymer Crystallisation under Shear |
| Dr P Turner | B Skelton (UWA), J McKinnon – (UNE) | The University of Sydney | Specialist Crystallography at the Advanced Photon Source (SCrAPS2003) |

**XOR-CAT at Advanced Photon Source, Chicago, USA**

| | | | |
|---|---|---|---|
| Dr C Dillon | P Lay, J Aitken | The University of Sydney | Micro-SRIXE and Micro-XANES Analyses of Chromium Compounds in Lung Cells: |
| Dr P Donnelly | J Aitken, W Reade | The University of Sydney | Synchrotron studies of Chocolate-on-White Ware: SA Levantine Ceramic from the Levant Dating from c1550 to 1450 BC |
| Prof T Hambley | R Alderden, T Failes, M Hall | The University of Sydney | Monitoring Hypoxia Selective Agents in Tumors and Tumor Models |
| Prof E Harvey | | CRC MicroTechnology | Fabrication of Two-Layered Structures with Alignment for a Micropump |
| Prof P Lay | C Dillon, J Aitken | The University of Sydney | Micro-SRIXE and Micro-XANES Investigations of the Intracellular Distributions and Forms of Indoleamine 2,3-deoxygenase (IDO) |
| Prof K Nugent | | The University of Melbourne | Coherent X-ray Optics and X-ray Imaging |
| Dr M Ridgway | C Glover, G Foran | The Australian National University | Electronic Structure and Interface Effects of Ge Nanocrystals Embedded in a $SiO_2$ Mixture |
| Dr C Ryan | B Etschmann | CSIRO Minerals | Selective X-ray Bragg Spectrometry: Optimizing Fluorescence Microprobe Sensitivity for Precious Metals |
| Dr R Welberry | D Goosens, A Heerdegen | The Australian National University | Diffuse Scattering from Crystals Containing Flexible Organic Molecules |

**Supported by AMRFP, 2003-04**

| Facility | Principal Investigator | Others | Institution | Topic |
|---|---|---|---|---|
| APS | Dr C Chantler | Z Barnea, N Rae, M de Jonge, L Young, S Southworth | The University of Melbourne | High Precision Measurement of Imaginary Component of Atomic Form Factor at Intermediate Energies for Silicon |
| APS | A/Prof B King | | The University of Newcastle | Surface Analysis Using a Free Electron Laser |
| BESSY II | Dr J Riley | A Tadich, L Broekman, E Huwald | La Trobe University | Angle Resolved Photoelectron Spectroscopy of Alloy Systems |

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|---|---|---|---|---|
| Elettra | A/Prof A Gerson | C Piantadosi, R Jones | University of South Australia | Surface and Bulk X-ray Photoelectron Spectroscopic Analysis of Metal Sulfide Minerals |
| Elettra | Dr K Siu | M Morgan, T Beveridge | Monash University | Glioma Detection in a Rat Model Using Diffraction Enhanced Imaging |
| ESRF | Dr J Bartlet | | ANSTO | Mechanism for Silica and Zirconia Nanoparticle Growth and Final Size in compartmented Salt-Free Catanionic Nanoreactors |
| ESRF | Dr A Berry | H O'Neill, S Sommacal | The Australian National University | Effects of Composition, Oxygen Fugacity, Pressure and Cooling on the Sulfur Speciation in Quenched Silicate Melts by μXANES |
| ESRF | Dr I Grey | E Silvester, C Macrae | CSIRO Minerals | Redox Reactions of Chromium During Ilmenite Alteration |
| ESRF | Dr J McKinnon | | University of New England | Non-Linear Optical Properties of Molecular Materials: An Innovative Approach Using High-Resolution X-ray Diffraction Data |
| ESRF | Dr P Turner | | The University of Sydney | Single Crystal Diffraction Data Collections (3 experiments) |
| Hasylab, DESY | A/Prof T Finlayson | | Monash University | X-ray Sensitive Polymer Films |
| SPring-8 | Prof R Lewis | K Sui, M Kitchen | Monash University | A Novel Method of Diffraction Enhanced Imaging (DEI) that Permits Imaging of Dynamic Processes by the Simultaneous Acquisition of Refraction and Absorption Images |
| SPring-8 | Dr A Nikulin | A Darahanau | Monash University | High Resolution Tomographic X-ray Phase Retrieval |
| SPring-8 | Dr K Pavlov | J Gillam | Monash University | A New Multi-Wave Diffraction Enhanced Imaging Technique: Laue Diffraction Case |
| SRS Daresbury | Dr E Gilbert | | ANSTO | Parallel SAXS and DSC Investigation of Incommensurate Modulated Structures in Phase Separating Binary Paraffin Mixtures |
| Swiss LS | Dr V Streltsov | | CSIRO Health Sciences & Nutrition | Structural Studies of Complexes of Interleukin-6 and its Receptors |
| Swiss LS | Dr J Varghese | V Steltsov | CSIRO Health Sciences & Nutrition | Structure of Interleukin-6 Signalling Complexes |

**Supported by ASRP 2002–03**

| Principal Investigator | Others | Institution | Topic |
|---|---|---|---|
| **Australian National Beamline Facility at Photon Factory, Tsukuba, Japan** | | | |
| Dr G Azevedo | B Johannessen | The Australian National University | Characterisation of Nanocrystal Formation in $SiO_2$ with EXAFS |
| Dr A Berry | H O'Neil, D Scott | The Australian National University | The Effect of Composition on Cr and Fe Oxidation States in Silicate Glasses and Melts |
| Dr A Berry | H O'Neill, S Sommacal | The Australian National University | The Oxidation State of U in Silicate Glasses |
| Dr S Best | M Bondin, S Borg | The University of Melbourne | Redox Initiated Structural Change in Iron-Sulfur Compounds (continuation) |
| Dr S Best | S Borg, M Bondin | The University of Melbourne | Redox Initiated Structural Change in Iron-Sulfur Compounds (continuation) |
| Dr S Best | M Bondin, G Heath, A Edwards | The University of Melbourne | Redox State Modulation of Metal-Metal Bonding |
| Dr J Brugger | W Liu, B Etschmann | SA Museum | Structure of Fe(III) and Cu(I) Chloro-complexes in Hypersaline Solutions |
| Dr R Corkish | Dr A Nikulin, E-C Cho, J Xia | The University of New South Wales | Structural Studies of $Si/SiO_2$ Interface Prepared by High Temperature Oxidation of SOI Wafer |
| Dr R De Marco | A van Riessen, A Lowe | Curtin University of Technology | An In-Situ Synchrotron Radiation-Grazing Incidence X-ray Diffraction Study of the Surface Chemistry of the Iron Electrochemical Sensor |
| A/Prof G Edward | G Simon, J Ma | Monash University | Processing Effects on Polymer Morphology and Orientation |
| Dr G Edward | J Healy, P W Zhu | Monash University | Morphology and Orientation Resulting from Polymer Processing |
| Dr B Etschmann | W Liu | CSIRO Exploration and Mining | Structure of Cu(I) Chloro-complexes in Hypersaline Solutions |
| Dr C Glover | P Kluth | The Australian National University | EXAFS Measurements of the Local Structure of Ferromagnetic GaMnAs Alloys |
| Dr T Hambley | M Hall, C Underwood | The University of Sydney | Investigations into the Rate of Biotransformation of Inorganic Chemotherapeutics |
| Dr R Hart | A van Riessen, K Winters | Curtin University of Technology | Defect Density, Size, Size Distribution and Strain in Kaolins |

| | | | |
|---|---|---|---|
| Dr M James | T Boecking | ANSTO | Investigation of Long Range Order in Ultra Thin Organic Monolayers on Silicon |
| Dr B Kennedy | Q Zhou, C Howard | The University of Sydney/ANSTO | Structures and Phase Transitions in $Ba_{1-x}Sr_xBi_2Nb_2O_9$ |
| Dr B Kennedy | L Li | The University of Sydney | Valence Transitions in $Ba_2PrRu_{1-x}Ir_xO_6$ |
| Dr B Kennedy | | The University of Sydney | High Temperature Phase Transitions in the Perovskite $SrRhO_3$ |
| Dr B Kennedy | Q Zhou | The University of Sydney | High Temperature Phase Transitions in the Layered Bismuth Oxide $Bi_4Ti_3O_{12}$ |
| Dr B Kennedy | C Howard | The University of Sydney/ANSTO | High Temperature Phase Transitions in the Double Perovskite Cryolite $Na_3AlF_6$ |
| Dr C Kepert | K Chapman | The University of Sydney | Negative Thermal Expansion in the $M^{II}Pt^{IV}(CN)_6$ Family |
| Dr P Kluth | B Johannessen | The Australian National University | Structural Properties of Metallic Nanocrystals Formed by Ion Implantation into $SiO_2$ Measured with Temperature Dependent EXAFS |
| Dr K Latham | | RMIT University | A Preliminary EXAFS Study on the Incorporation of Iron into the Crystalline Lattice of Zeolite LTL |
| Prof P Lay | J Aitken, A Levina, I Mulyani | The University of Sydney | XAFS of Cr Dietary Supplements and Genotoxic Chromium Complexes |
| A/Prof J Low | Z Oo, B Stauble | Curtin University of Technology | Depth-Profiling of Near-Surface Composition in Vacuum-Treated Aluminium Titanate |
| Dr A Masters | R Syna, S McNiven | The University of Sydney | Mo EXAFS as a Probe of Molybdenum Speciation in the Production of Pharmaceuticals |
| A/Prof T Masters | R Syna, S McNiven | The University of Sydney | Mo EXAFS as a Probe of Molybdenum Speciation in the Production of Pharmaceuticals |
| Dr A Nikulin | A Benci, C Langer | Monash University | Characterisation of SiGe:C Alloys Near Absorption Edge of Ge II |
| Prof G Parkinson | M Loan, A van Riessen | Curtin University of Technology | Understanding Nanoscale Materials with Short-Range Order: Ferrihydrite |
| Dr K Pavlov | M Tabuchi, S Mudie | Monash University | Investigation of In Segregation in InGaN Heterostructures by Methods of Statistical Diffraction Theory (Reciprocal Space Mapping) |
| Dr K Pavlov | S Mudie, M Tabuchi | Monash University | Characterisation and Comparison of a Novel Reciprocal Space Mapping Routine, Utilising Image Plates as the Detector |
| Dr M Ridgway | W Wesch | The Australian National University | EXAFS Measurements of Structural Relaxation in Amorphised Compound Semiconductors |
| Dr M Ridgway | B Johannessen | The Australian National University | Irradiation Induced Preferential Amorphisation of Semiconducting and Metallic Nanocrystals in $SiO_2$ Measured with EXAFS |
| Dr B Singh, | A Tong, B Kennedy | The University of Sydney | Interaction of Copper, Iron, Lead, Chromium with Synthetic Kaolinite |
| Dr D Sutton | T Hanley | ANSTO/University of New South Wales | Structure Development in Nanocomposite Materials |
| Dr S Thomson | V Luca, C Griffith | ANSTO | EXAFS Experiments on a New Titanium Mesoporous Oxide (TOM) Support Material |
| Dr A van Riessen | R Hart, K Winters | Curtin University of Technology | Mimicking Biomineralisation of Calcium Carbonate Polymorphs |
| Dr L Vance | G Thorogood, M Carter | ANSTO | X-ray Spectroscopy and Diffraction of Hollandites |
| Dr C Weeks | C Kepert, K Chapman | The University of Sydney | XAFS Study of Negative Thermal Expansions in $Zn^{IV}(CN)_2$ and $Zn^{II}Pt^{IV}(CN)_6$ |
| Dr Z Zhang | C Howard, G Lumpkin | ANSTO | Phase Diagram and Structures in the Perovskite System $SrTiO_3$-$La_{2/3}TiO_3$ |
| Dr Z Zhang | C Howard | ANSTO | Phase Diagram for the Perovskite System $SrTiO_3$-$La_{2/3}TiO_3$ |
| **BioCARS Beamline at Advanced Photon Source, Chicago, USA** | | | |
| Dr Paul Carr | Samir Hamdan, James Murphy | The Australian National University | Probing the Active Site of the Epsilon SubUnit of DNA Polymerase III |
| Dr Luke Guddat | Jennifer McCourt | The University of Queensland | Branched Chain Amino Acid Biosynthesis |
| Dr B Kobe | | The University of Queensland | Crystal Structure Determination and Peptide Recognition of the FHA Domain from the Yeast Protein Kinase Dun1 |
| Dr M Lawrence | Jenni Carmichael | CSIRO | Insect Hormone Receptorl |
| A/Prof Jenny Martin | C Gee, F McMillan, B Heras | The University of Queensland | Structural Studies on Medically Relevant Protein Targets |

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|---|---|---|---|
| Dr Michael Parker | Julian Adams, Geoff Kong | St Vincents Med Res Inst | Human Class Pi Glutathione Transferase: Structural Basis for Substrate Binding |
| Dr G Polekhina | Michelle Dunstone, Geoffrey Kong | St Vincents Med Res Inst | Stuctural Studies of Intermedilysin, APP and Siah in Complex with its Binding Partners |
| Dr J Rossjohn | | Monash University | Coral Pigment |
| Dr J Rossjohn | | Monash University | Immune Receptors |
| Dr J Whisstock | | Monash University | Serine Proteinase Inhibitors |
| A/Prof M Wilce | | University of WA | Structural Analysis of SH2 Domains |
| **ChemMat CARS at Advanced Photon Source, Chicago, USA** | | | |
| Dr Chris Garvey | Robert Knott | ANSTO | An ASAXS Study of the Structure of Polymaleic Acid Aggregates |
| Dr Jinan Cao | Jon Wright | Swinburne University | Correlation between X-ray Diffraction of Human Hair Keratin and Biological Characteristics |
| Dr Ian Gentle | Jeremy Ruggles, Ben O'Driscoll | The University of Queensland | Molecular Recognition between Metalloporphyrins and Solubilized Cations at the Air-Water Interface |
| Dr Ian Gentle | J Ruggles, G Foran | ANSTO | Studies of Interfacial Structure of Porphyrins and Silicates by X-ray Reflectivity |
| A/Prof V James | M Read, G Corino | The Australian National University | A Study of Changes in the Diffraction Patterns of Human and Baboon Hair with Disease |
| Dr Robert Knott | Tracey Hanley, David Sutton | ANSTO | Polymer Crystallisation and the Effects of Shear |
| Dr Kay Latham | John White | RMIT University/The Australian National University | Small-Angle X-ray Scattering Studies on the Earliest Stages of Crystallisation of Zeolite Molecular Sieves from Clear, Homogenous Solution Using SR |
| **SRI-CAT at Advanced Photon Source, Chicago, USA** | | | |
| Dr A Buckley | Siew Wei Goh | The University of New South Wales | Oxygen K-edge XAS of Surface Oxide Layers on Aluminium |
| Dr A Buckley | Siew Wei Goh | The University of New South Wales | Threshold S KLL Auger Spectroscopy and XAS of Metal Sulfides |
| Dr P Dastoor | J Quinton, L Thomsen, B Watts | University of Newcastle | Molecular Alignment of Organosilanes on Surfaces Studied by X-ray Absorption Spectroscopy |
| Dr P Donnelly | Jade Aitken, Wendy Reade | The University of Sydney | Synchrotron Studies of Chocolate-on-White Ware: A Levantine Ceramic from Jordan and the Levant Dating from c1550 to 1450 BC |
| Dr M Ghantasala | Errol Harvey | Swinburne University | LIGA Fabrication Studies Using SU8 Resist with Aligned Structures for Making a Micropump |
| Dr M Ghantasala | | Swinburne University | Fabrication of Two-Layered Structures with Alignment for a Micropump |
| A/Prof T Hambley | Mr M Hall, Ms R Alderden | The University of Sydney | Investigation Into the Mechanism of Action of Platinum Anticancer Complexes in Tumour Cells |
| Prof P Lay | Jade Aitken, C Dillon | The University of Sydney | Micro-SRIXE and XANES Investigations of the Intra-cellular Distributions and Forms of Indoleamine 2, 3-deoxygenase (IDO) |
| Dr A Mancuso | Keith Nugent, Andrew Peele | The University of Melbourne | Recovering Phase in the Presence of Scattering |
| Prof B O'Connor | A Van Riessen, Matthew Rowles | Curtin University of Technology | Dependence of Si and Al Radial Density Distributions on Chemical Composition in Alkali-Activated Aluminosilicate Polymers |
| Dr Tim Payne | P Milham | ANSTO/UWS | Cadmium Distribution in Sydney Basin Agricultural Soils by Synchrotron X-ray Fluorescence |
| Dr M Ridgway | C Glover, G Azevedo | The Australian National University | Local Structural Characterisation of Amophised and Annealed InP and GaP |
| Dr Chris Ryan | B Etschmann | CSIRO | Synchrotron – Nuclear Microprobe Energy: Towards Real-Time, Quantitative SXRF Elemental Imaging |
| Dr J Thornton | | DSTO | Finding the Pair Distribution of Pristine and Degraded Thermal Barrier Coating Zirconia |
| Dr N Tran | R Lamb, H Zhang | The University of New South Wales | Structural Order of Residual Oxygen in GaN Films Grown by Single Source Chemical Vapour Deposition |
| Dr N Tran | R Lamb, H Zhang | The University of New South Wales | Structural Order of Residual Oxygen in GaN Films Grown by Single Source Chemical Vapour Deposition |

**Supported by AMRFP, 2002-03**

| Facility | Principal Investigator | Others | Institution | Topic |
|---|---|---|---|---|
| ALS, USA | Dr J Martin | | The University of Queensland | Structural Studies on PNMT, Mouse Latexin, Insect Ferritin |
| APS, USA | Dr A Berry | | The Australian National University | (i) Copper Speciation as a Function of Temperature in Fluid Inclusions (ii) Micro-XANES Determination of the Oxidation State of Fe in Natural Melt Inclusions |
| APS, USA | Prof V James | | The Australian National University | A Study of Changes in the Diffraction Patterns of Hair with Disease |
| APS, USA | A/Prof B King | | University of Newcastle | Surface Analysis Using a Free Electron Laser |
| BESSY II, Germany | Prof R Leckey | E Huwald, A Tadich | La Trobe University | Electronic Structure Determinations Using an Advanced Toroidal Spectrometer |
| BESSY II, Germany | A/Prof J Riley | A Tadich | La Trobe University | Observations of Mn Layers on GaAs Using Angle Resolved Photoemission |
| BESSY II, Germany | A/Prof J Riley | | BESSY II Germany La Trobe University | Development of a Toroidal Spectrometer and Observations of Mn Layers on GaAs Using Angle Resolved Photoemission |
| Centre for Advanced Microstructures and Devices, USA | Dr M Ghantasala | C Davenport | Swinburne University | Fabrication of High Aspect Ratio Structure Micro-components for Microfluidic Applications Using Synchrotron Radiation |
| Elettra, Italy | Dr K Siu | | Monash University | Extending the Applications of Diffraction Enhanced Imaging DEI: Dosimetry and Contrast Agent Studies |
| ESRF, France | Dr J McKinnon | | University of New England | Non-Linear Optical Properties of Molecular Materials: An Innovative Approach Using High-Resolution X-ray Diffraction Data |
| ESRF, France | Dr M Ridgway | G Azevedo | The Australian National University | Structure of Metal-Decorated Nanocavities in Si |
| NSLS, USA | Ms V Peterson | | University of Technology, Sydney | Investigation of Tricalcium Silicates |
| Pohang, Korea | Dr Deenapanray | M Petravic | The Australian National University | Structural Characterisation of (In)GaAsN Epitaxial Layers by Photoemission Spectroscopy |
| Pohang, Korea | Prof R Lamb | N Tran, E Lee | University of New South Wales | Structural Order of Ultra-Thin Films Grown by Single Source Chemical Vapour Deposition |
| Pohang, Korea | Dr A Nikulin | I Svalbe, R Horney | Monash University | Experimental Studies in Quantitative X-ray Phase Retrieval |
| Pohang, Korea | Dr J Russell | M Hill, R Lamb | University of New South Wales | Crystallographic Orientation of ZnO Films on Optical Fibres |
| Pohang, Korea & APS, USA | Dr M Petravic | P Deenapanray, V Coleman, M Fraser | The Australian National University | (i) Synchrotron-based Photoemission Studies of Composition Changes on III-N-V Surfaces Under Low Energy Ion Bombardment (ii) FEL-based Resonance Ionisation Spectrometry of Impurities from Semiconductor Surfaces |
| SLAC, University Stanford | Dr B Begg | | ANSTO | Actinide Incorporation in the Zirconolite Polytypes |
| SLAC, University Stanford | Dr M Guss | S Graham | The University of Sydney | Structures of Metalloproteins and Metalloenzymes |
| SLAC, University Stanford | Dr M Maher | | The University of Sydney | Multiple Wavelength Anomalous Dispersion MAD Data Collection from Metalloprotein Crystals |
| SLAC, University Stanford | Dr M Ridgway | | The Australian National University | EXAF Characterisation of Implanted-Induced Disorder in Compound Semiconductors and Structural Perturbations in Elemental Nanocrystals |
| SLAC, University Stanford | Dr C Young | C Doonan, D Nielsen | The University of Melbourne | Metal and Sulfur XANES and EXAFS Studies of Molybdo Enzyme Models |
| SPring-8 Japan | Prof R Lewis | | Monash University | An Investigation into the Nature of the Speckle Pattern Seen in Images of Lung Tissue |
| SPring-8 Japan | Dr A Nikulin | | Monash University | Fundamental Studies of 90 Degree Bragg Reflection |
| SRRC, Taiwan | Dr A Buckley | N Tran, B Holzschuh | University of New South Wales | Structural Order of Residual Oxygen in GaN Films Grown by Single Source Chemical Vapour Deposition |

*Source: ASRP annual reports*