International Networks and the Competitiveness of Australia's Science and Technology

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Australian Academy of Science

The report was compiled by:

Dr Fiona Wood
Centre for Higher Education Management and Policy,
University of New England, and

Dr Keith Boardman AO FAA FRS FTSE
Australian Academy of Science

with the assistance of the Academy's Secretariat:
Trish Nicholls and Rachel Douglas.

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FOREWORD

Since its formation in 1954, the Academy has had a strong and continuing commitment to international activities. These include its scientific exchange programs which enable Australian scientists to undertake collaborative research with researchers in overseas laboratories, strong associations with overseas science academies and active participation in the many working groups of the International Council for Science (ICSU).

The paper *International science and technology: its value to Australia and the role of the Academies* was prepared for the Australian Academy of Science (AAS) and the Australian Academy of Technological Sciences and Engineering (ATSE) in 1997 by Professor Michael Pitman and Professor Greg Tegart. One of the aims of that paper was 'to explore views about international cooperation in science, technology and engineering involving both public and private sector research'. Our geographic isolation, as the paper points out, has meant that Australian scientists have always been outward looking.

However, the widely reported studies of Professor Paul Bourke and Ms Linda Butler have shown that since the mid to late 1980s the share of world citation to Australian research has declined. The 1996 report by the Academy of Science, *The impact of Australian science*, examined the reasons for this decline. This study concluded that *the most likely cause of the decrease in citation of Australian scientific papers in international science journals was a weakening of the networks between young researchers and their overseas colleagues*. Apart from ensuring the exchange of leading-edge knowledge, international links enhance a country's ability to attract to its laboratories and universities the world's top scientists and scholars.

The main aim of our current study was to assess the opportunities available for early career researchers in the sciences to obtain overseas research training and career development. Information was also sought on the support provided for established researchers to maintain overseas research networks. In addition the study investigated the type and level of support provided by a number of Australian universities for visits by foreign nationals for collaborative research purposes. A further area of inquiry concerned the numbers of overseas PhD students undertaking their training in Australia but who were expected to return to their home countries at the end of this training. *The authors found that there were many obstacles for young researchers seeking overseas experience and these are detailed in the report.* The authors also draw specific attention to the substantial investment by the European Union in supporting the mobility of young scientists from its member countries via its Framework research programmes.

The report addresses the topic of international networks and Australia's competitiveness in science and technology from a number of different perspectives and in so doing draws upon a wide range of material. The report's authors have impressively integrated this diverse material in mapping the complexities of scientific linkages and in identifying issues of concern for the Australian science effort.

The Health and Medical Strategic Review, *The virtuous cycle—working together for health and medical research*, chaired by Mr

Peter Wills, was released at the time this text was being finalised. It also stresses the benefits of overseas study for new postdoctoral researchers. These benefits include the development of ideas, networks, collaborations and exposures to other systems. This view is strongly supported by the Academy.

I am very grateful that the Australian Research Council and its Chair, Professor Vicki Sara, has supported the Academy's study. I wish especially to thank Dr Keith Boardman who began this task whilst Science Policy Secretary for the Academy and Dr Fiona Wood, the Academy's consultant for the project, for producing such a valuable resource.

I look forward to further debate, discussion and exploration of the many issues raised in the report. The Academy would be most grateful for comments and additional evidence on these issues.

Brian D O Anderson
President
Australian Academy of Science

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The report includes a discussion of the internationalisation of training and research activities of a number of Cooperative Research Centres (CRCs) and Rural Research and Development Corporations. The following staff and organisations were particularly helpful in providing the necessary data and contextual information about these activities:

The Directors of the following Cooperative Research Centres:

- Alloy & Solidification Technology;
- Materials Welding and Joining;
- Broadband Telecommunications and Networking;
- Australian Photonics;
- Australian Petroleum;
- Hydrometallurgy (AJ Parker);
- Legumes in Mediterranean Agriculture;
- Tropical Plant Pathology;
- Antarctic and Southern Ocean Environment;
- Ecologically Sustainable Development of the Great Barrier Reef;
- Cellular Growth Factors;
- Eye Research and Technology;

and Mr T Hill, CRC Secretariat, Science and Technology Division, Department of Industry, Science and Resources.

The following Rural Research and Development Corporations:

Cotton Research and Development Corporation; Dairy Research and Development Corporation; Grains Research and Development Corporation; Horticultural Research and Development Corporation; Land and Water Resources Research and Development Corporation; Pig Research and Development Corporation; and the Sugar Research and Development Corporation.

The report draws attention to the importance of international networks in areas of science and technology where international cooperation is vital because of the global nature of the area. In this regard the Academy would like to acknowledge the authoritative and timely contributions to improving understanding of this topic by: Dr A D McEwan, Senior Science Adviser—Oceanography, Bureau of Meteorology; Professor G I Pearman, Chief, CSIRO Division of Atmospheric Research; Professor P G Quilty, Australian National Antarctic Research Expeditions (ANARE) Chief Scientist, Australian Antarctic Division; and Dr J W Zillman, Director of Meteorology, Bureau of Meteorology.

In the early stages of the project's development the Academy, via its Newsletter, invited comment on the topic of international networks in science and technology. Appreciation is expressed to those who responded to this invitation by sharing their views, experiences and concerns.

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Professors A L J Beckwith, D H Green, K Lambeck, M G Pitman, I G Ross, J A Young and J W White provided comments and advice on the draft report. Particular appreciation is expressed to them for this assistance.

ABBREVIATIONS AND ACRONYMS

AAO	Anglo-Australian Observatory
AAS	Australian Academy of Science
ABARE	Australian Bureau of Agricultural and Resource Economics
ABG	L'Association Bernard Gregory
ABS	Australian Bureau of Statistics
ACIAR	Australian Centre for International Agricultural Research
ANARE	Australian National Antarctic Research Expeditions
ANSTO	Australian Nuclear Science and Technology Organisation
APEC	Asia Pacific Economic Cooperation
ARC	Australian Research Council
ATSE	Australian Academy of Technological Sciences and Engineering
AusAID	Australian Agency for International Development
AVCC	Australian Vice-Chancellors' Committee
BIE	Bureau of Industry Economics
CAMBIA	Center for the Application of Molecular Biology to International Agriculture
CERN	European Organization for Nuclear Research
CGIAR	Consultative Group on International Agricultural Research
COST	European Cooperation in the field of Scientific and Technical Research
COSTAI	Collaboration on Science and Technology Australia-Indonesia
CRC	Cooperative Research Centre
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DETYA	Department of Education, Training and Youth Affairs (formerly DEETYA)
DEETYA	Department of Employment, Education, Training and Youth Affairs
DFAT	Department of Foreign Affairs and Trade
DILGEA	Department of Immigration, Local Government and Ethnic Affairs
DIMA	Department of Immigration and Multicultural Affairs
DIST	Department of Industry, Science and Tourism
EC	European Community
EMBL	European Molecular Biology Laboratory
ESA	European Space Agency
ESF	European Science Foundation
ESO	European Southern Observatory
EU	European Union
EUREKA	Cooperation between European firms and research institutes in the field of advanced technology
EuroHORC	European Union Research Organisations Heads of Research Councils
FASTS	Federation of Australian Scientific and Technological Societies

GRDC	Grains Research and Development Corporation
HFSP	Human Frontier Science Program
HHS	US Department of Health and Human Services
IAS	Institute of Advanced Studies, Australian National University
ICSU	International Council for Science
IE Aust	Institution of Engineers, Australia
IFIAS	International Federation of Institutes for Advanced Study
INSERM	L'Institut National de La Sante et de La Recherche Medicale
IRAP	Industrial Research Alliances Program
IREX	International Researcher Exchange Program
IRF	International Research Fellowships Scheme
IS&T	International Science and Technology
ISR	Industry Science and Resources (Dept. of) (formerly DIST)
ISTP	International Science and Technology Program
LWRRDC	Land and Water Resources Research and Development Corporation
MOU	Memorandum of Understanding
NASA	National Aeronautics and Space Administration
NATO	North Atlantic Treaty Organisation
NHMRC	National Health and Medical Research Council
NIH	US National Institutes of Health
NRC	National Research Council
NSB	National Science Board
NSERC	Natural Sciences and Engineering Research Council
NSF	National Science Foundation
OECD	Organisation for Economic Cooperation and Development
OPRS	Overseas Postgraduate Research Scholarship
OST	Office of Science and Technology
OSTP	Office of Science and Technology Policy
PRDC	Pig Research and Development Corporation
RDC	Research and Development Corporation
SCAR	Scientific Committee on Antarctic Research
SET	Science, Engineering and Technology
SMEs	Small and Medium Enterprises
SPIN	Sponsored Programs Information Network
SPSS	Statistical Package for the Social Sciences
STA	Science and Technology Agency
UNESCO	United Nations Educational, Scientific and Cultural Organization
WCRP	World Climate Research Programme
WHO	World Health Organization

TABLES

EXECUTIVE SUMMARY AND RECOMMENDATIONS

The centrality of knowledge to economic growth and international competitiveness is widely recognised. For a country such as Australia, which has a well-developed but comparatively small science base, access to global networks and the world's leading researchers and laboratories is therefore of particular importance. It is through such linkages that Australia can ensure that its level of skills and skills training in research are of international standard. Such networks also provide timely access to the latest developments in knowledge, including new instrumentation and technical advances. Furthermore, international collaboration is an important mechanism for maintaining the visibility of Australian research and researchers.

Whilst the international dimension of scientific research is not new, what has changed over the last two decades is that technological progress and market competitiveness are contingent on this research being conducted in accordance with international best practice.

It is within the above context that this report investigates: (1) the various mechanisms by which international scientific networks are formed and maintained; and (2) actual and potential barriers to this process. The report addresses the topic from a number of different perspectives, paying particular attention to the opportunities for young scientists to acquire overseas research training and career development. As such the report provides an important framework for considering a wide range of issues that Australia needs to address if its linkages to world class scientific research networks and activities are to be kept strong.

An overview of the structure of the report, the findings and recommendations is provided below:

Personal networks account for much of the international linkages in science but their formation and maintenance and their influence are often due to various governmental and non-governmental structures. Part of the objective of Chapter 1 is to map out the many different elements of the international science system. This Chapter also overviews the policies, structures and mechanisms developed by some of the industrially advanced nations to promote international cooperation and mobility of scientists and improve industrial competitiveness. Of particular importance in this regard are the Framework Programmes of the European Community. A common feature of the Programmes is the emphasis on research collaboration between Member States and public and private sector organisations. Support is provided by the European Community Programmes for young scientists to gain training and experience in research institutions, including industrial laboratories, in other countries.

Another mechanism for the facilitation of international scientific collaboration is access to major facilities such as synchrotrons and astronomical observatories which are cost-shared among participating countries.

The important role of national government research funding agencies in facilitating international exchanges, particularly for young scientists, is illustrated through examples drawn from the United States and the United Kingdom. In addition, Chapter 1

explores the ways in which personal considerations are taken into account in ensuring successful international exchanges. The Marie Curie Fellowship Association and L'Association Bernard Gregory are discussed in this context.

Our overview of programs which support international cooperation in science and technology indicates the increasing recognition of the value and importance of greater cooperation between countries in research and research training.

Recommendation 1: That the policies and structures intended to support the internationalisation of Australian scientific effort and participation in international research activities be benchmarked against those of comparator countries and regional economies.

A different set of network issues is raised by global research programs in which international cooperation is essential if an effective understanding is to be achieved. Chapter 3 focuses on several such research programs where Australian cooperation is required as part of meeting international obligations or to ensure that issues in the Southern Hemisphere receive sufficient visibility and attention. Particular attention is directed in this Chapter to the networks needed in research associated with meteorology and oceanography and the Antarctic environment.

The formation of the international networks in these global research programs appears to be driven largely by the scientists. However, whilst there has been an effective involvement of Australian scientists in the networks and in the international research programs, Australia's participation is becoming increasingly fragile. This is attributed to the constrained resources and the difficulty of attracting funding for the long-term monitoring programs. Similar issues are also raised in regard to access by Australian scientists to international research facilities.

The rapid advances in information and communication technologies have increased the amount of information which can be readily accessed and provided the means for more effective research collaboration, nationally and internationally. It is vital that Australia continues to have access to international scientific literature as well as to the expanding international databases. Chapter 1 identifies a range of problems for Australia to overcome in relation to access to the international scientific literature and databases, and emphasises the importance of a national approach to solve them.

Recommendation 2: A national strategy be adopted for securing access to electronic versions of all major scientific journals and electronic databases.

A number of Australian organisations which support international research training, exchange of scientists and research and development collaborations are overviewed in Chapter 2. These organisations are: the National Health and Medical Research Council (NHMRC), the Australian Research Council (ARC), the Department of Industry, Science and Resources (ISR), the Australian Academy of Science (AAS) and the Australian Academy of Technological Sciences and Engineering (ATSE).

Most of the programs support short-term exchanges and there are few that provide

for overseas postdoctoral training and career development of young researchers, with the opportunity for a position in an Australian institution or company at the completion of the overseas training. This issue is taken up again in Chapter 4.

The CJ Martin Fellowships of the NHMRC, which were established in 1952, and some of the other named fellowships of the NHMRC are an excellent model for international research training and career development of young researchers with direct benefits for Australia. The fellowships are usually awarded for four years, two of which are spent overseas and two in Australia.

Australia would benefit greatly from the establishment of a national overseas fellowship scheme. Although the ARC would be the appropriate body to be responsible for the operation of a national overseas fellowship scheme, the establishment of the scheme and the policies governing its operation would be relevant to several portfolios. An appropriate body to consider Recommendation 3 is the Coordination Committee on Science and Technology.

Recommendation 3: A national overseas postdoctoral fellowship scheme should be established, with conditions similar to the CJ Martin Fellowships of the National Health and Medical Research Council, to significantly increase the opportunities for early career researchers to gain research experience overseas. The four-year fellowships should be tenable in both public and private sector laboratories, overseas and in Australia.

Opportunities to acquire research experience in the world's leading research laboratories often vary depending on the career stage of the scientist. However, there is a view expressed by a number of peak scientific bodies within Australia that there are fewer opportunities for young researchers to obtain such experience.

So what are the various types of awards and level of funds provided for young Australian scientists to gain overseas training and career development? The report addresses this question from several perspectives. In Chapter 4, the focus is on sponsored awards provided by organisations listed in a database entitled *SPIN-Australia*. On the basis of this database, profiles were prepared in the following broad discipline areas: Medicine; Science & Technology; Engineering; Energy; Agriculture; and 'Other' (i.e. no discipline restrictions). The programs listed within these profiles are of *potential* opportunities to obtain funding support for research training/career development overseas for young Australian scientists. One outcome from these profiles is that funding opportunities appear to vary quite substantially between fields of research, and for many awards funding is inadequate. Recommendation 3 above is also relevant in this context.

The SPIN program summaries contained in Appendix 2 also list a range of potential awards for established researchers, including exchange programs, conference attendance and travel abroad. The profiles of sources of support for overseas research experience for young Australian scientists represent one of the first efforts to systematically identify these opportunities within this country.

Recommendation 4: Universities ensure that all their overseas research funding opportunities are listed on SPIN-Australia or an equivalent database.

Chapter 5 reports the results of an investigation of the type and level of support actually provided by Australian higher education institutions for the establishment and maintenance of international networks. A questionnaire was designed to obtain the required information and sent to all those institutions with 1997 commencing PhD enrolments in the Sciences of at least 100. Information was requested in relation to academic staff (established staff and early career researchers), research students and overseas scholars. Obstacles to the facilitation of international networks were also canvassed.

It was apparent during the conduct of the survey that information regarding international linkages has not been routinely or systematically collected by the participating institutions. This relates particularly to destination information for PhD graduates and information about overseas early career researchers. Similar concerns were also raised in Chapter 2 regarding the need to improve the collection of data regarding the international mobility of both Australian and overseas scientists and engineers to and from Australia. Whilst individual institutions might feel that the collection of such data is yet another burden, the payoffs in terms of being able to illustrate successful placement of postgraduates in leading overseas institutions must surely outweigh such concerns.

There are other good reasons for universities to compile information on the destinations of their PhD graduates besides the consideration of overseas training. These relate to the employment opportunities for PhD graduates and the aims of PhD training.

Recommendation 5: Greater attention needs to be directed to the systematic compilation of time series data on PhD graduate employment destination information both in terms of country of employment and sector of employment. The scientific manpower surveys undertaken by the US National Science Foundation and the Federation of American Societies for Experimental Biology are instructive in this regard. This is an issue which needs to be discussed by the AVCC and the Graduate Careers Council of Australia.

Despite the difficulties mentioned above, the survey results provide a useful insight into the role and adequacy of institutional support for networking opportunities for Australians overseas and for visiting overseas scholars in Australia. In this regard, whilst forms of support vary between the survey institutions a common concern was that there were insufficient funds to support international linkages at the level considered appropriate. One consequence of this identified by several institutions was that younger scientists were forced to compete with established researchers for these limited funds. The relatively small number of postdoctoral fellowships awarded by the major national research funding agencies which allowed for a component of overseas training for young scientists was also

considered an impediment to the formation of international networks for this group. Also whilst it was well-recognised that participation in overseas conferences was an important component of research training for young scientists it was clear that the funding available for these conferences was very limited, particularly for PhD students.

In relation to established researchers one of the main obstacles to maintaining and enhancing international networks was considered to be the limited funding available to support the range of activities required. The value of the Australian dollar, combined with high living costs in major industrialised countries were identified as particular obstacles to overseas research work. Concern was also raised regarding the many different work commitments for established academic staff. These were considered to restrict the ability of established staff to take advantage of opportunities for overseas based research activity.

Whilst attracting high calibre international visitors to Australia for the purposes of exchanges or conference/workshop participation is considered just as important as Australians going overseas for the same purposes, a number of obstacles to this, in addition to funding, were identified. These include the very distance of Australia from the world's leading research centres combined with the perceived quality of the research infrastructure in Australia. Visa application procedures and taxation issues were also identified as potential impediments.

In relation to overseas PhD students receiving training at the survey institutions the most prominent home countries were China and Indonesia. A range of funding sources were listed regarding the support of these students. These included support provided by the host institution, AusAID, the student's home country, and the Overseas Postgraduate Research Scholarship Scheme administered by the Department of Education, Training and Youth Affairs.

For those institutions providing information regarding overseas postdoctoral fellows/early career researchers the most prominent home countries were Europe and North America. The Host Institution, the Home Country and the ARC were listed as principal sources of support for facilitating this training in Australia.

The focus of Chapter 6 is on the opportunities provided by the industry-linked Cooperative Research Centres and the Rural Research and Development Corporations for PhD students and researchers to attend overseas conferences and visit research institutions, and for collaborative research or arranging strategic alliances.

Considerable support and encouragement is provided by the Cooperative Research Centres (CRCs) for their PhD students to attend international conferences and visit research institutions. Research staff of the CRCs have many opportunities for overseas visits to industry establishments as well as to universities and other research organisations. Several CRCs reported improved linkages with universities and companies in the Asia-Pacific region. Commercial-in-confidence requirements have not been a problem for the participation of CRCs in international networks. CRCs also have been able to provide for their researchers the type of interface between public and private sector organisations along the lines of the Mobility and Training Programme of the European Union.

The Rural Research and Development (R&D) Corporations recognise the importance of international links and often approve overseas travel for their grantees for conferences and visits to institutions.

Collaborative research with overseas institutes, such as the Consultative Group on International Agricultural Research (CGIAR), is supported on occasion when it contributes to meeting the objectives of the research project.

The important role international conference participation plays in establishing and extending research networks, particularly for young scientists, is reflected in a number of different sections in this report. In this regard, universities are encouraged to consider how best to implement the following recommendation:

Recommendation 6: Resources should be provided to enable PhD students to attend at least one international conference during the period of their training.

1 THE INTERNATIONALISATION OF SCIENCE AND TECHNOLOGY

Economic context

Globalisation is a term that has become part of common usage in discussions regarding economic development and international affairs. The term is used to convey the growing interconnectedness of previously independent national economies, and is associated with deregulated international trade, increasing capital movements between countries and internationalisation of production. The process of globalisation is considered a synergistic outcome of the rapid advances in electronic and communication technologies achieved in the early 1970s and the movement to relax trade barriers and deregulate exchange rates that also characterised this period. However, there does not appear to be any standardised definition of the phenomenon—nor does there appear to be a consensus about the inevitability of national or regional economies being displaced by the emergence of a 'global knowledge economy' (Richards 1997; ATSE 1997; Condit & Pipes 1997; Lundvall and Borras 1998; Makinda 1998; Archiburgi & Michie 1997; OECD 1996a; NSB 1998; Garten 1997).

What is not in dispute, however, is the centrality of knowledge to economic development and international competitiveness. Not surprisingly, the advent of multinational companies and ongoing development of sophisticated and readily accessible telecommunications and computer capacities have also seen the increasing internationalisation of research and development activities. International cooperation in the conduct of these activities is also driven by: the growing number of issues and problems of a global nature; the increasing number of problems requiring research strategies that transcend traditional disciplinary boundaries; the incentive to cost-share expensive research infrastructure (e.g. CERN); and an increasingly mobile scientific and technological workforce (cf. Georghiou 1998).

The challenge for those countries seeking to ensure international competitiveness is to understand 'the role of information, technology and learning in economic performance' and to commit adequate investment in and management of intellectual capital. In this regard the OECD (1996a) has argued that knowledge distribution networks and national systems of innovation 'are the agents and structures which support the advance and use of knowledge in the economy and the linkages between them. They are crucial to the capacity of a country to diffuse innovations and to absorb and maximise the contribution of technology to production processes and product development.'

International dimension

The international dimension of science and technology activities is not new. As Fenner observes:

> *By its very character, natural science is independent of national boundaries, hence the health and orderly*

> *development of any scientific discipline requires communication between scientists of different countries, not only to ensure that scientists are acquainted with advances made by their colleagues in other countries, but also to allow agreement to be reached on all sorts of issues that are critical to the prosecution of a scientific discipline, for example, cooperative experimental programmes, standards, units, nomenclature, terminology, conventions, to name but a few (Fenner 1995: 185).*

However, what has changed over the last two decades is that technological progress and market competitiveness are contingent on scientific effort being conducted in accordance with international best practice. For countries such as Australia which produce only a small proportion of the world's scientific output, the maintenance of international linkages to leading overseas researchers and facilities is therefore vital. It is through such linkages that scientists are able to both access and assess the latest advances in knowledge and skills development essential to the national scientific endeavour.

Yet a desire for international cooperation with those at the forefront of knowledge production in either the public or private sectors is insufficient on its own to ensure such linkages. The reputation of the scientific group and the quality of the research infrastructure are major factors influencing the formation and continuance of international linkages. A good infrastructure for research, which includes laboratory space, equipment, libraries and computer facilities is essential for the performance of internationally competitive research and to attract talented individuals. As Keynan (1991) observes in a report prepared by the Carnegie Commission on Science, Technology, and Government:

> *Finally, the quality of the research capacity of the cooperating partner is a positive incentive for scientists and engineers to cooperate internationally. It is easy to convince a team of scientists and engineers to cooperate with a group equal to or better in their performance from whom they can learn and advance themselves. It is much more difficult to convince scientists to cooperate with teams they consider to be inferior (cf. Larkins 1996; Nossal 1996; Boardman 1996; AAS and ATSE 1997; Ince 1998).*

An integral component in establishment and maintenance of research groups of high quality as benchmarked against world standards and performance is therefore the recruitment and retention of talented researchers. For it is the international networks of these researchers which will help ensure the high level skills training of young researchers.

However, several bibliometric studies regarding the publication of Australian research papers have indicated a declining share of world citations in a large number of fields since the mid-to-late 1980s (Bourke and Butler 1993; BIE 1996; AAS 1996). This is at a time when international collaboration on scientific publications is increasing (NSB 1998; Wellcome Trust 1998; Leydesdorff 1992; Nichols 1993; Luukonen et al. 1992). Such findings clearly question the visibility of Australian scientific effort internationally and the strength and calibre of existing research networks.

For those at an early stage in their scientific training and career development, international experience is an important way

of establishing and maintaining research networks (cf. Keynan 1991; Blume 1995). However, increasing concern has been expressed regarding whether there are sufficient opportunities for postgraduates and postdoctorates to gain training and career development overseas. These opportunities relate to participation in international conferences and workshops; visits for short periods at major overseas public or private research facilities; exchanges; and actual PhD and postdoctoral fellowships tenable at overseas institutions.

Whilst it is extremely difficult to obtain time series data on the level, type and frequency of overseas experience acquired by young Australian scientists, there is a view held by a number of peak scientific bodies that opportunities for such experience have substantially declined. The principal explanations being that:

- sources of adequate overseas funding have become more difficult to obtain;
- there are very few schemes in Australia which support this type of experience at a realistic funding level;
- the awards provided under these schemes are too few in number—generating unreasonably intense levels of competition;
- funding pressures within Australian universities overall, force young researchers to compete with established researchers for support;
- the cost of living in many overseas countries, combined with a weak Australian currency, are active deterrents to overseas travel in general.

Elements in the international science system

Apart from personal networks there are various other mechanisms for facilitating international linkages. The listing compiled by the International Federation of Institutes for Advanced Study (IFIAS 1995) provides a useful framework for categorising the different elements in the international system of science. This framework can also be extended to include other mechanisms which essentially 'broker' international linkages. For example, organizations that provide supra-regional coordination of science and technology activities and national research funding agencies. Selective illustrations of these various elements/mechanisms are provided below.

According to IFIAS, 'the international system of science retains, like geological layers, institutions that were created at each step of the historical development of science'. The system elements identified by IFIAS include:

- Personal networks of mutual collaborative interest usually through universities;
- International science organizations and academies, e.g. International Council for Science (ICSU);
- International government institutions, e.g. UNESCO, WHO;
- Research in aid of global conventions e.g. Intergovernmental Panels on Climate Change;
- International non-governmental institutions e.g. International Federation of Institutes for Advanced Study;
- International programmes/experiments, e.g. Consultative Group on International Agricultural Research (CGIAR);

- International aid and development agencies;
- International corporate research;
- National non-government organisations with international research interests.

It is important to appreciate, however, that whilst the organisational elements identified above have an international scientific component, their governance, objectives and funding (and therefore impact as facilitators of linkages) vary widely. For example, international government institutions such as UNESCO[1] are mission-oriented and do not conduct the research themselves. International cooperative organizations such as the OECD[2] and the World Bank[3] have as their central focus economic activities. Nonetheless they deal with science and technology issues as part of their international operations. Indeed the OECD has provided a major forum for the analysis of science and technology issues and has been instrumental in the coordination of research and development policies in its member countries. The World Bank also publishes World Development Indicators annually with sections on human capital and global links.

Supra-regional coordination of research, technology and development is facilitated by the Framework Programme of the European Community[4]. The focus of these Programmes is on improving industrial competitiveness through creating 'a genuine European technological community' that transcends the different research environments of the EC Member States. The Frameworks run for a period of five years with the First Framework operating for the period 1984–1987.

The Frameworks vary in regard to the breadth of aims, focus and budget. However, a common feature is the emphasis on research collaboration between Member States and public and private sector organisations. To be eligible for funding, applicants' institutions must fall within one of the following five categories: Big Companies, Small and Medium Enterprises (SMEs), Public or Private Research Centres, Higher Education Institutions and Others. Australia, as an industrialized country outside Europe, can participate as a full partner in *some* EC supported R&D projects but on a self-funded basis.

The Fifth Framework[5] Research Programme research programme has an overall budget of ECU 14.96 billion (10.5 billion pounds). This Programme sets out the priorities for the EU's research, technological development and demonstration (RTD) activities for the period 1998–2002. It differs from the earlier Framework Programmes and is focused on a limited number of research areas combining technological, industrial, economic, social and cultural aspects.

The Fifth Framework Programme is organised under four activities. The first activity comprises Thematic research programmes: quality of life and management of living resources; user-friendly information society; competitive and sustainable growth; energy, environment and sustainable development.

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1 UNESCO Home Page at: http://www.unesco.org/

2 OECD Home Page at: http://www.oecd.org

3 World Bank Home Page at: http://www.worldbank.org

4 Information on EU Research, Technology and Development activities can be obtained on the CORDIS (Community Research and Development Information Service) Web site at: http//www.cordis.lu/

5 Overview of the Fifth RTD Framework Programme 1998-2002 provided at: http://www.cordis.lu/fp5/src/over.htm

The second, third and fourth activities are designated Horizontal programmes. The second activity is the promotion of cooperation with third countries and international organisations. The third activity is the dissemination of the results of EU's research with emphasis on the participation of SME's. The fourth activity is the stimulation of the training and mobility of researchers in the EU.

In addition to the Framework Programmes, priority is given to 'promote cooperation and interlinking with other European networks and international organisations' such as COST, EUREKA, CERN, ESA, EMBL, ESO and ESF. Such associations clearly provide the additional benefits of being able to access the extensive international networks of these organisations.

In relation to young researchers, training and mobility within the EC has been developed in parallel with university mobility programmes. The EC has provided support for a number of years for young scientists to study in recognised scientific institutions in other countries and has a number of mechanisms for facilitating training in industry organisations as well. Also, in recognition of the different taxation and social security systems imposed by national authorities on fellows, efforts have been undertaken to ensure that 'Training, Mobility and Research' grants are reasonably comparable with national or local salaries.

Two further activities under the EC Training and Mobility of Researchers Programme of particular relevance to young scientists are the 'Research Training Networks' and Euroconferences. The intention of the Networks is 'to encourage research teams from a number of countries to work together on high quality joint research projects and, in this context, to promote the training and mobility of researchers, particularly young post-doctoral researchers. Such research networks are also intended to encourage the interaction between different disciplines, the combination of different technologies, the transfer of techniques from one scientific domain to another, the dissemination of results, and cooperation between academia and industry'. The Euroconferences are 'high-level scientific meetings with a focused theme at the cutting-edge of research bringing together young researchers and established scientists'. These meetings are held in a closed environment over several days with participants numbering between 30 and 100.

The structural initiatives which have been set in place by the EC to facilitate scientific mobility and exchange both between countries and public and private sector organisations, are an important recognition that strategic alliances cannot be left solely to linkages initiated on the basis of personal contact between individuals (cf. Blume 1995)[6].

Another mechanism for the facilitation of international scientific collaboration is via access to major facilities, such as astronomical observatories and synchrotrons, which are cost-shared amongst participating countries. Participation in collaborative research of this scale brings substantial returns to nations with small scientific communities which it could be argued, far outweigh the costs of membership.

6 An overview of 'practical considerations' for Australian proposers wishing to participate in the Framework Programs of the EU is provided by Tuckwell (1998). This overview specifically addresses: criteria for participation; forms of collaboration; and forms of association.

According to the US National Science Board (1998:xx-xxi) international collaboration in 'megascience' projects has grown. Indeed the OECD established a 'Megascience Forum' in 1992 to facilitate discussion and exchange of information about large-scale cross-national projects. As part of the 'Forum' technical working groups have been focusing on neutron sources, bioinformatics, nuclear physics, and radio astronomy.

In 1998 the OECD completed an important study of future needs for major regional and international facilities through its Megascience Forum. The study indicated the need for major regional facilities but also the maintenance of national facilities linked into them in a complementary way. For example, there is a major synchrotron in Grenoble, another one in Chicago and one in Japan. It is likely that there will be no further instruments of this size built for many years, but there will be construction of complementary national instruments. A large number of people travel to use the regional facilities for neutron scattering and astronomy. In the case of the ISIS neutron spallation source in the United Kingdom, early career scientists are the major users of this facility with almost two thirds under the age of 35.

International research partnerships formed as a result of strategic alliances between private sector organisations are a more recent feature of the international science system. Indeed, industrial organisations are increasingly using 'global research partnerships as a means of strengthening core competencies and expanding into technology fields that are crucial to maintaining market share' (NSB 1998). Furthermore, these strategic technology alliances are on the increase. In this regard the US National Science Board reported that: 'Since the mid-1980s, companies worldwide have entered into over 4,000 known multi-firm alliances involving strategic technologies. More than one-third of these were between US firms and European or Japanese firms. Most of the alliances were created to develop and share information technologies' (cf. AAS and ATSE, 1997).

An important example of international scientific organizations and associations is the International Council for Science (ICSU) and the many specialist unions that operate under its auspices, e.g. the International Union of Crystallography. ICSU was established in 1931[7] to promote international scientific endeavour in the natural sciences and to encourage international interdisciplinary programmes. The International Geosphere-Biosphere Programme (IGBP) is an example of one of these programmes. The aim of IGBP is 'to describe and understand the interactive physical, chemical and biological aspects of the total Earth system.'[8] Other areas addressed by ICSU include: capacity building in science; access to data; development of standards; science and technology in developing countries; and ethics. ICSU also produces a range of journals and proceedings of meetings and convenes approximately 600 conferences and symposia per year.

The Australian Academy of Science is the national member of ICSU, and its specialist unions, and a number of Australian scientists are senior office holders in the different specialist unions and technical working groups and commissions. Australia has voting rights at the meetings which

7 From 1998, the International Council of Scientific Unions (ICSU) became known as the International Council for Science (ICSU)

8 ICSU home page at http://www.lmcp.jussieu.fr:80/icsu/index.html

determine the science agenda for these groups. The Academy's formal links with ICSU operate through the Academy's National Committees and arrangements with many Australian scientific societies. A number of ICSU scientific congresses are held in Australia and these provide an excellent opportunity for younger researchers and students to attend significant international meetings. The Australian Research Council contributes funds towards the Academy's membership of ICSU.

Another mechanism for facilitating ongoing international cooperation for specific research issues are multinational grants programs such as the Human Frontier Science Program (HFSP[9]). The program operates under the US National Science Foundation Directorate for Biological Sciences and the NSF is one of four contributing agencies. Based in Strasbourg, the aim of the program 'is to promote, through international collaboration, basic research to elucidate the complex mechanisms of living organisms, including man' (HFSP 1998). However, only research that transcends national boundaries is approved. A minimum annual contribution of US$450 000 is required for membership, with an associate membership annual fee being US$225 000. The current eligible countries are: Austria, Belgium, Canada, Denmark, Finland, Germany, Greece, Italy, Japan, Luxembourg, the Netherlands, Portugal, Ireland, Spain, Sweden, Switzerland, the UK and USA. Japan, however, has been the major financial contributor, accounting for about 80 per cent of the HFSP budget (cf. Georghiou 1998).

Support is offered in three areas: research grants, fellowships and workshops. Grants (up to 3 years) for basic research must be carried out jointly by teams in different countries. Principal applicants must be from the eligible countries, but co-applicants need not be so, and Australians are able to be members of the teams. Fellowships are for young researchers early in their careers and from the eligible countries who wish to do research in foreign countries, or for young researchers from outside the eligible countries who wish to do research in one of the eligible countries. Thus Australians can apply for a fellowship at any of the eligible countries listed above. Fellowships can be short-term (to 3 months) or long-term (1–2 years). However, grants for international conferences must be organised by researchers from the eligible countries and the workshops held in Strasbourg.

Whilst Memoranda of Understanding (MOUs) between countries are often used to signify intentions of greater collaboration in specific areas—such as science and technology—there is often a 'disconnection' between the signalling of intent and the actual commitment of funds to support activities covered by MOUs (cf. Wagner 1998).

International linkages facilitated by national research funding agencies

The following discussion focuses on the different mechanisms used by national research funding agencies to provide support for international linkages. Of particular interest are the forms of support provided for young scientists to obtain research development/training in foreign countries. The agencies discussed are drawn from countries which are major research

9 http://www.hfsp.org/welcome.htm

performers internationally. These agencies are: the National Science Foundation and the National Institutes of Health in the US and the UK Research Councils. Attention is also directed to the activities of The Royal Society in relation to its support of international research linkages.

The US National Science Foundation (NSF)[10]

Among the US government research funding agencies the NSF has been argued to have 'by far the most varied and extensive support for projects with an international component' (Wagner 1998). These international activities are coordinated by the International Division of the NSF. While not operating laboratories itself, the NSF supports National Research Centers, certain oceanographic vessels and Antarctic research stations.

The NSF carries out its international support role through a variety of programs including: fellowships, travel grants, summer institutes, workshops, research and education workshops and Antarctic projects. The NSF has extensive international activities, supporting research programs and providing training for graduate students, research fellows and to a lesser extent undergraduate and pre-college students. The NSF estimates that it commits approximately US$350 million to supporting a wide range of research activities that have a significant international character (NSF 1998). About four-fifths of the funding support goes to the sciences.

Included in the NSF's international activities is a set of programs that target collaborative projects; the development of reliable data on the science and engineering resources of other countries, the advanced training of US scientists and engineers overseas, and the development of international electronic networks.

In relation to fellowship support, the following two are of particular interest:

NSF-NATO Postdoctoral Fellowship in Science and Engineering:[11] These are 12 month postdoctoral fellowships for beginning scientists, mathematicians and engineers. Approximately 20 fellowships are available for US citizens to undertake research in NATO partner countries in 1999. Another 20 awards are available for US institutions to host a Visiting Scientist from NATO partner countries. The fellowship stipend is US$2 750 per month, together with a travel allowance, round trip travel, and a special allowance for costs of research and special travel to visit other laboratories or scientific meetings.

NSF-CNPq Collaborative Research Opportunities:[12] The NSF and the Conselho Nacional de Desenvolvimento Cientifico e Tecnologico (CNPq) of Brazil announced in 1998 a pilot activity to support new efforts in international cooperative research in any computer and information science and engineering (CISE) related area where the efforts are likely to produce complementary and synergistic effects. The purpose of the initiative is to advance scientific and engineering knowledge through joint research efforts of investigators having complementary talents and interests, and to capitalise on the international character of modern scientific research and the ability to conduct collaboration at a distance, supported by computer networks. Around 6–10 awards each year will be administered by the CISE directorate. Projects can be from individuals or teams,

10 http://www.nsf.gov/home/int/start.htm

11 http://www.nsf.gov/pubs/1998/nsf9849/nsf9849.htm

12 http://www.nsf.gov/pubs/1998/nsf9839/nsf9839.htm

backed by focused research workshops and supported by short and long-term visits by junior (postdoctoral) and senior staff to enable more in-depth exchange of expertise.

In addition to the international mobility support for young scientists, the NSF also administers a Grant Opportunities for Academic Liaison with Industry[13] which serves as a catalyst for University-Industry partnerships, providing funding for faculty, postdoctoral fellows and students to develop creative interactions with individual or small group projects, and industry-based fellowships for graduate students and postdoctoral fellows.

Examples of other NSF activities which have an international component are summarised below from the Foundation's web site. Attention is drawn to those activities of particular relevance to Australia:

- US participation in global-scale projects and research networks—The NSF supports the Global Oscillation Network Group, a six station network which includes Australia.
- Support for international facilities overseas and in the US—Australia is involved with the US on 3 of its facilities, with a 4th planned: The Joint Australian Centre for Astrophysical Research in Antarctica; the Cape Roberts Project (Antarctic drilling); The National Center for Atmospheric Research, based in the US; and a planned collaboration with Australia on the Laser Interferometer Gravitational Wave Observatory.
- US access to the research programs and facilities of other countries—Open and reciprocal access to research and education facilities and programs by US researchers and students and those of foreign countries is a principle endorsed by the NSF. By and large US scientists and engineers are encouraged to make their own arrangements abroad either on an ad hoc basis, or within the framework of existing agreements. The NSF also supports joint programs with Japan, the EU, individual European countries, Canada and Russia.
- International experience for new US scientists and engineers—The NSF provides opportunities for doctoral students and postdoctoral fellows to obtain international professional experience via programs which are designed specifically for international tenure or via participation in research that has international dimensions. The main international programs that target postdoctoral and junior faculty are: the International Research Fellows Program, the Research Fellowships Opportunities in Japan and the NSF/NATO Fellowships in Science (see above).
- Monitoring research and education developments in other countries—The NSF spends about US$8 million each year on an estimated 5 000 scientists, engineers and educators to participate in international conferences.

The US National Institutes of Health (NIH)[14]

Of the US federal government agencies within the US Department of Health and Human Services (HHS) the NIH is the most significant in terms of support for international collaboration and cooperative research activities. The NIH offers a wide variety of research training and career

13 http://www.nsf.gov/pubs/1998/nsf98142/nsf98142.htm

14 http://www.nih.gov/grants/training/careerdev/RTCDINTRO.HTM

development programs. These are divided between two broad categories—extramural (research training, career development and research activities at US colleges, universities and other organisations) and intramural (programs at the NIH Bethesda campus and a small number of other NIH sites).

The NIH programs are divided into career-type levels, from high school, college, graduate, postgraduate to the Fogarty International Centre programs which provide support for US citizens wishing to study abroad and foreign nationals who wish to study or research at US facilities (cf. Durso 1997). The postdoctoral programs cover 29 individual awards through travel fellowships for minority physiologists, dental scientists, mentored clinical scientists, minority access for senior scientists to the more conventional individual postdoctoral fellowship which 'offers up to 3 years of fellowship support for biomedical and behavioural research training in selected domestic and foreign research institutions' (NIH 1998). Other awards include those for under-represented minorities, individuals with disabilities and supplements to promote re-entry into research careers after attending to family responsibilities.

The Fogarty International Centre Programs include international training for AIDS (targeted only at developing nations), Environmental and Occupational Health, Population and Health and a joint NIH/NSF Summer Institute in Japan (8 weeks training for US doctoral students). The International Research Fellowships allow postdoctoral training for scientists from developing nations, while there is a reverse arrangement whereby US scientists are funded by 8 foreign countries to conduct research at their facilities (Australia is not among the countries offering support). An NIH Visiting Program allows foreign scientists to conduct collaborative research at NIH labs, but the appointment must be requested by a senior NIH investigator. The structure includes 3 basic categories, early postdoctoral (not more than 3 years) as well as mid-career and senior researchers. However, the major emphasis appears to be on Senior International Fellowships which provide opportunities for mid- and senior career level US scientists to conduct biomedical research at foreign institutions.

The UK Research Councils

In 1993 as part of an effort to align the science base more closely to national economic needs, the British government created six new research councils and replaced the Advisory Board for the Research Councils with a coordinating Director-General of Research Councils. The research councils are:

- Biotechnology and Biological Sciences Research Council
- Engineering and Physical Sciences Research Council
- Economic and Social Research Council
- Medical Research Council
- Natural Environment Research Council
- Particle Physics and Astronomy Research Council

In 1995 the Council for the Central Laboratories of the Research Councils was created from the former Daresbury and Rutherford Appleton laboratory complex.

The Engineering and Physical Sciences Research Council (EPSRC)[15] (the largest of the Research Councils) and the Medical Research Council (MRC)[16] are briefly discussed below in regard to international linkages and postgraduate training and postdoctoral fellowships.

15 http://www.epsrc.ac.uk

16 http://www.mrc.ac.uk

In relation to the Engineering and Physical Sciences Research Council, of particular importance in determining collaboration is that the research must be relevant to the EPSRC mission, must have the support of the research community, and be of first rate aside—support for any collaboration is to be competitively assessed against national proposals.

EPSRC manages its international activities in several ways. Interactions in a given scientific area are handled at the program level. A Cross-Program Group handles interactions across scientific areas and access to multidisciplinary facilities. Interactions with other funding agencies are handled by Corporate International Group (CIG). The principal function of CIG is representation, liaison and coordination with an emphasis on communication with EPSRC Programs and external organisations, both in the UK and overseas. CIG can provide general advice to the research community on EPSRC's international activities and support mechanisms. The Group takes responsibility for the EPSRC agreements which facilitate collaboration with: KOSEF (South Korea); Monbusho (Japan); the European Science Foundation (ESF); the ESPRC sponsorship of the UK Research and Higher Education European Office (UKRHEEO); and the Secretariat of the EuroHORCs network (European Union Research Organisations Heads of Research Councils). The EPSRC uses its normal grant funding mechanisms to support international collaboration.

The central aims of the Medical Research Council are to improve health by promoting research into all areas of medical and related science. Research support is provided through MRC research establishments; grants to scientists; and support for postgraduate students.

International opportunities are provided by: fellowships, EC supported Conferences, calls for proposals and travel grants. For example, the Canon Foundation Visiting Fellowships target researchers aged 30-45 years who are European or Japanese nationals to go to Japan or Europe respectively, for periods normally of 12 months. The international division is the contact point for the EU Framework programs. The office is the UK national contact point for BIOMED and future programs in biomedicine, and also provides a help-line and information service. Policy support is provided to the Office of Science and Technology (OST) in negotiating new research and development programmes—at present the Fifth Framework. The work of the European Science Foundation and UK interests in other programmes (EMBL, EMBC, IARC and HFSP) are also part of the division's responsibilities, together with coordination of incoming and outgoing international visits and support to OST on scientific issues.

The Research Fellowships in the Non-Clinical Career Stream enable high calibre scientists at the early postdoctoral stage to further develop their research skills and experience in biomedical and related biological sciences within the UK. The scheme provides the opportunity to spend up to a year in a research establishment or in UK industry.

The Royal Society[17]

The Royal Society, founded in 1660, has a dual role, as the UK academy of science, acting nationally and internationally, and as the provider of a broad range of services for the scientific community. The Society is the national member of ICSU and one of the UK members of the European Science

17 http://www.royalsoc.ac.uk/index.htm

Foundation. It collaborates in the activities of the All European Academies. The Royal Society awards a large number of university research fellowships, funded either from the Parliamentary Grant-in-aid or from its own private funds. The Society also funds 18 research professorships and 9 senior research fellowships.

The Society has both formal agreements and less formal exchange arrangements with leading scientific organisations in many countries overseas. In general, exchange visits, both to and from the UK, fall into two categories:

- *study visits* are short-term visits generally between two weeks and three months, the key objectives being to enhance the research capabilities of individual scientists, develop international collaborative links, enable participation in international programmes and preserve high quality science;
- *fellowships* are aimed at young postdoctoral scientists to enable them to spend a significant period based at a research laboratory in the partner country. Such fellowships are viewed as critical to the career development of both British and foreign researchers. The length of the award varies according to scheme.

The Society also supports *joint projects* on a bilateral basis between the UK and most European countries (including the former East bloc), Japan and China.

The Society's exchange programmes focus broadly on three principal areas: Europe (including the former East bloc); the Far East, in particular China and Japan; and the Commonwealth. The administrative and financial arrangements for exchange visits vary from one country or programme to another.

The schemes run by The Royal Society enabled about 1 600 scientific exchange visits throughout the past year.

Europe

The Society's European Science Exchange Programme, promotes bilateral relations between research scientists in the UK and in other European countries. Although initially funded by private donors, the scheme is now supported through the Society's Parliamentary Grant-in-aid with matching funds provided by countries participating in the programme. Currently 24 other European countries are partners to the Society in this scheme, including an increasing number of countries in Central and Eastern Europe and the former Soviet Union.

Changes in Europe have dramatically increased the number of scientists travelling between the UK and Eastern Europe and the Society's programmes have correspondingly seen a substantial expansion. In particular the Society has established a postdoctoral fellowship programme to enable young scientists from the former Soviet Union and Central and Eastern Europe to spend up to one year undertaking research in the UK.

China, Japan and the Far East

Exchanges with China form a significant part of the Society's international exchanges activity. Formal agreements exist with a number of bodies in China to facilitate a two-way flow of scientists, although visits may also be supported outside these arrangements. The Society administers a number of fellowship programmes for Chinese scientists to visit the UK for periods of up to 12 months.

The Society administers two programmes for fellowships to Japan funded by the Japan Society for the Promotion of Science (JSPS)

and the Science and Technology Agency (STA). Fellowships are tenable in either Japanese universities or national laboratories/public research organisations. The Society also supports study visits to Japan, as well as a scheme for joint research projects between British and Japanese groups under a tripartite agreement with the JSPS and the British Council in Japan. In addition return fellowships provide scientists returning to the UK from Japan with up to one year's funding in the UK.

Grants are also available for visits to and from Hong Kong SAR, Korea, Malaysia, Mongolia, Taiwan and other countries in Southeast Asia.

Developing Countries

Developing World Fellowships are open to scientists resident in Africa, Asia, the South Pacific, and Central and South America. Awards made under this scheme cover short-term visits by senior scientists and fellowships of up to six months (exceptionally twelve) for younger scientists.

Commonwealth

The Royal Society has active exchange agreements with Commonwealth countries, especially Australia, New Zealand and India. The Howard Florey Fellowship Programme was set up in 1996 in association with the John Curtin School of Medical Research at the Australian National University. The scheme provides for two-year Fellowships in the UK with a further year in Australia. The Florey Fellowships are for Australian biomedical scientists with no more than three years research experience.

The Royal Society also has formal exchange programmes with Argentina, Brazil, Chile, Cuba, Mexico, Israel, Jordan, Lebanon, Palestine and several other countries. Links with South Africa are promoted.

The human factor

Whilst the internationalisation of research training is growing and the importance of facilitating such mobility well-recognised, the success of such training is strongly influenced by a range of non-scientific issues. These issues relate to the personal adjustments that are necessary for research students and postdoctorates to work effectively in a different culture. In this regard, differences in the legal, social, language and economic systems of the host country can often seem insurmountable. On completion of such training there is also the crucial question of how these young scientists can be successfully repatriated into professional positions in their home countries.

Two responses to ensuring that the returns on internationalisation of research training are realised both nationally and for the individual, are described below. These are the Marie Curie Fellowship Association and the Bernard Gregory Association.

Marie Curie Fellowship Association[18]

The European Community has been awarding research grants to support individual scientists since 1958. These have been allocated under a range of different programmes and it is estimated that around 5 000 researchers have benefited from such grants. These fellowships have now been given a new identity under a scheme entitled the Marie Curie Fellowships. The scheme is intended to stimulate the mobility of young researchers in Europe between member states and between university and industry.

18 http://www.cordis.lu/mariecurie/home.html

An Association of Marie Curie Fellows was launched in 1996. Two of its objectives are to:

- establish a structured interface between fellows and the world of research, including industry;
- develop and foster the international dimension of Marie Curie fellowships.

Activities proposed for the association include setting up:

- a mentoring scheme to aid the integration of new fellows in the host country, and fellows returning to their original country;
- a career development assistance scheme.

There are two distinct levels of the Association—one is at the European level and based in Brussels, the other is at the individual country level (cf. Jobbins 1998)[19].

L'Association Bernard Gregory (ABG)[20]

The ABG is a non-profit organisation established in the 1970s in response to the poor career prospects for young French scientists. The Association which is funded by four Ministries, provides a mechanism for bringing together business professionals, those concerned with scientific training and the young scientists themselves. The objectives of the ABG include maximizing awareness of relevant employment opportunities for young scientists; assisting them in the preparation of applications for these positions; and also providing this profile information to the personnel sections of different enterprises (cf. Ezratty 1995). In addition to this type of support, the ABG undertakes a number of studies on manpower prospects for young doctoral level scientists.

The ABG has played an important role in helping young French scientists obtaining research training in foreign countries to find work on their return France, in either public or private sector organisations. Part of this entails publishing separate lists of such researchers which draws attention to their particular qualifications and experience.

The ABG has also assisted the Scientific Mission at the French Embassy in Washington to organise 'fora in the United States to allow French public and private employers to meet some 1 000 young French researchers living abroad' (Ezratty 1995). A Postdoctoral Training Committee 'Ulysses' has also been established by the ABG which brings 'together the institutions involved in sending postdoctoral students abroad, in order to facilitate their return to France'. The committee is known as 'Ulysses'. The electronic message service 'FROGJOBS' which is aimed at providing young people with information on public and private job openings is also an initiative of this committee.

The programs outlined in this chapter for supporting international cooperation in science and technology indicate the increasing recognition of the value and importance of greater cooperation between countries in research and research training for economic growth and national well being. Countries which do not participate sufficiently in international cooperative programs will be at a disadvantage in the global market.

Recommendation 1: That the policies and structures intended to support the internationalisation of Australian scientific effort and participation in international research activities be benchmarked against those of comparator countries and regional economies.

19 See for example, the UK subgroup at: http://www.sc.ic.ac.uk/~mcfa/use/faq.htm

20 ABG Home Page at: http://www.abg.asso.fr/agb.html

Research networks and information and communication technologies

As indicated earlier in this chapter, rapid advances in the development of information and communication technologies (ICTs) in the 1970s played an integral part in the emergence of globalisation. In relation to the science community in particular, these advances have had a dramatic impact on the production and communication of knowledge—although with some variation between disciplines.

The most immediate impacts relate to the speed with which scientists in different parts of the world can communicate with each other and provide files (draft manuscripts; data sets etc.) as electronic attachments. The World Wide Web has also substantially increased the amount of information that can be accessed by individuals and hence increased the visibility of research activities internationally. Such developments clearly enhance network building and opportunities for research collaboration and also as many commentators have observed greatly facilitated trans-disciplinary approaches to complex research questions.

In relation to scientific periodicals, a major advantage of an electronic format has been the substantially reduced lag-time in the availability of scientific articles. Electronic journals have also enhanced the range of information that can be provided to the reader, through, for example, hypertext links to references—so there is a high value-added component of the electronic format compared with the print. Many new journals and newsletters are available only in electronic form.

However, despite the numerous advantages of ICTs, an increasing number of international fora have been addressing some of the perhaps unanticipated (or not fully realised) drawbacks of ICTs for the science system (cf. Butterworth 1998; Brody 1996; OECD 1996b; Ginsparg 1996; Pullinger 1996; Machovec 1997; Steele 1997; Shaw and Elliott 1998). In relation to electronic journals the following issues have been of concern: the increasing tying-up of distribution and access to scientific information by commercial organisations whose pricing considerations are determined principally in regard to their shareholders; archiving responsibilities; copyright considerations; peer review and quality assurance with electronic publications; and differential access to hardware and software as well as training in the effective use of electronic sources—all of which have the potential to produce 'information haves and have nots'.

The provision of electronic versions of print journals was considered by many to be the answer to constantly increasing subscription rates for the hardcopy version. However, the substantial initial investment required in both capital and technical support for electronic publishing has subsequently tempered this view. In addition to these costs there is the pricing 'conundrum' whereby publishers raise journal prices to keep pace with inflation and profit margin considerations thus leading to increased cancellations in subscriptions which then in turn lead publishers to raise the price for the remaining subscribers (cf. Yocum 1996). Robnett (1997) provides the following explanation regarding the complexities of pricing of electronic journal access:

> *Price, at one time a relatively simple concept that implied institutional or individual subscription costs occasionally increased by added*

volumes, now also encompasses tiered licenses under which various numbers of simultaneous users are permitted access according to the agreed-upon price, particularly for the electronic abstracting and indexing services. While most electronic journals are not priced according to number of simultaneous users, gateways to those journals, such as OCLS's Electronic Collections Online, have adopted the simultaneous-user approach, and the add-on costs must be considered. A variant of the simultaneous-user approach is access to electronic serials priced according to user population size. Pricing is made additionally complex when libraries enter into consortial agreements, in which multiple institutions combine their purchasing power to attain what they hope will be a reduced cost per institution for access to the electronic publications.

The rise in journal subscription rates and the continuing proliferation of new journal titles coupled to the weakening Australian dollar have resulted in a significant increase in costs to maintain library collections. There has not been a commensurate increase in funding to maintain collections. Indeed it has been argued a major crisis is being faced by Australian university libraries, with currency problems forcing them to cancel nearly $7 million in subscriptions to overseas publications this year (cf. Simonds 1998).

As Fletcher (1997) has argued, Australia needs 'a national approach to securing electronic access to all major international scientific journals, in the interests of both general availability and cost economies'.

Although it is apparent from the above discussion that the most obvious advantage of ICTs is the provision of very rapid access to new scientific knowledge through electronic versions of periodicals, the importance of electronic data bases should not be discounted. Productive internationally competitive scientific research requires not only ready access to electronic journals but also convenient methods for finding and examining relevant publications in the earlier literature. A good example in this regard is 'CAS online', the electronic version of Chemical Abstracts. 'CAS online' covers the literature for chemistry, biochemistry, pharmaceuticals, chemical engineering, and a variety of related areas. Its highly flexible search program enables access to references and to abstracts for all relevant published work, including patents, for approximately the past three decades. The cost of access to this database in Australia is relatively modest and it is widely used in industry, CSIRO and the universities.

The data base 'Crossfire' is also well regarded by researchers working in the chemistry fields. This database contains detailed chemical and physical properties, and the literature references for all organic chemical compounds prepared over the last century. It is very easily searched through the input of structural formulae and requires substantially less time to use compared with conventional library searches of the literature. However, despite such advantages, 'Crossfire' is not available in any institution in Australia because of cost considerations. Another extremely valuable data base that is not available in most Australian scientific institutions is the 'Scientific Citation Index'. In the UK this Index is available free of cost to all universities.

The lack of access to such important data bases and reference lists clearly places Australian chemists and scientists working in related biological and physical areas at a considerable disadvantage by comparison with their North American and European colleagues.

A national approach is also needed to secure access to electronic databases.

Nonetheless, the importance of a national commitment to investing in ICTs has been well-appreciated by the West Committee in its recent review of the higher education sector in Australia (Commonwealth of Australia 1998: 62). The Committee concluded in its report that: 'If we are to maintain our competitiveness in research, we can ill afford not to adopt and invest in applications of information and communications technologies'.

Recommendation 2: A national strategy be adopted for securing access to electronic versions of all major scientific journals and electronic databases.

2 NATIONAL SUPPORT FOR INTERNATIONAL SCIENCE AND TECHNOLOGY

There is a wide range of Australian government and non-government organisations which are involved in the facilitation of international science and technology linkages. This chapter concentrates on discussing a select number of such organisations to illustrate the mechanisms used for providing this support. These are: the National Health and Medical Research Council, The Australian Research Council, the Department of Industry, Science and Resources, the Australian Academy of Science and the Australian Academy of Technological Sciences & Engineering. Particular attention is directed to the support provided for young scientists to establish overseas linkages. Case studies regarding the type and level of support provided by a select number of universities, Cooperative Research Centres and Research and Development Corporations are provided later in this report.

National Health and Medical Research Council (NHMRC)[21]

The NHMRC provides awards at both postgraduate and postdoctoral level and provision is made for overseas training (at various levels) under these awards. Those fellowships which provide for international professional experience for young researchers are described below.

The *NHMRC Postgraduate Scholarships (Ph.D)*, will fund research in the medical, dental, public health and biomedical fields. Initially awarded for one year, these scholarships are renewable for up to a maximum of 3 years of full-time study. With Council approval, scholarship holders may spend a maximum six months at an overseas institution, without allowance for travel expenses. Each year the highest-ranking medical/dental training scholarship applicant is awarded the *Gustav Nossal Scholarship*—$3 000 additional stipend and $2 000 travel allowance (overseas travel allowed).

The NHMRC Overseas Training Fellowships are for young Australian researchers to undertake full-time training overseas, followed by a similar period of training back in Australia. These Fellowships are: *CJ Martin Fellowships*, *Neil Hamilton Fairley Scholarships*, *Sidney Sax Fellowships*, *NHMRC/RG Menzies Fellowship* and *INSERM Exchange Fellowship*. 11 CJ Martin Fellowships were offered in 1999, 5 Neil Hamilton Fairley, and one each of the RG Menzies and INSERM Fellowships. The set of conditions for these Training Fellowships—i.e. timing, salary, allowances (for accompanying partner, rent, travelling, conference attendance), salary loadings, sick/maternity/recreation leave, and superannuation—are fairly standard across the awards. These Fellowships are discussed in more detail below:

21 NHMRC Home Page - http://www.health.gov.au/nhmrc

The *CJ Martin Fellowships* were established in 1952 and are the NHMRC's major overseas postdoctoral award. They provide for full-time training overseas and in Australia in basic research within the biomedical sciences, working on research projects under nominated supervisors. The aim is to encourage persons of outstanding ability to make a career of medical research. The fellowships are usually awarded for four years, two of which are spent overseas, and two in Australia. Fellowships are tenable only in approved institutions (teaching hospitals, universities, research institutes). Fellowship stipends commence at Research Officer 1 level ($39 335 at January 1999) and, if appropriate, clinical loadings will be paid. Stipends and allowances are payable monthly in Australian currency to an Australian administering institution, while advances against anticipated and authorised expenses may be paid. A contributory superannuation allowance above the mandatory Superannuation Guarantee contribution may also be payable. Minimum cost airfares for Fellows and dependents is provided for direct travel to/from overseas.

An overseas allowance of $500 per annum is payable, and $2 324.40 per annum for a fellow with a dependent partner. A rent allowance of $4 000 for each year overseas is provided in addition to a Local Allowance set to partially compensate for the cost of living difference between Australia and overseas. A maintenance allowance is provided of $4 000 per annum for research support for the Australian component of the award and an additional allowance of $500 per annum is provided towards the cost of conference travel. These allowances are reviewed annually by Council. It is expected that overseas compulsory fees and research expenses will be the host institutions responsibility.

The *Neil Hamilton Fairley Fellowships*, which were established in 1977, are intended to provide full-time training overseas and in Australia in areas of clinical research or community medicine, including the social and behavioural sciences. Emphasis is placed on the applied value of the proposed research. The *Sidney Sax Fellowships* provide a vehicle for full-time training overseas and in Australia in public health research. Fellowships are normally awarded for four years, of which the first two may be spent overseas. Award conditions for both the *Fairley* and *Sax Fellowships* are identical to those for the *CJ Martin Fellowships*, although under certain circumstances Fellows may earn additional income.

Applicants for the *CJ Martin*, *Fairley* and *Sax Fellowships* who indicate a specific interest for the overseas component of the fellowship may be considered for the one *NHMRC/RG Menzies Fellowship* awarded each year. This fellowship was established in 1997, and is offered under similar conditions to the other fellowships except that the Menzies Foundation provides minor additional financial support. The Foundation seeks applicants with leadership ability, capacity to contribute to university life and interest in the service of others.

The *INSERM Exchange Fellowship* is a bilateral exchange scheme between the NHMRC and its French equivalent, INSERM, and is offered to a young person of outstanding ability who wishes to make medical research a full-time career. One Fellowship is offered every second year for a period of four years, two of which are spent in France, two in Australia. The Health and Medical Research Strategic Review (1998) report suggests the INSERM Scheme be used as a model for exchanges with other countries including the United States.

The Australian Fellowships are for similar purposes and provide similar benefits to *CJ Martin Fellowships*, with the condition that the overseas portion be spent at an INSERM laboratory. During the two years of the Australian fellowship, recipients are permitted to undertake paid clinical/teaching duties for an average 10 per cent of each working week, subject to endorsement by the supervisor and institution that this work constitutes a necessary part of the program. Stipends are determined within the level of RO 1-3 in accordance with current NHMRC salary scales ($39 335 to $42 224 as at January 1999). INSERM will accept responsibility for the French living expenses of Australian researchers, taking seniority into account. Other expenses such as maintenance allowances, are expected to be met by the host laboratory. Fellowship stipends will be determined and administered by INSERM, but should be comparable to NHMRC salary scales. The following NHMRC awards are for research to be undertaken in Australia.

The NHMRC has long recognised the importance of career support, especially the need for salary stability in allowing researchers to make a career in health/medical research. The Research Fellowship Scheme provides this for established researchers, while the *R Douglas Wright Awards* cater for those setting out on a career path after three years, but not more than seven, of postdoctoral experience. These awards are designed to provide outstanding early career researchers with an opportunity for independent research, but they are not intended as an initial postdoctoral appointment. Six new awards were made for 1999. An allowance of $10 000 per annum is payable to the department where the awardee is appointed, $3 000 of which may be used for conference travel.

The recently renamed *Peter Doherty Fellowships* target those with not more than 2 years of postdoctoral experience and are provided for training in basic and/or clinical research within the biomedical sciences. They are awarded for a period of 4 years and the purpose is to provide for training in Australia and to enable fellows to work on projects under nominated supervisors. Under certain circumstances fellows may earn additional income. Fellowships are tenable only in approved institutions and stipends and allowances are the same as for the *CJ Martin Fellowships*.

The NHMRC reserves part of its funding allocation for six independent institutes. These are perceived to be the most visible examples of government support for medical research, and their 1998 'block funding' accounted for 16 per cent of total. Those receiving block funding and their respective establishment dates are as follows: Walter and Eliza Hall Institute (1968); Howard Florey Institute (1973); Baker Institute (1981); Murdoch and Garvan Institutes (1987). All except the Garvan (sited in NSW) are situated in Victoria. The Queensland Institute for Medical Research has recently (1997) gained block funding.

All the institutes place emphasis on research training and the wide range of international linkages from which young scientists can benefit are evidenced in the annual report listings of overseas research grants obtained, papers delivered at major international conferences, and significant overseas visitors. The Hall Institute has recently established three new Fellowships, named after retired researchers of international repute—Nossal, Metcalf and Miller. These have three aims: development of outstanding scientists with leadership potential of 21st century medical science; investment in the Institute's intellectual

property to secure a competitive position for Australian medicine and biotechnology; and attraction back home of the brightest and best biomedical scientists.

In order to benefit from the expertise gained by leading Australian medical researchers based overseas, the NHMRC has established three schemes. Two of the schemes, the *Burnet Fellowships* and the *Eccles Awards* are targeted at high-calibre, distinguished expatriate researchers who have been overseas at least seven years and who hold or would be expected to return to a post at the Australian standard of Professor/Associate Professor. For both these schemes there are no fixed number of awards or specific application rounds. Grants are offered subject to funding and only one Burnet Fellowship award was made in 1998. For early career researchers the *Howard Florey Centenary Fellowships* provide for young Australian researchers working overseas to return and continue with a biomedical/health related research career. Applicants would normally have 2-5 years of postdoctoral experience and the award, held at an approved institution, is for a period of 2 years. Five fellowships were awarded for 1999.

Australian Research Council (ARC)[22]

The Australian Research Council supports international research through both its research grants and fellowships. The different awards made during 1997 to 1998 are listed in Appendix 1.

Of particular importance to facilitating overseas collaboration and linkages is the International Research Exchange (IREX) Scheme. IREX is administered by DETYA and referred to the Australian Research Council for advice on selection of grant recipients. It meets obligations under international agreements between the ARC and peak research bodies in other countries, including Memorandums of Understanding and reciprocal fellowship agreements.

Funds are competitively allocated for research in all disciplines except clinical medicine and dentistry which are funded by the NHMRC, and in the case of the United Kingdom Fellowships element, all disciplines except the humanities, clinical medicine and dentistry.

The key function of IREX is to support the movement of researchers to and from Australia, enabling collaboration between researchers in centres of research excellence in any country. It includes the previous International Fellowships Scheme.

The exchange of researchers between Australia and overseas countries is an important factor in maintaining Australia's continued international competitiveness. Such a mechanism for exchange of high calibre researchers will enhance Australia's research efforts and contribute to the internationalisation of Australian research.

The Scheme will provide up to $2.5m in 1999 in order to:

1. Build strong ongoing collaboration between research groupings or centres of excellence in Australia and overseas, involving exchange of researchers at both senior and junior levels;
2. Strengthen international research experience for junior researchers at both postdoctoral and postgraduate levels; and

22 Information of ARC funding programs available at: http://www.detya.gov.au/highered/research/grants/schemes.htm

3. Enhance existing and develop new collaborations among senior researchers.

IREX has the following elements:

- **International Fellowships.** Reciprocal exchange fellowships with Germany, France, Korea and the UK, providing salaries, travel and consumables for the periods of between four and twelve months at either senior or junior levels, depending upon the terms of the reciprocal agreement.
- **IREX Awards.** Researcher Exchanges and collaboration over periods of up to three years with researchers in any country, providing full support of travel (excluding salaries). Preference may be given to applications involving countries with which the ARC has a Memorandum of Understanding, where there are traditional research links or countries which are in the Asia-Pacific region.

Australia would benefit greatly from the establishment of a national overseas fellowship scheme. Although the ARC would be the appropriate body to be responsible for the operation of a national overseas fellowship scheme, the establishment of the scheme and the policies governing its operation would be relevant to several portfolios. An appropriate body to consider Recommendation 3 is the Coordination Committee on Science and Technology.

Recommendation 3: A national overseas postdoctoral fellowship scheme should be established, with conditions similar to the CJ Martin Fellowships of the National Health and Medical Research Council, to significantly increase the opportunities for early career researchers to gain research experience overseas. The four-year fellowships should be tenable in both public and private sector laboratories, overseas and in Australia.

Department of Industry, Science and Resources (ISR)

The former International Science and Technology Program (ISTP) provided funds for exchange visits for collaborative research by individual research scientists and for small technical workshops. It focused on collaborative research which benefitted Australia, such as projects which seek access to research facilities not available in Australia; those where Australian researchers gain access to the latest overseas developments in their fields; and those where study of particular problems overseas will provide useful input to similar Australian problems. Funding only covered travel and overseas living expenses. The specific benefits of this Program have been documented by AAS and ATSE (1997) and Wood *et al* (1993). A number of responses to the university survey and to the survey of Cooperative Research Centres reported elsewhere in this paper indicated how beneficial this program had been in establishing the initial collaborative networks.

This program was replaced in August 1998 with the much broader Technology Diffusion Program (TDP). Details are available on the department's web site[23]. The broad focus has changed and apart from funding to the Academies (see below) and access to major international facilities, most of the funding is directed to supporting research collaboration with clearly targetted industry spinoffs. The program has been operating

for such a short time that it is premature to comment on its effectiveness in promoting international linkages.

Academies in Science and Technology

The Australian Academy of Science (AAS)[24] was established in 1954 as a national body to promote and disseminate scientific knowledge and foster international links for Australian scientists. As mentioned in Chapter 1, the AAS is Australia's representative on ICSU. The Australian Academy of Technological Sciences and Engineering (ATSE)[25] was inaugurated in 1976. Whilst independent, non-governmental organisations, both Academies are supported by the Federal Government and liaise with Government Departments and Agencies on international affairs.

One element of the TDP is the International Science and Technology Networks (ISTN) program which is administered by the Academies on behalf of ISR. The ISTN program continues to support the international relations activities of the ATSE, and the bilateral exchanges that were previously administered by the AAS under the ISTP. These bilateral exchange agreements enable Australian scientists to undertake collaborative research with scientists in laboratories in: China, Japan, the United Kingdom, France, Korea, Taiwan and Germany.

Due to the shift in priorities under the TDP, the AAS has restructured the program to include the promotion of visits by Australian scientists to the United States of America, Mexico and Canada. The AAS has broadened activities to Europe through the introduction of a program for Australian scientists to conduct scientific visits to Europe. Both of these programs have received a large number of high quality applications indicating the benefit of these programs, and the need to continue supporting collaborations with these regions.

A contribution towards living and travelling costs is provided but this varies between programs. Under the agreements between the AAS and Asian counterparts, the sending side pays for the international airfare, and the receiving side provides a living allowance. Participants of the Europe and North America programs receive a grant-in-aid from the AAS to contribute towards an airfare (maximum of $2,600), and a living allowance (based on $125 per day for a maximum of 42 days).

A list of the fellowships awarded for 1998 is provided in Appendix 2.

The Academy also has close ties with the US National Academy of Science, the Royal Society in the United Kingdom and the Royal Society in New Zealand. In addition, there is a number of Memoranda of Understanding with equivalent scientific organisations throughout the world. The Academy is a member of the Federation of Asian Scientific Academies and Societies as well. The type and extent of collaboration the AAS has had with foreign academies over the past four decades is discussed in detail by Fenner (1995). Of particular interest is the long history of association between the AAS and the Academia Sinica (Peoples' Republic of China) and the former USSR Academy of Sciences. Perhaps of some concern, however, is the number of

23 www.disr.gov.au/science/ist/technddiff/tap.html

24 AAS Home Page at : http://www.science.org.au

25 ATSE Home Page at: http://www.atse.org.au

exchange schemes between the AAS and overseas counterparts which had to be discontinued due to lack of funds to support reciprocal visits by Australian scientists.

The ATSE has developed formal linkages with a number of Academies and other organisations, particularly in the Asia-Pacific region and has been active in encouraging the formation of Academies in the regions. Some of these formal links have been undertaken jointly with the AAS. The ATSE was a Foundation Member of the Council of Academies of Technological Science and Engineering—an organisation with members from around the world. The Academy also recently decided to elect Foreign Fellows 'with the ability to facilitate international relationships between the Academy and overseas organisations'.

Other forms of support for internationalising the S&T effort

The Australian Vice-Chancellors' Committee (AVCC) supports a wide range of international activities of the higher education sector. These include activities relating to Memoranda of Understanding which provide for educational and/or scientific cooperation. Of particular interest in regard to regional cooperation is the University Mobility in Asia and the Pacific Program. This Program is aimed at increasing the mobility of staff and students through reciprocal exchange arrangements[26]. The AVCC provides a coordinating role for this program.

The AVCC also collects information from higher education institutions regarding formal linkages with overseas counterparts. The data collection focuses on arrangements which are aimed to facilitate the following categories of interaction: student exchange, study abroad arrangements, staff exchange and academic/research collaboration[27]. However, such listings on linkages on their own do not signify the precise nature/quality or volume of interchange.

An overview of the range of other government programs which provide assistance for Australians to study overseas and overseas students to study in Australia is provided by Baker *et al*. (1996a). These include the Australian Studies Abroad (Offshore Australian Studies) program which provides Postgraduate and postdoctoral support and exchange programs and the Overseas Postgraduate Research Scholarship scheme. The scheme is funded by DETYA and intended to attract high calibre overseas postgraduate students to areas of research strength in higher education institutions. The Targeted Institutional Links program and the Research and Development in Asia program are also aimed at internationalising the research effort in Australian higher education institutions.

International mobility data for scientists and engineers

Australian data collection efforts regarding the geographic movement and activities of highly skilled labour are fragmented. They also vary in terms of the purposes for which these data are collected, the level of detail recorded, their comprehensiveness,

26 Information on UMAP can be obtained from: http://www.deetya.gov.au/divisions/ieys/umap/default.htm

27 The 1997 survey summary is provided at: http://www.avcc.edu.au/avcc/internat/flinks.htm

accuracy and reliability and also their usefulness as a basis for time-series analyses. Whilst this situation is by no means peculiar to Australia (cf. Blume 1995; Burgess et al. 1995) it is important that priority be directed to the coordinated profiling of science and engineering activities which can be used to inform national decisions regarding the allocation of S&T resources (cf. NSB 1998; Garrison and Gerbi 1998).

Although academia has been regarded traditionally as a world labour market, from an Australian perspective it is important to note that foreign scientists wishing to work in Australia enter the country under two broad categories—those seeking to enter permanently and those who come under temporary visas. However, the regulations governing overseas entry of academic staff to Australian higher education institutions are considered relatively liberal (cf. Green 1993).

3 GLOBAL RESEARCH PROGRAMS

There is a number of global research programs in which international cooperation is essential if an effective understanding is to be achieved. This Chapter focuses on several research programs where Australian cooperation is required as part of meeting an internationally agreed upon obligation or to ensure that issues in the Southern Hemisphere receive sufficient visibility and attention. Particular attention is directed to the networks needed in research associated with meteorology and oceanography and the Antarctic environment. Impediments to Australian scientists participating in global research programs are also discussed.[28]

Another area where Australia has played a leading role because of its geographic location is astronomy. It has also been involved in the Ocean Drilling Program. There are also international research programs where Australia should be involved to a greater degree than at present. One such program is the Human Genome Project, which was established as an international project, because of its widespread implications and the scale and cost of sequencing the human genome.

Meteorology and oceanography

The scale and interconnectiveness of the world oceans and atmosphere means that international cooperation is essential for an effective understanding of the process governing the circulation of atmosphere and oceans and their application to weather and climate forecasting and prediction of global warming and climate change. There is now a realisation that detailed simulations of the dynamics and chemistry of the ocean and the atmosphere as a coupled atmosphere-ocean system are essential for the prediction of climate variability and change. Over the past decade, the scientific community has focused strongly on the integrated behaviour of the natural systems of the earth, atmosphere, ocean and land; and realised that a high degree of international cooperation is required to gain a more systematic understanding of the global system. Australia has an important role because of its position in the Southern Hemisphere and bordering the Southern Ocean. The two main sets of institutional structures relevant to international cooperation in earth observation are the various multilateral intergovernmental agencies and programs of the United Nations (UN) and the non-governmental machinery of the International Council for Science (ICSU).

The features of the UN system are its universal membership, its established mechanisms for international decision making, its ability to draw on the resources of governments and its long experience in the implementation of cooperative international operational programs. ICSU, on the other hand, has the advantage of

28 The preparation of this chapter was greatly assisted by information provided by: Dr A D McEwan; Dr G I Pearman; Professor P G Quilty; and Dr J W Zillman.

relative freedom from the formality of intergovernmental processes and its special ability to draw on, and mobilise, the intellectual resources of the international scientific community across disciplines, institutions and nations (Zillman 1997).

Principal intergovernmental agencies are the World Meteorological Organisation and the Intergovernmental Oceanographic Commission of UNESCO. They work closely together with the International Hydrology Program of UNESCO and with the programs of ICSU and joint initiative such as in the World Climate Research Programme (WCRP) and the Global Climate Observing System (GCOS). Joint sponsorship arrangements between ICSU and UN bodies also have occurred for major oceanographic programs which include the Tropical Ocean Global Atmosphere (TOGA) experiment, the World Ocean Circulation Experiment (WOCE), and the Climate Variability and Predictability Study (CLIVAR).

More recently, there has been coordinated global impetus for the creation of a Global Ocean Observing System (GOOS) which will be loosely linked with Atmospheric and Terrestrial observing systems to form an Integrated Global Observing Strategy (IGOS). IGOS is being developed by the Committee for Earth Observation Satellites (CEOS), a non-governmental consortium of the major satellite-deployment agencies of the world. In turn, a major new global international experiment linking GOOS, CEOS and CLIVAR, entitled the Global Ocean Data Assimilation Experiment (GODAE) is planned for implementation in the 2003–2005 period.

These programs depend, for their planning and functioning, on the participation of scientists, technologists and managers worldwide. Participation in international networks is an almost mandatory requirement for involvement in large scale experiments.

In several programs, Australians have played a leading role, ensuring that the program directions are also aligned to particular national needs. Australia benefits greatly from international efforts in a scale which can not be achieved otherwise. An example is the international effort devoted to predicting El Niño.

Formation of networks

The formation of international networks is largely driven from below by the scientific specialists who perceive the need for large scale, often disciplinary experiments and massive data collection. Larger scale experiments need involvement by governments for sponsorship, official sanction and access to organisations and facilities. As a result, there occurs a de facto partition between the mainly scientific planning function overseen through ICSU machinery and the implementation functions which involve the UN agencies. Factors influencing the formation of networks are:

1. Commonality of international interest in a particular scientific task
2. Degree to which the programs proposed align with national interests and aspirations
3. The degree to which tasks can be accomplished without networks.

Impediments to Australian participation

Programs which have intergovernmental interest involving the large nations are likely to be well resourced with funds for the effective formation of the necessary networks. Their quality is generally very good and there has been an effective involvement by Australia. However, Australia's participation is becoming increasingly fragile because of constrained

resources and it is difficult to maintain our historical level of involvement.

There is an increasing reluctance of governments to commit to scientific programs which have inherently long time-scales in terms of perceived community benefit. In the atmospheric and ocean sciences and technologies, it is very difficult to attract resources for the long-term monitoring programs which are an essential prerequisite for further progress on many of the global issues which confront the international community. International networks generally do not seem to have as much visibility in government and are vulnerable to changes in policy and budget.

These pressures are being experienced at the time when the need for international cooperation in meteorology and oceanography has never been greater. Not only is the community more aware of the importance of many of the contemporary global environmental issues but also the science has matured to the point where multidisciplinary approaches are essential.

In the national competitive schemes for network participation, early career scientists are at a disadvantage due to their lack of exposure to overseas counterparts. This highlights the need for domestic funding schemes to compensate for this particular difficulty which tends to evaporate as the scientist becomes better known.

Antarctic research

International cooperation in science is vital for the understanding and protection of the Antarctic environment. Australia is an important signatory to the Antarctic Treaty and has particular responsibilities because of its claim to a considerable proportion of Antarctic territory

The Antarctic Treaty System consists of the Antarctic Treaty itself (in effect since 1961) and a series of other agreements under the Treaty umbrella. The most important of these are the Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR), and the recent Protocol on Environmental Protection to the Antarctic Treaty which came into effect on 14 January 1998.

There are two levels of membership of the Treaty:

- Consultative Parties who have acceded to the Treaty and also conduct research programs in the Antarctic that are recognised by other ATCPs as warranting a role in the formal government of the Antarctic south of 60°S, and
- Acceding states who have formally agreed that they accept the Antarctic Treaty but have not developed a research program there. Accession is often taken as a step along the way to consultative party status.

The question of whether the science program is worthy of recognition for consultative party status is judged on the following criteria:

- scale and diversity of the research program
- the international journals used for publication (must be international, refereed and respected, not simply internal)
- evidence that long term productivity is planned.

CCAMLR has both a Commission and a Scientific Committee. The Scientific Committee meets for a week immediately prior to the Commission meeting, each year in Hobart. It examines diverse topics relating to fishery management, and publishes its own journal (*CCAMLR Science*) in the four

languages of the Antarctic Treaty. The Scientific Committee of CCAMLR has been a very important development and Australia has had a major role in its evolution and effectiveness. CCAMLR, largely through it Scientific Committee, has been instrumental in developing new approaches to fishery management.

Australia has focussed much of its Antarctic marine biology effort (and support science) on the needs of CCAMLR. Australian scientists have a major role in the meetings and the program is widely respected because of the scientific expertise and ability to work within a partly diplomatic milieu.

Recently, the Protocol on Environmental Protection came into being, largely because of Australian diplomatic efforts. It has scientific needs but these are being determined and no mechanisms are formally in place.

Scientific Committee on Antarctic Research

Strictly outside the Treaty, but often loosely included in the Treaty System, is the Scientific Committee on Antarctic Research (SCAR), a member of the ICSU family. Its role is to coordinate scientific activities in the Antarctic and it is generally agreed that SCAR has been very successful. It is formally independent of the Antarctic Treaty and is asked regularly by the Treaty for independent scientific advice on issues such as Global Change, sharing of scientific data, and scientific advice to the Committee on Environmental Protection which has just been established under the Treaty Protocol.

Membership of SCAR is through national academies of science (for example, Australian membership is via the Australian Academy of Science). Nations contribute to the functioning of SCAR on a scale established by SCAR and implemented voluntarily. The scale relates to the level of national activity in Antarctica.

Australia has been an important player in SCAR. It has held three of the 25 SCAR meetings, has held three vice-presidencies, and has been very active in the Chief Officer role of many of the Working Groups and ad hoc committees. Currently, Australians head the Working Groups in Geodesy and Geographic Information, Human Biology and Medicine, and the Joint Committee on Antarctic Data Management (JCADM), a committee jointly hosted with the Council of Managers of National Antarctic Programs. The Joint Committee is an important initiative in which Australia has taken a driving role. The Joint Committee was established to help the Treaty meet its obligation (Article IIIc) which states that 'scientific observations and results from Antarctica shall be exchanged and made freely available'. Nations are urged to establish national data centres to act as nodes in a data exchange network. Australia leads this activity.

International networks

There is a significant component of overseas involvement in Australia's Antarctic research program. For example, in the 1998/99 summer, the Italian Antarctic program is paying half the cost of RSV *Aurora Australis* for a major marine geophysics/geology voyage around the eastern Australian Antarctic Territory, and normally about 10 per cent of the scientists participating in the Australian program are from overseas. Many Chinese scientists have been involved in the Australian Antarctic program and Australia also has hosted scientists from Romania, The Netherlands, Mexico, Peru, India and Finland. Australian Antarctic science has strong links with that of Japan,

especially in biology and geology. Many overseas PhD students come to Tasmania to study at the University of Tasmania in the Antarctic CRC and in many other departments. Many are co-supervised by staff at the Antarctic Division.

To a large extent, the current level of Antarctic networking is adequate but it allows little scope for development of new, young scientists in this activity. It is desirable to have more flexibility in this regard.

Although it is agreed that scientific research is a key element in the Antarctic Treaty System, the long term nature of much of the research is not always recognised, particularly by the diplomats involved in Antarctic issues. There is the potential to introduce training programs for young scientists in approaches to international diplomacy and explaining their science to non-scientific audiences.

4 SPONSORED SUPPORT FOR OVERSEAS RESEARCH TRAINING AND CAREER DEVELOPMENT

Introduction

The exchange of scientific personnel between the world's leading research laboratories has long been recognised as an important component in both the advancement of knowledge and individual career development. In regard to young scientists, a key mechanism for facilitating these exchanges has been the provision of postdoctoral fellowships. Traditionally, such fellowships were often arranged on the basis of personal linkages between senior staff at the respective exchange institutions (cf. Blume 1995). However, as was indicated in Chapter 1, structural initiatives designed to increase the international training and mobility of young researchers have become increasingly prominent. In this regard the following observation from a recent US National Science Board report is of interest:

> *Foreign scientists and engineers represent approximately 50 per cent of the postdoctoral pool in the United States; the United Kingdom and France have a high percentage of foreign postdoctorates as well, although the number of postdoctoral positions in these countries is much smaller. In addition, Japan is attempting to improve the quality of its basic research at universities by offering more postdoctoral fellowships for both Japanese and foreign doctoral scientists and engineers (NSB 1998).*

In relation to postgraduate students, Blume (1995) comments that a limited number of OECD countries have been the principal source of research training for large numbers of foreign students. This concentration largely reflects such factors as the reputation of the higher education institutions and research laboratories in these countries, historical ties between nations and geographic proximity (cf. Lapidus et al. 1995). Foreign students accounted for 21 per cent of all Australian PhD awards made in 1991. In 1996 the proportion of award completions for 'Doctorate by Research' to foreign students was about the same (DEETYA 1997).

Obstacles to the effective internationalisation of research training have been discussed in several sections of this report. Differential resourcing of exchange agreements being of particular concern. However, personal or lifestyle considerations can also present substantial mobility barriers. Recognition of the need to take into account such considerations was discussed in Chapter 1 in relation to the Marie Curie Association and the Bernard Gregory Association. In Australia a voluntary effort to provide a network of support for young scientists in regard to research training and career opportunities was made in 1997 when the 'Next Generation of Australian Scientists Society' was established.[29]

That life style issues can affect the willingness of individuals to undertake training in a foreign country is well-illustrated in the following quote from Blume (1995):

29 Web site for 'Australia's Next Wave' located at: http://www.chem.usyd.edu.au/public/australias-next-wave/

Changing life styles may be posing increasing barriers to mobility. Compare the following two stereotypes. On the one hand, there is the research student wholly committed to preparation for a life of science, wishing to take maximum advantage of the years of training with which he or she has been provided, and anxious to grasp all possible opportunities. Against this, the modern research trainee is very likely to be committed to a partner who is also trying to make a career, there may be children whose schooling cannot easily be disrupted, and there may be roots in the local community. In addition, adequate housing often cannot be guaranteed in the designated city.

Many studies have highlighted the difficulties encountered by students from abroad, especially those coming from significantly different cultures, and who may have expectations wholly at variance with usual practices in the host country. Problems derive not only from loneliness and differences in life style. Manners of teaching and learning, cultural traditions for the presentation of evidence and argument, excessive "distance" between student and supervisor due to non-Western cultural norms of age and status—all these may trouble the student's experience of advanced study abroad (see also Pearson and Ford 1998).

Thus for sponsors and individuals to receive the maximum return on their investment in overseas research training, the conditions of the fellowship awards need to accommodate lifestyle considerations.

There are of course other mechanisms which aid in the internationalisation of research training. For example, the importance of international symposia for the exchange of ideas and promoting new collaborative research endeavours is well appreciated. However, whilst there is usually a wide range of costs associated with attending such meetings (e.g. travel, accommodation, meal costs and registration charges) these costs affect scientists differentially. As Seiken (1990) has observed, '(i)t's an issue that affects scientists of all stripes, but it particularly bedevils young researchers. Lacking the stature to regularly attract all-expenses paid invitations to give papers or lead seminars at meetings, they are the ones who must scramble the most to finance their travel.'

So how do young scientists find out about the range of opportunities and the level of resources available to support overseas career training and development? Unfortunately there does not appear to be any central national register which provides such information. As a result, effort was directed as part of the Academy project to attempt to establish some form of base-line information regarding this support. To obtain some idea of what this base-line of opportunities might be (either funded by national or foreign sources), two approaches were subsequently developed. The first entailed profiling funding opportunities listed on an electronic database called SPIN—the results of which are presented in this chapter. The second entailed a survey of a select number of Australian universities—the results of which are discussed in the following chapter.

SPIN-Australia

The SPIN-Australia (Sponsored Programs Information Network)[30] database is a subset of SPIN International and forms part of an integrated package of products and services provided on the Internet by InfoEd International Inc—the main offices of which

are based in the United States and the United Kingdom. SPIN is targeted primarily to institutions of higher education and the funding opportunities catalogued on the database cover a wide range of subject areas and award types. Included in the award types are: fellowships; exchange programs; student scholarships; collaborative projects; travel abroad; conference attendance; and prizes/awards. Information regarding each funding opportunity is obtained from the sponsoring organisation. Each award is assigned a Program Number and the catalogued entry contains a wide range of information. This includes the contact details of the sponsor (including electronic and web site addresses where given); deadlines; funding limits; duration of the award; applicant type; award type; geographic restrictions; locations tenable; citizenship requirements; a synopsis of the award and information on the award objectives and restrictions.

Of importance to note is that the SPIN database is a 'live' database. That is, in contrast to registers of funding opportunities provided in print form, the database is updated several times a week by a team of 'writers.'[31] This also means that there is likely to be some variation in search outputs conducted at different times to reflect new opportunities entered on to the database and previous opportunities deleted because, for example, sponsor funding is no longer available. This point should be noted in relation to the results presented below. It should also be noted that whilst many universities throughout the world offer PhD fellowships to foreign nationals on a competitive basis, this source of training support is not fully reflected in the SPIN-Australia database.

The search criteria for interrogating SPIN comprised the different categories of award information described above and the actual searches were conducted within specific disciplinary fields. In this regard the SPIN 'Keywords' category contains eleven disciplinary fields plus the field 'Other' (which contains those sources of support that do not have any discipline restrictions). The profiles discussed in this chapter focus on the following five fields: *Medical; Science and Technology; Engineering; Agricultural; and Other*.[32]

Method for profiling opportunities listed in SPIN-Australia

The first field to be profiled from SPIN-Australia was Medicine. The profile strategy developed for this field of science was used as a model for the remaining fields referenced above. The final profile is based on five files: (1) a listing of the program title; (2) a table which contains summary comments regarding each program; (3) an electronic version of all the program profiles generated by SPIN; (4) hard copy versions of these profiles; and (5) a numerical data file recording summary information for each program regarding 'funding source', 'award type', 'travel costs', 'country tenable',

30 The Australian Vice-Chancellors' Committee has contracted with InfoEd International for provision of SPIN and other services SMARTS and GENIUS (see Appendix 3.1). The AVCC applies a differential annual subscription rate to those universities wishing to access these databases. Web access for subscribing universities is at: http://www.unsw.edu.au/

31 One of these writers is located at the University of New South Wales and has responsibility for maintaining all SPIN programs sponsored by agencies and organizations in Australia.

32 Due to the substantial overlap between the 'Energy' profile and those for 'Science & Technology' and 'Engineering' specific discussion of this profile was not warranted. However, the programs contained in this profile, which were not duplicated in the other profiles, are listed in Appendix 3.2.

'period of tenure', 'funding limit' and 'subject inclusivity'. Statistical analysis of this numerical data file was undertaken using version 6.1 of the Statistical Package for the Social Sciences (SPSS)[33].

The preparation of the profiles was an extremely labour intensive activity. Apart from having to read through all profiles for relevance and then to code the programs and prepare descriptive and statistical summaries, any changes (deletions/additions etc.) made to one of the five files listed previously had to be made to the remaining four files. As the profiling exercise entailed ongoing refinements to maintain a high level of relevance of the program listings, the time taken to ensure that such changes were consistently reflected across all files was substantial.

As part of the profile strategy a decision was made to err on the side of *inclusivity* in relation to potential opportunities and resources available to support 'young' researchers to acquire overseas experience and establish international networks. Thus where a scholarship was tenable at an Australian institution but had listed funding for travel as part of the support provided, this scholarship was retained in the profile.

The final profile reflects opportunities provided from national and overseas sources for Australian graduates and postdoctorates (either directly targeted to Australians or as part of a 'no citizenship restriction'). The profile contains a wide range of potential opportunities for Australians to acquire overseas research training/experience in addition to actual scholarships/fellowships. These include collaborative grants (of which funding can be used to support these younger researchers); conference/travel funds; access to facilities; prizes; and temporary government assignments. Also included are opportunities for research support in an overseas country once the applicant has actually taken up residence in that country (these opportunities are mostly provided by programs where the sponsors do not list citizenship restrictions).

Finally, to obtain an indication of how comprehensive the SPIN-Australia database was compared to print alternatives, a selective comparison was made with the print publication *The Grants Register 1997: The Complete Guide to Postgraduate Funding Worldwide* (Austin 1996). Whilst SPIN-Australia contained far more funding opportunities of potential relevance to the project than the Grants Register, it did not list, for example, the 'Burnet Fellowships,' the 'Eccles Awards' or the 'Rhodes Scholarship'[34]. Also, some funding awards of relevance, such as the 'Ruth Bedford Travelling Scholarship' or the 'Keith & Dorothy MacKay Postgraduate Travelling Scholarship,' were not contained in either source of information.

The following section provides a summary of the statistical analysis undertaken of each of the profiles in terms of the variables listed above. Again, it should be noted that the profiles are of *potential* opportunities. In regard to those opportunities which are overseas funded, very little could be said about the *actual* success of Australian nationals for these awards (unless they were specifically targeted to Australians). Moreover, for those programs which do not list any citizenship restrictions it would be expected that Australian applicants would constitute only a small percentage of the overall number of international applicants.

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33 SPSS 6.1 is 'a powerful software package for microcomputer data management and analysis'.

34 The omission of the latter scholarship from the SPIN data base is in the process of being rectified by Info Ed.

Appendix 3 lists the potential funding opportunities for each profile and provides summary comments regarding each program. As would be expected, there is some overlap between the profile listings.

1. Profile of potential opportunities in Medicine

Issues to do with career training and development in the medical sciences and mechanisms to facilitate international experience in this area were discussed in Chapter 2. Particular attention was directed to the support provided by the National Health and Medical Research Council and the Research Institutes for these activities. However, whilst the CJ Martin Fellowship scheme and the Florey Fellowship scheme were considered to provide excellent models for facilitating international research training, the number of awards made by these schemes was considered inadequate[35].

The final number of programs considered eligible for inclusion in the medical sciences profile was 222. These are programs that provide overseas research experience for young researchers in some form—whether this be a conference, fellowship, acceptance of a prize, access to an overseas research facility or laboratory, a collaborative grant and the like.

Half of the programs listed in the medical sciences profile are PhD or postdoctoral scholarships/fellowships. Of the remaining programs, just over a third provide funding support in other forms such as: a general project grant; access to overseas facilities; exchanges; collaborative grants; internships; conference attendance; and prizes. A small proportion of the programs provides a combination of scholarships/fellowships and other award types.

Slightly more than half of the programs (121) did not specify country restrictions for the undertaking of the award. However, fourteen per cent were restricted to North America, just over ten per cent to Australia and eight per cent of the programs listed a country restriction of the United Kingdom. In terms of the period of tenure for the award, just under half are multi-year awards and a third are tenable for periods from seven to 12 months. About sixty per cent of the programs are funded from sources outside Australia, with North America accounting for almost two-fifths of all sources.

Whilst three-fifths of the funding opportunities are limited to medical fields only, two fifths of all programs are classified as multi or cross-disciplinary or generic (i.e. no field restriction for the funding opportunity). The majority of programs listed in the profile provide for overseas travel costs in some way (either fully or partially supporting this travel). In regard to the scholarships/fellowships, some of these awards provide only for the stipend in the overseas country (i.e. no travel funds); others provide funds for the recipient (and in some cases the recipient's family) for return economy air travel in addition to a stipend, health insurance, relocation allowances and the like.

Of the 93 programs supported from Australian funding sources, about two-thirds specifically relate to PhD or postdoctoral scholarships/fellowships. No country restrictions were listed for 48 of these Australian sponsored programs, although 24 awards specified Australia and 7 the United Kingdom. Only 26 of those programs supported from Australian sources provided award funding of more than A$30 000. Nonetheless, 60 of the programs allowed for overseas travel costs in some form—either fully or partially funding this travel.

35 The NHMRC is currently attempting to address this issue.

Of the 84 programs sponsored from North American sources, about three-fifths are limited to supporting research work in medical fields only. Some form of overseas travel costs support is also provided by about two-thirds of the North American sponsored programs. However, a small proportion specifically excludes funding for overseas travel as a legitimate award expense.

Comment

The importance of providing opportunities for overseas research experience for PhD students/early career researchers is explicitly recognised by a number of funding organisations in Australia and overseas. In relation to Australia, the Royal Australasian College of Physicians and the NHMRC are good examples of this. However, the question must be raised as to the adequacy of the actual numbers of young researchers who are supported from these sources for ensuring the future vitality of the national science base.

It is difficult not to gain the impression that for some awards, the level of funding provided is grossly insufficient for the costs actually incurred by young researchers. This raises a number of issues. The first is that if young researchers do go overseas for research training/career development then other sources of funding are required, and it is likely that personal funds would be a main contributor to this. The second is that small levels of funding may act as a disincentive for potential applicants: i.e. it is not worth the time and effort required to submit an application.

Other issues raised from the profile exercise concern the comprehensiveness of the support provided under different awards. For example, some awards recognise the importance of ensuring that the successful applicants are provided with sufficient funds for re-location and language training. Some recognise the importance of enabling the successful applicants to bring their families. Others make clear that funding is restricted to the award recipient only. Health insurance is clearly a major concern for young researchers going to countries such as the United States. Yet only a few awards provide for this cost for the applicant and family health insurance is usually not considered a legitimate award cost. Visa and passport costs are rarely provided.

Where the tenable period for an award is six months or less, what output can reasonably be expected? It is likely that a period of adjustment is required by the successful applicant to both living in a foreign country and successfully integrating into the foreign research organisation. With short periods of tenure there may be the risk of waste in the investment by both the research sponsor and the successful applicant.

How successful are Australian nationals in the competition for the awards provided by the overseas sponsors listed in this profile? This is a difficult question to answer for those awards which do not specify 'Australian citizenship' as part of the nationality restrictions. However, given the internationalisation of the science effort it is important to establish how competitive young Australians are in gaining overseas sponsorship.

The SPIN profile for medicine shows that there is a wide range of potential funding opportunities to support overseas training/development—although the levels of support vary widely.

It is clear from the SPIN profile exercise that there are too few fellowships which provide the total package of support required for a young scientist to be based in an overseas country for other than the short-term and that competition for these fellowships is intense.

Therefore, both students and postdoctorates need to develop a strategy which entails targeting a number of different types of sponsorship for the overseas component of their research and ensuring that a variety of overseas networking experiences are reflected in this strategy (e.g. conferences, exchanges, collaborative research, and access to facilities). The strategy also needs to reflect a time continuum viz the stage of the young researcher's career—i.e. not focus on ad hoc opportunities but look to ensuring ongoing competitiveness for international participation. For such a strategy to be effective effort has to be directed to its development at the beginning of the young scientist's PhD studies/postdoctorate appointment.

One clear difference between the awards provided by North American sponsors and Australian, is the number of professional association prizes, or other similar forms of recognition, for PhD students and early career researchers. In this regard it needs to be questioned to what extent University Medical Departments and Research Institutes encourage their students/postdoctoral fellows to apply for these overseas awards? It is apparent that recipients of such awards are given important networking opportunities and visibility within the international context.

Yet it is possible that young Australian scientists are not being sufficiently encouraged/supported to apply for these prizes.

As indicated in Chapter 2, there are NHMRC programs which aim to provide support for young Australians to obtain training/career development overseas. There are also several awards aimed at repatriating these researchers to Australia on the conclusion of their training.

2. Profile of potential opportunities in Science & Technology

The field designated Science and Technology in the SPIN database is based on more than 800 keywords. It is broader than the other fields profiled in this exercise and there is overlap with them.

Results

About the same number of opportunities were listed in these fields of science as in the medical sciences. However, of the 204 programs contained in the science & technology profile only slightly more than two-fifths specifically relate to PhD or postdoctoral scholarships/fellowships. Funding support in other forms, such as: a general project grant; collaborative grants; and conference attendance, was provided by 109 of the programs.

Whilst, around a quarter of all programs were restricted to North America and about a tenth to Australia, just over two-fifths of the programs listed no country restrictions. For the 154 programs providing information on the period of tenure for the awards, the majority were for seven months or more or multi-year awards.

About a third of the programs are funded from Australian sources and just over half from North America. The programs were fairly evenly divided between those that were science & technology specific and those that did not have any field restrictions for the proposed research activity. The majority of the programs provide for overseas travel costs in some way.

Of the 63 programs supported from Australian funding sources, just over two-fifths specifically relate to PhD or postdoctoral scholarships/fellowships.

Just over a third of these Australian sponsored programs are restricted to

Australia and just under a fifth to Japan/Asia. Around a quarter of the programs did not specify any country restrictions. About half of the programs did not contain sufficient information regarding the level of funding support. However, eleven provide for more than A$30 000. Almost three-quarters of the funding opportunities are multi or cross-disciplinary or generic (i.e. no field restriction for the funding opportunity). Overall, most of the programs support overseas travel costs in some way (fully or partially supporting this travel).

Of the 111 programs where funding support is provided from a North American source, almost two-thirds relate to 'other' award types. Slightly less than half of the 111 programs are awards which are specifically restricted to North American institutions. As with the Australian funded programs, the majority of North American sponsored programs provide for overseas travel costs in some way.

Comment

The S&T profile contains some of the more prestigious international awards e.g. Smithsonian Museum, Nuffield Foundation, Wellcome Trust and the Howard Hughes Medical Institute (HHMI). In regard to those awards that support medical research (listed in both of the S&T profile and the Medical Sciences profile) there is a number which provide a comprehensive and well-resourced package of support for the successful applicants. The NHMRC fellowships and the Australian National Heart Foundation Fellowships are in the A$30 000 to $40 000 plus range, with research allowance, economy air fares and conference travel. These awards are comprehensive and structured to reflect the basic constraints of working overseas in a different environment. In regard to the United States, the HHMI fellowships carry a stipend of US$40 000 to 60 000 p.a. (for Physicians) for 3 years and have a research allowance of US$16 000 (which will cover conference travel) as well as a $13 000 institutional allowance. The Smithsonian Postdoctoral and Senior Fellowships provide a stipend of US$27 000 for 6–12 months.

A number of the postdoctoral awards from research organisations like NSERC, NRC and several Australian institutions (e.g. the University of Queensland) also appear to try and provide realistic levels of support for successful applicants.

Within the science & technology profile, NASA unsolicited proposals programs were prominent. While the amount of money available is not specified, the programs do allow flexibility in terms of timing (requests presented as any time) and there are no restrictions on domestic or foreign travel.

3. Profile of potential opportunities in Engineering

Of the 185 programs contained in this profile, 127 (or just over two-thirds) were in the form of general project grants, collaborative grants and conference attendance support. Slightly less than a third of the programs were targeted to PhD or postdoctoral scholarships/fellowship support.

Almost half of the programs did not specify any country restrictions for where the awards could be taken up. However, a fifth of the programs were restricted to North America. For the 113 programs providing information on the period of tenure for the awards, the majority were for seven months or more or were multi-year awards.

The principal sources of funding for the Engineering awards were North American and these accounted for around 60 per cent of funding sources. Australian sponsorship accounted for under a quarter of the

programs. The majority of programs (four-fifths) were multi- or cross-disciplinary or generic (i.e. no field restriction for the funding opportunity). About two-fifths of the programs provide support for overseas travel costs in some way.

Of the 43 programs supported from Australian funding sources about half specifically relate to PhD or postdoctoral scholarships/fellowships. Less than fifteen per cent of these Australian sponsored programs have no country restrictions, just over ten per cent are restricted to Australia and about a quarter to Japan/Asia. Ten of the programs provide funding between A$15 000-A$30 000 and eight provide for more than A$30 000. In terms of the period of tenure for the award, over half are for 7-12 months or multi-year awards.

All of the funding opportunities provided from Australian sources are multi- or cross-disciplinary or generic (i.e. no field restriction for the funding opportunity). Thirty of the forty-three programs provide for overseas travel costs in some way (fully or partially supporting this travel).

Of the 112 programs where funding support is provided from a North American source, less than a fifth relate to PhD or postdoctoral scholarships/fellowships—the bulk being for 'other' type of awards. Just over two-thirds of the North American sponsored programs do not have any country restrictions. North American institutions are however specified in slightly less than a third of the awards.

About three-quarters of the funding opportunities provided from North American sources are generic/multi- or cross-disciplinary. Forty (approx. one-third) of the programs provide for overseas travel costs in some way (fully or partially supporting this travel).

4. Profile of potential opportunities in Agriculture

International collaboration in agricultural research is facilitated by a number of organisations, which include the Consultative Group on International Agricultural Research (CGIAR), the Food and Agricultural Organization (FAO) the United Nations and the aid agencies of many of the developed countries. AusAID and the Australian Centre for International Agricultural Research are among the aid agencies that have played an important role in improving agricultural production in the developing countries. Australia is recognised internationally as a source of expert advice on improving agricultural production and for research training of overseas agricultural students and scientists. Australian scientists have played a key role in the operations of CGIAR.

Results

The number of programs considered eligible for inclusion in the agricultural profile was 69—which is substantially lower than the other profile totals. About half of these programs are PhD or postdoctoral scholarships/fellowships. In contrast to the medical sciences, 'prizes' are not a component of the potential sources of support in agriculture.

Twenty five (just over a third) of the programs listed no country restrictions for where the awards could be taken. However, Australia was specified in twelve programs and North America in eleven. For the fifty-two programs providing information on the period of tenure for the awards, approximately four-fifths were for seven months or more or multi-year awards.

About sixty per cent (42) of the programs are funded from Australia sources and about thirty per cent (20) have North American

sponsorship. Ten of the programs funded from Australian sources provide support ranging from between A$15 000–A$30 000.

The majority of awards were not agriculture-specific but multi- or cross-disciplinary or generic (i.e. no field restriction for the funding opportunity). About three-fifths of the programs provide for overseas travel costs in some way. However, a number are quite restrictive: for example, the Smithsonian Graduate Student Fellowships do not provide for travel funds to get to the US; and the Rockefeller Foundation Bellagio Study and Conference Centre will only provide round trip economy airfare for those from developing countries.

One of the most significant sources of Australian support comes from the Rural Industries Research and Development Corporations. For example the Pig Research and Development Corporation states that its travel grants 'recognise that travel is an essential component of the process of R&D and technology transfer'. As part of the Land and Water Resources Research and Development Corporation research funding a travelling fellowship is provided for early to mid-career researchers which is: 'Intended to help promising young researchers already part of the research community to work and travel overseas for up to one year'. The R&D Corporations are discussed in more detail in Chapter 6.

Comment

Whilst the medical sciences profile contained a number of career structured awards that provided for research experience overseas, these type of awards are less apparent in the agricultural sciences profile. In part this may be a result of the overlap between agricultural sciences and a wide range of other disciplines (e.g. biological sciences; vet sciences; ecosystems management and economics). Nonetheless, it is clear that several of the R&D Corporations' awards recognise the importance of providing international linkage opportunities for young Australians in the agricultural sciences. However, whilst it is apparent from Chapter 6 that the Cooperative Research Centres also play an important role in supporting international linkages for young scientists in the agricultural sciences, the entry information for the CRCs on the SPIN database does not reflect this.

In contrast to what appears to be a small number of Australian sponsored support for international linkages for young scientists in the agricultural fields, substantial funding is provided to support training for those from developing countries in Australia (cf. AusAID and its predecessor AIDAB; and ACIAR).

5. Profile of potential opportunities in 'Other'

This category contains programs which did not list any field of science restrictions and therefore is of relevance across all the science fields profiled in this chapter.

Results

The final number of programs considered eligible for inclusion in the profile was 49. Of these programs, 35 specifically relate to PhD or postdoctoral scholarships/fellowships. Eleven provide funding support in other forms, such as: a general project grant; collaborative grants; and conference attendance. Three of the programs provide a combination of scholarships/fellowships and other award types.

Thirteen (just over a quarter) of the programs listed no country restrictions for where the awards could be taken up. However, the United Kingdom/Ireland, Other European countries and North America were listed in twenty-eight of the programs. Just under half

of the programs had periods of tenure for seven months or more or were classified as multi-year awards.

About a quarter of the programs are funded from Australian sources, a quarter from North America and the remainder from other countries. Twenty-two of the programs provide for overseas travel costs in some way. However, seven programs specifically excluded travel costs.

Comment

Not surprisingly the 'Other' profile contains a miscellaneous range of programs. However, there are a number of well-known sources of international research support. These include for example, the British Council, Churchill Fellowships and Royal Society of Edinburgh. Two of the programs (the AAUW International Fellowships and the Bunting Institute Fellowship Program) are targeted at women. The Churchill Fellowships are not restricted to those from academic backgrounds.

The UNSW Vice-Chancellor's Postdoctoral Fellowships provide remuneration in the range of $34 801 to $40 804 in addition to a research allowance for materials and conference expenses. However, the SPIN database indicates that only two are awarded annually.

The London Goodenough Trust provides a somewhat different type of support for overseas graduates. The Trust subsidises collegiate accommodation for postgraduate students as well apartment units for couples/families. Unfortunately, it is apparent in some of the programs profiled that there is a sponsor perception that travel for the purpose of overseas conferences is not a legitimate research cost.

Conclusion

A clear outcome from the SPIN profile exercise is that whilst overseas travel (for whatever research purpose) is expensive, the extent to which the numerous costs associated with this travel are covered by the different funding bodies varies substantially. Relocation costs for those taking up PhD fellowships or postdoctoral fellowships overseas include the following: passport and visa costs; insurance (life/medical and dental/travel/public liability); transportation costs to and from the host country; costs for domestic travel in the host country for research related activities; laboratory costs; field study costs; and accommodation and living expenses. However, only a few fellowships acknowledge the full range of these costs by providing establishment/relocation subsidies, adequate stipends and research materials funding, travel and insurance costs and assistance with language training. Overall, the personal financial commitment required by individual young scientists wishing to participate in international training/experience appears to be sizeable. When coupled with uncertain employment prospects back in Australia (even when the overseas training has been completed) this situation is likely to act as a clear disincentive to young Australians considering the study of science as a viable career option.

It is not unusual for Australian universities to provide listings of relevant overseas research funding opportunities for their staff and students on the Home Page of their Internet site. However, there appears to be some variation in the extent to which the institutional listed funding opportunities were listed on the SPIN Australia database or the printed register referred to earlier. A question that perhaps needs to be addressed

in this regard is whether or not Australian staff and students are being systematically alerted to the full range of overseas and national funding opportunities available. On the basis of the profile task it would seem that a more concerted effort is indicated to ensure that all relevant funding opportunities for Australian nationals are listed on a central data base (such as SPIN-Australia).

Recommendation 4: Universities ensure that all their overseas research funding opportunities are listed on SPIN-Australia or an equivalent database.

Profiling the opportunities for research training/career development overseas for PhD students and early career researchers from Australia is a little like 'herding cats'. No one source of information (electronic or print) could claim to reflect all relevant funding opportunities available and as such it is very difficult to establish a 'base line'. This raises the question of the type and level of support provided by universities themselves in alerting their staff and students to the variety of funding sources available and their relative strengths and weaknesses. Chapter 5 provides some insight on this issue.

The results of the SPIN profiling exercise raise the question of where the responsibility lies for ensuring that young scientists develop grantsmanship strategies at an early enough stage in their careers to maximise on the opportunities available for overseas research training and career development. This is a somewhat different issue from that raised by the question of whether the level of national funding is sufficient to support young scientists to participate (in whatever form) in overseas based research networks.

5 UNIVERSITY SUPPORT FOR INTERNATIONAL LINKAGES

Issues and problems in the development of explicit policies for postgraduate research training were the focus of an OECD report released in the mid-1990s (OECD 1995). According to this report the main challenge to the effective development of such training policies lay with the need to address an increasingly wide range of complex issues. These have been summarised as: '…the problem of relevance (notably the issue of making research training relevant to a wider variety of careers than it traditionally has been); the location of research (questioning the central role of universities in national research systems); the increasing extent of internationalisation; and concern with improving the quality of research training' (Blume 1995; see also: Garrison and Gerbi 1998; Zare 1998; Cooper 1997; Lehrman 1996). Much effort has been directed in recent years to examining ways to effectively meet these policy challenges. However, the extent to which training policies and strategies are successful in doing this is largely dependent on there being effective co-ordination between universities, research grant agencies, private sector organisations and other peak bodies.

According to Back *et al.* (1996) two types of strategies are required in the internationalisation process within higher education. These are:

- Organisation strategies which help to ensure that an international dimension is institutionalised through appropriate policies and administrative systems; and
- Program strategies which integrate an international dimension into the main functions of a higher education institution.

However, several recent studies have identified barriers to the mobility of Australian postgraduates and postdoctorates going overseas for training/career development purposes (cf. Baker et al. 1996b; Bazeley et al. 1996). These include travel and accommodation and other associated relocation costs; personal readjustments for accompanying family members; problems in obtaining employment on return to Australia and insufficient numbers of positions which have a clearly defined career-structure (cf. FASTS 1998).

There are several ways by which universities support internationalisation of their activities. These include providing scholarships for overseas students to come to Australia and for domestic students to study overseas. As the conditions set by the Australian government regarding paid work activities for overseas students and their dependents are not considered unduly restrictive, this also helps facilitate internationalisation in higher education.

Survey of university support for international linkages

To further improve understanding of just how Australian higher education institutions conceive and implement their role regarding overseas training, career development and network opportunities for graduates and academic staff, a survey was undertaken during 1998. Of particular interest were the type and level of support provided by

universities to facilitate international linkages. A semi-structured questionnaire was designed to obtain the required information and provision made for returns to be lodged electronically.

Due to time and other resource restraints the survey was targeted at those Unified National System institutions with 1997 commencing PhD enrolments in the Sciences[36] of at least one hundred. This category comprised: the Australian National University; Monash University; the Royal Melbourne Institute of Technology; the University of Adelaide; the University of Melbourne; the University of New South Wales; the University of Queensland; the University of Sydney; and the University of Western Australia (see Table 1).

The questionnaire was divided into five parts. Part A sought information on institutional support provided for: (1) graduates and early career researchers[37]; (2) established research staff; and (3) visiting overseas scholars. To facilitate the compilation of this information a *pro forma* was provided for the first two categories.

The focus of Part B was on the efforts (formal and informal) that the universities undertook to ensure that students and staff were aware of the various forms of support available for overseas research activity. This section also sought information on what were considered to be the main obstacles to facilitating international research linkages.

The aim of Part C was to establish the number of overseas researchers currently visiting each University for collaborative work or career development or training purposes. The concern of Part D was with the type of information maintained by the institutions regarding the overseas fellowship training of their respective PhD graduates; and the source(s) of support for this training. Provision was also made for each of the institutions to comment on any other issues relating to international research linkages which were not covered elsewhere in the questionnaire.

It was apparent during the conduct of the survey that information regarding international linkages has not been routinely or systematically collected by the participating institutions. As a result, some universities were unable to provide information for some of the questionnaire items, or could only provide 'guessestimates' or incomplete data. This relates particularly to destination information for PhD graduates and information about overseas early career researchers. Similar concerns were also raised in Chapter 2 regarding the need to improve the collection of data regarding the international mobility of both Australian and overseas scientists and engineers to and from Australia. Whilst individual institutions might feel that the collection of such data is yet another burden, the payoffs in terms of being able to illustrate successful placement of postgraduates in leading overseas institutions must surely outweigh such concerns. There are other good reasons for universities to compile information on the destinations of their PhD graduates besides the consideration of overseas training. These relate to the employment opportunities for PhD graduates and the aims of PhD training.

36 The survey focused on university research activity that fell within the ABS Field of Research Classifications 010000 (Mathematical Sciences) through to, and including 100000 (Medical and Health Sciences) but excluding 109900 (Health Services Research).

37 An Early Career Researcher is defined by the ARC as 'one who is currently within his/her first five years of academic or other research-related employment, allowing for uninterrupted, stable research development, following completion of postgraduate research training'.

Recommendation 5: Greater attention needs to be directed to the systematic compilation of time series data on PhD graduate employment destination information both in terms of country of employment and sector of employment. The scientific manpower surveys undertaken by the US National Science Foundation and the Federation of American Societies for Experimental Biology are instructive in this regard. This is an issue which needs to be discussed by the AVCC and the Graduate Careers Council of Australia.

Problems for universities in being able to readily provide the type of information sought in the questionnaire can be attributed in part to the devolution of decision making by a number of universities to the faculty/department level. As a result there appears to be no central record provision for the collection, compilation and maintenance of the necessary data. However, whilst there is growing appreciation in the higher education sector of the importance of collecting time series information on staff and student international movements, methodologically the collection of such information is complex (cf. Burgess et al. 1995). One particular obstacle to collecting data regarding student travel overseas for research training/career development is the voluntary basis on which such information is provided. A further question which needs to be addressed is whereabouts within a university the responsibility should lie for the collection of the necessary profiling data. Related to this is the question of the type and level of resources which need to be committed to ensure that the data sets are comprehensively and accurately maintained and monitoring reports provided.

Despite the above difficulties, the institutional responses to the survey are nonetheless indicative of a number of issues and problems from the university perspective regarding the facilitation of international linkages at the graduate student/postdoctoral level and for established researchers. As such they provide a useful basis for the consideration of a more comprehensive and investigation of the role and adequacy of university support for the networking opportunities for Australians overseas and for visiting overseas scholars in Australia.

A summary of the survey outcomes is presented below[38]:

International linkages for graduates/early career researchers

The survey institutions were asked to provide information on the type and level of support provided for their graduates/early career researchers to pursue research training/experience/ career development overseas. Suggested possibilities included PhD/Masters scholarships; exchange programs; funding for overseas conferences/workshops; professional development; and access to overseas facilities.

38 In regard to the ANU, the response is based on a sample of returns from Science disciplines across the University. The response rate was approximately 50 per cent. The University's view is that the patterns shown by those returns are indicative of the general position within this institution. Therefore, where University-wide numbers were required for any purpose it was considered 'reasonable and appropriate' to apply a factor of 2 to the numbers provided in the University's return.

Several of the universities commented that there were no special university-wide awards as such for this group. Instead, there were programs offered generally by the university for which early career researchers were eligible to apply to for support. Also Deans and Heads of Departments appear to have discretion to fund PhD students/early career researchers to take part in specific activities overseas, including conference participation. The following discussion is illustrative only of the type and range of awards provided.

The University of Sydney has a range of scholarships specifically designed to assist in the undertaking of research overseas. Nine of the scholarships listed are intended for short-term visits overseas and have funding ranging from $300 to $2 500. Two scholarships tenable at an overseas institution are multi-year awards, with one having a value of $4 000 and the other $15 000. At the University of Melbourne a number of institutional as well as Faculty and Department awards are provided to support overseas training for research higher degree students. These include: Travelling Scholarships of up to $1000 for brief visits; and Postgraduate Overseas Research Experience Awards of up to $10 000 of which 50% is centrally funded and 50% from other departmental sources. The Overseas Research Experience Awards are for approximately 6 months study overseas. At the University of Adelaide, The Faculty of Agriculture & Natural Resource Sciences Special Initiatives Scheme provides for up to $5 000 and a second scheme in this faculty provides for between $1 500–$20 000. However, this latter award is not exclusively targeted at early career researchers.

The University of Queensland provides a range of funding opportunities which can be used for the support of new researchers and postgraduates through its internal research grant schemes and also through its distribution of research infrastructure block grants. Support schemes at the University of Western Australia include the Hackett/Gledden Scholarships for UWA graduates to study for a recognised degree overseas. These scholarships pay compulsory fees and travel allowances and there is also provision of a hardship allowance for living costs should this be necessary.

Overseas conference attendance for early career development purposes is provided by a number of universities. For example: ANU provides between $1 000–$2 000; Monash University provides between $140–$1 700—although the applicant must be a principal author of the paper being presented. The University of Adelaide listed three different awards which included support for postgraduate researchers to attend overseas conferences. Two of these were for $1 000 or less.

The ANU indicated that Professional Development awards of $1 000 were available to support the exposure of early career researchers to overseas research. ANU and Adelaide also indicated that they had awards with maximum funding limits of $5 000 available to provide access to overseas facilities/equipment.

A number of other types of awards to support international linkages for postgraduates and early career researchers (or from which this group could benefit) were also listed. For example, apart from overseas conference support for postgraduates, The Monash Research Initiative Fund stimulates collaborative research undertakings with international universities and research institutes. The University of New South Wales awards five Anthony Mason Fellowships annually which are designed to allow UNSW staff to spend one-month working with an overseas

research colleague on a research project of importance in the Asia-Pacific region. The University of Queensland has an Early Career Researcher Grants Scheme which is similar to the ARC Small Grants Scheme. In addition there is a New Staff Research Start-Up Fund whereby matching Central research funding and Faculty funding up to a maximum of $10 000 is awarded. A number of different Travelling Scholarships are awarded by the University of Sydney with varying levels of funding (e.g. $10 500 per annum; $35 000 per annum; and $9 000 per annum with discretionary grant-in-aid and supplementation funding). The University of Sydney annually awards 15 U2000 Postdoctoral Research Fellowships as well. These Fellowships have a $25 000 start up grant which may be used for study/travel overseas. A University Research Grants Scheme restricted to early career researchers also provides support for international travel.

International linkages for established researchers

A further objective of the survey was to establish the type and level of support provided for established academic staff to maintain overseas research networks. The types of awards considered to fall into this category included: sabbatical leave; exchange programs; attendance at overseas conferences; collaborative research projects; and access to overseas facilities/equipment. As observed in the previous section, devolution provides substantial discretion to Faculties/Departments regarding the type and level of support provided for such linkages.

A main source of support for international research linkages for established staff is the university (special) studies programs. Within this category the following types of overseas research activities can be undertaken: sabbaticals, professional development, attendance at overseas conferences, and use of research facilities or materials not available in Australia. Conditions such as length of visit and level of funding available, vary for these awards. At the University of Melbourne, for example, there is a program which encompasses the following schemes:

Visiting research scholars awards

To assist researchers at leading universities and research institutions in Australia and overseas to visit the University of Melbourne for periods of three to twelve months for collaborative research.

Awards for joint research projects

To encourage the development of joint research projects with other universities and research institutions, or with industry, both nationally and internationally, by providing matching project funding.

International exchange agreements collaborative research awards

To assist researchers at the University of Melbourne to engage in collaborative research at universities and research institutions overseas with which the University has entered into formal agreements calling for research collaboration.

The University of Melbourne also has a 'Special Studies Program—Short' and a 'Special Studies Program—Long' which are open to all researchers.

As part of its form of support for overseas networks the University of Sydney provides 150 awards under its Overseas Conference and Travel Grants Scheme. In addition there are arrangements in place for Secondment or Exchange of academic staff to overseas institutions. In regard to collaborative research projects the University of Sydney has three categories of awards: Category A "Good Neighbour" Activities, designed to

enhance the University's general international standing without necessarily leading to immediate student recruitment or income generation. Category B Activities, which are specifically designed to enhance and facilitate developments and strategic relationships of academic units in the international domain. Category C Activities are designed to enhance strategic relationships with leading institutions with which the University of Sydney has inter-institutional agreements. Category C grants in 1998 are restricted to China. The funding for these awards ranges from $5 000–$30 000.

The University of Western Australia's international research support schemes include: the Gledden Travel Award which enables academic staff to attend conferences or continue their research at an overseas institution; and an Academic Staff Exchange Programme which currently has active staff agreements with one university in Singapore and France and two universities in the USA.

As part of its support, the University of Queensland has a 'Travel Scheme for International Collaborative Research—Category 2'. The duration of the awards is one year and a maximum of $100 000 is available in total under the scheme. At RMIT sabbaticals, exchange programs, overseas conference participation and collaborative research projects are supported.

The Anthony Mason Fellowships are a high prestige award provided by the University of New South Wales as part of its efforts to sustain international linkages in the Asia-Pacific region. Five awards are made annually of approximately $4 000 each and for a duration of a month. As part of its professional development support the University of Adelaide has a Special Studies Program which enables staff to spend up to a year at another university or institution, usually overseas. Support for professional development and overseas conference attendance can also be sought from the Faculty of Agriculture and Natural Resource Sciences Research Scheme. In addition, established researchers can seek support up to $2 000 in any two year period for overseas conference participation.

The Australian National University has a wide range of support mechanisms for international linkages including secondments. However, there are variations regarding the type and level of support to reflect the divisional structure of the University into Faculties and Research Schools.

Support provided for visiting scholars from overseas

There are various mechanisms used by the survey universities to provide support for visiting scholars from overseas. However, often there is no university-wide policy regarding this type of support. Rather the Faculties/Departments have the discretion regarding the type and level of support provided. At ANU, for example, the support could include the waiver of laboratory fees or fee concessions; direct grants ($1 000–$15 000) for a 12 month stay; and infrastructure provision (e.g. office space, access to computer facilities etc.). At RMIT short term visits are supported by matching funds provided by the Faculty of Biomedical and Health Sciences & Nursing and participating departments.

The Faculties of Science and Agriculture and Natural Resource Sciences at the University of Adelaide, provide grants of $2 000–$3 000 to support visits by overseas researchers. Other forms of support include a Senior Visiting Research Fellowship and Memorial Lectures. A contribution towards expenses of $3 000–$12 000 is provided under the University of Melbourne's Visiting

Research Scholars Scheme. Similarly, the University of Queensland has a 'Travel Scheme for International Collaborative Research'. The University of Western Australia includes in its support for overseas scholars, a Development Aid Grant Scheme (for those from developing countries); Postdoctoral Research Fellowships; and a Senior Visiting Fellowship.

Support schemes for visiting scholars provided by The University of Sydney include an international development fund to support activities designed to enhance the University's strategic academic relationships and collaboration; and intensive English language programs. The University of New South Wales uses the Anthony Mason Fellowship Scheme for short-term research visits from selected visitors from overseas. The University also has a Vice-Chancellor's Postdoctoral Fellowship Scheme which provides for 5-6 research Fellows annually.

Visibility of funding opportunities for research overseas

The survey institutions were asked to specify what efforts were made to ensure that their graduates/early career researchers were aware of funding opportunities for research overseas provided through both national and international sources. All universities appear to use a range of mechanisms to alert their staff and students of opportunities for research overseas. The extent of efforts to disseminate such information often varies from area to area within the university. The type of mechanisms recorded include: funding opportunities listed on the Research Services' and Postgraduate Students' web sites; emailing of opportunities by Research Services to staff and students; use of university bulletins/newsletters; direct consultation between Research Services staff and individual departments; seminars and information sessions provided by Research Services; access to the SPIN database; provision of access to the world wide web; and assistance to younger researchers from senior academic staff and research student supervisors within departments to link them directly into their international research networks.

Obstacles to establishing and sustaining international networks for early career researchers

Limited or lack of funds available to support overseas travel for research purposes is identified as a clear obstacle to the establishment of international networks for younger scientists. Indeed there is a view by some institutions that the limited funding available places this category of researchers in direct competition for funds with established staff. The level of access to facilities and to research support at the department level for more junior staff was therefore considered to make it more difficult for this group to sustain research productivity.

In regard to conferences the view in general appeared to be that there are insufficient funds to contribute significantly to the costs of international conference participation. However, conferences are considered to be a critical mechanism for establishing and maintaining international links.

Universities are encouraged to consider how best to implement the following recommendation:

> *Recommendation 6: Resources should be provided to enable PhD students to attend at least one international conference during the period of their training.*

The limited number of postdoctoral fellowships provided through the major national research funding agencies is also considered a clear obstacle to the formation of international networks. A related concern is that the funding which is provided for overseas research activities is generally insufficient to support the amount of time needed to maximise on this opportunity. The opportunity for this group to obtain postdoctoral training overseas and then to bring these networks and linkages back to Australia was considered by one institution to be the 'key' to establishing international linkages.

Whilst communication with overseas colleagues is clearly enhanced via email access and participation in internet discussion groups it was argued that such linkages could only be consolidated by face-to-face contact. Greater opportunities for young scientists to participate in overseas conferences and ideally work at overseas universities and research institutes were considered an essential component in the facilitation of international networks.

Senior researchers were also considered to have an important role to play in facilitating access to international networks for younger researchers by sharing their own connections in this regard. Some concern was expressed that Australia was not adequately fulfilling the reciprocal nature of international research links. Consequently the ability of the host institution to offer attractive resources to overseas researchers was considered an important determinant of whether Australian researchers would continue to be welcomed abroad.

Where younger staff have fairly substantial teaching responsibilities it was considered they have less time to take advantage of opportunities which would help in the establishment of international networks.

Obstacles to establishing and sustaining international networks for established researchers

One of the main obstacles to maintaining and enhancing international networks for established researchers is the limited funding available to support the range of activities required and at the level to realise sufficient returns.

The frequently heavy commitment of established researchers to a range of conflicting demands, (particularly relating to teaching and administration), was considered to limit the opportunities for international research. The discontinuation of the Department of Industry, Science and Resources collaborative research grants scheme was also seen to remove an important source of funding for the maintenance and enhancement of international research networks.[39]

The very distance of Australia from the world's leading research centres was identified as a clear disincentive to attracting high calibre international visitors for the purposes of exchanges or conference/workshop participation. Visa application procedures and taxation issues were also suggested as potential impediments. A related concern was the perceived quality by leading overseas researchers of the facilities and equipment available at Australian universities and other research institutions.

Other impediments listed by the universities regarding sustaining international linkages included: the limited government funding to support access to major overseas facilities;

39 This scheme has been replaced by the Technology Diffusion Program which has changed the focus from scientific collaboration persé to a requirement of industry involvement.

limited travel funds and travel grant schemes; the declining value of the Australian dollar combined with the high cost of living and working in industrialised countries; the low priority given to travel funding in a number of research grant programs; and the conditions under which Australian scientists could participate in the EU 4th and 5th Frameworks.

Overseas PhD students/early career researchers

The following discussion concerns PhD students and postdoctoral fellows/early career researchers whose normal place of residence is overseas but who at the time of the survey were undertaking training/career development in the Sciences at one of the survey institutions. The home countries of these researchers and their principal sources of funding support whilst in Australia, were two questions of particular interest.

It is generally recognised that the training of students from overseas can have potential benefits for the establishment of international networks, and the exchange of researchers as well as for research collaborations. The interaction of foreign and Australian students during PhD training leads to a better appreciation of cultural differences, which can assist Australian students who obtain postdoctoral positions overseas to adjust to a different culture. The personal friendships which are forged can be important for the effectiveness of international links in the long term.

PhD students

Tables 2 and 3 list the home countries of the overseas PhD students. Slightly more than a quarter of the overseas PhD students come from China, just over a tenth from Indonesia and just over a tenth from Europe, with five per cent from North America[40].

The majority of institutions listed a range of funding support for their overseas PhD Students. This included funding provided by: the host institution; the student's home country/government; from international support agencies (e.g. WHO); from Australian research/government agencies (e.g. ARC, CSIRO, GRDC, ACIAR, AusAID, CAMBIA, Overseas Postgraduate Research Scholarship/DETYA); Industry support (e.g. via CRCs); and Self-funding. Two institutions indicated that data were not available regarding industry funding.

The two principal sources of funding listed by the institutions are as follows: ANU (OPRS; ANU Scholarships); Monash (Host Institution; Home Country); RMIT (Self-Funded; OPRS); Adelaide (AusAid; Home Government); Melbourne (Australian Government Agencies; Students' Home Country/Government); UNSW (AusAID; Students' Home Country/Government); Queensland (Host Institution; Australian funding agency/Host country); and Sydney (DETYA (OPRS); AusAID)[41].

The predominance of PhD students from China, a country destined to become a major force in world affairs has considerable potential benefits for Australia; not only for strengthening R&D linkages and research collaborations with China and Australia's geographic region, but also for cultural reasons and for the effectiveness of our future political, social and economic interactions with China.

The Australian Vice-Chancellors' Committee recently signed an agreement with the Chinese Education Association for International Exchange which aims to

40 These calculations are based on the uncalibrated total (i.e. without weighting of ANU numbers) of 793.

41 No information was available for UWA.

promote cooperation between Australian and Chinese universities. A joint working group has been established to develop and implement programs under the agreement.

Postdoctoral fellows/early career researchers

In contrast to information regarding PhD students, information regarding postdoctoral fellows/early career researchers was more difficult to obtain. Four of the institutions (UNSW, Monash, Melbourne and UWA) indicated that no data were available for this group. For the five remaining universities, Tables 4 and 5 show the home countries of their respective overseas early career researchers. Whereas China and Indonesia were prominent as the home countries of PhD students, Europe (88) and North America (41) predominate as the home countries for early career researchers—at least for those institutions providing this information. The United Kingdom accounted for 25 of these researchers, China 22, Germany 19 and New Zealand 15.

As with PhD students, a number of different sources of funding support were listed. The two principal sources of funding listed by those institutions which had records of such details are: ANU (Host institution and ARC); Monash (Host Institution; Home Country); RMIT (Host Institution); Adelaide (Home Government and Host Institution); UNSW (Host Institution and ARC); Queensland (Host Institution and ARC); and Sydney (DETYA/ARC and Host Institution through U2000 Fellowships).

Destinations of university PhD graduates

Part D of the questionnaire focused on the records maintained by the universities regarding the following: (1) employment of PhD graduates as postdoctoral/research fellows following graduation; (2) the number of Australian/permanent resident PhD graduates going overseas for postdoctoral training; (3) the countries to which they go; and (4) their source(s) of funding support for this overseas training. However, it is apparent from the institutional returns that destination information is in general not systematically collected.

Of the universities surveyed[42], four (Monash, Adelaide, UMelb, UNSW) indicated that they did not keep a record of how many of their PhD graduates are employed as postdoctoral/research fellows following graduation. ANU indicated that it did not collect this information on a university-wide basis. However, this did not preclude such records being maintained in particular areas of the university. RMIT indicated that it had 'very limited data' of the sort requested. Whilst the University of Queensland University noted that it had recently begun collecting destination information, information which could be used for the purposes of the survey was not available. Also, whilst the University of Sydney collected general information regarding destinations of its PhD graduates it was not collected at the level of detail relevant to the survey.

Five universities (Monash, Adelaide, UMelb, UNSW, USydney) indicated that they did not keep any records of how many of their Australian/permanent resident PhD graduates go overseas for their postdoctoral training. However, whilst the ANU acknowledged that there was no central record of such information, its view was that the majority of its PhD graduates go to North America, followed by mainland Europe and then the UK. In a similar vein, RMIT indicated that most of these PhD graduates go to North America followed by the UK.

42 No information was available for the University of Western Australia

Only the University of Queensland indicated that its recently initiated destination records included information on the sources of funding used to support its Australian/permanent resident PhD graduates to go overseas. However, whilst this information was possibly available at a School/Faculty/Department level at the Australian National University, there was no university-wide information available. The remaining universities did not keep any records which would assist in responding to this question.

Although the purpose of Part D of the questionnaire was to obtain information on the extent to which PhD students go overseas for postdoctoral training, there are other good reasons for universities to compile information on the destinations of their PhD graduates. These relate to the employment opportunities for PhD graduates and the aims of the PhD training.

In particular, the mismatch between the supply of PhD graduates and the number of actual academic positions available has become an issue of concern for many OECD countries (Garrison and Gerbi 1998; Zare 1998; Lehrman 1996). This in turn has raised the question of how best to broaden the employment prospects of PhD graduates outside academia. These issues are further discussed at the conclusion of the following chapter in relation to industrial R&D.

Other comments provided by the universities

Several institutions took the opportunity to further clarify responses to particular items in the questionnaire or to provide additional comments. For example, the ANU return referred to the policy adopted by some sections of the university to partially fund at least one overseas conference trip per postgraduate student and one per junior staff member per year. This approach was considered an important aid in the establishment of international links for younger researchers.

Similarly, some sections of the university had also instituted a strategy of funding visitors for up to six months to work on specific research projects. Tenured IAS staff generally have a number of collaborations with overseas laboratories. The University of Queensland also referred to mentoring schemes which were being encouraged within and between departments/faculties.

The University of New South Wales stressed that for Australia's long term future, it was important to promote research links with Asia (even in difficult times) along with those to the United States and Europe. The international reputation of the research group for high quality research was in general considered a main determinant of the level of international collaboration. However, the maintenance of this reputation was considered highly dependent on the level of research infrastructure support that could be committed.

Discussion

The survey results presented above are indicative of particular problems and issues regarding international linkages for staff and graduate students. The responses are also considered to provide a basis to guide further inquiries in this area—particularly regarding the systematic collection and analysis of time series data which can be used for monitoring purposes and also to inform institutional policy. In the absence of comprehensive information regarding funding sources for international linkages it is difficult to establish the extent to which Australia is meeting the reciprocal resource expectation entailed in such linkages.

These general conclusions are supported by Baker *et al*. (1996b) in their recent report on internationalisation of Australian higher education, where they comment that 'funding allocated to assist Australian students study overseas varies widely between institutions and the overall level of funding is modest.'

It is clear from the paucity of information provided regarding early career researchers that extracting details for this group from institutional data sets is more difficult than for PhD students. In this regard, it is also apparent that the ARC definition for an 'early career researcher' is of limited usefulness as an entry point for extracting information from the annual institutional staff data sets returned to DETYA.

Table 1

Commencing and Total students by enrolment category in 1997—Sciences[43]

Institution	Doctoral Commencing	Total	Masters Commencing	Total
Australian Catholic University	1	1	3	8
Australian Defence Force Academy	16	68	6	19
Australian Maritime College (a)		1	8	16
Australian National University	169	539	16	36
Central Queensland University	13	50	13	46
Charles Sturt University	12	47	12	28
Curtin University of Technology	59	215	78	163
Deakin University	54	145	34	75
Edith Cowan University	20	48	37	97
Flinders University of South Australia	38	132	5	23
Griffith University	58	227	12	43
James Cook University of North Queensland	74	282	30	73
La Trobe University	38	261	50	113
Macquarie University	47	200	33	91
Monash University	196	916	127	323
Murdoch University	43	201	8	37
Northern Territory University	15	54	9	14
Queensland University of Technology	78	265	38	119
Royal Melbourne Institute of Technology	100	302	125	353
Southern Cross University	14	42	6	15
Swinburne University of Technology	44	128	23	85
University of Adelaide	153	695	89	212
University of Ballarat	19	35	10	19
University of Canberra	11	37	31	79
University of Melbourne	327	1101	153	312
University of New England	46	187	15	49
University of New South Wales	263	1124	132	296
University of Newcastle	81	231	70	151
University of Queensland	315	1376	101	308
University of South Australia	55	168	25	73
University of Southern Queensland	31	91	23	51
University of Sydney	350	1317	177	395
University of Tasmania	89	375	24	91
University of Technology, Sydney	45	181	20	69
University of Western Australia	167	638	53	151
University of Western Sydney	58	212	30	106
University of Wollongong	75	278	20	69
Victoria University of Technology	39	191	17	71
TOTAL	3213	12 361	1663	4279

Included: Agriculture; Engineering; Dentistry; Medicine, Medical Sciences; Health Sciences; All sciences, mathematics & computer sciences; Veterinary sciences

43 Source: DEETYA Higher Education Student Collection Data.

Table 2

Country of origin for overseas PhD students (science only)[44]

Institution	Austria	France	Germany	Greece	Ireland	Italy	Netherlands	Norway	Spain	Sweden	Switzerland	UK
NSW			4							1	1	1
Sydney		1		4			1	1			1	4
Monash				3	1	1						1
RMIT		1							1			1
Melbourne		1	2				1					2
Qld		3	4	1	1	2	1		1	1	1	8
UWA			1									3
Adelaide	1	1	4									2
ANU			4		1	3	3					4
TOTAL	1	7	23	4	3	6	6		2	2	3	26

Institution	Canada	USA	China	Hong Kong	Japan	Korea	Philippines	Taiwan	India	Indonesia	Malaysia	Singapore
NSW		2	51									
Sydney	1		30	1	1	5	1		9	8	4	
Monash		3	8		1	1		1	2	5	7	1
RMIT		3	10	1	1	1	1	1	4	12	5	6
Melbourne	1	2	8	1		4	1	1	3	3	1	1
Qld	5	7	44	1	2		5	2	12	22	9	5
UWA	2	1	9		2					2	1	3
Adelaide	4	1	24		1	3	5	2	9	28	2	5
ANU	3	7	24		2		1			14	2	2
TOTAL	16	26	208	4	10	14	14	7	39	94	31	23

Institution	Vietnam	Other SE Asia	NZ	PNG	Other Pacific Islands	Israel	Other Middle East	Africa	Sth America	Other	TOTAL
NSW											60
Sydney	1	6			1	1	4		4		95
Monash		4					1	3			49
RMIT	3	4					5		1		65
Melbourne				1				4		10	50
Qld	2	9	26	7			6	5		6	215
UWA											24
Adelaide	1	8					17	7	4		138
ANU	2		1	1				1			194
TOTAL	9	31	37	9	1	1	33	20	9	16	793

44 The ANU return was based on a sample of returns. Multiplying the total of the sample returns by a factor of 2 provides a reasonable estimate for the University-wide numbers.

Table 3

Country of origin for overseas PhD students (science only)

Country	No. of students
EUROPE	
Austria	1
France	7
Germany	23
Greece	4
Ireland, Republic of	3
Italy	6
Netherlands, The	6
Norway	1
Spain	2
Sweden	2
Switzerland	3
United Kingdom	26
Other Europe	14
Subtotal	98
NORTH AMERICA	
Canada	16
United States	26
Subtotal	42
FAR EAST ASIA	
China, People's Republic	208
Hong Kong	4
Japan	10
Korea, Republic of	14
Philippines, The	14
Taiwan	7
Subtotal	257

Country	No. of students
SOUTH EAST ASIA	
India	39
Indonesia	94
Malaysia	31
Singapore	23
Thailand	43
Vietnam	9
Other South East Asia	31
Subtotal	270
PACIFIC ISLANDS	
New Zealand	37
Papua New Guinea	9
Other Pacific Islands	1
Subtotal	47
MIDDLE EAST	
Israel	1
Other Middle East	33
Subtotal	34
AFRICA	20
SOUTH AMERICA	9
OTHER	16
Raw TOTAL	**793**
Amended TOTAL	**890**[45]

45 Amended total reflects calibration for ANU sample return - see explanation Table 2.

Table 4

Country of origin for overseas postdoctoral fellows/ early career researchers (science only)[46]

Institution	Belgium	Denmark	France	Germany	Ireland	Netherlands	Norway	Poland	Spain	Sweden
NSW										
Sydney	1		1	1		2				
Monash										
RMIT	1		2	1						
Melbourne										
Qld										
UWA										
Adelaide		1	1	8		1	1		1	3
ANU			4	9	2	1		4	1	
TOTAL	2	1	8	19	2	4	1	4	2	3

Institution	Switzerland	UK	Other Europe	Canada	USA	China	Japan	Korea	India	Indonesia	Malaysia
NSW											
Sydney		5		1	6	1	1				
Monash											
RMIT		1		2							
Melbourne											
Qld		1	1	3	5						
UWA											
Adelaide		7	5	2	10	8	2	1	3		
ANU	4	11	7	3	11	11	5		1	1	1
TOTAL	4	25	13	9	32	22	8	1	4	1	1

Institution	Vietnam	Other SE Asia	Fiji	NZ	PNG	Other Middle East	Africa	South America	TOTAL
NSW									0
Sydney		1							20
Monash									0
RMIT									7
Melbourne									0
Qld									10
UWA									0
Adelaide			1	2		1		1	59
ANU	1			13	1		1	1	186
TOTAL	1	1	1	15	1	1	1	2	282

46 Information was not available for UNSW; Monash; Melbourne; UWA. The ANU return was based on a sample of returns. Multiplying the total of the sample returns by a factor of 2 provides a reasonable University-wide estimate.

Table 5

Country of origin for postdoctoral fellows/early career researchers from overseas employed by universities (science only)

Country	No. of staff
EUROPE	
Belgium	2
Denmark	1
France	8
Germany	19
Ireland, Republic of	2
Netherlands, The	4
Norway	1
Poland	4
Spain	2
Sweden	3
Switzerland	4
United Kingdom	25
Other Europe	13
Subtotal	88
NORTH AMERICA	
Canada	9
United States	32
Subtotal	41
FAR EAST ASIA	
China, People's Republic	22
Japan	8
Korea, Republic of	1
Subtotal	31
SOUTH EAST ASIA	
India	4
Indonesia	1
Malaysia	1
Vietnam	1
Other South East Asia	1
Subtotal	8
PACIFIC ISLANDS	
Fiji	1
New Zealand	15
Papua New Guinea	1
Subtotal	17
MIDDLE EAST	
Other Middle East	1
Subtotal	1
AFRICA	1
SOUTH AMERICA	2
Raw TOTAL	189[47]
Amended TOTAL	282[48]

47 No data for UNSW; Monash; Melbourne; UWA.

48 Amended total reflects calibration for ANU sample return - see explanation Table 2.

6 INTERNATIONAL NETWORKS AND INDUSTRY-LINKED RESEARCH AND DEVELOPMENT

Cooperative Research Centres

The Commonwealth Government established the Cooperative Research Centre (CRC) Program in 1990. One of the objectives of this Program is to capture the benefits of research by strengthening the links between research and its commercial and other applications. A principal mechanism for achieving this objective is through the active involvement of the users of research in the work and management of the Centres. Another objective of the Program is to stimulate a broader education and training experience, particularly in graduate programs, through the active involvement of researchers from outside the higher education system in the supervision of graduate students. The building of centres of research concentration by promoting cooperative research and strengthening research networks is a further aim of the CRC Program. At least one higher education institution must be included in the organisations participating in a CRC.

There are 67 CRCs across Australia covering six industry or user sectors—manufacturing technology, information and communication technology, mining and energy, agriculture and rural-based manufacturing, environment, and medical science and technology. All CRCs now have some commercial or user linkages and CSIRO is a core participant in 53 CRCs.

CRCs have established substantial education programs for postgraduate students. Over the period 1991–1995, there were 2 292 PhD students and 922 other students in CRCs (Mercer and Stocker 1998). The active involvement of CRC researchers from outside the higher education system in educational activities including the joint supervision of postgraduate students is an important feature of the CRCs. Students benefit from contacts with researchers from outside the higher education system and by an increased awareness of industrial and commercial practice, including technology, research management and intellectual property. As Mercer and Stocker stress:

> *A vitally important output of the CRC program is the postgraduates who complete their research degrees within the framework of a CRC and with supervision from a university and another organisation (Mercer and Stocker 1998).*

Survey of CRCs

The 1996/97 annual reports of all the CRCs were examined for information on their international links and involvement in the training of postgraduate students. On the basis of this examination, a number of CRCs were selected from each of the industry categories (see Table 6). The final selection was guided by the level of involvement of the CRC in the training of postgraduate students. Information was then sought from the Directors of the selected CRCs regarding the following questions:

1. What opportunities for international links exist for your PhDs through

attending conferences, overseas visits and collaborative research with overseas based researchers in (a) universities and (b) industry.

2. Similarly, what opportunities for international links exist for research staff.
3. In your experience, have there been any impediments to establishing and enhancing international links.
4. Have there been any changes during the last five years which have influenced you in establishing these links. If so, please elaborate on these.
5. To what extent do Commercial in Confidence requirements influence participation in the international research networks of your staff and doctoral students?
6. In 1997-8 how many overseas PhDs were employed in your CRC?[49]

Opportunities for students to form international links

Responses were received from the CRCs listed in Table 6. All CRCs indicated their encouragement for their PhD students to attend international conferences and develop international links by including visits to overseas universities, research institutes and relevant industry as an extension of their conference travel. The level of direct financial support from CRC funds varied between CRCs as is illustrated below:

- The CRC for Broadband Telecommunications and Networking gives full support for each of its PhD students to attend one international conference per year provided the conference is a quality conference and the student has a paper accepted at the conference.
- The A J Parker CRC for Hydrometallurgy provides a reasonably generous maintenance allowance to their students, and virtually all students make one overseas trip per year. Students are encouraged to visit companies as well as universities while they are overseas and the Centre arranges appropriate introductions.
- The CRC for Eye Research and Technology provides funding for each PhD student to attend one international conference during his or her training, and students are encouraged to apply for further funding to attend international conferences.
- The CRC for Legumes in Mediterranean Agriculture has a travel fund to support students to attend conferences and visit laboratories.
- The CRC for Cellular Growth Factors and the CRC for Antarctica and the Southern Ocean have policies which support their PhD students to attend overseas conferences and visit laboratories in the last year of their PhD. The rationale for this is that overseas trips for students in the final year or at the end of their PhD studies will be valuable as a way of introducing them to other relevant laboratories and assist them in assessing and obtaining postdoctoral positions. A student is more likely to be in a position to promote his or her research findings and the work of the CRC in the final year of a PhD.
- The CRC for Cellular Growth Factors hosted a major international conference, which provided an important opportunity for the Centre's PhD students to participate in an international conference. The CRC has supported the

49 i.e. those expecting to return to their own country at the completion of their training.

access of postgraduate students and staff to electronic conferencing. Developments in broadband telecommunications should ensure significant improvements in electronic conferencing over the next few years and considerable expansion of its use. International, as well as national electronic conferencing has the potential to increase the contact and interaction with researchers and facilitate the establishment of new networks as well as strengthening existing networks. It should be of particular benefit to Australia because of our higher travel costs to attend international conferences in Europe and USA.

- The CRC for Alloy and Solidification Technology reported that their students have considerable opportunities for developing international links through attendance at conferences, overseas visits and collaborative research with both overseas universities and industry. Several students from the Australian Photonics CRC have spent periods working on collaborative projects in overseas institutions under the former International Science and Technology Program of the then Department of Industry, Science and Tourism.
- The CRC for Tropical Plant Pathology has invested substantial funds in sending many students to a major international conference. The CRC for the Great Barrier Reef sponsored 10 PhD students to attend a major International Coral Reef Symposium.
- The CRC for Broadband Telecommunications and Networks participates in the activities of international standards bodies and some of its students are involved in standards meetings, with full support from the CRC.
- Some students of the Antarctic CRC have been involved in international experiments, for example, the World Ocean Circulation Experiment (WOCE) and the Joint Global Ocean Flux Study (JGOFS).

Table 6 also indicates the number of overseas postgraduate students in the CRCs participating in the survey. Three of the CRCs have no overseas postgraduate students and the Australian Photonics CRC only one. The highest number of overseas students are with the Australian Petroleum CRC (15), the CRC for Eye Research and Technology (7) and the CRC for Legumes in Mediterranean Agriculture (7).

International linkages

The annual reports of the CRCs and the responses from the surveyed CRCs demonstrate the importance which these Centres place on international linkages. Research staff are provided with many opportunities to attend overseas conferences and visit research establishments; in industry as well as universities and other research organisations. These international linkages provide access to leading researchers and laboratories and assist in the development of collaborative research projects. For many CRCs the international linkages are also important for the development of commercial arrangements for the industrial partners and new business opportunities for the products of the CRC.

Details of international linkages are listed in the annual reports of the CRCs. While the majority of linkages are with universities, several have significant contact with industry. For example, the Director of the CRC for Alloy and Solidification Technology has participated in overseas marketing missions by the Australian Magnesium Corporation to potential customers in the

automotive industry. The Centre has a major collaborative project with the Australian Magnesium Corporation and two European companies and a project of a similar nature is being developed with two American companies.

Australian Photonics CRC has focused on establishing linkages with groups and companies in the Asia-Pacific region. Initial seed funding from the Department of Industry, Science and Resources was important. For a relatively small investment in the order of $30 000, the Centre has won business worth around $1.2M with Korean entities.

Most of the responses from the CRCs listed the cost of international travel and funding as the main impediments to establishing and enhancing international linkages. The time taken for overseas travel was also mentioned as a factor limiting face-to-face contact with researchers internationally. In the case of university staff, arranging a replacement to take over teaching duties during an extended absence overseas was not always easy. A further concern was that obtaining visas or work permits for partners, as well as researchers, could be difficult. One CRC mentioned the reciprocal problem; difficulties for foreign nationals in obtaining visas to work in Australia.

Commercial-in-Confidence/intellectual property considerations

A surprising outcome was the response to the question about the impact of "Commercial-in-Confidence" requirements on participation in international research networks. With possibly one exception, it was universally considered that "Commercial-in-Confidence" requirements had not been a problem. The CRC for Broadband Telecommunications and Networking has implemented a comprehensive intellectual property management procedure which requires all parties to agree beforehand on the sharing and protection of intellectual property. Australian Photonics CRC has a similar policy with each party required to sign a confidentiality agreement before commencement of an activity, and there is agreement on arrangements for intellectual property. Most CRCs have policies which ensure that research which is discussed at meetings does not breach "Commercial-in-Confidence" agreements. It is usual to require staff and students to sign confidentiality agreements. This can place some restrictions in the dissemination of the research results of a CRC.

The CRC for Legumes in Mediterranean Agriculture had few impediments in international links, but face some problems in identifying appropriate organisations and individuals who are able to sign off on access to genetic resources. This is particularly the case in the joint collections of germplasm. Over the last five years, this has not been an issue, but it is likely to become so as more countries and groups become involved in transgenic techniques.

For many CRCs, intellectual property issues have become increasingly important over the past five years. For example, the CRC for Eye Research and Technology reports that:

> *"… the global nature of the eye research and vision care industries reinforces the need for a worldwide approach. The success of our major international collaborations with groups in India, the USA and Canada has established the importance and value of such relationships."*

Comment

It is apparent from the responses that international links for the CRCs have been strengthened over the past five years. A prime reason for this is the growing reputations of the CRCs for their research and education programs. The attendance of PhD students as well as staff at international conferences is probably the most effective method of promoting the worth of a CRC and forming new international links.

Several CRCs reported improved linkages with universities and companies in the Asia-Pacific region. The funding provided for visits and the exchange of researchers by the bilateral and international programs of the then Department of Industry, Science and Tourism was seen as valuable seed funding for establishing international relationships.

To summarise, the CRCs have been able to establish a wide range of valuable international links with universities, research institutes and companies. They have provided many opportunities for their postgraduate students to participate in international conferences and visit laboratories. CRCs also have been able to provide for their researchers the type of interface between public and private sector organisations and national/overseas organisations along the lines of the European Union Mobility and Training Program (albeit on a smaller scale). It would appear that the CRCs have more flexibility in the allocation of their resources than universities, and have been able to support more overseas visits by their students and early career researchers at an appropriate level. There is scope, however, for the CRCs to selectively train more overseas graduate students.

Commonwealth Scientific and Industrial Research Organisation (CSIRO)[50]

It was beyond the scope of this project to examine the many international linkages and networks of CSIRO and other Government research agencies, the Defence Science and Technology Organisation (DSTO), State Departments and private sector companies. However, we sought information from CSIRO on the numbers of postgraduate students associated with the organisation and the opportunities for them to attend overseas conferences.

There are more than 700 PhD students affiliated with the Divisions of CSIRO. Attendance at overseas conferences tends to be for those students giving presentations, but short overseas visits are sometimes made for other purposes. Researchers at postdoctoral level have opportunities for overseas visits.

One Division offers the opportunity for recent postdoctoral fellows to attend an international conference during their period of employment as part of its Postdoctoral Fellowships Training and Development Program. The Division supports attendance of their PhD students at conferences in Australia, and at international conferences of particular relevance to their studies.

50 'CSIRO International Science and Technology Activities 1998', at: http://www.csiro.au

Rural Research and Development Corporations and Council

The Rural Research and Development (R&D) Corporations and Council were established by the Commonwealth Government in 1989. The intention was to encourage greater end user participation in research; to work with industry and research organisations to facilitate and actively pursue the commercialisation of research and the realisation of industry opportunities; and to promote and become involved in technology transfer.

There are currently twelve industry R&D Corporations and one rural industry R&D Council. They are jointly funded by industry and the Commonwealth, with Commonwealth contributions generally matching on a dollar-for-dollar basis levies up to a maximum of 0.5 per cent of the industries gross value of production. Two of the R&D Corporations, Land and Water Resources R&D Corporation and Rural Industries R&D Corporation, receive most of their funding through appropriations. Commonwealth support for the Rural R&D Corporations in 1998/99 totals $158 million.

Through the use of competitive grant schemes, the Rural R&D Corporations fund research of particular relevance to their respective industry in the universities, CSIRO and other research agencies, State Departments and CRCs.

The Rural R&D Corporations allocate significant funds for postgraduate training and for postdoctoral fellowships. Although the conditions of awards and the amounts paid for postgraduate and postdoctoral fellowships vary between the R&D Corporations, the research is focused on the priorities and needs of a particular industry.

The Rural R&D Corporations recognise the importance of international links and provide funding to researchers for overseas travel and the presentation of papers at international conferences. The type of support provided is illustrated below:

- The Pig R&D Corporation awards postdoctoral fellowships to individuals who have already made a contribution to the industry. The awards are not restricted to study in Australian institutions.
- The Grains R&D Corporation, one of the largest of the Corporations provides a range of awards, including postdoctoral scholarships for Australian researchers to work at the institutes of CGIAR. The Corporation may provide fares and expenses for postgraduate students to attend conferences and workshops relevant to their research project. In 1996/97, the Grains R&D Corporation offered 5 senior fellowships, 41 junior research fellowships, 5 visiting fellowships, 3 industry development awards and 2 inservice awards.
- The Grape and Wine R&D Corporation provides research grants which focus on research on problems and opportunities of national and regional significance to the grape and wine industry. Applications for travel, study tour, and conference attendance that align with the corporations priority-areas are considered.
- The Cotton R&D Corporation provides postdoctoral research fellowships for research in Australia, but, in special circumstances, research outside Australia may be approved. In addition, to overseas travel and

conference attendance that are integral to a research project, the Corporation also funds conference travel and overseas visits with the purpose of developing the skills and knowledge of the research for technology transfer.

- The Land and Water R&D Corporation established a fellowship scheme in 1996-97. One component of the scheme funds promising young researchers for a period of work and travel overseas. The other component provides funds to bring leading overseas researchers to work in Australian institutions. The fellowships are targeted to areas where Australia can obtain an early benefit from improved access to overseas knowledge and expertise.

Comment

The Rural R&D Corporations and Council provide an essential interface between public sector research and the private sector. They facilitate cooperative research through their granting schemes and support national networks.

The levels of resources provided by the Corporations for postgraduate and postdoctoral training for the support of international linkages are realistic.

Industry R&D

The number of PhD graduates produced in Australia and many other countries far exceeds the number of job opportunities in academia and public sector research institutions. Strategies are being developed to make PhD training more relevant to the needs of the economy. As Blume (1995) has observed, there has been a 'decoupling' of PhD training in the majority of OECD countries from its traditional function of preparing for a career in academic research and teaching to training that provides for much wider relevance to industry needs. Also, there is a growing emphasis on transferable research skills with the quality of the PhD training 'being assessed more in terms of the mastery of a body of research skills and less than in the past in terms of the originality of the contribution to knowledge' (cf. Blume 1995) (see also Zare 1998).

This raises the question as to the type of overseas postdoctoral training which is suitable for PhD graduates who are likely to seek employment in the private sector.

A brief presentation of the scope of this project was made to a meeting of the Australian Industrial Research Group (AIRG), which consists of research managers of companies with significant R&D activities. During discussion, the views of members of the AIRG on the value of overseas postdoctoral training for PhD graduates were canvassed. Some members considered overseas postdoctoral training valuable for PhD graduates desiring to join the private sector if it were used to broaden the experience of their PhD training. Some thought that a PhD graduate pursuing postdoctoral training before joining a company could be at a disadvantage for promotion compared with the graduate who joined immediately following graduation.

It could be an advantage for a PhD graduate to spend some time in industry before undertaking overseas postdoctoral training.

Table 6

Postgraduate students in selected CRCs

CRC (by category)	Overseas Postgrads.	Total Postgrads.[51]
Manufacturing Technology		
• CRC for Alloy and Solidification Technology	4	22
• CRC for Materials Welding and Joining	0	47
Information and Communication Technology		
• CRC for Broadband Telecommunications and Networking	6	23
• Australian Photonics CRC	1	71
Mining and Energy		
• Australian Petroleum CRC	15	92
• A J Parker CRC for Hydrometallurgy	4	35
Agriculture and Rural Based Manufacturing		
• CRC for Legumes in Mediterranean Agriculture	7	60
• CRC for Tropical Plant Pathology	5	35
Environment		
• CRC for Antarctica and the Southern Ocean	4	55
• CRC for Ecologically Sustainable Development of the Great Barrier Reef	0	77
Medical Science and Technology		
• CRC for Cellular Growth Factors	0	18
• CRC for Eye Research and Technology	7	41

51 These figures were taken from the 1998 CRC Compendium, Department of Industry, Science and Tourism (now Department of Industry, Science and Resources).

APPENDIX 1

Australian Research Council (ARC) International Fellowships and Projects (1997–1998)

Statistical data 1997–1998

International research fellowships

Funding year	Country	Total amount funded ($A)	Average duration per application (months)	Number	Highest funded application	Lowest funded application	Average funding level $A
1997	France	$157,709	10.3	3	$58,055	$42,040	$52,570
1997	Korea	$341,411	11	4	$115,243	$65,662	$85,353
1997	Germany	$199,237	8	3	$95,411	$44,804	$66,412
total		$698,357					
1998	France	$236,320	12	4	$62,702	$51,887	$59,080
1998	Korea	$222,986	12	3	$90,784	$66,042	$74,329
1998	Germany	$278,590	8.9	5	$82,628	$27,577	$55,718
1998	UK	$100,553	10.5	2	$53,409	$47,144	$50,277
Total		$838,449					

International projects

Funding year	Country	Total amount funded ($A)	Average duration per application (months)	approximate number
1997	USA	$50,274	4	6
1997	China	$13,900	7.5	2
1997	Canada	$14,629	6.5	2
1997	Sweden	$12,764	4.5	2
1997	Germany	$18,000	1.5	2
1997	Korea	$54,000		4
Total		$163,567		
1998	USA	$69,501	3.5	12
1998	China	$14,701	1.8	4
1998	Germany	$20,900	2	3
1998	Korea	$85,600		6
1998	France	$52,850	3.7	4
1998	UK	$35,159	2.6	6
1998	Netherlands	$9,290	1	2
1998	Switzerland	$5,000	4	1
1998	Japan	$6,000	3	1
1998	Italy	$3,699	1	1
Total		$302,700		

APPENDIX 2

Australian Academy of Science (AAS) International Exchange Programs (1997–98)

Program	Duration/Award	Number of Australian Applicants	Number Successful
Bede Morris Fellowship Scheme *Australia France Foundation Fellow* *Commonwealth Fellow (x three)* *Rhône-Poulenc Fellow* *Rhône-Poulenc Awardee* *French Embassy Fellow* (France)	Contribution towards an airfare (max $2,600) and a daily living allowance (max. $125 per day x 42 days) French Embassy Fellow receives grant (FF24,000) from French government	20	7 Australians
Royal Society Exchange Program (UK)*	Contribution towards an airfare (max. $2,600) and a daily living allowance (max. $125 per day x 42 days)	31	10 Australians 38 British
Taiwan Exchange Program*	Reciprocal Program. Sending side pays for the airfare and receiving side pays for domestic costs Max. 6 weeks (short-term)	6	5 Australians 2 Taiwanese (plus 10 Australians and 5 Taiwanese in workshops)
Korea Exchange Program*	Reciprocal Program. Sending side pays for the airfare and receiving side pays for domestic costs Max. 6 weeks (short-term) Max. 12 months (long-term)	4	11 Australians 8 Koreans (plus 7 Australians and 5 Koreans in workshops)
Scientific Visits to Germany	Contribution towards an airfare (max $2,600) and a daily living allowance (max. $125 per day x 42 days)	32	11 Australians 1 German
China Exchange Program	Reciprocal Program. Sending side pays for the airfare and receiving side pays for domestic costs Max. 6 weeks (short-term)	9	5 Australians 7 Chinese

* Joint programs with the Australian Academy of Technological Sciences and Engineering.

Australian Academy of Science (AAS) International Exchange Programs (1997-98) (continued)

Program	Duration/Award	Number of Australian Applicants	Number Successful
JSPS Exchange Program (Japan)	Reciprocal Program. Sending side pays for the airfare and receiving side pays for domestic costs Max. 6 weeks (short-term) Max. 12 months (long-term)	12	6 Australians 5 Japanese
S & T Awards (Japan)	Monthly living allowance 12 months	Applications are administered by Australian Embassy in Tokyo	2 Japanese
JSPS Postdoctoral Fellowship (Japan)	Fully funded by Japanese government Visits are between 1 and 2 years	16	5 Australians
STA Postdoctoral Fellowship (Japan)	Fully funded by Japanese government Visits are between 1 and 2 years	19	6 Australians
STA Short-Term Fellowship (Japan)	Fully funded by Japanese government Visits are between 1 and 3 months	9	6 Australians
Japanese Government Researchers Awards for Foreign Specialists (JGRAFS)	Fully funded by Japanese government Visits are between 1 and 12 months	2	2 Australians
Agency of Industrial Science and Technology of Japan Foreign Researcher Invitation Program (AIST FRIP)[52] (Japan)	Fully funded by Japanese government 1 to 3 months	0	0
APEC Postdoctoral Fellowships in Science and Engineering (Korea)[53]	Fully funded by the Korean government	0	0
Scientific Visits to Europe[54]			
Scientific Visits to USA, Mexico and Canada[54]			

52 There were no applicants for this Program in 97–98 and therefore no awardees. This Program has been going for 8 years. There have been no applicants in that time. Possible reasons: There are only 16 participating institutes in this Program and the conditions of the grant are very narrow.

53 There were no applicants for this Fellowship in 97–98 and therefore no awardees. Possible reasons: This Fellowship was advertised for the first time in 1998. There was only a two-month lead up to the deadline for applications.

54 These are new programs which become operational in 98–99.

APPENDIX 3

Sponsored Programs Information Network (SPIN)

55 Program numbers of funding support of particular relevance/interest have been bolded.

The following background information is provided by the Australian Vice-Chancellors' Committee[56] regarding the services it has contracted from InfoEd International.

Sponsored Programs Information Network

Access to SMARTS and GENIUS now available

The Australian Vice-Chancellors' Committee has a contract with InfoEd International for the provision to Australian Universities of the Sponsored Programs Information Network (SPIN) database. As part of this contract, SMARTS and GENIUS are now available to subscribing Australian Universities at http://spin.web.unsw.edu.au

SPIN is an international database of funding opportunities that are targeted to Australian citizens. SMARTS and GENIUS work with SPIN. GENIUS is an expertise database and SMARTS is a matching and retrieval system which provides personalised matching between researchers' profiles and SPIN keywords, Emailing researchers directly with information on funding opportunities as they become available.

SMARTS allows individual researchers to enter their research interests, categorised by the keywords within SPIN, and thereby develop a profile of personal research interests. Whenever a funding scheme is updated on the SPIN system, the keywords associated with that scheme are cross checked against the researcher profiles in SMARTS. If there is a match, then the researcher is automatically sent a targeted Email notifying them of the opportunity.

GENIUS builds on the profile data, which is entered for SMARTS matching, and allows researchers to enter a comprehensive set of information about their research expertise. This then forms the basis for an institutional expertise database that can be used to locate individuals with specific interests or expertise both within Australia and overseas. GENIUS may also be used as a listing of researchers who indicate they are willing to provide information and expertise to the media or wishing to consult in their areas of expertise.

56 http://www.avcc.edu.au/avcc/spin.htm

Medicine—SPIN programs as of second quarter 1998

Allows overseas research experience/training/career development for young researchers

00027 **FFS—Grants-in-Aid**
Younger investigators who have limited or no research funding. Research must be conducted in the US or Canada. Awards to non-residents limited. Travel costs not generally supported.

00047 **NASA—Ames Research Center—Unsolicited Proposals**
Organisations as applicants which includes foreign orgsns. Domestic and foreign travel.

00087 **CRI—Postdoc. Fellowships in Cancer Immunology or General Immunology**
Special emphasis to projects in tumour immunology. Research may be conducted anywhere in the US or abroad. Allowance of $1500—may be used to cover travel to scientific meetings, health insurance, and research supplies.

00117 **Smokeless Tobacco Research Council Research Grants**
Grant-in-aid for one year with possibility of extension. Eligible expenses include salaries, consultants, supplies, travel and equipment.

00119 **Smithsonian—Graduate Student Flwshps.—Biology/Physical Sciences**
10 weeks only prior to doctoral-travel and research allowances not offered—must be enrolled as a doctoral student.

00131 **Grass Fellowships in Neurophysiology at MBL, Woods Hole, MA**
14 weeks during the Summer. Round trip travel. Late postdoctoral or early postdoctoral to no more than 3 years postdoctoral. Travel funds for fellow only for those outside the US (internal applicants receive travel funds for fellow and family).

00168 **UICC International Cancer Technology Transfer Fellowships (ICRETT)**
Averaging $3000 provided for travel support and living expenses.

00195 **Smithsonian—Predoctoral Flwshps.—Biological/Physical Sciences**
Includes travel allowance to assist with temporary relocation but probably restricted to US nationals.

00197 **Smithsonian—Postdoctoral Flwshps.—Biological and Physical Sciences**
Includes travel allowance to assist with temporary relocation but probably restricted to US nationals.

00218 **Jane Coffin Childs Memorial Fund Postdoctoral Fellowships**
Not more than 1 year postdoctoral experience. Foreign nationals may only hold awards in the US. $750 allowance for each child but nothing for spouse. Travel award will also be made for the fellow and family to travel to the sponsoring laboratory. Return travel for fellows will be considered.

00293 **ICP—Fellowship Program**
57 300 Belgium francs (A$2470) per month for one year. Fellowships designed to encourage scientific exchange between ICP and foreign institutions. Scientists from EU must not be older than 33 and others not older than 30.

00349 **NMSS—Research Grants**
Institutions are the recipients of the grant. Any country. Travel and other expenditures directly related to conducting the research covered.

00422 **ADA—Lions Club Intl. Training Grants Pgm.—Foreign Investigators**
Must be a non-US citizen, hold appropriate degree, have a faculty level appointment at an institution outside the US. $40,000 per year for 2 years. Funds may be used for travel costs—but restricted to $3000 the first year, $1000 the second and includes round trip 'coach' airfare to the US and scientific meetings.

00501 **Center for Field Research Grants**
Postdoc—Earthwatch not mainstream (allowable travel is of principal investigator to and from the field). Minimum size of project has to involve 15 volunteers. Average award $800. (Public health one of the fields listed).

00561 **WHO/IARC Fellowships for Research Training in Cancer**
Junior scientists—room board and incidental expenses for one year. Applicants must provide reasonable assurance that they will return to a post in their own countries at the end of the fellowship. Travel costs for recipient and in certain circumstances those for one dependent. Should be able to read and write English or the language of the country in which the fellowship is tenable. Preference will be given to applicants who have not previously received postdoc training abroad in cancer research.

00584 **UICC Yamagiwa-Yoshida Memorial (YY) International Cancer Study Grants**
$9000 for 1–3 months. Travel awards contribute towards the least expensive international two-way (return) air fare or other appropriate transport. Support is not provided for basic training, attending courses, meetings, conferences etc. 15 awards made annually. Possibly more aimed at established researchers. No support provided for dependants.

00644 **Population Council—Postdoctoral Fellowships**
Proposals must deal with the developing world. Preference given to applicants from developing countries.

00679 **Hayashibara International Cancer Research Fellowship Program**
1 year, renewable up to 5 years. 2 awards a year. Stipend 3.5–4.5 million yen p.a. depending on qualifications. Round trip travel expenses are provided.

00727 **Amer. Cancer Soc./Audrey Meyer Mars Internatl. Flwshp. In Clin. Onc.**
$35,000 one year, travel allowance. One award may be made to a candidate to a priority cancer designated by the sponsor. Fellows must return to their country of origin after completing their fellowship.

00817 **Fondation Simone et Cino del Duca Travel Grants**
Foreign researchers travelling to France. (For French travelling abroad and foreign researchers travelling to France). Travel for conferences not allowed.

00874 **HHMI—Postdoctoral Research Fellowships for Physicians**
For 3 years. $40,000–$60,000 per year. Annual research allowance of $16,000 and an institutional allowance of $13,000. Research allowances covers travel to professional meetings.

01033 **NRC—Reg. Resident Associateships in Life, Medical, & Behavioral Sci.**
Certain labs do not accept non-US nationals. Non-US nationals reimbursed for round-trip travel. Attendance at 1–2 professional meetings per year is encouraged. Limited funds are available for such travel.

01076 **Cancer Res. Fund—Postdoc. Res. Flwshps. for Basic & Physician Sci.**
Only those beginning their first fulltime post doc research fellowship are eligible. Foreign candidates may only apply to do their research within the US. Candidates must apply under the guidance of a sponsor who is a senior member of the scientific research community. Expense allowance for the fellow's educational and scientific expenses.

01114 **NASA—Johnson Space Center—Unsolicited Proposals**
Awarded to institutions not individuals. Wide range of disciplines including biomedical research. Fringe benefits for each participant includes domestic and foreign travel.

01182 **NIDR—Small Grant Program**
Dental health—sponsor supports high-risk venture research and other small projects. Providing career development opportunities for new and minority investigators. Budget allows for travel.

01318 **McDonnell Fndn.—McDonnell-Pew Pgm. in Cognitive Neuroscience**
Must be conducted at a US institution. Interdisciplinary training and seed funds for collaborative research. Won't support conference travel.

01330 **Arthritis Fndn.—Postdoctoral Fellowships**
Foreign applicants must pursue training at US institutions. $25,000–32,000 per year for two years plus $500 institutional grant.

01354 **Joseph P. Kennedy, Jr. Fndn.—Grants Program: Mental Retardation**
Provides seed funding. Sponsor supports international professional exchange in this field. No funding specified.

01522 **Human Frontier Science Program Short-Term Fellowships**
To promote basic research through International cooperation—fairly broad fields of science covered. Preference given to young investigators in the early stages of their careers. 2 weeks—3 months. Awards not intended to enable researchers to attend workshops, courses or symposiums. Round trip travel expenses.

02004 **Rockefeller Fndn. Bellagio Study & Conf. Ctr.—Intl. Conferences**
Provided for groups. Health/nutrition one of the fields covered 25 participants per group. B&B but no airfares. 3 days. At least half of the participants must be other than US-Canadians and no more than half the participants from any one country.

02227 **Lady Davis Graduate Fellowships**
To study in Israel—priority to Canadians. 9–12 months includes travel costs.

02399 **Weizmann Institute of Science Postdoctoral Fellowships**
1 year possible extension to 2. Travel expenses and an allowance for participation in scientific meetings abroad—$US1276 p.a. for these expenses.

02426 **NMSS—Advanced Postdoctoral Fellowships**

Support 3 years or less—travel expenses included. $25,000–$35,000 p.a. depending on experience.

03273 **Grayson-Jockey Club Res. Fndn.—Equine Research Grants**

Sponsor offers grants for medical research related to the horse. Kentucky, US. Travel for scientific meetings only.

03430 **Lady Davis Postdoctoral Fellowships**

To study in Israel—priority to Canadians (medicine and dental medicine amongst fields supported). Stipend includes travel allowance.

03805 **Human Frontier Science Program Organization Long-Term Fellowships**

$40,000 annually for post doc applicants who wish to pursue research in foreign countries. Provide travel expenses or language training up to $5,000 US.

03831 **Fondation Simone et Cino del Duca Maintenance Grants**

French researchers travelling abroad and foreign researchers travelling to France. Travel funds implied but not specified. Funds may not be used for participation in conferences or congresses.

04174 **Percy Sladen Memorial Fund—Grants for Research Abroad**

Natural and earth sciences, including pathology. 100–500 pounds sterling. Funds not provided for UK based field work. Funds not provided for conferences.

04186 **Golda Meir Fund—Fellowships at the Hebrew University of Jerusalem**

Medicine and dental medicine amongst fields listed. Grants intended to defray costs of travel for postdoc fellows only.

04255 **Rockefeller Archive Center Travel and Research Grants**

Archival collections of Rockefeller family. Major subjects at the centre include medicine. Travel grant—successful applicant would need other funds to support stay.

04258 **Procter & Gamble—University Exploratory Research Program**

Supports areas of emerging sciences which might not otherwise be funded because considered too speculative. $50,000 p.a. for 3 years.

04640 **NEI—Clinical Trial Planning Grants**

Up to $50000 in direct costs for one year covers such items as travel expenses, preliminary studies to refine trial procedures and document recruitment potential, and consultant fees for biostatisticians. Domestic and foreign for-profit and non-profit organizations, public and private and eligible agencies of the Federal government. No restrictions, location, citizenship, geographical.

04820 **ILSI Allergy and Immunology Research Awards**

1–2 years—$25,000–$75,000 per year. 2 awards given.

05329 **EFA—William G. Lennox International Clinical Research Fellowship**

$40,000 for one year for experience outside applicant's own country.

05444 **NRC—Reg. Resident Associateships in Engineering/Applied & Comp. Sci.**

Biomedical engineering included. $27,7500–$45,500 per year but may be renewed to 3 years. Attendance at one or two professional meetings per year is encouraged. Limited funds available for such travel.

05445 **NRC—Reg. Resident Associateships in Chemistry**

Biochemistry and medicinal research included in fields supported. $27,7500–$45,500 per year but may be renewed to 3 years. Foreigners reimbursed for round trip travel. Attendance at one or two professional meetings per year is encouraged. Limited funds available for such travel.

06111 **Myasthenia Gravis Fndn. Kermit E. Osserman Fellowship**

$30,000 for one year. US citizens and foreign nationals who have been accepted to work in a US lab.

06416 **AAAAI—International Travel Grant Award**

Sponsor provides grants to enable foreign researchers to attend the sponsor's annual conference held in Washington. $US1000.

06870 **AAP Professional Medical Education Award**

Award recipients receive $3000 cash gift, engraved award, travel, lodging and meal expenses to attend the annual meeting. (Includes medical students, residents and nurses).

08292 **NRC—Hughes Predoctoral Fellowships in Biological Sciences**

Up to 80 awards. Stipend of $15,000 p.a. Awarded for one year initially with the possibility of extending it to three years. Institutions receive annual cost of education allowance of $15,000 p.a. for three years—$1,500 of which must be used for the direct benefit of the fellow e.g. funds may be spent for travel expenses to scientific meetings. No dependency allowances.

08480 **American Academy of Periodontology Balint Orban Memorial Program**

Aimed at students or recently trained periodentists. Competition. $500 award. Participants selected to present their papers receive reimbursement for their travel expenses to and from the meeting and one night's hotel room expense.

08964 **AFUW-QLD Commemorative Fellowships**

Postgraduate study in a wide range of disciplines at universities in Australia. Awards made to Australian citizens are also tenable overseas. $AUS 14,000 for one year.

09258 **NMSS—Postdoctoral Fellowships**

Tenable in US for os applicants. Stipends commensurate with experience, travel expenses are included. Support not usually provided for more than 3 years.

09520 **ACC Young Investigators Awards**

Cardiology—Best study for a project on cardiovascular disease for those presently in a residency or fellowship training program. A plaque, a certificate and a cheque for $2,000 for first place. Second place a certificate and a cheque for $1,000. Travel and per diem expenses for attending sponsor conference.

09682 **AmFAR Short-Term Scientific Awards (Temporarily Suspended)**

09725 **PAF—Pediatric Short-Term Scientific Awards**

Up to $5000 for travel and short term study in area of study in pediatric AIDS.

09972 **AAP Lay Education Award**

Award recipients receive a $3,000 cash gift, an engraved crystal award, and travel, lodging and meal expenses to attend the sponsor's annual meeting. No citizenship restrictions but nominees must be pediatricians who are members of the American Academy of Pediatrics.

10333 **Osteogenesis Imperfecta Fndn. Grants for Research-Related Activities**

Awards up to $2,000 but usually for $1,000 or less. Applicants are primarily postdoctoral researchers. Funds to sponsor and/or travel funds to attend medical symposia, meetings, conferences, workshops and advocacy efforts to encourage research.

10466 **AFSP Postdoctoral Research Fellowships**

Eligible applicants are investigators who have received a PhD degree within the preceding five years and have not had more than three years of fellowship support. Fellowships provide an annual stipend of $22,000 in the first year, and $24,000 in the second year, if applicable. The stipend does not provide special allowances for dependents, travel, or moving expenses.

10727 **Amer. Coll. of Surgeons International Guest Scholarships**

Eight scholarships of $10,000 each provide competent young surgeons with an opportunity to visit clinical, teaching, and research activities in North America and to attend and participate fully in the educational opportunities and activities of the sponsor's Clinical Congress. Eligible applicants are surgeons from the international community between the ages of 30 and 42 who have strong interests in teaching and research.

10948 **Lifeline Foundation—E.J. Wylie Traveling Fellowship**

Provided to faculty-appointed physicians for visits to centers of excellence in vascular surgery in the US and abroad. Applicants must be under 40 years of age and have completed a postgraduate vascular training program. Up to $10,000 is available for expenses related to travel, research, and clerical help.

11174 **ADHF/AGA—International Travel Fellowship Awards**

Up to three fellowships with a maximum of $1,500 per fellowship per year are provided to enable young, non-North American investigators who do not have travel funds to attend the sponsor's annual meeting and present their abstracts. Must be under 40 years of age, reside outside the US and work in gastroenterology related areas.

11175 **ADHF/AGA—Student Abstract Prize**

Up to 33 prizes available for best abstracts by student or medical resident. Winner receives travel support of up to $1000 to attend the sponsor's annual meeting; a certificate plus a $5000 honorarium; and publication of the abstract in the journal 'Gastroenterology'. The next 5 runners-up receive travel support of up to $1000 each to attend the meeting. Other selected runners-up will receive up to $5000 each in travel support.

13484 **Dystonia Medical Research Foundation—Dystonia Research Grants**

$35,000 per year. All non profit organizations and institutions within the US, Canada, and those countries overseas where supervision of grant administration is possible. Travel costs not allowed under grant.

13981 **Rockefeller Fndn. Bellagio Study & Conf. Ctr.-Team Residencies**

Health/Nutrition studies developing countries among fields supported. International, interdisciplinary teams of problem-solvers. 3–10 people staying from one week to one month. B&B no travel funding or stipend.

14898 **AAN John Jay Dystel Prize for Multiple Sclerosis Research**

Prize of $7,500 awarded to a researcher in recognition of outstanding contributions to MS. Not a lifetime achievement award. Reimbursement of round trip air travel, 2 day meals and lodgings and attendance at annual meeting and presentation of lecture.

14920 **ACOG Warren Pearse/Wyeth-Ayerst Women's Health Policy Research Award**

Applicants must be American College of Obstetricians & Gynecologists junior fellows or fellows. One fellowship of $15,000 is awarded. Also covered are travel expenses for the awardee to attend the sponsor's annual meeting to receive the award.

14957 **ASPET—Goodman and Gilman Award in Drug Receptor Pharmacology**

Award of $2,500 offered biennially. Travel support for winner and spouse to the award ceremony. No restrictions on nationality or age or institutional affiliation.

14960 **ASPET—John J. Abel Award in Pharmacology**

$2,500 offered to stimulate research by young investigators. Must be under 39 years. Award given yearly at the sponsor's annual meeting. Recipient's travel and hotel expenses paid.

14967 **ASPET—Epilepsy Res. Award for Pharmacology of Antiepileptic Drugs**

Award of $1000—no restrictions age, sex, nationality, etc. Award presented at annual meeting. Travel expenses for recipient provided.

14970 **ASPET—Award for Experimental Therapeutics**

Award of $2500 and bronze medal. Presented at agm—travel expenses, including hotel costs, for winner and spouse.

15094 **SOT—Colgate-Palmolive Postdoc. Flwshp. in In Vitro Toxicology**

Fellowship of $33,500 offered to postdoctoral trainees in their first year of study beyond PhD, MD, or DVM. Offered biennially. Funds include stipend of $22,000 and additional funds which can be used for supplies, equipment or research-related travel. Second year possible.

15362 **NSERC—Visiting Flwshps. in Canadian Govt. Labs/Life Sci./Psychology**

Stipends of $35,184 per year, plus travel, for up to two years for research at a Canadian government lab in the disciplines of the Life Sciences or Psychology. Awards made to a citizenship quota: two thirds to Canadians. Travel allowance for the fellow, spouse, and children.

15749 **Univ. of Melbourne Flwshps. for Women w/ Career Interruption**

Generic—$32,118–$43,588 plus allowance $4000 per year to support field work or attend conferences.

18585 **Monbusho Research Student**

Sponsor offers funding to foreign students for 1year or 1 year and a half (both include 6 months Japanese language study). Medicine and dentistry among large number of fields offered for study. Applicants must be under 35 years of age. Awards include monthly allowance, transportation to/from Japan, field work allowance and accommodation assistance.

19750 **Mizutani Foundation for Glycoscience—Research Grant**

Applicants must hold Doctorate and be member of scientific institution (where he/she can carry out proposed project). Award maximum is 10,000,000 yen p.a. Budget may include travel.

21256 **ASCN—Young Investigator Award (American Society for Clinical Nutrition)**

To promote interest in young investigators still in training in graduate/medical school. Five finalists receive plaques and $750 cash for travel to sponsor's annual meeting; overall winner receives extra $500. Must be sponsored by mentor who is ASCN member.

21264 **APS—John F. Perkins, Jr. Memorial Fellowship Awards**

Awards from $1500 to $3000 to support families of foreign physiologists who have arranged for fellowships/sabbatical to carry out scientific work in US. 'It is in the interest of the sponsor to develop the full potentialities for cultural benefit associated with scientific exchange.' Ordinarily 4–6 awards available in any one year. Host institution must be member of APA.

22244 **DIST Bilateral Science & Technology Collaboration Program (NB—replaced mid-1998)**

Support for collaborative research between Australia and other countries in science and technology (academic and industrial applications). Funding covers or contributes to travel and living expenses for Australians abroad. May also support visits by overseas scientists to Australia. 'PhD students can be supported to travel overseas as long as they are not the principal Australian participant but are listed in the application as a member of a project team.' Cost of overseas travel by Australian researchers would include an allowance to offset living costs. Program does not support visits over six months; post doctoral fellowships; scholarships, fellowships or student bursaries; sabbaticals, lecture tours etc.

22249 **NHF—Post-Doctoral Fellowships**

Tenable for 3 years initially, possibility of extension to no more than 5 years. Available for medical /science graduates qualified within past 4–6 years. Allowances for travel for specific purpose directly related to research program may be granted.

22250 **NHF—Overseas Research Fellowships**

Fellowships of 3 years—two overseas, third in Australia (possible extension to 4 years). Available to graduates resident in Australia with at least 2 years experience in research. Fellowship covers salaries ($38284 to $46503) and appropriate allowances (e.g. initial expenses and rent), including minimum return air fares for Fellow and family, and a four week annual vacation.

22251 **NHF—Clinical Research Fellowships**

Applicants must have appropriate clinical experience and hold higher qualification. ' These fellowships aim to build research expertise, future career opportunities, and a long term commitment to clinical cardiovascular research among clinicians.' Tenable 1–2 years, with part-time tenure in special circumstances. Travel for specific purpose directly related to the research program may be granted.

22253 **NHF—Travel Grants**

Grants to assist both junior investigators and NHF Fellows (engaged in clinical or basic medical sciences research related to cardiovascular physiology/disease). Grants to attend conferences, meetings or take up posts in overseas institutions. Four types of grants are specified.

22394 **G. Passe/R. Williams Mem. Fndn. Overseas Research Fellowships**

Tenable for 2 years overseas, 2 years on return to Australia/NZ. Candidates normally not more than 6 years postgraduate/postdoctoral experience. Minimum cost airfares for Fellow and dependents, with family allowances currently applicable. An additional allowance of $3000 p.a. is payable towards the cost of local and overseas scientific travel.

22408 **Mackenzie Trust—Post-Doctoral Fellowship in Comparative Anatomy**

Awarded every 2 years (for 2 years of study) to medical graduate recently completed appropriate research degree. Must undertake comparative study of anatomy of animals and human beings. Award offers $48000 in first year, $47000 in next. This includes $6000 stipend for first year and $5000 for second(for first year equipment, maintenance and Australasian conference travel costs).

22412 **NHMRC—Project Grants**

Main avenue for support of biomedical research. Normally 3 years (limited number 5 yrs for distinguished researchers). One subcategory is named Priming Grant—special consideration given to new investigators (not previously held a NHMRC grant). Project grants provide funding for salaries, equipment and maintenance, but requests for travel grant will not be considered. Professional staff employed on NHMRC grants are eligible to attend one conference in their discipline each year. However, costs (e.g. airfare) must be met from project's existing funding. Request for conference travel will not be considered.

22414 **Matsumae International Foundation Fellowship Program**

Offering 20 fellowships (especially for applicants from developing countries) in fields of natural science, engineering and medicine. In 1999 for period of 3–6 months. Eligibility requirements—hold doctorate, under 40 years of age, conversational ability in English or Japanese, should not have visited Japan before, must return to own country. Support will include round-trip airfare, cost of accommodation, local travel, personal accident/sickness insurance, but no support for family.

22415 **NHMRC—C.J. Martin Fellowships**

Post doctoral training in basic research for 4 years—2 overseas, 2 Australia. Stipend commences $38 284 (as at 1/1/98). Superannuation and overseas allowance payable, plus research maintenance of $4 000 p.a. Minimum cost airfares for Fellow and dependents. Additional allowance of $500 payable towards cost of conference travel.

22420 Wellcome-Ramaciotti Research Travel Grants

Open to postdoctoral researchers able to demonstrate independent research experience. Not available for travel solely to attend meetings, congresses, educational or vocational purposes. Duration may range from few weeks of up to 3 months. Letter from institution supporting visit is necessary. Cost of economy class airfare provided, but where provided a subsistence rate will be provided by host country.

22426 NHMRC—Australian Clinical Research Postdoctoral Fellowship

Awarded max 4 years and may be divided between two different institutions. An allowance of $500 p.a. is payable toward the cost of conference travel (no stipulation that this has to be in Australia)

22431 NHMRC—Peter Doherty Post-Doctoral Fellowships

Awarded for a period of 4 years. An allowance of $500 p.a. is payable toward the cost of conference travel (no stipulation that this has to be in Australia)

22434 NHMRC—Neil Hamilton Fairley Fellowships

Post doctoral training in clinical research for 4 years—2 overseas, 2 Australia. Stipend commences $38 284 (as at 1/1/98). Superannuation and overseas allowance payable, plus research maintenance of $4 000 p.a. Minimum cost airfares for Fellow and dependents. Additional allowance of $500 payable towards cost of conference travel during the Australian portion of the Fellowship.

22463 NHMRC—R D Wright Awards

This Australia-based award is not intended as an initial postdoctoral appointment, but is meant for outstanding researchers at an early stage in their careers. (Applicants have to provide evidence of high quality research output.) Salary at $43 260 for 4 years, plus allowance of $10 000 p.a., of which $3 000 may be used for conference travel.

22535 AFA Rheumatology Research & Professional Education Overseas Flwshp.

Two fellowships on offer to medical graduates with at least 6 years post MBBS experience (preference to applicants 35 years or less)—(a) AFA-ARA Heald Fellowship, tenable in Canada or US, value US$26 000 (of which $1 000 for travel); (b) Michael Mason Fellowship, tenable in UK, value £16 000 (of which £1 000 for travel). The Heald Fellowship is also open to science graduates with several years postdoctoral experience.

22542 DHFS—World Health Organisation Fellowships

Supports the international exchange of scientific knowledge and techniques relating to health—provide opportunities not available in home country. Special consideration for medical/health workers have not had/do not have significant opportunities for international experience. Candidates must fulfil conditions—minimum 2 years experience in field, return to own country 2/3 years service, be in good health, not over 50–55 years (depending on retirement age), speak/read/write language for proposed study. Economy air travel, modest daily stipend, but attendance at meetings, conferences, congresses not generally allowed. Funding limit appears to be $10 000.

(Possibly targeted more at administrators than active scientists).

22545 ARC Large Research Grants

Supports 1–3 year grants $30 000 p.a. except clinical medicine and dentistry. Eligibility criteria pertain to: (a) Chief Investigators; (b) Team Leaders; (c) Partner Investigators and (d) Associate Investigators. Provided the project is based in Australia there may be support for travel funds to be used outside Australia for fieldwork/visiting libraries or laboratories; travel and attendance at conferences.

22546 ARC Fellowships

ARC Fellowships open to world wide competition in any field except clinical medicine and dentistry. Three types offered; (a) Australian Postdoctoral Research Fellow (recent doctoral candidates); (b) Australian Research Fellow/QE11 Fellow (3–8 years postdoctoral); and (c) Australian Senior Research Fellow (more than 8 years postdoctoral).

Aims to foster opportunities for pursuing internationally competitive independent research, targeting those who have demonstrated a clear commitment to high quality research. Provides opportunities for career development, supply trained personnel to education and industry. Tenured and untenured researchers may apply, but must resign before taking up Fellowship. Approx. 55 Australian Postdoctoral Fellowships available with tenure of 3 years. In 1999 proposal for 4 year teaching and research APD. Types (a) and (b) attract research support grant—used for fieldwork/ conference attendance, workshops, symposia associated with Fellowship.

22547 **ARC Strategic Partnership with Industry Research & Training (SPIRT)**

Collaborative research only plus can seek funds for an APAI or Australian Postdoctoral Fellowship (Industry).

Overseas Industry partners—ARC is prepared to accept overseas organisations as eligible industry partners subject to meeting criteria that : the economic or social benefit of the research is to Australia; and the intended use of the research outcomes is in Australia. Travel is considered a legitimate expense (but doesn't stipulate if this is just domestic).

Associate Investigators—must warrant mention of his/her name on publications arising from the project, but should not be at a level sufficient for the researcher to be eligible as a Team Leader, Chief Investigator or Partner Chief Investigator. Associate Investigators may act as mentors for APD (I)s.

APA (I) stipend at top of APA range.

22724 **DRDC—Research & Development Grants: Industry Performance Portfolio**

Included in funding support is travel and workshops/conferences. The Industry Performance Portfolio has five programs—(4) is Human nutrition—heart disease and the role of fats; calcium and osteoporosis; probiotic effects and physiologically functional foods; and other nutritional effects of dairy products.

22729 **Cancer Council—Travel Grants: Conference**

Funds to assist in presentation of papers at overseas conferences of standing and of relevance to cancer. Limited funds for accommodation and economy return air fare up to a maximum of $2,500.

Preference given to those applicants who are new to working or researching in the area of cancer, but who have demonstrated achievements.

22731 **Cancer Council—Travel Grants: Training**

Travel grants awarded to assist health professionals to attend centres of excellence to learn specific skills. Funds available for travel in Australia or overseas for periods of up to three months. Preference given to those applicants who are new to working or researching in the area of cancer, but who have demonstrated achievements. Maximum for overseas training is $2,500.

22806 **Kathleen Cunningham Fndn.Breast Cancer Research Project Grants**

One off pool of funding provided by Australia Post and Federal Government. Processed via NHMRC—travel is an approved item but not clear whether covers o.s.

22835 **AAS—Japan Soc. for the Promotion of Sci. Postdoc. Flwshps. in Japan**

Five one- or two-year postdoc fellowships for young Australian scientists in the field of natural science, non-clinical medicine and engineering to conduct research in Japan. Provides return airfare, a monthly living allowance of 270,000 yen, a monthly housing allowance, a settling-in allowance, a family allowance if accompanied by dependents, and medical and accident insurance coverage for the fellow only. Provision will be made for Japanese language training.

22842 **NHMRC—Sydney Sax Fellowships**

Designed for appropriately experienced people to pursue careers in public health, based on a project for which the recipient is a senior investigator, but under supervision. Up to four years, one of which may be spent abroad. Fellowships commence at NHMRC Ro1plus allowances and clinical loading where applicable. Applicants must outline proposed career development and possible opportunities available in Australia in the area of public health on completion of the Award.

22846 **AAS—Science and Technology Agency: Postdoctoral Flwshps. in Japan**

Young Australian scientists and technologists—conduct research in a scientific, technological, engineering or medical field, in national laboratories and public research corporations (excluding universities and university-affiliated institutes) in Japan. Award is for a period of 6 months to 2 years. Applicants should be under 35 years of age. Fellows provided with a return airfare, a monthly living allowance of 270,000 yen, a monthly housing allowance, a settling-in allowance, an annual travel allowance, a family allowance if accompanied by dependents, and medical and accident insurance coverage for the fellow only. Provision will be made for Japanese language training.

22857 **AAS—Rhone-Poulenc Flw. Under the Bede Morris Flwshp.:**

Rhone-Poulence Australia, a subsidiary of the French chemical and pharmaceutical company, provides funds for a professional scientist to visit France in 1998. Provides return excursion airfare to France and a grant-in-aid for up to six weeks at a rate of $125 per day (approx $5420 for 42 days). Need to propose a collaborative research project, or a specific activity, which has been developed in consultation with a host scientist in France.

22875 **AAS—University of Oxford—Oxford Nuffield Medical Fellowship**

No limit as to age or status 'applications from keen young research students are welcomed'. Tenable for 2 years with possibility of a third year. Requirement of returning to Australia for at least 3 years after Nuffield Fellowship. Clinical Lecturers' scale—28,370–29,670–30,970 pounds per annum. A child allowance of 100 pounds per annum for each dependent child, and travel allowances for travel on official business during appointment. Direct economy air fares for the appointee, spouse and children up to 18 years of age. Generous baggage allowance. Range of risk insurance also provided.

23494 **JDFA Travel Grants (diabetes)**

Provides travel grants of up to A$3,500 to young researchers for the purpose of furthering the researcher's expertise in the study of IDDM. One specific grant dedicated annually to travel entailing study in another laboratory or institution.

23572 **Fndn. for High Blood Pressure Res.—Young Invest. Travel Awds. (Temporarily suspended)**

Travel awards are available for up to ten postgraduate students and postdoctoral fellows to enable them to attend the International Society of Hypertension Meeting. Between 1–2 thousand dollars to assist with airfares and accommodation.

23573 **Fndn. for High Blood Pressure Res.—Postdoctoral Awards**

Offers up to three Postdoctoral Fellowships for researchers for up to two years, the award includes salary, on-costs, superannuation and laboratory support, consumables, travel to scientific meetings.

23628 **Asthma Foundation of NSW—Research Fellowships**

Provides one to three-year fellowships. Grants may cover salaries, technical or other assistance, cost of equipment, materials or other necessary items. Travelling fellowships for graduates undertaking further research overseas will be considered.

23752 **World Bank—MIGA Summer Employment Program**

Public Health included amongst a variety of fields supported. Summer employment in Washington DC for graduate students to improve their skills and experience working in an international environment. Must be enrolled in a full-time graduate study program and have strong computer skills. Fluency in English required knowledge of World Bank languages useful. Monthly salary and travel allowances provided.

23759 **QCF—Travel/Study Grants**

Provides Travel/Study grants to Queensland resident working in the fields of cancer research. 'Those presenting work at a meeting for the first or second time are especially encouraged to apply'. Grant in aid rather than full funding.

23776 **QCF—Allied Health Professionals Oncology Study/Travel Grant**

Opportunity for allied health professionals working in the area of oncology and resident in Queensland to undertake further study or travel, nationally or internationally, to attend conferences, workshops, seminars or study tours in the field of oncology. Value of award is A$5,000.

24130 **NHMRC—INSERM Exchange Fellowships**

Enables fellows to work overseas on specific projects. Offered to a young person of outstanding ability. One fellowship offered every second year for a period of 4 years, two of which are spent in France and two in Australia. Bilateral exchange scheme. Minimum cost airfares provided for fellows and their dependents for the direct journey to and return from the designated research center (INSERM). No allowance payable in respect of conveyance of luggage, goods or chattels not covered by the free allowance provided under normal passenger agreements. Overseas: INSERM will accept responsibility for the living expenses in France of Australian researchers taking into account their seniority.

24447 **Canadian Cystic Fibrosis Foundation Visiting Scientist Award**

Support provided for a limited number of investigators from abroad who are invited to work in cystic fibrosis research at a Canadian institution; or Canadians who wish to work in another Canadian lab or abroad. Funding average around $3,500.

24783 **AAS—Science and Technology Agency Short Term Fellowships in Japan**

20 short-term fellowships (one—three months) worldwide. Approximately 270,000 yen provided. Work in national labs and public research corporations (excluding universities and university-affiliated institutes) in Japan. Return airfare to Japan, a monthly living allowance of approx. 270,000 yen, a monthly housing allowance, a settling-in allowance, a travel allowance, a family allowance if accompanied by dependents, and medical insurance coverage for the fellow only. Provision may be made for Japanese language training.

24812 **Arthritis Society Metro A. Ogryzlo International Fellowship**

Support provided for advanced training in clinical rheumatology at a Canadian Rheumatic Disease Unit by non-Canadian graduate students. Max of $31,000 Canadian per annum. 12 months. Fellows will be awarded a travel allowance from their usual place of residence to their place of training in Canada. An allowance of up to $500 provided to meet out-of-pocket expenses to attend one or more professional or scientific meetings during the fellowship year.

24813 **Arthritis Society Geoff Carr Lupus Fellowship**

Provides support to train a rheumatologist to be an expert in the management of patients with lupus. Awards tenable only at accredited Lupus Clinics at Ontario medical schools. Max of $50,000 per annum. 12 months. Award of a travel allowance of p to $1000 for fellows to take up training in Canada. An allowance of up to $500 provided to meet out-of-pocket expenses to attend one or more professional or scientific meetings during the fellowship year.

24869 **Earthwatch Australia—Dunlop Earthwatch in Asia Fellowships**

$5000. 18–40 age category. Placing paying volunteers in the field to work with scientists and scholars. Public health/welfare among fields supported.

25186 **Novartis Foundation Symposia Bursary Scheme**

To enable young scientists to attend NF symposia, and immediately following the meeting, spend up to 12 weeks in the department of one of the symposium participants. Award provides travel expenses to the symposium and host lab and board and lodging for the duration of the bursary. Tenable UK/Europe.

25258 **Creswick Fndn. Fellowship in Family Relations and Child Development**

At least two fellowships of approx. $10,000 each available to 'experienced professional persons' to study in an approved centre overseas for a period of approximately 3 months in the area of family relations and child development (psychiatrists/psychologists plus others). One or two short visits to other centres would also be acceptable. Return economy airfare and overseas living expenses of the successful candidate for up to three months. Applicants need to be able to indicate how they wish to extend their knowledge and how they plan to use this experience in training, teaching or other appropriate practical ways on return to Australia.

25575 **ACU—Development Fellowships (Association of Commonwealth Universities)**

Needs of developing countries. Provides funding for fellowships tenable for short periods in developed or developing Commonwealth countries. . Provides up to 5,000 British pounds, intended to cover: international return airfare at the lowest available economy class rate and by the most direct route; ground travel to home airport and from airport abroad to final destination; medical insurance; local travel abroad; board and lodging; and fees.

25853 **ASRF Research Grants (Spinal research)**

Small = <$1500 and large >$1500. Travel allowed but not specified re: os.

25862 **French Embassy Scientific Fellowships**

Supports junior Post-graduate Australian scientists, with at least 2 years professional experience, to undertake training or research in French labs/institutions for a period of 3 to 6 months. Includes a monthly allowance, registration fees, basic medical cover and accommodation. Travel costs not covered. Need to have a good knowledge of French. No provision of benefits for dependents (special visas, medical cover, accommodation). Evidence of personal funds for family must be provided if family accompanies fellow.

25878 **Vera Scantlebury Brown Memorial Trust Child Welfare Scholarship**

Public health plus other fields. Enables applicant to undertake pg studies o.s. or in Australia. Women only. $3000—must return to Victoria to work for at least 12 months in the area of scholarship.

26089 **ICFA—Scholarships**

Field of cystic fibrosis—individuals who wish to improve their knowledge in a recognized CF centre worldwide. No more than 6 months.

26091 **ICFA—Research Project Grants**

Support for internationally relevant projects of a globally applicable nature in the field of clinical CF. Must be done in conjunction with a medical scientific institution in a 'developing' country. One year.

26092 **ICFA—Training Courses for Allied Health Professionals**

Training courses for allied professionals in CF. Grants cover costs for courses both in the applicant's country and abroad. Duration not to exceed three weeks and value not to exceed $US 3000

26278 **Ctr. for Study of Aging & Human Dev.—Busse Research Awards**

Promote international research in gerontology by promising scientists (junior and mid-career). $2000 award presented at the Congress and up to $2500 for travel and living expenses for the Congress. Awards not offered every year.

26330 **ACU—Medical Electives Bursaries**

Open to senior medical students in the Commonwealth who wish to take up an elective period elsewhere in the Commonwealth. Third World countries are a priority. Up to 1,000 pounds to cover part of the travel, subsistence and local costs of the student. Tenable in any Commonwealth country apart for the candidate's.

26490 **Apex Fndn. for Res. into Intellectual Disability Ltd.—Research Grts.**

Travel an approved budget item but unclear as whether it includes overseas.

26546 **Wellcome Trust—Res. Trng. Flwshps. in Pop. Studies & Reprod. Hlth.**

Adolescent health, health and safety education among areas supported. Tenable for maximum of 4 years, 2 years in an approved institute and 2 years at a centre of excellence (either in the applicant's country or abroad). Applicants outside EU need to provide a guarantee from their home institution that they have a position to return to and the opportunity for continuing research.

26550 **Wellcome Trust—Short-Term Travelling Research Fellowships**

3–6 months fellowships to carry out research in natural or clinical sciences. Provide the costs of return travel, a subsistence allowance, and a contribution to research costs. Awards tenable in Australia, NZ, South Africa, US, UK and Republic of Ireland.

26552 **Wellcome Trust—Travelling Research Fellowships**

1–2 year fellowships to postdoctoral scientists and medical graduates from any country except USA or NZ who wish to gain further research experience by working in leading labs in the UK or Repub of Ireland in any branch of natural or clinical sciences which has a bearing on human or veterinary medicine.

Two types of awards: (1) Research fellowships—awards to those who have less than 10 years postdoc research experience, proven research record and be seeking an extension of their skills and training opportunities; (2) Research training fellowships: awards to those who have received doctoral training but require further training in research methods or techniques. These awards are for one year.

Fellowships stipend within the range from 14,317 pounds to 28,564 pounds depending on age and experience. They also include costs of the research, attendance at scientific meetings and return travel.

26565 **Wellcome Trust—Research Training Fellowships in Reproductive Biology**

Stipend plus project and travel expenses for research on reproductive biology of relevance to the potential development of novel, safe and effective contraceptive methods. Tenable for 4 years in a university or med school. Intended to provide a period of research training at an internationally recognised centre of excellence (either in the applicant's country or abroad), which may be followed by up to two years support at an approved (home) institute in the applicant's country.

Exceptional candidates who succeed in the above training fellowships may be considered at a later date for further support through the Trust's wider funding portfolio.

Applicants outside EU need to provide a guarantee from their home institution that they have a position to return to and the opportunity for continuing research.

26662 **ORIA Research Grants in Ophthalmology**

Grants from A$12,000 to A$30,000 for one year. May cover travel but not specified whether this can be overseas.

26668 **NHMRC—PHRDC—Public Health Travelling Fellowship (replaced by Sax)**

Tenable in Australia or overseas for research in immunisation. Provides assistance towards travel expenses, living allowances etc. Not to exceed $19,700. Concentrated study in a limited number of places (one or two centres) will receive more favourable consideration than proposals which involve multiple brief visits to numerous locations world wide. Two—6 month period.

27038 **CAG/ASTRA Research Initiative Award**

Fellowships aimed at further advancing biomedical research in Canada relevant to gastroenterology. Salary and operating expenses for a period of two years (min value $50,000 Canadian per annum). Eligible applicants must have five years or less of postdoctoral training at the start of the award. Tenable only at Canadian universities, hospitals, or research institutes.

27039 **CAG/Industry Fellowship Program (Gastroenterology—Canada)**

Aimed at training clinical investigators and scientists for an academic career in biomedical science relevant to gastroenterology. Salary support for a period of one year. Tenable generally at Canadian universities, hospitals, or research institutes.

27373 **ACOG/Searle Res. Award in Gynecologic Infections & Their Complication**

Seed funds for junior investigators for clinical research—one award of $20,000 for one year. $1000 travel stipend is provided for attendance at the American College of Obst & Gyns.

27408 **Apex Fndn. Trust for Autism—NAA Research Grants**

Medical practitioners, psychologists, scientists, and students from overseas apply to come to Australia, or from Australia to travel abroad, for research, study, teaching and demonstrating theory and practices relating to Autism and related disorders.

Support up to 1 year. No upper limit on funds to be requested set.

27411 **AMRAD Post-Doctoral Awards**

Up to 4 awards of A $20,000 plus a commemorative medallion will be awarded annually for research and travel to supplement other fellowships or salary support. These are awarded to assist the career development of outstanding young Australian biomedical research scientists who are returning to Australia after a post-doctoral period overseas. Approx. $5000 to be spent on travel to relevant scientific meetings held outside Australia and to at least one meeting held in Australia. The award should be expended within three years.

It is intended that these awards will contribute to the strength of Australia's research base by enhancing the repatriation of talented young Australian researchers, and will help bridge the gulf between academia and industry.

27502 **Canadian High Commission—Travel Grants to Canada**

Four grants for postgraduate students to undertake a short research trip to Canada. Up to $2,800 Australian available for travel to and within Canada and for sustenance. All academic areas that have a distinctly Canadian orientation—includes some branches of health.

28104 **Japan World Exposition Commemorative Fund Grant Program**

Nonprofit organizations or foundations in Japan or abroad. Preference given to new applicants and applicants of countries that participated in the 1970 Japan World Exposition. One million to thirty million Japanese yen awarded per project. Travel and accommodation expenses can be funded. Only half total project costs covered. Project duration = one year.

28111 **Stroke Association—Stroke Research Awards**

Award open to medically qualified and other clinically active researchers in the UK—no citizenship restrictions. Max award is stlg180,000. One to three years of support. Between 20–30 grants awarded. Researcher and support staff salaries covered, some equipment costs, consumables and essential travel.

28229 **ANU—Howard Florey Fellowships in the Biomedical Sciences**

Four fellowships awarded annually—tenable for 2 years in the UK followed by one year in Australia. Stipend, return air fares, resettlement and expense allowance in the UK, and research and conference support in Australia. Estbed by the Royal Society, NHMRC, ANU. 25,000 per annum sterling and 27,000 if based in London.

28502 **Merck Company Fndn. International Fellowships in Clinical Pharmacology**

For those outside the US—4 fellowships awarded annually for terms of up to 2 years at recognized training institutions in the US. Annual stipends of US$30,000. In addition, the sponsor will provided funds to the US training institution to cover standard tuition and fees for the fellow, medical benefits for the fellow, spouse and two dependents, and travel expenses incurred by the fellow, spouse, and two dependents travelling to the training institution in the US at the start of the program and back home upon completion of training. Fellows are expected to return to their home countries and contribute to the advancement of clinical pharmacology there.

28861 **HRCNZ—Postdoctoral Fellowships (Health Research Council of NZ)**

Support for outstanding graduates who have recently completed a doctoral degree. Funding for up to four years. Tenure at a NZ institution. A special allowance of up to $1,750 may be provided to cover limited working expenses associated with the research and to allow the fellow to travel to one scientific meeting in NZ or eastern Australia.

28924 **RCPCH—Heinz Fellowships: Type A**

Fellowships intended for paediatricians from any part of the Cwlth and developing countries to spend some time studying in the UK. Award covers cost of air fares and living expenses. Length of study is up to 12 weeks. Preference in general given to applicants from developing countries.

28991 **UICC Asia-Pacific Cancer Society Training Grants (APCASOT)**

Fellowships for professionals from Asia-Pacific and Latin American regions only actively engaged in cancer research. Grants cover one to two weeks and training at two societies is encouraged. About 5 fellowships averaging US$1,800 each are awarded each year. Must have fluency in a language that will permit effective communication at the host institution. Grants contribute to the least expensive round-trip air fare, and to living costs. Visa, passports, airport taxes etc are the responsibility of the grant recipient—no financial support provided for dependents.

29133 **Multiple Sclerosis Society of G.B. & N. Ireland-Research Grants**

Grants and PhD studentships. Grants up to five years—studentships are offered for three years. Grants also cover costs of travel in connection with attendance at regional or international conferences. Tenable in the UK.

29355 **GRDC—Grains Industry Research Scholarships**

Stipend of $21,000 per year for three years, with an additional $5,000 to the supporting institution. Biotechnology and human nutrition among fields supported.

29780 **IDP Frank Knox Memorial Flwshps.—Harvard University**

One academic year—US$15,000. 2 fellowships for Australian students.

Range of disciplines including public health. Tuition fees and health insurance and service fees met in addition to stipend.

30113 **IDP—Australia-China Institutional Links Program (ACILP)**

Support linkages between Australian and Chinese institutions. Range $50,000–$100,000 per annum for two to three years. Three major sectors of concentration including Health. Range of activities covered including staff/student exchanges; seminar/workshops. Funds available to meet the costs of Economy class airfares for Chinese and Australian participants.

30468 **Lloyd's of London Tercentenary Foundation**

Post doc research fellowships tenable at UK institutions. Aimed at under 35 year age group and those who wish to progress their research at another institution. Approx 3 awards for 1998–99. Medicine attracts 3 year fellowships. Salary based on age and experience.

30531 **Asthma Fndn. Victoria—Lillian Roxon Mem. Asthma Res. Trust Travel**

Up to $2000 for travel overseas to continue research or to present a paper at a recognised international meeting.

31067 **Ian Potter Foundation—Travel & Cultural Trust Institutional Grants**

Small travel ndn. F to institutions to assist young staff members to attend overseas conferences or to pursue studies. No upper limit but generally awards are between $5,000–$20,000.

31243 **Wellcome Trust—Travelling Flwshps. for Res. in SE Asia/Pacific**

2 years support for young Australian postdoctoral scientists wishing to work in a developing country. Further support for 2 years to continue the study in Australia will also be provided. Includes a stipend, return travel costs, reasonable research costs for both materials and equipment.

31580 **DFAT Australia-India Council Grants**

Supports activities designed to promote a greater awareness of Australia in India and of India in Australia, including visits and exchanges between the two countries, and development of institutional links. Health amongst the range of priority areas supported. (Conference travel unlikely to be supported).

32162 **NNFF—Young Investigator Awards (National Neurofibromatosis Foundation)**

Support to investigators who are no more than seven years past the completion of their training, wishing to pursue a novel idea or concept related to NN. Up to two years for no more than $35,000 per year. Awards made only for salary support; benefits and travel not covered. 'The investigator is commonly a postdoctoral fellow associated with the lab of a more senior researcher, who acts as the research sponsor'.

32450 **Ramaciotti Fndns.—Travel Awards**

3 grants of $5000 each four times per year to support Australian researchers working in the fields of medical research to undertake visits to countries other than the UK for a period of 1 to 3 months.

32967 **RACP Arthritis Foundation of Australia Flwshp. In Rheumatology (T.S.)**

12 month fellowship valued at $40,000 to Advanced Trainees of the College in Rheumatology or Fellows of the College who have completed advanced training in rheumatology within the previous five years. Tenable in Aus, NZ or overseas.

32968 **RACP Astra Fellowship in Medical Research**

12 month fellowship valued at $20,000 to Fellow or Advanced Trainees of the RACP or its Faculties for the purpose of furthering research in internal medicine or paediatrics. Tenable Aus, NZ or os.

32969 **RACP JJ Billings RACP Overseas Travelling Fellowship**

$10,000 travelling fellowship to fellows or advanced trainees of the College or its faculties in Aus or NZ. Awards designed to assist recipients in obtaining overseas research experience.

32970 **RACP CRB Blackburn RACP Overseas Travelling Fellowship**

$10,000 travelling fellowship to fellows or advanced trainees of the College or its faculties in Aus or NZ to support overseas research experience.

32973 **RACP Bushell Travelling Fellowship in Medicine or the Allied Sciences**

$15000 travelling fellowship to graduates in medicine of a university of Australia or NZ who is a fellow or an advanced trainee of the College or its Faculties. Award designed to assist those who already have formal research training to take up an overseas post doctoral position.

32975 **RACP Cottrell Fellowship**

A one year fellowship of $30,000 for research or training in areas of epidemiology, social or community medicine, or for research or training relating to areas of special relevance to the Asia Pacific Area. Applicants should be fellow or advanced trainees of the College or its Faculties. The research or training programme may be carried out in Australia or overseas.

32976 **RACP Vincent Fairfax Family Foundation Research Fellowship (T.S.)**

To support a research fellowship in the area of diseases associated with ageing, and to promote leadership and community spirit within the profession and the community. The Fellowship is awarded for one year with a value of $50,000. The research may be carried out in Australia, NZ or overseas.

33001 **Wellcome Trust—Prize Studentship**

Studentships to outstanding graduates of the biological and physical sciences who want to go in to biomedical research. Students will receive a stipend related to research assistant 1B scale, as well as approved tuition fees at the home student rate, 4,000 pounds per annum research expenses, and funds for travel. Students must be nominated for the award by the holders of the Trust's Senior Fellowships, Principal Fellowships, and programme grants.

33041 **Integrated Preclinical/Clinical AIDS Vaccine Development**

The goal of the program is an iterative process of development, production and testing of candidate vaccines. All awardees are strongly encouraged to attend the NIAID-sponsored annual meeting on AIDS vaccine development and may include a request for travel funds for this purpose. Foreign institutions may apply for these grants.

33111 **RACP Don and Lorraine Jacquot Travelling Fellowship**

$50,000 for overseas training of nephrologists to advance knowledge in the treatment of renal disease. Tenable in any university, hospital or research centre outside Australia. Up to two more years may be supported.

33133 **RACP Rhone-Poulenc Rorer Fellowship in Oncology**

Award of $20,000 to support a fellowship for approx. 6 months duration. Tenable in Australia or overseas. Grant from Rhone-Poulenc Rorer Australia Pty Ltd.

33143 **RACP Sanofi Winthrop Travelling Fellowship**

$15,000 to support travelling and living costs and may be used in conjunction with other support. It is the policy of the RACP to support as many of its Fellows as is possible to obtain overseas research experience.

33144 **RACP Cardiovascular and Metabolic Fellowship**

One year and valued at $41,000. The research or training programme may be carried out in Australia, NZ or overseas. The Fellowship possible through a grant from Servier Laboratories (Australia) Pty Ltd.

33145 **RACP Short-term Study Grants**

Awards are designed to assist researchers/clinicians to undertake a short term of study overseas. $2000. Available to Fellows or Advanced Trainees of the RACP or its Faculties in Aus or Fellows of the College resident in South-East Asia.

33479 **George Alexander Foundation—Grants Program**

Supports wide range of research from $5,000–$20,000. Categories for support include (7) Travel—to give predominantly young Australians the opportunity to gain further experience and to meet their peers in the international scene.

33493 **Natl. Planning Off.—PNG Population and Family Planning Project**

Applicants on a cooperative research arrangement basis between Australian/New Zealand institutions with research capacity and PNG agencies, focusing on capacity building of the PNG agency and addressing the project objectives. One year or less.

33701 **NIA—Exploratory Grants for Multidisc. Clinical Studies of Sarcopenia**

Intended to facilitate new collaborative efforts. Foreign and domestic non-profit and for-profit public and private institutions can apply. Up to $100,000 per year direct costs. May include support travel for the collaboration.

33754 **RACS—Foundation Stuart Morson Scholarship in Neurosurgery**

$20,000 to a young neurosurgeon to assist in meeting the costs of undertaking further training and/or research work in neurosurgery. Australia or overseas. Funds can be used to meet travel, accommodation, sustenance and/or research material costs.

33755 **RACS—Foundation Travelling Fellowship**

A$13,500 to up to three outstanding young Fellows for the purpose of overseas travel, the object of which is to gain knowledge or expertise in a field which will ultimately benefit the Fellow, the College and the community. Funds support travelling and accommodation expenses.

34221 **NHMRC—Howard Florey Centenary Research Fellowships**

Provides a vehicle for medical researchers working overseas to return to Australia and continue with a medical research career. Full time research and awarded for a period of 2 years and provide a salary, annual maintenance allowance of $10,000 and $500 conference travel allowance.

34538 **IDP—Australia South Africa Institutional Links Program: Round 2**

Round 2 will fund up to 10 links projects of collaborative activities of South African and Australian higher education institutions (as specified). Funding normally in range of A$50 000–$100 000 p.a. for 2 years. Academic liaison subordinate to social policy objectives. Institutions required to provide counterpart contributions (include local travel costs). Economy class airfares for participants. Proposals should demonstrate how project will be sustained beyond funding period.

34539 **CHATA Harry Windsor Biomedical and Medical Postgraduate Scholarships**

For medical or biomedical science graduates (Australian citizens or permanent residents) in area of tuberculosis, respiratory disease or health of disadvantaged. Stipend $15 888–$23 630 plus allowances, initially 1 year, but may be extended to 3. Confined to NSW, ACT, NT or near neighbouring countries. Allowance of $1 500 of which $500 towards travel to one approved conference p.a.

34585 **NASA—Headquarters—Unsolicited Proposals**

Support for unique and innovative unsolicited proposals—usually fundamental research in specified areas. Foreign organisations eligible. Domestic and foreign travel allowed.

34586 **USAMRMC—Breast Cancer Research Program—Research Awards**

Foreign institutions eligible to promote research directed towards eradicating breast cancer. 2 categories—Idea Awards ($53m—average $70 000 p.a.), Clinical Translational Research Awards ($27m—no $ restrictions). Complete research in 4 years. Travel to 1 scientific conference p.a. allowed.

34588 **USAMRMC—Breast Cancer Research Program—Training/Recruitment Awards**

Prepare new scientists for careers in breast cancer research and enhance expertise of existing researchers. Support available in 4 categories. Travel to 1 scientific meeting yearly is funded.

34608 **Natl. Ctr. for Responsible Gaming-Problem Gambling/Underage Gambling**

3 years support for tax-exempt organisation to examine wide range of topics. Award may cover costs of travel and other items not exceeding 15% of total grant.

35011 **CAG Helicobactor Research Fellowship**

Salary support for 1 year (generally tenable only at Canadian universities) for medical school graduates with Royal College certification and/or PhD of 5 years or less postdoctoral, to train in biomedical science relevant to gasteroenterology, specifically helicobactor pylori. Preference given to candidates who will strengthen Canadian gastroenterology.

35665 **UICC—ACS International Fellowships for Beginning Investigators**

Enable beginning investigators/clinicians to carry out basic/clinical research projects. Foster bidirectional flow of knowledge, experience, expertise and innovation to and from USA. Around 8–10 Fellowships yearly of average value $30 000 for stipend and travel support (least cost return airfare—no allowance for dependents).

35696 **UICC Latin America COPES Training and Education Fellowships (LACTEF)**

Five awards annually with grants of $1 800 for 1–2 weeks. Provide staff and accredited volunteers from voluntary cancer societies in Latin America with non-medical training opportunities in prevention and early detection programs. Grants contribute to least cost return airfare and living costs.

35715 **USAMRMC—U.S. Army Prostate Cancer Res. Pgm.(New Invest. Awards)**

Eligible applicants include cooperative groups and for-profit and nonprofit organisations, including foreign institutions. The "new investigators" must have own independent research facilities, be within 6 years postdoctoral. Phase 1 awards $75 000 p.a. for 30 months and may include up to $1 500 annually for travel to scientific meetings.

35719 **USAMRMC—U.S. Army Prostate Cancer Res. Pgm. (Idea Devlpmnt. Awards)**

Sponsor provides support to established prostate cancer investigators or those who want to move into this field in order to undertake under-investigated avenues of research. All Phase 1 awards must incorporate one of five designated research categories. Eligible applicants include cooperative groups and for-profit and nonprofit organisations. Need for some relevant preliminary data re proposed project and access to own independent research facilities. Maximum of $125 000 per year for 30 months for Phase 1 Awards, which may include up to $1 500 annually for travel to scientific meetings. Conditions for Phase 11 awards, depending on funding availability.

36236 **NSERC—Visiting Flwshps. in Canadian Govt. Labs/Cellular & Molec. Bio**

The Natural Sciences and Engineering Research Council of Canada (NSERC) provides fellowships of $35 184 per year, plus travel (fellow, spouse, children) for up to 2 years at Canadian Govt. labs in Cellular and Molecular Biology. Applicants should have PhD in natural sciences or engineering within last 5 years, or be doctoral candidate. Citizenship quota—2/3 of awards to Canadian citizens or permanent residents.

36297 **ANSTO—Australian Synchrotron Research Program ASRP Res. Flwshp.**

Young Australian scientists (recent or about to receive PhD in relevant area) and who wish to pursue career in field requiring synchrotron radiation facilities are invited to apply for fellowship, tenable up to 3 years and with salary of $45 000 (annual research grant included). ASRP Fellows will be attached to 1 of 8 eligible institutions.

36351 **IARC—Fellowships for Research Training in Cancer**

One year fellowships provided to junior scientists (with some postdoctoral research experience) engaged in medical or allied sciences who wish to pursue career in cancer research. (Preference given to those not previously received postdoctoral training abroad). Fellows must have adequate knowledge of English or language of host country. Stipends (cost of room, board and living expenses) will vary with cost of living/country where fellowship is pursued. Economy class return air fare provided.

36564 **UICC Translational Cancer Research Fellowships (TCRF)**

Sponsor offers fellowships designed to accelerate translation of basic/experimental/applied research into clinical applications—new drugs/vaccines/prevention/intervention. Applicants must have fluency in language of host institution. Fellowship value is US$55 000. Travel award covers return economy airfares for fellow, spouse and up to 2 children (if under 18 and staying for 6 months).

36950 **National Meningitis Trust—Research Grant**

Support for all aspects of meningitis, but priority on development of Group B vaccine. Grants to UK researchers and occasionally from abroad. Necessary travel expenses may be covered.

36989 **RCOG—Eden Travelling Fellowship**

Fellowship to gain additional knowledge and experience of a current research project. Award of £5 000 (depending on project and travelling expenses involved) to graduate of not less than two years.

36992 **RCOG—Malcolm Black Travel Fellowship**

Award offered biennially for College Member/Fellow of up to 5 years standing to travel to/from British Isles to attend postgraduate training courses/visit research centres of particular expertise within specialty. Travel and subsistence costs to maximum of £1 000.

38421 **NIGMS—Supplements for the Study of Complex Biological Systems**

NIGMS will provide supplements to existing NIGMS grants (must have at least one year of grant support remaining) to support salary expenses of collaborating investigators (e.g. physicists, engineers, mathematicians). Salary, fringe benefits and travel expenses will be provided.

38886 **ECFMG—International Fellowships in Medical Education**

Sponsor provides opportunities for medical faculty from schools outside US to study aspects of US medical education of use to their home country. Provides stipend of $2 200 monthly for basic living expenses, insurance cover for fellow and family, travel for fellow only (return economy fare) and travel to 1 scientific meeting in US. Fellows must have adequate English and 3 years work experience in home country with job guarantee on return.

38904 **Monash University—Logan Research Fellowships**

Five fellowships yearly to applicants with 2–6 years of postdoctoral experience. Appointment for 3 years, extendable to 6. Salary range
A$ 46 269–$51 113 and research support from A$ 5 000–$20 000 for first 3 years. Return airfares for fellows and dependents. Subsistence and fares for field work, necessary consultation, conferences/ seminars related to research.

39241 **Royal Society—Howard Florey Fellowships**

Applicants must be Australian citizens and of postdoctoral or equiv. qualification. Duration of the award is two years, to be taken up in the UK. Upon return to Australia, the NHMRC provides Florey fellows taking up full-time positions in Australian universities or research institutes, with a stipend and allowance for one year. Four awards available.

40190 **Cancer Fndn. of WA—John Nott Cancer Fellowship**

Up to $10 000 to assist individual Western Australian researcher to work up to 3 months (elsewhere in Australia or overseas) with a cancer research/treatment department/unit in a recognised institution. May also be used to bring cancer expert to W.A. Special consideration given to individual progressing towards PhD or MD. Required to return to W.A. on completion and present report on overseas work.

40199 **GESA—Glaxo-Wellcome Travel Award (Gastroenterological Society of Aust)**

Members of GESA may apply for this award which provides $5 000 support for attendance at a meeting outside Australia or visit to Institution relevant to applicant's career development. Applicants must be undertaking speciality training or higher degree, or completed same not more than 3 years previously. One/two awards made per 6 months cycle.

40200 GESA—Pharmacia and Upjohn Senior Travel Award

Members of GESA may apply for this award which provides $5 000 support for attendance at a meeting outside Australia or visit to Institution relevant to applicant's career development. Applicants must have completed training/higher degree 3–12 years previously.

40201 GESA—Astra Grant-in-Aid for Overseas Travel

Members of GESA may apply for this award which provides $5 000 support for travel outside Australia for purposes of study for minimum of 3 months. Eligible applicants must be aged under 40 years and have a commitment to a career in Australia in either treatment of/research into GI disease. One/two awards made per 6 months cycle

40202 GESA—Astra Career Development Awards

Members of GESA may apply for this award which provides $50 000 support over 1–2 years to aid career development after a period of overseas training. Eligible applicants must be aged under 40 years and have a commitment to a career in Australia. Applicants should have spent a minimum of 6 months working overseas/be overseas/returned to Australia within 6 months of close of applications.

40208 GESA—Travelling Fellowship in Clinical Hepatology

Members of GESA may apply for the Birmingham Fellowship to support advanced training in hepatology/clinical research at the Liver and Hepatobiliary Unit, QE Hospital, Birmingham. Stipend £19 255–23 235 for period of 1 year. Travelling expenses are not provided.

40209 GESA—UCL Hepatology Fellowship

Members of GESA may apply for the University College London (UCL) Fellowship to support research training in Hepatology. Fellowship for initial period of 1 year , renewable with respect to further studies (must have completed training degree no more than 3 years previously and have completed certain other requirements). Stipend £19 255–23 235.

40346 ARC International Researcher Exchange Program (IREX)

3 elements of program (1) International Fellowships; (2) Asia-Pacific Link Awards; (3) MoU Awards.

40517 USAMRMC—Breast Cancer Research Program—Academic Awards

Sponsor provides support to fund following: (a) critical appraisal of state of science in an aspect of breast cancer research; (b) new avenues of investigation in breast cancer research. Eligible applicants (including foreign institutions and individuals) are for-profit and nonprofit organisations. Proposals may request on average $100 000 per year in direct costs, for maximum of $300 000 over 3 years. Funds can be requested for salary support and travel to scientific meetings (one trip to scientific meeting per award per year).

41223 RACP Arnott Fellowship in Cancer Research

Sponsor awards fellowship for cancer research valued at A$40 000 to RACP Fellows or Advanced Trainees. Fellowship tenable in Australia, NZ or overseas.

41225 RACP Basser Travelling Fellowship

Sponsor awards fellowship for research in internal medicine or paediatrics valued at A$25 000 to RACP Fellows or Advanced Trainees. Fellowship tenable in Australia, NZ or overseas.

41227 RACP Bayer Australia Medical Research Fellowship

Sponsor awards fellowship for research in cardiovascular, anti-infective and metabolic medicine valued at A$40 000 to RACP Fellows or Advanced Trainees. Fellowship tenable in Australia, NZ or overseas.

41228 RACP Eric Burnard Fellowship

Sponsor awards fellowship valued at A$5 000 to young Australian paediatrician intending to visit overseas (and return) or complete a research project. May be used to support travel expenses.

41230 RACP CSL Fellowship in Medical Research

Grant from CSL Ltd , matched with funds from RACP, provides a fellowship for research in infectious diseases or cancer immunotherapy valued at A$50 000 to RACP Fellows or Advanced Trainees. Fellowship tenable in Australia, NZ or overseas.

41232 RACP Ego Pharmaceuticals Paediatric Travelling Fellowship

Sponsor awards fellowship valued at A$5 000 to help young Australian paediatricians visit overseas centres. Two types of fellowship available: (a) support travel expenses for training position abroad and return; (b) attend paediatric meeting/s or short visit to overseas centre/s to complete research project.

41234 RACP Geoffrey T Ey Travelling Flwshp. for Isolated Rural Physicians

Sponsor awards fellowship valued at A$5 000 to support rural physicians (Fellows of the College or its Faculties resident in Australia) seeking to further their own continuing education through a short-term project in an institution overseas or in Australia. Funds may be used to assist attendance at refresher courses, learn new technical expertise, clinical training or in part for replacement locum.

41236 **RACP Glaxo Wellcome Australia Neonatal Scholarship**

Sponsor awards fellowship valued at A$3 500 to support Advanced Trainees in paediatrics registered with the College Neonatal/Perinatal Training Committee, intending to visit overseas centre or complete a research project in neonatology. Scholarship assists : (a) travel expenses for previously-confirmed training position abroad and return; (b) attendance at paediatric meeting/s or short visit to overseas centre/s to study neonatology or complete research project.

41243 **RACP Murray-Will Fellowship for Rural Physicians**

Sponsor awards fellowship valued at A$5 000 to support rural physicians who are Fellows of RACP or its Faculties resident in Australia, seeking to further their own continuing education through a short-term project in an institution within Australia or overseas. Funds may be used to assist attendance at training course, technical expertise updating, visits to appropriate institutions or for replacement locum.

42485 **RFA—DE-98-009—Biometics & Tissue Eng. in the Restor. Of Orofacial.**

Up to 3 awards to develop natural and novel approaches to, restoration, and replacementof oral, craniofacial, dental, skin and musculskeletal tissues and organs based on a comprehensive scientific understanding of biological structures and their functions. Particularly interested in supporting collaborative, interdisciplinary teams of scientists from the fields of engineering, chemistry, physics, mathematics, and biology. Range of funding ($600,000 total costs for only 2–3 individual R01s)—R21s must limit requests to $100,000 direct costs per year for two years).

Science & technology—SPIN programs as of second quarter 1998

Allows overseas research experience/training/career development for young researchers

00045 **ACS—PRF—Type AC Research Grants**
Fundamental research related to petroleum field. Support for postdocs/undergraduates/summer faculty/travel. Max. of $60 000 for 2 years, $90 000 for 3 years.

00047 **NASA—Ames Research Center—Unsolicited Proposals**
Domestic and foreign organisations can apply. Domestic and foreign travel.

00063 **American Museum of Natural History Frank Chapman Memorial Fund Grant**
Awards provide one year of support, generally ranging from $200 to $1000 for ornithological research anywhere in the world. Average is $700. For graduate students and postdoc researchers.

00119 **Smithsonian—Graduate Student Flwshps.—Biology/Physical Sciences**
10 weeks only prior to doctoral-travel and research allowances not offered—must be enrolled as a doctoral student.

00131 **Grass Fellowships in Neurophysiology at MBL, Woods Hole, MA**
14 weeks during the Summer. Round trip travel. Late postdoctoral or early postdoctoral to no more than 3 years postdoctoral. Travel funds for fellow only for those outside the US (internal applicants receive travel funds for fellow and family).

00158 **WHOI—Research Fellowships in Marine Policy and Ocean Management**
Social and natural sciences—postdocs or sabbatical researcher. No citizenship restrictions. Stipend $38 500 for 1 year plus modest research and travel funds.

00176 **SPIE—Educational Grants in Optical Engineering**
Grants $500–$7 000 to institutions to support optics/optical engineering. Student travel grants to SPIE functions only.

00195 **Smithsonian—Predoctoral Flwshps.—Biological/Physical Sciences**
Includes travel allowance to assist with temporary relocation but probably only within US.

00197 **Smithsonian—Postdoctoral Flwshps.—Biological and Physical Sciences**
Includes travel allowance to assist with temporary relocation but probably only within US.

00305 **American Museum of Natural History Research Fellowships**
One year in-residence fellowships support advanced study in vertebrate zoology, invertebrate zoology, paleontology, anthropology and earth and planetary sciences. Candidates normally must hold doctoral degrees; although equivalent experience considered. Two year appointments possible in vertebrate paleontology and ornithology. Fellowships provide limited support for research supplies, expenses, and travel, plus salary.

00355 **Smithsonian—Predoctoral Fellowships at Smithsonian Astrophysical Observatory (SAO)**
Awards provide annual stipends of $14,000 for in-residence research in atomic and molecular physics, high energy astrophysics, optical and infrared astronomy, planetary sciences, radio and geoastronomy, solar and stellar physics and theoretical astrophysics. Students who have completed preliminary course work and examinations for the doctoral degree may apply. No citizenship restrictions. Applicants must have approval from their institution to conduct research at SAO. One year up to three years—some funds may also be available for relocation, travel and other expenses.

00370 **Smithsonian—Postdoc. & Sr. Flwshps. at Marine Station, Link Port**
Awards provide an annual stipend of $27,000 to postdoctoral and senior postdoctoral scholars, plus research and travel allowances, for in-residence research at the Smithsonian Marine Station at Link Port, FL. No citizenship restrictions. Postdoctoral fellowships awarded to scholars who have held the PhD for up to seven years before the application deadline. Senior postdoctoral fellowships provided to scholars more than seven years beyond the doctoral degree. Duration ranges from 6 to 12 months for postdoctoral and three to twelve months for senior postdoc awards. Awards also provide a research allowance and a travel allowance equivalent to one round-trip fare from the nearest major airport to the research site.

00501 **Center for Field Research Grants**
Postdoc—Earthwatch not mainstream (allowable travel is of principal investigator to and from the field). Minimum size of project has to involve 15 volunteers. Average award $800.

00522 **American Museum of Natural History Lerner-Gray Fund for Marine Res.**

Awards provide one year of support generally ranging from $200 to $1000, average is $700, for projects in marine zoology. Eligible applicants are graduate students and postdoctoral researchers. Travel expenses included but conference or meeting costs not supported.

00543 **NASA—Goddard Space Flight Center—Unsolicited Proposals**

Domestic and foreign organisations can apply. Domestic and foreign travel

00557 **ONR Physical Sciences Science and Technology Research Program**

Support provided to individuals and institutions for research in the physical sciences in areas that have naval relevance (physical chemistry, atomic and molecular physics, polymer chemistry, electrochemical science and technology, solid state and surface chemistry, organic and organometallic chemistry, nonlinear dynamics, physical acoustics, lasers and electro-optics, and plasma physics). Foreign researchers eligible. Both direct and indirect co are allowed. Preliminary correspondence with sponsor encouraged to establish areas of mutual interest.

00561 **WHO/IARC Fellowships for Research Training in Cancer**

Junior scientists—room board and incidental expenses for one year. Should be able to read and write English or the language of the country in which the fellowship is tenable. Preference will be given to applicants who have not previously received postdoc training abroad in cancer research.

00687 **Smithsonian—Guggenheim Fellowships at the Natl. Air & Space Museum**

Support to pre- or postdoctoral candidates for in-residence historical and scientific research related to aviation and space at the National Air and Space Museum in Washington, DC. No citizenship restrictions. Stipends of $14,000 are provided to predoctoral candidates and stipends of $25,000 are provided to postdoctoral candidates. Limited funds for travel and miscellaneous expenses are also available. Duration of awards is six to twelve months.

00817 **Fondation Simone et Cino del Duca Travel Grants**

Foreign researchers travelling to France. (For French travelling abroad and foreign researchers travelling to France). Travel for conferences not allowed.

00858 **American Museum of Natural History Collection Study Grants**

Grants enable predoctoral and recent postdoctoral investigators to study the Museum of Nat History's collections. Awards are $1000. No citizenship restrictions. Awards may be used towards travel and subsistence expenses. The visit must be arranged through and sponsored by a scientific staff member of the Museum. Visits of four days or longer are encouraged.

00874 **HHMI—Postdoctoral Research Fellowships for Physicians**

For 3 years. $40,000–$60,000 per year. Annual research allowance of $16,000 and an institutional allowance of $13,000. Research allowances covers travel to professional meetings.

00921 **Lindbergh Foundation Grants**

Funds can't be used for travel.

00922 **Smithsonian—Molecular Evolution Fellowships**

Must have completed PhD. Based at different institutes. Includes travel allowance—wide range of disciplines.

00924 **National Geographic Society—Research Grants**

Grants averaging between $15,000 and $20,000 per year are provided to investigators with advanced degrees for geographic field research. Priorities are environmental concerns and global geographic issues. Emphasis placed on multi-disciplinary projects. Competition is keen and awards to non-PhD applicants are rare. As a general rule, all applicants are expected to have published a minimum of three articles in peer-reviewed scientific journals. Average grants between $15,000 and $20,000 per year. Grants may not be used for expenses not directly related to the project . Funds may not be used for travel to scientific/professional meetings or conferences. Grants are generally intended to function as complementary support, and the sponsor encourages applicants to seek additional, concurrent funding from other agencies.

00977 **NCAR—Postdoctoral Appointments**

Recent postdocs or no more than 4 years experience. 2 year appointment—$35 000 in first year, $37 000 in second for atmospheric research. No citizenship restrictions. Internal appointments reimbursed travel of $800 for fellow and family, $2 500 for externals. Modest assistance with health, life, removal expenses. $1 050 p.a. for scientific travel/registration fees.

01014 **Guggenheim Fndn.—Research Grants**

Support provided to individuals for research in any of the natural and social sciences and the humanities that will increase understanding of the causes, manifestations, and control of violence, aggression, and dominance. Range from $15,000 to $35,000 per year for one or two years. Priority given to areas and methodologies not receiving adequate attention and support from other funding sources. Funds are not supplied for overhead costs of institutions, travel to professional meetings etc.

01033 **NRC—Reg. Resident Associateships in Life, Medical, & Behavioral Sci.**

Certain labs do not accept non-US nationals. Non-US nationals reimbursed for round-trip travel. Attendance at 1–2 professional meetings per year is encouraged. Limited funds are available for such travel.

01114 **NASA—Johnson Space Center—Unsolicited Proposals**

Domestic and foreign organisations can apply. Domestic and foreign travel..

01115 **NASA—Langley Research Center—Unsolicited Proposals**

Domestic and foreign organisations can apply. Domestic and foreign travel.

01116 **NASA—Lewis Research Center—Unsolicited Proposals**

Domestic and foreign organisations can apply. Domestic and foreign travel.

01117 **NASA—Marshall Space Flight Center—Unsolicited Proposals**

Domestic and foreign organisations can apply. Domestic and foreign travel.

01118 **NASA—John C. Stennis Space Center—Unsolicited Proposals**

Domestic and foreign organisations can apply. Domestic and foreign travel.

01119 **Smithsonian—CAL Postdoctoral Conservation Fellowships**

Fellowships for advanced training in conservation and technical study of museum objects and related materials. Applicants must have completed the doctoral degree less than seven years before the application deadline. Award provides a stipend of $25,000 for one year, plus a travel and research allowance of $2000. Plus health insurance.

01318 **McDonnell Fndn.—McDonnell-Pew Pgm. in Cognitive Neuroscience**

Must be conducted at a US institution. Interdisciplinary training and seed funds for collaborative research. Won't support conference travel.

01399 **NSERC—Visiting Flwshps. in Canadian Govt. Labs-Eng./Comp./Math Sci.**

Natural sciences/engineering doctoral candidates or those with PhD of not more than 5 years. Up to 2 year fellowships at Canadian govt. lab. Stipend of $38 184, plus travel allowance for fellow and family. No citizenship restrictions but 2/3 of awards must be made to Canadian citizens.

01453 **Academy of Natural Sciences of Philadelphia McHenry Awards**

Awards of $250/week for up to 16 weeks support botanical science students wishing to conduct in-residence studies under the supervision or sponsorship of a member of the sponsor's curatorial staff. Round trip travel coasts are also allowed—up to a total of $1000 for travel from outside North America. Pre—and post doctoral students within several years of receiving their PhDs—no citizenship restrictions.

01469 **APS Frank Isakson Prize for Optical Effects in Solids**

A prize of $5000 offered in even-numbered years for contributions to the field of optical effects in solids. No citizenship restrictions. Certificate and travel expenses to the meeting.

01482 **APS Biological Physics Prize**

A prize of $5000 is offered in even-numbered years to recognize outstanding achievement in biological physics research. No citizenship restrictions. Certificate and travel expenses to the meeting.

01493 **American Society for Photogrammetry/Remote Sensing—Ta Liang Memorial Award**

One award of $500 available to facilitate research-related travel by an outstanding graduate student in remote sensing. Such travel may include field investigations, agency visits, participation in conferences, or any travel which enhances or facilitates a graduate research program. Applicants must be student members of the sponsor's society. No citizenship restrictions.

01522 **Human Frontier Science Program Short-Term Fellowships**

To promote basic research through international cooperation—fairly broad fields of science covered. Preference given to young investigators in the early stages of their careers. 2 weeks—3 months. Awards not intended to enable researchers to attend workshops, courses or symposiums. Round trip travel expenses.

01611 **American Orchid Society Grants for Orchid Research**

Support for researchers and graduate students to conduct research on orchids in every aspect and to assist in the publication of scholarly and popular scientific literature on orchids. Grants range from $500 to $12000 with a maximum duration of 3 years. Grants awarded to sponsoring institution. No awards are made directly to individuals. In general, travel to collect orchids is not supported. Other types of travel may be supported on a case-by-case basis.

01681 **APS W.K.H. Panofsky Prize**

A prize of $5000 recognizes achievements in experimental particle physics. Normally given for contributions made at an early stage of the recipient's career. Certificate plus allowance for travel to the meeting.

01686 **APS J.J. Sakurai Prize for Theoretical Particle Physics**

Prize of $5000 recognizes achievement in particle theory by a young physicist at an early stage of his or her research career. Certificate plus allowance for travel to the meeting.

01690 **APS Robert R. Wilson Prize**

Prize of $5000 recognizes achievement in the physics of particle accelerators. Prizes normally awarded for contributions made at an early stage of the recipients' career. Certificate plus allowance for travel to the meeting.

01705 **SPIE—Educational Scholarships in Optical Engineering**

Grants $500–$7 000 to undergraduate/graduate students to support optics/optical engineering. Student travel grants to SPIE functions only. No citizenship restrictions.

01942 **AAS Chretien International Research Grants**

Up to $20,000 available for international collaborative projects in observational astronomy. Eligible applicants are one or more individuals or groups of astronomers. Innovative development or use of new optics, devices, and techniques, and development of close working relationships with astronomers in other countries favoured. Emphasis on long-term visits. Any nationality but must have PhD or equivalent. Preference to individuals of high promise who are otherwise unfunded. Awards can be used for travel costs. If appropriate, the recipient's family is encouraged to accompany him or her.

02004 **Rockefeller Fndn. Bellagio Study & Conf. Ctr.—Intl. Conferences**

Provided for groups. Health/nutrition one of the fields covered; 25 participants per group. B&B but no airfares. 3 days. At least half of the participants must be other than US-Canadians and no more than half the participants from any one country.

02026 **Harbor Branch Postdoctoral Fellowships**

Support for study/training in marine science for 1 year, with renewal possible. PhD within 5 years. No citizenship restrictions. Limited budget for travel, partially subsidised health cover, affordable housing. Applicants advised to review sponsor's patent policy.

02055 **Sigma Xi Grants-in-Aid of Research**

Undergraduate or graduate assistance for scientific investigation in any field. Awards $1 000 max (except eye/vision $2 500). No citizenship restrictions. Travel and living expenses allowed for field research. Grants not made for travel to scientific meetings or symposia.

02227 **Lady Davis Graduate Fellowships**

9–12 months graduate study in Israel (extension may be possible). Priority given to Canadians. Travel costs, tuition fees and monthly stipend of $900.

02346 **MBL—Frank R. Lillie Fellowship**

Fellowship at the Marine Biological Laboratory for a research laboratory and funds for travel and supplies. Summer rentals are for a four-month period at a rate of $41.33 per square foot. Lab space may be shared by multiple investigators.

02350 **MBL—Nikon Fellowship**

A summer fellowship at the Marine Biological Laboratory for a young investigator for research in an area of biology in which they can make extensive use of advanced microscopy and/or micromanipulation systems provided by Nikon, Inc. for their laboratory, and also benefit from technical expertise offered by Nikon, Inc. to support these instruments. Includes a summer lab, housing, travel, and a budget for incidental expenses, equipment rental, and supplies.

02399 **Weizmann Institute of Science Postdoctoral Fellowships**

Postdoc candidates who have received a PhD degree of equivalent within the past three years. Awards include a stipend (adjusted to the cost-of-living index), a relocation allowance, and airfare. One year possibly two. Stipend varies depending on marital/family status. Fellows must arrange medical insurance for themselves and their family. All rental costs borne by fellow. Tenable middle/near East.

02575 **UCAR—NOAA Postdoctoral Program in Climate and Global Change**

Two-year visiting research appointments to postdoctoral candidates, to be paired with host scientists, to conduct research on the variability and predictability of the coupled ocean—atmosphere—land—ice system and the resulting socioeconomic consequences of climate variability. Fellows receive a fixed annual stipend and health, dental and life insurance. Preference to those recently graduated from PhD. Relocation allowance provided as well as allowance for scientific travel and other support costs.

02766 **NASA—Kennedy Space Center—Unsolicited Proposals**

Domestic and foreign organisations can apply. Domestic and foreign travel.

02788 **International Foundation for Ethical Research—Basic and Applied Research Grants**

Supports research on valid alternatives to the use of live animals in research, testing and teaching. Funding for one year with possible renewal. Grants up to $25,000. Does not provide for travel to scientific meetings.

03113 **NASA—Jet Propulsion Laboratory—Unsolicited Proposals**

Domestic and foreign organisations can apply. Domestic and foreign travel.

03230 **ACS—Awards Program**

54 different awards for individuals in diverse fields of chemical sciences. Each award has particular focus and certain restrictions may apply. In some cases nominees must be US citizens. Awards $3 000–$5 000, with funds for travel expenses $1 000–$1 500.

03430 **Lady Davis Postdoctoral Fellowships**

9–12 months postdoctoral fellowships in Israel (extension may be possible). Priority given to Canadians. Travel costs, accommodation allowance and monthly stipend of $1 300.

03479 **Academy of Natural Sciences of Philadelphia Jessup Awards**

Awards of $250/week for up to 16 weeks support natural science students wishing to conduct in-residence studies under the supervision or sponsorship of a member of the sponsor's curatorial staff. Round-trip travel costs are also allowed. Eligible applicants are pre- and postdoctoral students within several years of receiving their PhDs. No citizenship restrictions.

03483 **JILA Visiting Fellowships**

6 to 10 in-residence fellowships in low-energy atomic and molecular physics, astrophysics, chemical physics. Postdocs with extensive research experience and younger persons with significant scientific achievements. No citizenship restrictions.

Stipends based on need/experience, normally $3 500 per month. Help with transport costs of fellow and family. $1 500 for professional travel within US.

03494 **Michigan Society of Fellows—Postdoctoral Fellowships**

PhD within last 3 years. Provides 3 years in-residence with stipend of $36 000 and $1 500 for travel/research expenses.

03805 **Human Frontier Science Program Organization Long-Term Fellowships**

$40,000 annually for post doc applicants who wish to pursue research in foreign countries. Provide travel expenses or language training up to $5,000 US.

03831 **Fondation Simone et Cino del Duca Maintenance Grants**

French researchers travelling abroad and foreign researchers travelling to France. Funds may not be used for participation in conferences or congresses.

03898 **NRC—Research Associateships**

$39,366 p.a. Canadian for two years of research in sponsor's labs in Canada. Open to all nationalities but preference given to Canadians. Travel allowance for associates and their families is provided.

04138 **USGS—National Earthquake Hazards Reduction Program (NEHRP)**

Proposals for foreign research must be based on cooperation with scientific groups in the host countries, with host country personnel being used for operational functions, and host countries providing financial support for such personnel. Travel supported.

04186 **Golda Meir Fund—Fellowships at the Hebrew University of Jerusalem**

Medicine and dental medicine amongst fields listed. Grants intended to defray costs of travel for postdoc fellows only.

04255 **Rockefeller Archive Center Travel and Research Grants**

Archival collections of Rockefeller family. Major subjects at the centre include medicine. Travel grant—successful applicant would need other funds to support stay.

04258 **Procter & Gamble—University Exploratory Research Program**

Supports areas of emerging sciences which might not otherwise be funded because considered too speculative. $50,000 p.a. for 3 years.

04524 **Univ. of Queensland—Postdoctoral Research Fellowships**

Overseas and local candidates. $37,170 to $41,421 p.a. plus a sum of $3,500 to host departments for expenses connected to the research. $500 of each allocation will be made available to the Fellow as a contribution towards fieldwork or attendance at conferences, workshops or symposia directly associated with and essential to the Fellowship.

04889 **ARDF Research Grants**

Supports research on reducing or replacing the use of lab animals in biomedical research, product safety testing, or educational demonstrations. Funds can't be used for travel. One year grants—cover project costs, including equipment and supplies.

05040 **AGU—Horton Research Grant**

Items may include living costs; research costs, such as laboratory supplies, computer time, or field instrumentation; travel costs to one technical symposium; and book purchases. Eligible applicants—doctoral candidates.

05323 **Museum of Comparative Zoology Ernst Mayr Grants**

Grants averaging $1000 each fund animal systematists' travel to the sponsor's facilities or other museums, both domestic and foreign, to undertake research to complete taxonomic revisions and monographs. Preference given to scientists who could not otherwise afford to study these specimens. No citizenship restrictions.

05369 **APS Award For Outstanding Doctoral Thesis Research in Beam Physics**

$1,500 awarded plus an additional allowance of up to $500 for travel to the meeting at which the award will be presented. Presentation by awardee to the meeting invited.

05442 **NRC—Reg. Resident Associateships in Earth and Atmospheric Sciences**

Conduct research in the earth and atmospheric sciences at US Govt labs. Stipend from $27,750 to $45,500. Tenure one year, renewable up to three years. Non-US nationals living outside the US are reimbursed for round trip travel, relocation of dependents, and transport of a limited amount of personal belongings. Attendance at one or two professional meetings yearly is encouraged; limited funds are available for such travel. A health insurance program is available on a cost-sharing basis for associates and dependents.

05443 **NRC—Reg. Resident Associateships in Earth and Atmospheric Sciences**

Conduct research in the space and planetary sciences at US Govt labs. Stipend from $27,750 to $45,500. Tenure one year, renewable up to three years. Non-US nationals living outside the US are reimbursed for round trip travel, relocation of dependents, and transport of a limited amount of personal belongings. Attendance at one or two professional meetings yearly is encouraged; limited funds are available for such travel. A health insurance program is available on a cost-sharing basis for associates and dependents. (Aeronautical/Astronautical Engineering)

05444 **NRC—Reg. Resident Associateships in Engineering/Applied & Comp. Sci.**

Conduct research in engineering applied and computer sciences at US Govt labs. Stipend from $27,750 to $45,500. Tenure one year, renewable up to three years. Non-US nationals living outside the US are reimbursed for round trip travel, relocation of dependents, and transport of a limited amount of personal belongings. Attendance at one or two professional meetings yearly is encouraged; limited funds are available for such travel. A health insurance program is available on a cost-sharing basis for associates and dependents.

05445 **NRC—Reg. Resident Associateships in Chemistry**

Conduct research in chemistry at US Govt labs. Stipend from $27,750 to $45,500. Tenure one year, renewable up to three years. Non-US nationals living outside the US are reimbursed for round trip travel, relocation of dependents, and transport of a limited amount of personal belongings. Attendance at one or two professional meetings yearly is encouraged; limited funds are available for such travel. A health insurance program is available on a cost-sharing basis for associates and dependents.

05447 **NRC—Reg. Resident Associateships in Mathematics and Physics**

Conduct research in mathematics and physics at US Govt labs. Stipend from $27,750 to $45,500. Tenure one year, renewable up to three years. Non-US nationals living outside the US are reimbursed for round trip travel, relocation of dependents, and transport of a limited amount of personal belongings. Attendance at one or two professional meetings yearly is encouraged; limited funds are available for such travel. A health insurance program is available on a cost-sharing basis for associates and dependents.

06411 **Bermuda Biological Station for Research, Inc. Volunteer Internship Programme**

Offers in-residence volunteer internship program to broaden the student's knowledge of marine and atmospheric sciences and to acquaint him/her with the daily operations of a research station. Minimum four months. Free room and board. Students must pay for their travel to and from Bermuda. No stipend.

06425 **BBSR Visiting Graduate Internship Program**

Offers in-residence internships for M.S. and Ph.D. candidates to conduct thesis research in mine sciences and oceanography. Housing, lab facilities and sponsor may offer $200 per month in exchange for service as teaching associates and research assistants. Initial appointments for three to twelve months. Travel costs must be covered by the intern or the intern's home institution.

06451 **JILA Postdoctoral Research Associateships**

In-residence, postdoctoral research associateships—$28,000–$35,000 at the Joint Institute for Laboratory Astrophysics. One year renewable for two. Transportation to Boulder may be paid for the appointee and his/her spouse and minor children. An allowance for shipment of personal effects of up to $400 for single appointees and $600 for married appointees, as well as an allowance for appropriate professional travel within the US during the period of appointment.

07682 **WHOI—Postdoctoral Fellowships**

One year stipend of $38,500 plus limited support for travel, equipment, supplies and special services. Duration 18 months. Relocation allowance. Eligible for group health insurance.

07683 **WHOI—Program of Summer Study in Geophysical Fluid Dynamics**

Up to ten pre-or post-doctoral fellowships available with stipends of $3,900 for a ten week summer program for study in geophysical fluid dynamics. Aim is to provide an up-to-date review of the subject and exposure to applications in several disciplines in order to stimulate further research. Allowance is provided for travel expenses in the US.

07953 **NASA—Langley Research Center—ICASE Senior Staff/Staff Sci. Appt.**

Opportunities for recent PhD recipients and those with at least five years experience after the PhD to collaborate with NASA scientists and engineers. Appointments up to 2 years. Financial assistance available (includes stipends and travel plus relocation allowances). Staff scientist positions are available for recent PhD recipients without institutional affiliations who show unusual promise.

07954 **NASA—Langley Research Center—ICASE Graduate Student Appointments**

Opportunities for doctoral candidates to collaborate with NASA scientists and engineers. Financial assistance, including stipends and travel-relocation allowances, is available. Stipends are competitive with academic salaries. Specific arrangements are on an individual basis in order to accommodate the particular requirements of each appointee.

08069 **NIAMS—Res. on Effects of Microgravity on the Musculoskeletal System**

Basic, applied and clinical research projects. Applications submitted by institution.

08196 **Morris Animal Foundation Research Grants**

Grants fund research into disease and health problems of canine, equine, feline and avian animals, llamas and wildlife and studies in the reduction of pain perception. Average $21,000 p.a. Awards for wildlife related projects limited to $15000 annually. Pilot studies funded up to a max. of $4000. Max duration 3 years. Support does not include travel to scientific meetings.

08292 **NRC—Hughes Predoctoral Fellowships in Biological Sciences**

Up to 80 awards. Stipend of $15,000 p.a. Awarded for one year initially with the possibility of extending it to three years. Institutions receive annual cost of education allowance of $15,000 p.a. for three years—$2,200 of which must be used for the direct benefit of the fellow e.g. funds may be spent for travel expenses to scientific meetings. No dependency allowances.

08564 **ACS—PRF—Type B Research Grants**

Support provided for research related to the petroleum field. Awards up to $25,000 for two years. Funds may be used for stipend support for undergraduates; summer salary support for the principal investigator; research-related travel; and equipment. Summer salaries are not provided for principal investigators in colleges or universities outside of the US.

08565 **ACS—PRF—Type SE Grants for Scientific Education**

Support provided for travel of foreign speakers to conferences, symposia, meetings or other educational activities of a special nature. Priority given to support non US and non-Canadian speakers at meetings in US or Canada. $1000 max per speaker—max 2 foreign speakers.

08763 **APS Award/Outstanding Doc. Thesis Res. in Atom./Mole./Opt. Physics**

Annual prize of $1000 recognizes outstanding doctoral thesis research in atomic, molecular, or optical physics, and encourages effective written and oral presentation of research results. All finalists receive a travel stipend of $500.

08903 **Smithsonian—CAL Graduate Conservation Internships**

One-year internships provide training in conservation and technical study of museum objects and related materials. Eligible applicants are advanced students enrolled in graduate conservation training programs that require a year of such experience. Awards provide a stipend of $14,000 plus $2000 travel plus health insurance.

08906 **Smithsonian—CAL Pre-doctoral Conservation Fellowships**

Offers a year-long fellowship in conservation and technical study of museum objects and related materials for an individual who has completed all coursework for the PhD, and who are engaged in dissertation research. Includes a $20,000 stipend, $2,000 for travel, plus health insurance.

09520 **ACC Young Investigators Awards**

Cardiology—Best study for a project on cardiovascular disease for those presently in a residency or fellowship training program. A plaque, a certificate and a cheque for $2,000 for first place. Second place a certificate and a cheque for $1,000. Travel and per diem expenses for attending sponsor conference.

09725 **PAF—Pediatric Short-Term Scientific Awards**

Up to $5000 for travel and short term study in area of study in pediatric AIDS.

10425 **Smithsonian—Paul E. Garber Fellowship**

Provides a fellowship for one or more years to pre- and postdoc candidates interested in astrophysics or planetary and terrestrial geologic and geophysical studies for in-residence research at the National Air and Space Museum. Stipend equivalent to the National Research Council Awards, with limited funds available for travel and miscellaneous expenses.

11360 **Northwood University—Alden B. Dow Creativity Center Fellowship Pgm.**

Sponsor provides for four ten-week in-residence fellowships each summer on the Midland campus for individuals in any field or profession who wish to pursue an innovative project or creative idea. Awards include travel, living quarters, board, and a stipend of $750. Expenses for foreign citizens will be covered from the point of entry into the continental U.S.

12923 **OSA—New Focus Student Travel Grants**

Travel grants of up to $500 each will be available to students to present papers at the sponsor's annual meeting.

13484 **Dystonia Medical Research Foundation—Dystonia Research Grants**

$35,000 per year. All non-profit organizations and institutions within the US, Canada, and those countries overseas where supervision of grant administration is possible. Travel costs not allowed under grant.

15094 **SOT—Colgate-Palmolive Postdoc. Flwshp. in In Vitro Toxicology**

Fellowship of $33,500 offered to postdoctoral trainees in their first year of study beyond PhD, MD, or DVM. Offered biennially. Funds include stipend of $22,000 and additional funds which can be used for supplies, equipment or research-related travel. Second year possible.

15351 **NSERC—Visiting Flwshps. in Canadian Govt. Labs/Physics & Chemistry**

Stipends of $35,184 per year, plus travel, for up to two years for research at a Canadian government lab in the disciplines of Physics and Chemistry. Awards made to a citizenship quota: two thirds to Canadians. Travel allowance for the fellow, spouse, and children.

15362 **NSERC—Visiting Flwshps. in Canadian Govt. Labs/Life Sci./Psychology**

Stipends of $35,184 per year, plus travel, for up to two years for research at a Canadian government lab in the disciplines of the Life Sciences or Psychology. Awards made to a citizenship quota: two thirds to Canadians. Travel allowance for the fellow, spouse, and children.

18591 **AVS—Peter Mark Memorial Award**

$3,500 and a certificate to recognise outstanding theoretical or experimental work by a young scientist or engineer (less than 36). Travel expenses to presentation reimbursed.

19750 **Mizutani Foundation for Glycoscience—Research Grant**

Applicants must hold Doctorate and be member of scientific institution (where he/she can carry out proposed project). Award maximum is 10,000,000 yen p.a. Budget may include travel.

20861 **UCAR—NOAA Office of Hydrology Visiting Scientist Program**

Two visiting scientists with graduate degrees or equivalent experience in hydrology, physical geography, snow science, or related earth science, and development and application of geographic techniques. Three years with a fixed stipend. Benefits include health and dental insurance, paid holidays, participation in a retirement fund and life insurance. A relocation allowance is provided as well as an allowance for scientific travel and other support costs.

22249 **NHF—Post-Doctoral Fellowships**

Tenable for 3 years initially, possibility of extension to no more than 5 years. Available for medical /science graduates qualified within past 4–6 years. Allowances for travel for specific purpose directly related to research program may be granted.

22250 NHF—Overseas Research Fellowships

Fellowships of 3 years—two overseas, third in Australia (possible extension to 4 years). Available to graduates resident in Australia with at least 2 years experience in research. Fellowship covers salaries ($38284 to $46503) and appropriate allowances (e.g. initial expenses and rent), including minimum return air fares for Fellow and family, and a four week annual vacation.

22251 NHF—Clinical Research Fellowships

Applicants must have appropriate clinical experience and hold higher qualification. ' These fellowships aim to build research expertise, future career opportunities, and a long term commitment to clinical cardiovascular research among clinicians.' Tenable 1–2 years, with part-time tenure in special circumstances. Travel for specific purpose directly related to the research program may be granted.

22253 NHF—Travel Grants

Grants to assist both junior investigators and NHF Fellows (engaged in clinical or basic medical sciences research related to cardiovascular physiology/disease). Grants to attend conferences, meetings or take up posts in overseas institutions. Four types of grants are specified.

22408 Mackenzie Trust—Post-Doctoral Fellowship in Comparative Anatomy

Awarded every 2 years (for 2 years of study) to medical graduate recently completed appropriate research degree. Must undertake comparative study of anatomy of animals and human beings. Award offers $48000 in first year, $47000 in next. This includes $6000 stipend for first year and $5000 for second (for first year equipment, maintenance and Australasian conference travel costs).

22414 Matsumae International Foundation Fellowship Program

Offering 20 fellowships (especially for applicants from developing countries) in fields of natural science, engineering and medicine. In 1999 for period of 3–6 months. Eligibility requirements—hold doctorate, under 40 years of age, conversational ability in English or Japanese, should not have visited Japan before, must return to own country. Support will include round-trip airfare, cost of accommodation, local travel, personal accident/sickness insurance, but no support for family.

22415 NHMRC—C.J. Martin Fellowships

Post doctoral training in basic research for 4 years—2 overseas, 2 Australia. Stipend commences $38 284 (as at 1/1/98). Superannuation and overseas allowance payable, plus research maintenance of $4 000 p.a. Minimum cost airfares for Fellow and dependents. Additional allowance of $500 payable towards cost of conference travel.

22426 NHMRC—Australian Clinical Research Postdoctoral Fellowship

Awarded max 4 years and may be divided between two different institutions. An allowance of $500 p.a. is payable toward the cost of conference travel (no stipulation that this has to be in Australia)

22431 NHMRC—Peter Doherty Post-Doctoral Fellowships

Awarded for a period of 4 years. An allowance of $500 p.a. is payable toward the cost of conference travel (no stipulation that this has to be in Australia)

22434 NHMRC—Neil Hamilton Fairley Fellowships

Post doctoral training in clinical research for 4 years—2 overseas, 2 Australia. Stipend commences $38 284 (as at 1/1/98). Superannuation and overseas allowance payable, plus research maintenance of $4 000 p.a. Minimum cost airfares for Fellow and dependents. Additional allowance of $500 payable towards cost of conference travel during the Australian portion of the Fellowship.

[NB last proviso not in C.J. Martin but generally conditions are supposed to be the same.]

22463 NHMRC—R D Wright Awards

This Australia-based award is not intended as an initial postdoctoral appointment, but is meant for outstanding researchers at an early stage in their careers. (Applicants have to provide evidence of high quality research output.) Salary at $43 260 for 4 years, plus allowance of $10 000 p.a., of which $3 000 may be used for conference travel.

22538 FRDC Fisheries Research & Development Investment

Funding may be used for both domestic and overseas travel. Organisations/individual researchers. R&D projects. Likely that grants are awarded to more established researchers who can include early career researchers as part of the research team.

22545 ARC Large Research Grants

ARC has entered into agreements with research agencies overseas in order to facilitate joint-funding of

research projects. Austria, France, Germany, Netherlands, Italy and EU.

For the straight Large Grants travel can be outside Australia as long as the project is based in Australia. Also travel and attendance at conferences is permitted. Salaries can be sought for salaried non-tenured post-doctoral personnel.

22546 ARC Fellowships

Foster opportunities for pursuing internationally competitive independent research. It is expected that part of funds to be used for field work or conference/symposium associated with or essential to the fellowship.

22547 ARC Strategic Partnership with Industry Research & Training (SPIRT)

Projects must be undertaken by investigators including APD Fellows (Industry). Normal travel overseas for field work collaboration, conferences etc is permitted. Nothing in profile regarding travel for students associated with the project.

22549 ARC Small Grants

University discretion regarding how small grants allocated and whether or not overseas travel is supported.

22687 DEST—Antarctic Research Project and Grants

Limited funding available for investigators based at Australian agencies or organisations which are not normally funded by the Commonwealth or State governments to undertake research. Research will be subject to ANARE'S program areas plus intrinsic scientific merit. Australian researchers planning to work in Antarctica but outside the Australian Antarctic Territory may be eligible for funding. Sponsor sees task as supplying funds for special facilities needed for a project over and above basic facilities provided by the researcher's own organisation. Allowances included travel and support costs—economy air fares to/from Hobart prior to departure/return Antarctica. $400–$600 allowed for mandatory medical examinations. Unlikely equipment costing more than $20 000 will be supported.

22688 DFAT Australia-Korea Foundation Grants

Grants intended to provide seed funding for innovative proposals to foster long-term links between individuals and institutions in Australia and counterparts in Korea. AKF seeks to promote understanding of contemporary aspects of both countries, including history, culture, language and traditions, plus increased collaboration in industry, science and technology. No funding for conference travel, attendance at meetings, field work and other short-term activities where travel is the principal element of the grant proposal.

22816 Australian-American Educational Fndn. Fulbright Postdoctoral Fellow

Awards for postdoctoral research for 3–12 months (extensions possible in some cases, but without allowance). Most economical airfare for fellow and one dependent included, plus monthly allowance (A$1 950 per month), modest living allowance and limited health insurance cover for fellow. All academic disciplines allowed, but applications from special fields encouraged. Two awards given in 1998. Applicants must be Australian citizens by birth or naturalisation. Applicants should be no more than 3 years postdoctoral (4/5 years may be considered). Preference given to those without previous US academic or professional experience. An additional travel entitlement of A$2 500–A$3 000 is available depending on length of program.

22844 GRDC—Research Grants

Covers travel where it forms an integral part of the project (not necessarily overseas).

22846 AAS—Science and Technology Agency: Postdoctoral Flwshps. in Japan

Young Australian scientists and technologists—conduct research in a scientific, technological, engineering or medical field, in national laboratories and public research corporations (excluding universities and university-affiliated institutes) in Japan. Award is for a period of 6 months to 2 years. Applicants should be under 35 years of age. Fellows provided with a return airfare, a monthly living allowance of 270,000 yen, a monthly housing allowance, a settling-in allowance, an annual travel allowance, a family allowance if accompanied by dependents, and medical and accident insurance coverage for the fellow only. Provision will be made for Japanese language training.

22848 ARC Research Infrastructure Equipment & Facilities Program Grants

Does allow for travel costs to participate in international consortiums.

22854 AAS—Frederick White Prize

Awarded biennially to scientists in physical, terrestrial, planetary or biological sciences. Preference given to younger scientists. Support up to $3 000—for cost of personal research program, including equipment, travel and publication.

22861 GWRDC—Research Grants

Focus on research on problems and opportunities of national and regional signficiance to the grape and wine

industry. Sponsor will consider applications for travel, study tour, and conference attendance that align with the Corporation's R&D priority areas.

22862 **AAS—Scientific Exchanges with China**

Supports scientific exchanges with the People's Republic of China. Two to six weeks to collaborate with Chinese researchers at Chinese Academy of Science Institutes. The Academy provides an excursion economy international airfare and the Chinese Academy of Sciences arranges and pays for accommodation, meals and travel within china.

22867 **AAS—Scientific Exchanges with the United Kingdom**

Primary purpose of the program is to support collaboration between Australian and UK researchers (should be of postdoctoral or comparable status). Proposals in any field of natural science (basic and applied), including mathematics and engineering science. Letters of invitation from host institutions must accompany applications. Provides for return airfare to max. of $2 600 and max. daily allowance of $125 for period of up to 6 weeks. Preference given to visits which are short-term and highly focused. Low priority to proposals to supplement study leave or gain immediate postdoctoral training. Support not given when primary purpose of visit is to attend a conference.

22875 **AAS—University of Oxford—Oxford Nuffield Medical Fellowship**

No limit as to age or status 'applications from keen young research students are welcomed'. Tenable for 2 years with possibility of a third year. Requirement of returning to Australia for at least 3 years after Nuffield Fellowship. Clinical Lecturers' scale—28,370—29,670—30,970 pounds per annum. A child allowance of 100 pounds per annum for each dependent child, and travel allowances for travel on official business during appointment. Direct economy air fares for the appointee, spouse and children up to 18 years of age. Generous baggage allowance. Range of risk insurance also provided.

23071 **DPIE—Australia/China Agricultural Co-Operation Agreement**

Provided to cover international travel. Within China, China meets the travel costs. Specifically for agri-business cooperation.

23147 **AW Howard Memorial Trust—Travel Grants**

$3000 to undertake overseas study tours or participate in international conferences related to pasture research. The awards represent a career development opportunity. Preference will be given to scientists who have had little opportunity to travel overseas.

23157 **Asialink Centre—Sir Edward 'Weary' Dunlop Asia Fellowship**

$20,000—citizens 18–40. Variety of disciplines. Fellows must maintain an association with the University of Melbourne through the Asia Link Centre.

23446 **SRDC—Travel/Conference Grants**

Overseas and domestic travel to attend seminars and conferences.

23471 **CRDC—Post-Doctoral Research Fellowships**

Research in Australia but in special circumstances research outside Australia may be approved.

23569 **DEETYA—Offshore Australian Studies Program (Temporarily Suspended)**

Temporarily suspended. Submissions may come from all education sectors, business and industry associations. Individual activities can be allocated for up to 3 years. Funds may be used for travel. Projects eligible include international visits, exchanges or collaborations, Australian studies awards or fellowships for academics.

23752 **World Bank—MIGA Summer Employment Program**

Open to students who are nationals of the banks member countries. Summer employment, monthly salary and travel allowances. Must have bachelors degree andd be enrolled as a fulltime student in a masters or PhD.

23937 **AMEEF Environmental Awards: Travelling Scholarship**

Awards of $15 000 for significant contributions to knowledge and practice of environmental management in minerals and energy industries. Program is to enable recipient to study new overseas developments. Person active in management/research/practice who is under 45 years of age and has appropriate experience is eligible to study overseas.

24130 **NHMRC—INSERM Exchange Fellowships**

Enables fellows to work overseas on specific projects. Offered to a young person of outstanding ability. One fellowship offered every second year for a period of 4 years, two of which are spent in France and two in Australia. Bilateral exchange scheme. Minimum cost airfares provided for fellows and their dependents for the direct journey to and return from the designated research center (INSERM). No allowance payable in respect of conveyance of luggage, goods or chattels not covered by the free allowance provided under normal passenger agreements. Overseas: INSERM will accept responsibility for the living expenses in France of Australian researchers taking into account their seniority.

24710 **Astronomical Assoc. of Qld. Edward Corbould Res. Fund—Astronom. Res.**

Association is primarily for the amateur astronomer. Fund is to assist amateurs and postgraduate students at tertiary institutions. $6 000 available for any field of study. Applicants must be Australian citizens. Travel to a major observatory allowed.

24780 AAS—Scientific Exchanges with Korea

Collaborate visits to Korea both short term 14 to 28 days and longer term visits 1–3 months. Return excursion economy class airfare to Korea and KOSEFF provides an allowance for living and travel expenses in Korea.

24783 AAS—Science and Technology Agency Short Term Fellowships in Japan

20 short-term fellowships (one—three months) worldwide. Approximately 270,000 yen provided. Work in national labs and public research corporations (excluding universities and university-affiliated institutes) in Japan. Return airfare to Japan, a monthly living allowance of approx. 270,000, Yen a monthly housing allowance, a settling-in allowance, a travel allowance, a family allowance if accompanied by dependents, and medical insurance coverage for the fellow only. Provision may be made for Japanese language training.

24799 AAS—Scientific Visits to Germany

Airfare and a daily allowance of A$125 is provided for up to six weeks. Does not provide for bench fees. Low priority will be given to applicants who wish to supplement study leave funding or to gain immediate postdoctoral training.

24805 AAS—Scientific Exchanges with Japan

Two programs—short term (3–6 weeks) and a longer term program (6–12 months). AAS provides return excursion economy airfare to Japan, JSPS provides and allowance for living and travel expenses in Japan.

24861 NEDO Intl. Res. Grt. in Materials/Energy/Effic. Energy Use/Global Env

The New Energy and Industrial Technology Development Organization's International Research Grant Program aims to contribute to the enhancement of the international level of industrial technology as well as to the advancement of international exchange by supporting international joint research teams which conduct superior research. Any international joint research team is eligible to apply. Each team must be composed of four or more researchers, of two or more nationalities. The research organizations where the team member's major activities take place must be located in two or more countries. Expenses covered include travel and conference.

24869 Earthwatch Australia—Dunlop Earthwatch in Asia Fellowships

$5000. 18–40 age category. Placing paying volunteers in the field to work with scientists and scholars. Public health/welfare among fields supported.

25186 Novartis Foundation Symposia Bursary Scheme

To enable young scientists to attend NF symposia, and immediately following the meeting, spend up to 12 weeks in the department of one of the symposium participants. Award provides travel expenses to the symposium and host lab and board and lodging for the duration of the bursary. Tenable UK/Europe.

25254 Royal Society of Victoria Research Grants

Sponsor provides up to A$500 to support research in biological or earth sciences. Grants may be used for field travel, but not for subsistence. Applicants need not be graduates, or be affiliated with any institution, but other things being equal, preference will be given to members of the Society. Preference given to those projects whose results would normally be suitable for publication in Society's Proceedings.

25575 ACU—Development Fellowships

Needs of developing countries. Provides funding for fellowships tenable for short periods in developed or developing Commonwealth countries. Provides up to 5,000 British pounds, intended to cover: international return airfare at the lowest available economy class rate and by the most direct route; ground travel to home airport and from airport abroad to final destination; medical insurance; local travel abroad; board and lodging; and fees.

25792 University of Cambridge—Scholarships for Overseas Students

Applicants must be accepted as graduate students at the University of Cambridge. Scholarships tenable for up to three years. Cover the University Composition Fee, college fees, a maintenance allowance sufficient for a single student, and a contribution towards travel to and from the University. Support is not provided for dependants.

25862 French Embassy Scientific Fellowships

Supports junior Post-graduate Australian scientists, with at least 2 years professional experience, to undertake training or research in French labs/institutions for a period of 3 to 6 months. Includes a monthly allowance, registration fees, basic medical cover and accommodation. Travel costs not covered. Need to have a good knowledge of French. No provision of benefits for dependents (special visas, medical cover, accommodation). Evidence of personal funds for family must be provided if family accompanies fellow.

25900 Royal Society of Edinburgh—SOED Personal Research Fellowships

Three-year fellowships for research in any discipline—with preference to topics likely to enhance transfer of ideas and technology from research community into wealth creation and improvement of Scottish quality of life. Applicants normally under age of 32 and have substantial published work relevant to proposed field of study, or 2–6 years postdoctoral experience. No citizenship restrictions. Salary according to age, qualifications, experience (currently £16 054–£24 600). In the first year up to £2 500 will be provided for travel and subsistence, conference fees, books, etc. of which £1 500 is for travel support and attendance at meetings.

26550 **Wellcome Trust—Short-Term Travelling Research Fellowships**

3–6 months fellowships to carry out research in natural or clinical sciences. Provide the costs of return travel, a subsistence allowance, and a contribution to research costs. Awards tenable in Australia, NZ, South Africa, US, UK and Republic of Ireland.

26552 **Wellcome Trust—Travelling Research Fellowships**

1–2 year fellowships to postdoctoral scientists and medical graduates from any country except USA or NZ who wish to gain further research experience by working in leading labs in the UK or Repub of Ireland in any branch of natural or clinical sciences which has a bearing on human or veterinary medicine.

Two types of awards: (1) Research fellowships—awards to those who have less than 10 years postdoc research experience, proven research record and be seeking an extension of their skills and training opportunities; (2) Research training fellowships: awards to those who have received doctoral training but require further training in research methods or techniques. These awards are for one year.

Fellowships stipend within the range from 14,317 pounds to 28,564 pounds depending on age and experience. They also include costs of the research, attendance at scientific meetings and return travel.

26565 **Wellcome Trust—Research Training Fellowships in Reproductive Biology**

Stipend plus project and travel expenses for research on reproductive biology of relevance to the potential development of novel, safe and effective contraceptive methods. Tenable for 4 years in a university or med school. Intended to provide a period of research training at an internationally recognised centre of excellence (either in the applicant's country or abroad), which may be followed by up to two years support at an approved (home) institute in the applicant's country.

Exceptional candidates who succeed in the above training fellowships may be considered at a later date for further support through the Trust's wider funding portfolio.

Applicants outside EU need to provide a guarantee from their home institution that they have a position to return to and the opportunity for continuing research.

26723 **Royal Society—Banks Alecto Fellowships**

Fellowships provided for young scientists from countries associated with Sir Joseph Banks' circumnavigation of the world 1778–1820. Postdoctoral fellowships of 3–12 months for research in natural history (botany or zoology). Fellows expected to undertake research in country other than that of their residence, on the natural history of that country. Provides for international and local travel and subsistence expenses to supplement expenses to existing salary or any assistance provided by host's contribution.

27407 **LWRRDC Travelling/Visiting Fellowship Scheme**

Up to four awards. Range of categories of researcher type. One category for early to mid-career researchers. 'Intended to help promising young researchers already part of the research community to work and travel overseas for up to one year'.

27412 **Boehringer Ingelheim Fonds Postgraduate Fellowships**

Awards available to scientists of any nationality and can be used in Germany or abroad. Pre-doctorate scientists should not be older than 28 years and post-doctorate scientists should not be over 30 years of age at the time of application. 45 Postgraduate Fellowships pr year focussing on biologists and molecular biology. Foundation only supports activities concerned with basic research and aimed at acquiring new scientific knowledge. Postgraduate fellowships generally awarded for two years and can be extended for an additional year. DM 400 will be added to the DM1.800 per month for pre-doctorates if spouse makes less than DM 800. No child allowance paid. For the period during which a fellow works abroad, a supplement is paid, based on the size of the family and on the country of work. All fellows are paid an additional flat rate sum of DM 200 per month to cover minor project related costs (travelling expenses etc).

27502 **Canadian High Commission—Travel Grants to Canada**

Four grants for postgraduate students to undertake a short research trip to Canada. Up to $2,800 Australian available for travel to and within Canada and for sustenance. All academic areas that have a distinctly Canadian orientation—includes some branches of health.

27679 **APS Award for Outstanding Doctoral Thesis Research in Plasma Physics**

Award provides recognition to exceptional young scientists who have performed original doctoral thesis work of outstanding scientific quality and achievement in area of plasma physics. World-wide nomination for any doctoral student. Award of $2 000, certificate citing accomplishment and travel allowance of $500 provided to attend annual meeting.

28104 **Japan World Exposition Commemorative Fund Grant Program**

Nonprofit organizations or foundations in Japan or abroad. Preference given to new applicants and applicants of countries that participated in the 1970 Japan World Exposition. One million to thirty million Japanese yen awarded per project. Travel and accommodation expenses can be funded. Only half total project costs covered. Project duration = one year.

28198 **CSIRO Oceanographic Research Vessel Franklin**

Areas of operation for 1999 Cruise Schedule include: the North West Shelf; Indian Ocean waters; the Timor and Arafura Seas; Torres Strait; the Gulf of Papual; the Coral Sea; The Great Barrier Reef; the Bismark Sea; the Solomon Sea; and other regional tropical Pacific Ocean Waters. Vessel available on a competitive basis to all Australian marine scientists, and their international collaborators, investigating Australian waters and waters that impinge or influence them. Scientists inolved in piggy back projects are charged victualling/accommodation costs only. All other costs associated with the project, e.g. travel for scientists and technical staff, transport costs for equipment must be met by successful proponents.

28502 **Merck Company Fndn. International Fellowships in Clinical Pharmacology**

For those outside the US—4 fellowships awarded annually for terms of up to 2 years at recognized training institutions in the US. Annual stipends of US$30,000. In addition, the sponsor will provided funds to the US training institution to cover standard tuition and fees for the fellow, medical benefits for the fellow, spouse and two dependents, and travel expenses incurred by the fellow, spouse, and two dependents travelling to the training institution in the US at the start of the program and back home upon completion of training. Fellows are expected to return to their home countries and contribute to the advancement of clinical pharmacology there.

28695 **RIRDC—Travel/Conference Funding**

Support travel to conferences or workshops. $3,500 per applicant. Daily subsistence may be considered for some international travel.

29038 **ESU—Lindemann Trust Fellowships**

UK and Commonwealth graduates to study at a university in the US. US$30,000 annual stipend; round trip travel expenses; and where appropriate a dependant's allowance. Length of study is one year.

29983 **CRDC—Industry Development Awards**

Awards are available for up to 12 months and will assist with the financing of projects and/or to help meet the costs of travel within Australia or overseas.

29985 **CRDC—Travel/Conference Funds**

The Cotton R&D Corpn provides study and/or conference travel for the purposes of developing the skills and knowledge of the researcher or improving technology transfer—to cover all overseas travel and domestic travel that is not an integral part of a research project.

30531 **Asthma Fndn. Victoria—Lillian Roxon Mem. Asthma Res. Trust Travel**

Up to $2000 for travel overseas to continue research or to present a paper at a recognised international meeting.

30904 **ASM—UNESCO Travel Awards**

Support provided for young investigators to travel to another country or a distant site to obtain expertise in a method, procedure, or specific topic in microbiology. Must be students or fellows at the pre- or postdoctoral level or a young scientist. The award will be up to $4000 for travel and subsistence usually not exceeding three months.

31067 **Ian Potter Foundation—Travel & Cultural Trust Institutional Grants**

Small travel grants to institutions to assist young staff members to attend overseas conferences or to pursue studies. No upper limit but generally awards are between $5,000–$20,000.

31580 **DFAT Australia-India Council Grants**

Supports activities designed to promote a greater awareness of Australia in India and of India in Australia, including visits and exchanges between the two countries, and development of institutional links. Health amongst the range of priority areas supported. (Conference travel unlikely to be supported).

33479 **George Alexander Foundation—Grants Program**

Supports wide range of research from $5,000–$20,000. Categories for support include (7) Travel—to give predominantly young Australians the opportunity to gain further experience and to meet their peers in the international scene.

33701 **NIA—Exploratory Grants for Multidisc. Clinical Studies of Sarcopenia**

Intended to facilitate new collaborative efforts. Foreign and domestic non-profit and for-profit public and private institutions can apply. Up to $100,000 per year direct costs. May include support travel for the collaboration.

34221 **NHMRC—Howard Florey Centenary Research Fellowships**

Provides a vehicle for medical researchers working overseas to return to Australia and continue with a medical research career. Full time research and awarded for a period of 2 years and provide a salary, annual maintenance allowance of $10,000 and $500 conference travel allowance.

34323 **JSPS—Postdoctoral Fellowships for American Researchers—Short-Term**

Support provided to assist promising and highly-qualified young foreign researchers wishing to conduct research in Japan. Fellowships awarded for 24 months although shorter tenure of at least 12 months considered. Support includes a round-trip ticket for fellow only; a monthly stipend of 270,000 yen; a settling-in allowance of 200,000 yen; a monthly housing allowance not to exceed 100,000 yen; a monthly family allowance of 50,000 yen if accompanied by dependents; and accident and sickness insurance coverage for the Fellow only. For FY 1998 there are 280 fellowships

34538 **IDP—Australia South Africa Institutional Linkks Program: Round 2**

Round 2 will fund up to 10 links projects of collaborative activities of South African and Australian higher education institutions (as specified). Funding normally in range of A$50 000–$100 000 p.a. for 2 years. Academic liaison subordinate to social policy objectives. Institutions required to provide counterpart contributions (include local travel costs). Economy class airfares for participants. Proposals should demonstrate how project will be sustained beyond funding period.

34585 **NASA—Headquarters—Unsolicited Proposals**

Applicants from non-profit and for-profit organizations. Contact with sponsor prior to submission of proposal encouraged.

34587 **NASA—Dryden Flight Research Center—Unsolicited Proposals**

Applicants from non-profit and for-profit organizations. Contact with sponsor prior to submission of proposal encouraged.

35696 **UICC Latin America COPES Training and Education Fellowships (LACTEF)**

Five awards annually with grants of $1 800 for 1–2 weeks. Provide staff and accredited volunteers from voluntary cancer societies in Latin America with non-medical training opportunities in prevention and early detection programs. Grants contribute to least cost return airfare and living costs.

35715 **USAMRMC—U.S. Army Prostate Cancer Res. Pgm.(New Invest. Awards)**

Eligible applicants include cooperative groups and for-profit and nonprofit organisations, including foreign institutions. The "new investigators" must have own independent research facilities, be within 6 years postdoctoral. Phase 1 awards $75 000 p.a. for 30 months and may include up to $1 500 annually for travel to scientific meetings.

35719 **USAMRMC—U.S. Army Prostate Cancer Res. Pgm. (Idea Devlpmnt. Awards)**

Sponsor provides support to established prostate cancer investigators or those who want to move into this field in order to undertake under-investigated avenues of research. All Phase 1 awards must incorporate one of five designated research categories. Eligible applicants include cooperative groups and for-profit and nonprofit organisations. Need for some relevant preliminary data re proposed project and access to own independent research facilities. Maximum of $125 000 per year for 30 months for Phase 1 Awards, which may include up to $1 500 annually for travel to scientific meetings. Conditions for Phase 11 awards, depending on funding availability.

35723 **Australian-American Educational Fndn. Fulbright Postgrad. Student Awd**

Postgraduate student awards for those wishing to undertake an approved course of study for an American higher degree or its equivalent; or to engage in research relevant to an Australian higher degree. Value A$28,250. 8 awards available in 1998 with a further 4 privately sponsored awards. (n.b. Awards open to all fields of study but Medical grads not eligible to apply if wishing to engage in clinical practice during the award period) Benefits include: a travel entitlement of A$3,000; a stipend of A$1,950 per month; an establishment allowance of A$1,500; an excess baggage allowance of A$150; for those accompanied by a dependant, there is an allowance of A$250 per month for 12 months; a limited level of health insurance cover is available for grantee only. Although the award does include a travel and a monthly allowance, applicants must be able to demonstrate that they have sufficient additional funds to provide adequate financial support for themselves and any dependents during their stay the United States.

36235 **NSERC—Visiting Flwshps. in Canadian Gvt. Labs/Earth Sci. & Ecology**

$35,184 per year for up to two years for research at a Canadian government laboratory in the disciplines of the Earth Sciences and Ecology. Two thirds of the awards are to Canadian citizens. Travel allowance for the fellow, spouse, and children.

36236 **NSERC—Visiting Flwshps. in Canadian Govt. Labs/Cellular & Molec. Bio**

The Natural Sciences and Engineering Research Council of Canada (NSERC) provides fellowships of $35 184 per year, plus travel (fellow, spouse, children) for up to 2 years at Canadian Govt. labs in Cellular and Molecular Biology. Applicants should have PhD in natural sciences or engineering within last 5 years, or be doctoral candidate. Citizenship quota—2/3 of awards to Canadian citizens or permanent residents.

36294 **AAS—Postdoc. Flwshps. in Science & Engineering Republic of Korea**

Fellowship of 6–12 months for research in universities and government supported research institutions in Korea. Purpose to facilitate and promote regional cooperation in science and technology by supporting young scientists in the APEC region. Provided with round-trip plane ticket, monthly living allowance of 1 million Won per month (equivalent to about USD1,100) and overseas travel accident insurance.

36564 **UICC Translational Cancer Research Fellowships (TCRF)**

Sponsor offers fellowships designed to accelerate translation of basic/experimental/applied research into clinical applications—new drugs/vaccines/prevention/intervention. Applicants must have fluency in language of host institution. Fellowship value is US$55 000. Travel award covers return economy airfares for fellow, spouse and up to 2 children (if under 18 and staying for 6 months).

36618 **CRDC—Postgraduate Research Fellowships**

Awarded for research within Australia, but in special circumstances, research outside the country may be approved. Awarded for periods of up to three years.

36887 **AusAID—Private Sector Linkages Program (PSLP)**

Includes airfare and living expenses overseas. Aimed at promoting sustainable development and economic growth by harnessing the expertise and capacity of Australian enterprises to work with counterpart organisations in developing countries.

36950 **National Meningitis Trust—Research Grant**

Support for all aspects of meningitis, but priority on development of Group B vaccine. Grants to UK researchers and occasionally from abroad. Necessary travel expenses may be covered.

36989 **RCOG—Eden Travelling Fellowship**

Fellowship to gain additional knowledge and experience of a current research project. Award of £5 000 (depending on project and travelling expenses involved) to graduate of not less than two years.

36992 **RCOG—Malcolm Black Travel Fellowship**

Award offered biennially for College Member/Fellow of up to 5 years standing to travel to/from British Isles to attend postgraduate training courses/visit research centres of particular expertise within specialty. Travel and subsistence costs to maximum of £1 000.

37157 **APS John H. Dillon Medal**

Prize of $2000 plus a bronze medallion offered for the most outstanding research accomplishments by young polymer physicists who have demonstrated exceptional research promise early in their careers. No more than 10 years since receipt of PhD. Allowance provided for travel to the meeting of the Society for the award.

38421 **NIGMS—Supplements for the Study of Complex Biological Systems**

NIGMS will provide supplements to existing NIGMS grants (must have at least one year of grant support remaining) to support salary expenses of collaborating investigators (e.g. physicists, engineers, mathematicians). Salary, fringe benefits and travel expenses will be provided.

38904 **Monash University—Logan Research Fellowships**

Five fellowships yearly to applicants with 2–6 years of postdoctoral experience. Appointment for 3 years, extendable to 6. Salary range

A$ 46 269–$51 113 and research support from A$ 5 000–$20 000 for first 3 years. Return airfares for fellows and dependents. Subsistence and fares for field work, necessary consultation, conferences/ seminars related to research.

39508 **DIST—Collab. on Science & Technology: Australia-Indosia (COSIAI)**

Collaborative projects with Indonesia (includes telecommunications, aerospace, clean energy and automotive). DIST may be able to contribute to the funding of travel, living expenses and the cost of conducting workshops.

39605 **DSD—Victoria Fellowship**

Six fellowships to be awarded annually to emerging leaders in fields of science, engineering and technology. $15 000 travel grant to undertake short-term study mission which will assist in career development, enable development of potentially commercial idea or undertake specialist training not available locally. Costs met for national and international travel, accommodation and living expenses, medical/travel insurance and out-of-pocket expenses while overseas. Sources of funds available to applicant should be declared, including source of salary or stipend during the study mission.

40346 **ARC International Researcher Exchange Program (IREX)**

3 elements of program (1) International Fellowships; (2) Asia-Pacific Link Awards; (3) MoU Awards.

41309 **UCAR—Off./Hydrology Visiting Scientist Pgm/River Mechanics Modeling**

Support provided in US for individual to join team conducting applied R&D and implementation of dynamic streamflow routing capabilities using specified operation. Program is for 1–3 years. Applicants must have Masters or PhD in physical or natural science or engineering, with emphasis on hydrology and/or river mechanics. Fixed annual stipend plus health/dental insurance, sick and annual leave, paid holidays, retirement fund contribution and life insurance. Relocation allowance and allowance for scientific travel and other support costs.

41463 **Ramsey Memorial Fellowships Trust—Fellowships for Chemical Research**

Aims to support advanced students of chemical research who have shown outstanding merit to pursue their work in universities or other places of higher education within the UK. Funding amounts vary. Upper age limit is 35. Must have been born in Commonwealth or graduated from a university within the Commonwealth. Grant not exceeding 500 pounds p.a. added to the stipend for (non-travel) expenses essential for the research undertaken. Tenable for two years.

41657 **DFAT—Australia-Korea Foundation Travel Grants**

Promotes individual and group visits and exchanges between Australia and Korea. $2000 travel grant available. Conference travel not normally supported.

42041 **AIAR—Council of American Overseas Research Center Fellowships**

Eight awards of up to $6000 each with an additional $3000 for travel available for advanced multi-country research. Preference given to candidates examining comparative and/or cross-regional questions requiring research in two or more countries. Doctoral candidates and researchers and investigators eligible as individuals or teams.

Engineering—SPIN programs as of second quarter 1998

Allows overseas research experience/training/career development for young researchers

00045 **ACS—PRF—Type AC Research Grants**
Fundamental research related to petroleum field. Support for postdocs/undergraduates/summer faculty/travel. Max. of $60 000 for 2 years, $90 000 for 3 years.

00047 **NASA—Ames Research Center—Unsolicited Proposals**
Domestic and foreign organisations can apply. Domestic and foreign travel.

00062 **ONR Mathematical, Computer, and Information Sciences Research Program**
Individuals or institutions (domestic or foreign)—basic/applied research in mathematical sciences important to navy. Direct and indirect costs allowed.

00123 **ONR Mechanics & Energy Conversion Science & Technology Research Pgm.**
Individuals or institutions (domestic or foreign)—basic/applied research in mechanics, energy conversion science and technology research important to navy. Direct and indirect costs allowed.

00158 **WHOI—Research Fellowships in Marine Policy and Ocean Management**
Social and natural sciences—postdocs or sabbatical researcher. No citizenship restrictions. Stipend $38 500 for 1 year plus modest research and travel funds.

00176 **SPIE—Educational Grants in Optical Engineering**
Grants $500–$7 000 to institutions to support optics/optical engineering. Student travel grants to SPIE functions only.

00543 **NASA—Goddard Space Flight Center—Unsolicited Proposals**
Domestic and foreign organisations can apply. Domestic and foreign travel.

00652 **Humboldt Foundation—Research Fellowships for Foreign Scholars**
Enables foreign postdocs (under 40 years) to research own study choice at German institutes. 6–12 months, open to all academic disciplines. Fluency in German or English required. Conference participation not funded.

00770 **ONR Materials Science & Technology Research Program**
Individuals or institutions (domestic or foreign)—basic/applied research in materials sciences and technology research important to navy. Direct and indirect costs allowed.

00909 **ONR Processes and Prediction Research Program**
Individuals or institutions (domestic or foreign)—basic/applied research in processes and prediction research important to navy. Direct and indirect costs allowed.

00915 **ASHRAE Grant-in-Aid for Graduate Students**
Grant $7 500 to institution to encourage full-time graduate students to conduct research in heating, ventilation, air-conditioning, refrigeration technologies. No citizenship restrictions.

00977 **NCAR—Postdoctoral Appointments**
Recent postdocs or no more than 4 years experience. 2 year appointment—$35 000 in first year, $37 000 in second for atmospheric research. No citizenship restrictions. Internal appointments reimbursed travel of $800 for fellow and family, $2 500 for externals. Modest assistance with health, life, removal expenses. $1 050 p.a. for scientific travel/registration fees.

01104 **ONR Electronics Research Program**
Individuals or institutions (domestic or foreign)—basic/applied research in electronics important to navy. Direct and indirect costs allowed.

01107 **AFOSR—Aerospace and Materials Sciences**
Institutions involved in research directly related to needs of air force. Foreign applications routed through sponsor's foreign offices. Funding depends on individual proposal. Indirect costs allowed.

01109 **AFOSR—Physics and Electronics**
Institutions involved in research directly related to needs of air force. Foreign applications routed through sponsor's foreign offices. Funding depends on individual proposal. Indirect costs allowed.

01110 **AFOSR—Chemistry and Life Sciences**
Institutions involved in research directly related to needs of air force. Foreign applications routed through sponsor's foreign offices. Funding depends on individual proposal. Indirect costs allowed.

01111 **AFOSR—Mathematics and Geosciences**
Institutions involved in research directly related to needs of air force. Foreign applications routed through sponsor's foreign offices. Funding depends on individual proposal. Indirect costs allowed.

01114 **NASA—Johnson Space Center—Unsolicited Proposals**
Domestic and foreign organisations can apply. Domestic and foreign travel.

01115 **NASA—Langley Research Center—Unsolicited Proposals**
Domestic and foreign organisations can apply. Domestic and foreign travel.

01116 **NASA—Lewis Research Center—Unsolicited Proposals**
Domestic and foreign organisations can apply. Domestic and foreign travel.

01117 **NASA—Marshall Space Flight Center—Unsolicited Proposals**
Domestic and foreign organisations can apply. Domestic and foreign travel.

01118 **NASA—John C. Stennis Space Center—Unsolicited Proposals**
Domestic and foreign organisations can apply. Domestic and foreign travel.

01398 **ASME Auxiliary—Rice-Cullimore Scholarship**
$2 000 support for foreign student of mechanical engineering to do 1 year graduate work in US. Students apply from own country.

01399 **NSERC—Visiting Flwshps. in Canadian Govt. Labs-Eng./Comp./Math Sci.**
Natural sciences/engineering doctoral candidates or those with PhD of not more than 5 years. Up to 2 year fellowships at Canadian govt. lab. Stipend of $38 184, plus travel allowance for fellow and family. No citizenship restrictions but 2/3 of awards must be made to Canadian citizens.

01479 **NIST Electronics & Electrical Engineering Lab Cooperative Rsch. Opps.**
No monetary support is provided. Opportunity for scientists, engineers from govt., industry, university, associations to use sponsor's facilities and access NIST staff.

01487 **ASPRS—Robert E. Altenhofen Memorial Scholarship**
$1 000 award offered to undergraduate/graduate students in US college/university or overseas who display interest in theoretical aspects of photogrammetry.

01540 **ARPA Unsolicited Proposals**
Individuals/institutions apply at any time with research proposal in any area that relates to military interests. Direct and indirect costs allowed.

01705 **SPIE—Educational Scholarships in Optical Engineering**
Grants $500–$7 000 to undergraduate/graduate students to support optics/optical engineering. Student travel grants to SPIE functions only. No citizenship restrictions.

02026 **Harbor Branch Postdoctoral Fellowships**
Support for study/training in marine science for 1 year, with renewal possible. PhD within 5 years. No citizenship restrictions. Limited budget for travel, partially subsidised health cover, affordable housing. Applicants advised to review sponsor's patent policy.

02055 **Sigma Xi Grants-in-Aid of Research**
Undergraduate or graduate assistance for scientific investigation in any field. Awards $1 000 max (except eye/vision $2 500). No citizenship restrictions. Travel and living expenses allowed for field research. Grants not made for travel to scientific meetings or symposia.

02200 **NIST Manufacturing Engineering Laboratory Cooperative Research Opps.**
No monetary support is provided. Opportunity for scientists, engineers from govt., industry, university, associations to use sponsor's facilities and pursue collaborative research with NIST staff.

02227 **Lady Davis Graduate Fellowships**
9–12 months graduate study in Israel (extension may be possible). Priority given to Canadians. Travel costs, tuition fees and monthly stipend of $900.

02616 **RTCA William E. Jackson Award**
Award of $2 000 to outstanding graduate student in aviation electronics or telecommunications. May be thesis, report, journal paper.

02668 **AFMC—Aeronautical Systems Center—Unsolicited Proposals**
Any organisation/person outside Air Force eligible to suggest proposals for aerospace technology and operational systems.

02669 **AFMC—Electronic Systems Center (ESC)—Unsolicited Proposals**

Srt is provided for R&D efforts that will assist the AFMC in the rapid advancement of aerospace technology and its adaptation to operational aerospace systems. Any organisation/person outside Air Force eligible to suggest an R&D effort.

02670 **AFMC—Air Force Flight Test Center (AFFTC) Unsolicited Proposals**

Any organisation/person outside Air Force eligible to suggest proposals for aerospace technology and operational systems, including flight testing.

02671 **AFMC—Air Force Development Test Center (AFDTC) Unsolicited Proposals**

Support provided for research related to aerospace technology and operational aerospace systems of interest to the Air Force, including nonnuclear munitions, electronic combat systems, and navigation/guidance systems. Any organisation/person outside Air Force is eligible to suggest an R&D effort.

02673 **AFMC—Human Systems Center (HSC) Unsolicited Proposals**

Any organisation/person outside Air Force (regardless of nationality) eligible to suggest proposals for human-centred research of interest to sponsor.

02674 **AFMC—Air Force Security Assistance Center (AFSAC) Unsolicited Proposals**

Any organisation/person outside Air Force (regardless of nationality) eligible to suggest proposals for research related to aerospace technology and operational aerospace systems—including foreign military sales, support programs, and the logistics support group.

02766 **NASA—Kennedy Space Center—Unsolicited Proposals**

Domestic and foreign organisations can apply. Domestic and foreign travel.

03113 **NASA—Jet Propulsion Laboratory—Unsolicited Proposals**

Domestic and foreign organisations can apply. Domestic and foreign travel.

03230 **ACS—Awards Program**

54 different awards for individuals in diverse fields of chemical sciences. Each award has particular focus and certain restrictions may apply. In some cases nominees must be US citizens. Awards $3 000–$5 000, with funds for travel expenses $1 000–$1 500.

03326 **OER—Energy Research Program (98-01)**

Awards up to 3 years—domestic or foreign organisations. No citizenship restrictions. Awards for conferences and scientific/technical meetings will not include payment for indirect costs.

03430 **Lady Davis Postdoctoral Fellowships**

9–12 months postdoctoral fellowships in Israel (extension may be possible). Priority given to Canadians. Travel costs, accommodation allowance and monthly stipend of $1 300.

03483 **JILA Visiting Fellowships**

6 to 10 in-residence fellowships in low-energy atomic and molecular physics, astrophysics, chemical physics. Postdocs with extensive research experience and younger persons with significant scientific achievements. No citizenship restrictions.

Stipends based on need/experience, normally $3 500 per month. Help with transport costs of fellow and family. $1 500 for professional travel within US.

03494 **Michigan Society of Fellows—Postdoctoral Fellowships**

PhD within last 3 years. Provides 3 years in-residence with stipend of $36 000 and $1 500 for travel/research expenses.

03898 **NRC—Research Associateships**

$39,366 p.a. Canadian for two years of research in sponsor's labs in Canada. Open to all nationalities but preference given to Canadians. Travel allowance for associates and their families is provided.

04138 **USGS—National Earthquake Hazards Reduction Program (NEHRP)**

Proposals for foreign research must be based on cooperation with scientific groups in the host countries, with host country personnel being used for operational functions, and host countries providing financial support for such personnel. Travel supported.

04258 **Procter & Gamble—University Exploratory Research Program**

Grants up to $50,000 per year for three years. Support for exploratory research in areas of emerging science of mutual interest to the university scientist and the sponsor which would not otherwise be funded because it is too speculative, even though it has intriguing potential. Funds can be used to pay for graduates or postdoctoral fellows, tuition and stipend for graduate students, capital costs of equipment, supplies and services, travel, and university overhead charges.

04434 **Lighting Research Institute Unsolicited Proposals**

Seed funding—budget can include salaries and wages, research assistantships, equipment, materials and supplies, travel, computer services, etc.

04524 **Univ. of Queensland—Postdoctoral Research Fellowships**

Overseas and local candidates. $37,170 to $41,421 p.a. plus a sum of $3,500 to host departments for expenses connected to the research. $500 of each allocation will be made available to the Fellow as a contribution towards fieldwork or attendance at conferences, workshops or symposia directly associated with and essential to the Fellowship.

04689 **OER—Global Change Assessment Research Program**

Grants from $30,000–$150,000 p.a. Applicants encouraged to collaborate with researchers in other institutions.

04995 **SNAME—Graduate Scholarships**

Foreign students can apply but must study in the US or Canada. Applicants must be members of the Society of Naval Architects and Marine Engineers for one year before applying.

05040 **AGU—Horton Research Grant**

Items may include living costs; research costs, such as laboratory supplies, computer time, or field instrumentation; travel costs to one technical symposium; and book purchases. Eligible applicants—doctoral candidates.

05369 **APS Award For Outstanding Doctoral Thesis Research in Beam Physics**

$1,500 awarded plus an additional allowance of up to $500 for travel to the meeting at which the award will be presented. Presentation by awardee to the meeting invited.

05442 **NRC—Reg. Resident Associateships in Earth and Atmospheric Sciences**

Conduct research in the earth and atmospheric sciences at US Govt labs. Stipend from $27,750 to $45,500. Tenure one year, renewable up to three years. Non-US nationals living outside the US are reimbursed for round trip travel, relocation of dependents, and transport of a limited amount of personal belongings. Attendance at one or two professional meetings yearly is encouraged; limited funds are available for such travel. A health insurance program is available on a cost-sharing basis for associates and dependents.

05443 **NRC—Reg. Resident Associateships in Space and Planetary Sciences**

Conduct research in the space and planetary sciences at US Govt labs. Stipend from $27,750 to $45,500. Tenure one year, renewable up to three years. Non-US nationals living outside the US are reimbursed for round trip travel, relocation of dependents, and transport of a limited amount of personal belongings. Attendance at one or two professional meetings yearly is encouraged; limited funds are available for such travel. A health insurance program is available on a cost-sharing basis for associates and dependents. (Aeronautical/Astronautical Engineering)

05444 **NRC—Reg. Resident Associateships in Engineering/Applied & Comp. Sci.**

Conduct research in engineering applied and computer sciences at US Govt labs. Stipend from $27,750 to $45,500. Tenure one year, renewable up to three years. Non-US nationals living outside the US are reimbursed for round trip travel, relocation of dependents, and transport of a limited amount of personal belongings. Attendance at one or two professional meetings yearly is encouraged; limited funds are available for such travel. A health insurance program is available on a cost-sharing basis for associates and dependents.

05445 **NRC—Reg. Resident Associateships in Chemistry**

Conduct research in chemistry at US Govt labs. Stipend from $27,750 to $45,500. Tenure one year, renewable up to three years. Non-US nationals living outside the US are reimbursed for round trip travel, relocation of dependents, and transport of a limited amount of personal belongings. Attendance at one or two professional meetings yearly is encouraged; limited funds are available for such travel. A health insurance program is available on a cost-sharing basis for associates and dependents.

(Chemical Engineering)

05447 **NRC—Reg. Resident Associateships in Mathematics and Physics**

Conduct research in mathematics and physics at US Govt labs. Stipend from $27,750 to $45,500. Tenure one year, renewable up to three years. Non-US nationals living outside the US are reimbursed for round trip travel, relocation of dependents, and transport of a limited amount of personal belongings. Attendance at one or two professional meetings yearly is encouraged; limited funds are available for such travel. A health insurance program is available on a cost-sharing basis for associates and dependents. (electrical engineering/electronics)

06451 **JILA Postdoctoral Research Associateships**

In-residence, postdoctoral research associateships—$28,000–$35,000 at the Joint Institute for Laboratory Astrophysics. One year renewable for two. Transportation to Boulder may be paid for the appointee and his/her spouse and minor children. An allowance for shipment of personal effects of up to $400 for single appointees and $600 for married appointees, as well as an allowance for appropriate professional travel within the US during the period of appointment.

07639 **FAA—Aviation Research Grants**

Organisations not individuals as eligible applicants.

07682 **WHOI—Postdoctoral Fellowships**

One year stipend of $38,500 plus limited support for travel, equipment, supplies and special services. Duration 18 months. Relocation allowance. Eligible for group health insurance.

07683 **WHOI—Program of Summer Study in Geophysical Fluid Dynamics**

Up to ten pre-or post-doctoral fellowships available with stipends of $3,900 for a ten week summer program for study in geophysical fluid dynamics. Aim is to provide an up-to-date review of the subject and exposure to applications in several disciplines in order to stimulate further research. Allowance is provided for travel expenses in the US.

07917 **PDA Fndn. Grants in Parenteral Research**

Two grants of $15,000 each for one year. Funds must be used in direct support of the approved graduate student working on the proposal for which the grant was made.

07918 **PDA Fndn. Millipore/Charles Schaufus Grant in Parenteral Processing**

Up to $10,000 per year and an additional $10,000 for equipment per year are available for three years.

07953 **NASA—Langley Research Center—ICASE Senior Staff/Staff Sci. Appt.**

Opportunities for recent PhD recipients and those with at least five years experience after the PhD to collaborate with NASA scientists and engineers. Appointments up to 2 years. Financial assistance available (includes stipend and travel plus relocation allowances). Staff scientist positions are available for recent PhD recipients without institutional affiliations who show unusual promise.

07954 **NASA—Langley Research Center—ICASE Graduate Student Appointments**

Opportunities for doctoral candidates to collaborate with NASA scientists and engineers. Financial assistance, including stipends and travel-relocation allowances, is available. Stipends are competitive with academic salaries. Specific arrangements are made on an individual basis in order to accommodate the particular requirements of each appointee.

07955 **NASA—Langley Research Center—ICASE Summer Visitor Program**

Provides opportunity for faculty and students to collaborate with NASA scientists and Engineers. Hosts 50–75 researchers for varying lengths of time during the summer.

08268 **NIEHS—Res. on Effects of Power Frequency Electric & Magnetic Fields**

Organisations as applicants—collaborations between closely related disciplines encouraged.

08564 **ACS—PRF—Type B Research Grants**

Support provided for research related to the petroleum field. Awards up to $25,000 for two years. Funds may be used for stipend support for undergraduates; summer salary support for the principal investigator; research-related travel; and equipment. Summer salaries are not provided for principal investigators in colleges or universities outside of the US.

08925 **Smithsonian—Env. Research Center Work/Learn Prog. in Env. Studies**

Internships enable students to participate in environmental research at the sponsor's 2,600 acre facility. Stipends provide $300 per week. Normally ten weeks to one year in duration. On site dorm accommodations available for $60 per week. Sponsor does not supply board.

08938 **ONR Ship Structures and Systems Science and Technology Research Pgm.**

Support to individuals and institutions. Preliminary correspondence with ONR required before application submitted.

08952 **ONR Cognitive and Neural Science and Technology Research Program**

Support to individuals and institutions. Preliminary correspondence with ONR required before application submitted.

08993 **ONR Sensing and Systems Research Program**

Support to individuals and institutions. Preliminary correspondence with ONR required before application submitted.

09122 **ASHRAE Unsolicited Research Proposals**

Full or partial funding up to $100,000 available for unsolicited research proposals for innovative research.

14453 **AFMC—Aerospace Guidance & Metrology Ctr (AGMC) Unsolicited Proposals**

Organisations or individuals. Preliminary correspondence with the Department of the Airforce required before application submitted.

14466 **AFMC—Arnold Engineering Development Center (AEDC) Unsol. Proposals**

Organisations or individuals. Preliminary correspondence with the Department of the Airforce required before application submitted.

14469 **AFMC—Rome Laboratory Unsolicited Proposals**

Organisations or individuals. Preliminary correspondence with the Department of the Airforce required before application submitted. Award duration may vary.

14472 **AFMC—Joint Logistics Systems Center (JLSC) Unsolicited Proposals**

Organisations or individuals. Preliminary correspondence with the Department of the Airforce required before application submitted. Award duration may vary.

15135 **NIST Chemical Science & Technology Laboratory Cooperative Rsch. Opps.**

Opportunities to conduct research utilizing the sponsor's Chemical Science and Technology Laboratory or to pursue collaborative research with the sponsor's staff.

Eligible applicants are scientists and engineers from industry, universities, trade associations and other government agencies. No monetary support is provided.

15149 **NIST Building & Fire Research Laboratory Cooperative Research Opps.**

Provides opportunities to conduct research utilizing the sponsor's Building and Fire Research Laboratory or to pursue collaborative research with the sponsor's staff.

Eligible applicants are scientists and engineers from industry, universities, trade associations and other government agencies. No monetary support is provided.

15351 **NSERC—Visiting Flwshps. in Canadian Govt. Labs/Physics & Chemistry**

Stipends of $35,184 per year, plus travel, for up to two years for research at a Canadian government lab in the disciplines of Physics and Chemistry. Awards made to a citizenship quota: two thirds to Canadians. Travel allowance for the fellow, spouse, and children.

15749 **Univ. of Melbourne Flwshps. for Women w/ Career Interruption**

Generic—allowance $4000 per year to support field work or attend conferences.

18585 **Monbusho Research Student**

Transportation to and from Japan to study at a Japanese university. Engineering amongst fields supported. 2 programs—one a year and a half the other two years. Monthly allowance. Field study allowance, arrival allowance and accommodation allowance.

19391 **Battelle DOE Innovative Concepts Program (InnCon)**

Up to 20 grants of $22,000 for innovators to conduct preliminary technical and market evaluations and to present their concepts to potential sponsors, to promote the identification and development of revolutionary approaches to energy conservation and efficient energy use that could lead to significant improvements.. 'Additional non-financial benefits should accrue to those who receive these grants'.

20530 **AFMC—Sacramento Air Logistics Center (SM-ALC) Unsolicited Proposals**

Any organisation or person outside the Air Force is eligible to suggest an R&D effort of interest to the Airforce Sacramento Air Logistics Centre—including electronic systems and programs and space systems. Award duration may vary. Sponsor should be contacted before proposal submitted.

Aerospace technology and operational aerospace systems.

20531 **AFMC—San Antonio Air Logistics Center (SA-ALC)**

Any organisation or person outside the Air Force is eligible to suggest an R&D effort of interest to the Airforce San Antonio Air Logistics Centre. Award duration may vary. Sponsor should be contacted before proposal submitted.

The Centre provides worldwide logistics support for weapons systems and is responsible for automatic test, precision measuring, and aircraft ground support equipment.

20533 **AFMC—Space and Missile Systems Center (SMC) Unsolicited Proposals**

Rapid advancement of aerospace technology and its adaptation to operational aerospace systems of interest. Any organisation or person outside the Air Force is eligible to suggest an R&D effort. Award duration may vary. Sponsor should be contacted before proposal submitted.

20535 **AFMC—Phillips Laboratory (PL) Unsolicited Proposals**

Support provided for research related to aerospace technology and operational aerospace systems of interest to Phillips laboratory. Any organisation or person outside the Air Force is eligible to suggest an R&D. Award duration may vary. Sponsor should be contacted before proposal submitted.

20536 **AFMC—Warner Robins Air Logistics Center (WR-ALC) Unsolicited Prop.**

Support provided for research related to aerospace technology and operational aerospace systems. The centre provides worldwide logistics management for utility aircraft, helicopters, missiles, and drone and remotely piloted vehicles.

22414 **Matsumae International Foundation Fellowship Program**

Offering 20 fellowships (especially for applicants from developing countries) in fields of natural science, engineering and medicine. In 1999 for period of 3–6 months. Eligibility requirements—hold doctorate, under 40 years of age, conversational ability in English or Japanese, should not have visited Japan before, must return to own country. Support will include round-trip airfare, cost of accommodation, local travel, personal accident/sickness insurance, but no support for family.

22545 **ARC Large Research Grants**

ARC has entered into agreements with research agencies overseas in order to facilitate joint-funding of research projects. Austria, France, Germany, Netherlands, Italy and EU.
For the straight Large Grants travel can be outside Australia as long as the project is based in Australia. Also travel and attendance at conferences is permitted. Salaries can be sought for salaried non-tenured post-doctoral personnel.

22546 **ARC Fellowships**

Foster opportunities for pursuing internationally competitive independent research. It is expected that part of funds to be used for field work or conference/symposium associated with or essential to the fellowship.

22547 **ARC Strategic Partnership with Industry Research & Training (SPIRT)**

Projects must be undertaken by investigators including APD Fellows (Industry). Normal travel overseas for field work collaboration, conferences etc is permitted. Nothing in profile regarding travel for students associated with the project.

22549 **ARC Small Grants**

University discretion regarding how small grants allocated and whether or not overseas travel is supported.

22580 **Australian Coal Res. Limited—Australian Coal Assoc. Research Program**

No constraints on who may apply—private researchers, consultants or institutions. No financial constraints. All proposals must comply with the 125% R&D tax incentive scheme. All proposals should make provision for a review of the current state of art in each relevant area.

22808 **RITE—Global Environment Research Proposals**

Individuals or groups engaged in research activities aimed at the development of innovative technologies which will contribute to the solution of global environmental problems at research institutions etc. Up to 10 million Japanese yen for each proposal. Year long research.

22835 **AAS—Japan Soc. for the Promotion of Sci. Postdoc. Flwshps.in Japan**

Five one- or two-year postdoc fellowships for young Australian scientists in the field of natural science, non-clinical medicine and engineering to conduct research in Japan. Provides return airfare, a monthly living allowance of 270,000 yen, a monthly housing allowance, a settling-in allowance, a family allowance if accompanied by dependents, and medical and accident insurance coverage for the fellow only. Provision will be made for Japanese language training.

22844 **GRDC—Research Grants**

Covers travel where it forms an integral part of the project (not necessarily overseas).

22846 **AAS—Science and Technology Agency: Postdoctoral Flwshps. in Japan**

Young Australian scientists and technologists—conduct research in a scientific, technological, engineering or medical field, in national laboratories and public research corporations (excluding universities and university-affiliated institutes) in Japan. Award is for a period of 6 months to 2 years. Applicants should be under 35 years of age. Fellows provided with a return airfare, a monthly living allowance of 270,000 yen, a monthly housing allowance, a settling-in allowance, an annual travel allowance, a family allowance if accompanied by dependents, and medical and accident insurance coverage for the fellow only. Provision will be made for Japanese language training.

22848 **ARC Research Infrastructure Equipment & Facilities Program Grants**

Does allow for travel costs to participate in international consortiums.

22859 **AAS—Commonwealth Fellows Under the Bede Morris Flwshp.: France**

Australian Government in association with the AAS will provide funds for a professional scientist to visit France in 1998. Provides return excursion airfare to France and a grant-in aid for up to six weeks at a rate of $125 per day. The visit may be extended at the participant's expense.

22862 **AAS—Scientific Exchanges with China**

Supports scientific exchanges with the People's Republic of China. Two to six weeks to collaborate with Chinese researchers at Chinese Academy of Science institutes. The Academy provides an excursion economy international airfare and the Chinese Academy of Sciences arranges and pays for accommodation, meals and travel within China.

22865 **AAS—Scientific Exchanges with Taiwan**

Supports scientific exchange between scientists and technologists in Australia and Taiwan. Provides a return airfare and a daily allowance for a period of up to four weeks.

22867 **AAS—Scientific Exchanges with the United Kingdom**

Supports scientific exchange programs between Australian and UK researchers. Provides a return airfare to a maximum of $2600 and a maximum daily allowance of $125 for a period of up to six weeks. Does not provide funds for bench fees.

23071 **DPIE—Australia/China Agricultural Co-operation Agreement**

Financial support up to $30,000 provided to cover international travel and minor operating expenditure. Chinese government meets the costs of travel within China. Specifically for agri-business cooperation.

23373 **ANU—International Exchange Network for Junior Academic Staff**

RSPACS plus the International Institute for Asian Studies, Leiden and the East-West Centre, Hawaii, seeks applications from Postdoctoral fellows and research fellows in Pacific or Asian Studies to spend a period of exchange at either of the above overseas institutions or at a nominated university in Europe or the United States on a reciprocal basis during 1997 or 1998. Exchanges for a period of three to six months. Sending institutions will pay the salary of researchers while on exchange, and receiving institutions will provide research and computing facilities. Supplementary funding will be provided to cover initial settling-in costs and to subsidise housing costs in particular. Return economy airfares will be funded.

23499 **ARC Special Research Centres**

Objectives include establishing Centres that will act as a major linkage to international centres and programs; and provide high quality research environments for postgraduate research education and postdoctoral training.

24780 **AAS—Scientific Exchanges with Korea**

Collaborate visits to Korea both short term 14 to 28 days and longer term visits 1–3 months. Return excursion economy class airfare to Korea and KOSEFF provides an allowance for living and travel expenses in Korea.

24783 **AAS—Science and Technology Agency Short Term Fellowships in Japan**

20 short-term fellowships (one—three months) worldwide. Approximately 270,000 yen provided. Work in national labs and public research corporations (excluding universities and university-affiliated institutes) in Japan.

Return airfare to Japan, a monthly living allowance of approx. 270,000 Yen a monthly housing allowance, a settling-in allowance, a travel allowance, a family allowance if accompanied by dependents, and medical insurance coverage for the fellow only. Provision may be made for Japanese language training.

24799 **AAS—Scientific Visits to Germany**

Airfare and a daily allowance of A$125 is provided for up to six weeks. Does not provide for bench fees. Low priority will be given to applicants who wish to supplement study leave funding or to gain immediate postdoctoral training.

24805 **AAS—Scientific Exchanges with Japan**

Two programs—short term (3–6 weeks) and a longer term program (6–12 months). AAS provides return excursion economy airfare to Japan, JSPS provides and allowance for living and travel expenses in Japan.

24861 **NEDO Intl. Res. Grt. in Materials/Energy/Effic. Energy Use/Global Env**

The New Energy and Industrial Technology Development Organization's International Research Grant Program aims to contribute to the enhancement of the international level of industrial technology as well as to the advancement of international exchange by supporting international joint research teams which conduct superior research. Any international joint research team is eligible to apply. Each team must be composed of four or more researchers, of two or more nationalities. The research organizations where the team member's major activities take place must be located in two or more countries. Expenses covered include travel and conference.

25179 **APICS Ed. & Res. Fndn.—Donald W. Fogarty Intl. Student Paper Comp.**

Cash awards for the best research papers in the field of production and operation management. Eligible applicants are full or part time graduate or undergrads. Awards range from $1500 to $750 for society level awards. The competition is designed to encourage a better understanding of resource management by: increasing student awareness of APICS; encouraging students to explore and develop knowledge in the field of resource management; rewarding outstanding efforts in the study of resource management; increasing student awareness of the practical application of production and inventory control principles for actual organizations; and increasing the awareness of persons in the upper echelons of industry regarding the emphasis that APICS places on education.

25575 **ACU—Development Fellowships**

Needs of developing countries. Provides funding for fellowships tenable for short periods in developed or developing Commonwealth countries. Provides up to 5,000 British pounds, intended to cover: international return airfare at the lowest available economy class rate and by the most direct route; ground travel to home airport and from airport abroad to final destination; medical insurance; local travel abroad; board and lodging; and fees.

25792 **University of Cambridge—Scholarships for Overseas Students**

Applicants must be accepted as graduate students at the University of Cambridge. Scholarships tenable for up to three years. Cover the University Composition Fee, college fees, a maintenance allowance sufficient for a single student, and a contribution towards travel to and from the University. Support is not provided for dependants.

25862 **French Embassy Scientific Fellowships**

Supports junior Post-graduate Australian scientists, with at least 2 years professional experience, to undertake training or research in French labs/institutions for a period of 3 to 6 months. Includes a monthly allowance, registration fees, basic medical cover and accommodation. Travel costs not covered. Need to have a good knowledge of French. No provision of benefits for dependents (special visas, medical cover, accommodation). Evidence of personal funds for family must be provided if family accompanies fellow.

26508 **British Council—Partnerships for Excellence**

Provides a variety of assistance—endorsement of a project; facilitation and brokerage assistance; seed contributions; contributions to underwriting costs to facilitate collaboration between Australia and the UK in the priority areas. Preference to projects with matching/counterpart funding and/or sponsorship. Any grant support is usually in the order of A$600—A$2000.

27067 **ONR Surveillance, Communications, and Electronic Combat Research Pgm**

Support provided to individuals and institutions for basic and applied research in surface/aerospace surveillance, communications and electronic combat. Preliminary correspondence with sponsor encouraged.

27407 **LWRRDC Travelling/Visiting Fellowship Scheme**

Up to four awards. Range of categories of researcher type. One category for early to mid-career researchers. 'Intended to help promising young researchers already part of the research community to work and travel overseas for up to one year.' (Water resource, management/planning; natural resources management).

27768 **ONR Strike Technology Research Program**

Support for basic and applied research in strike technology of importance to naval operations. Preliminary correspondence with sponsor encouraged.

28695 **RIRDC—Travel/Conference Funding**

Support travel to conferences or workshops. $3,500 per applicant. Daily subsistence may be considered for some international travel. (Communications and Information Systems)

28696 **RIRDC—Scholarships**

Postgraduate scholarships $21,500 plus $3,500 for institution (not clear whether this amount can be used for overseas travel).

29038 **ESU—Lindemann Trust Fellowships**

UK and Commonwealth graduates to study at a university in the US. US$30,000 annual stipend; round trip travel expenses; and where appropriate a dependant's allowance. Length of study is one year.

29174 **Imperial College—Concrete Structures Bursaries**

1 or 2 annual bursaries of up to 2000 pounds for one year's study at the Department of Civil Engineering at Imperial College. MSc/DIC course. The award is intended as a supplement to other finance or own funds.

29246 **Institution of Mechanical Engineers—Joseph Bramah Scholarship**

Up to two scholarships of up to stlg1,500 for one year of study are offered for postgraduate study. Shorter periods of study considered. Tenable at an approved centre or lab in the UK.

29248 **IME—Clayton Grants**

Several annual grants of up to stlg1,000 to enable the recipient to obtain special experience or training, or to supplement previous experience or training in mechanical engineering. Postgraduate study for less than one year. For study at an approved centre in the UK.

29249 **IME—Clayton Grants for Postgraduate Studies**

Up to three annual grants of stlg1,000 to assist outstanding postgraduates who experience hardship while undertaking courses of advanced study, training or research work on a course approved by the Institution. Tenable for one year postgraduate study.

29250 **IME—Thomas Andrew Common Grants**

Several grants valued according to individual assessment for approved conferences in areas relating to mechanical engineering overseas. Applicants must be members of the Institution under 40 years of age.

29253 **IME—Labrow Grants**

Several grants of up to stlg7,000 to assist research in mechanical engineering. Level of study is unrestricted. Grants open to members of the institution.

29254 **IME—Raymond Coleman Prescott Scholarship**

One scholarship of up to stlg500 for one year's study in any country, with the possibility of extension.

29256 **IME—Neil Watson Grants**

Several annual grants of stlg500 to enable young engineers to attend conferences and seminars and travel abroad to study engineering practices overseas.

29352 **GRDC—Grains Industry Post-Doctoral Scholarships**

3 categories. Available at overseas institutes of the CGIAR by Australian researchers. $40,000 plus oncosts. (Production Engineering)

29355 **GRDC—Grains Industry Research Scholarships**

$21,000 for three years with an additional $5,000 to the supporting institution. The corporation may provide fares and expenses for students to attend conferences and workshops relevant to the project.

29780 **IDP Frank Knox Memorial Flwshps.—Harvard University**

One academic year—US$15,000. 2 fellowships for Australian students.

Range of disciplines including public health. Tuition fees and health insurance and service fees met in addition to stipend.

30468 **LLTF—Post-Doctoral Research Fellowships**

Post doc research fellowships tenable at UK institutions. Aimed at under 35 year age group and those who wish to progress their research at another institution. Approx. 3 awards for 1998–99. Medicine attracts 3 year fellowships—other fields two years. Salary based on age and experience.

30847 **ACOS—Shipping Industry Research Grant**

Australian Chamber of Shipping—offers a program of biennial grants to encourage personal study which contributes to knowledge and understanding of shipping in the industry, the government or the wider Australian community. One grant of $5000 for a twelve month period.

31797 **NIST Information Technology Laboratory Cooperative Research Opps.**

To conduct research utilizing the sponsor's Information Technology Laboratory or to pursue collaborative research with the sponsor's staff. No monetary support is provided.

33479 **George Alexander Foundation—Grants Program**

7 categories—(7) Travel—to give, predominantly young Australians, the opportunity to gain further experience and to meet their peers in the international scene.

34323 **JSPS—Postdoctoral Fellowships for American Researchers—Short-Term**

Support provided to assist promising and highly-qualified young foreign researchers wishing to conduct research in Japan. Fellowships awarded for 24 months although shorter tenure of at least 12 months considered. Support includes a round-trip ticket for the fellow only; a monthly stipend of 270,000 yen; a settling-in allowance of 200,000 yen; a monthly housing allowance not to exceed 100,000 yen; a monthly family allowance of 50,000 yen if accompanied by dependents; and Accident and sickness insurance coverage for the Fellow only. For FY 1998 280 fellowships.

34538 **IDP—Australia South Africa Institutional Linkks Program: Round 2**

Round 2 will fund up to 10 links projects of collaborative activities of South African and Australian higher education institutions (as specified). Funding normally in range of A$50 000–$100 000 p.a. for 2 years. Academic liaison subordinate to social policy objectives. Institutions required to provide counterpart contributions (include local travel costs). Economy class airfares for participants. Proposals should demonstrate how project will be sustained beyond funding period.

34585 **NASA—Headquarters—Unsolicited Proposals**

Applicants from non-profit and for-profit organizations. Contact with sponsor prior to submission of proposal encouraged.

34587 **NASA—Dryden Flight Research Center—Unsolicited Proposals**

Applicants from non-profit and for-profit organizations. Contact with sponsor prior to submission of proposal encouraged.

35723 **Australian-American Educational Fndn. Fulbright Postgrad. Student Awd**

Postgraduate student awards for those wishing to undertake an approved course of study for an American higher degree or its equivalent; or to engage in research relevant to an Australian higher degree. Value A$28,250. 8 awards available in 1998 with a further 4 privately sponsored awards. (n.b. Awards open to all fields of study but Medical grads not eligible to apply if wishing to engage in clinical practice during the award period) Benefits include: a travel entitlement of A$3,000; a stipend of A$1,950 per month; an establishment allowance of A$1,500; an excess baggage allowance of A$150; for those accompanied by a dependant, there is an allowance of A$250 per month for 12 months; a limited level of health insurance cover is available for the grantee only. Although the award does include a travel and a monthly allowance, applicants must be able to demonstrate that they have sufficient additional funds to provide adequate financial support for themselves and any dependents during their stay the United States.

35949 **LWRRDC—Postgraduate Research Scholarship**

$20,000 is a stipend and $5,000 for the holder's operating expenses. (Unclear as to whether this includes overseas travel)

36235 **NSERC—Visiting Flwshps. in Canadian Gvt. Labs/Earth Sci. & Ecology**

$35,184 per year for up to two years for research at a Canadian government laboratory in the disciplines of the Earth Sciences and Ecology. Two thirds of the awards are to Canadian citizens. Travel allowance for the fellow, spouse, and children.

36294 **AAS—Postdoc. Flwshps. in Science & Engineering Republic of Korea**

Fellowship of 6–12 months for research in universities and government supported research institutions in Korea. Purpose to facilitate and promote regional cooperation in science and technology by supporting young scientists in the APEC region. Provided with a round-trip plane ticket, monthly living allowance of 1 million Won per month (equivalent to about USD1,100) and overseas travel accident insurance.

36474 **RAEng—Anglo-Australian Postdoctoral Fellowships-Eng./Sci./Social Sci**

New scheme funded by the Office of Science and Technology and enables UK academic institutions to nominate Australian postdoctoral researchers for awards to participate in cooperative research programs in the UK for 4–12 months. Aims of program: to encourage the career development of young researchers; to foster international contacts, networks and collaboration; and to promote relationships between two countries which could not have been achieved or sustained through short conference visits.

36696 **MEDRC—Novel Scale Prevention Techniques for Thermal Desalination**

Research proposals to provide assistance in the development or testing of new approaches to fouling control in thermal desalination heat exchanges. Awards are $50,000 for one year. Researchers are strongly encouraged to partner their research activities with multi-national and/or multi-institutional interests, in order to promote real capacity building and ensure maximum technology dissemination throughout the scientific community. The research contractor is expected to contribute at least 50% of the total project costs. The contribution can either be direct funding or in-kind matching resources from any sources (including personnel costs).

36697 **MEDRC—Improved Design of Reverse Osmosis Systems**

Proposals to develop improvements in system's design and ancillary hardware components of reverse osmosis desalination systems. Awards are up to max $50 000 for one year. Researchers are strongly encouraged to partner their research activities with multi-national and/or multi-institutional interests (one regional partner is required), in order to promote real capacity building and ensure maximum technology dissemination throughout the scientific community. The research contractor is expected to contribute at least 50% of total project costs. The contribution can be either funding or in-kind matching resources from any sources.

36698 MEDRC—Improved Membranes and Module Design

Proposals to develop improvements in principal components of reverse osmosis desalination, the membrane and membrane module. Awards are up to max $125 000 for 18 months. Researchers are strongly encouraged to partner their research activities with multi-national and/or multi-institutional interests (one regional partner is required), in order to promote real capacity building and ensure maximum technology dissemination throughout the scientific community. The research contractor is expected to contribute at least 50% of total project costs. The contribution can be either funding or in-kind matching resources from any sources (including personnel costs).

36706 MEDRC—Dev. of a Standardized Form & Content of Operation & Maint.

Proposals to develop improve documentation of operation and maintenance procedures utilised in desalination systems, and to contribute to optimising staff training. Awards are up to max $40 000 for one year. Researchers are strongly encouraged to partner their research activities with multi-national and/or multi-institutional interests (one regional partner is required), in order to promote real capacity building and ensure maximum technology dissemination throughout the scientific community. The research contractor is expected to contribute at least 50% of total project costs. The contribution can be either funding or in-kind matching resources from any sources (including personnel costs).

36714 MEDRC—Beach Well Intakes for Small Seawater Reverse Osmosis Plants

Proposals to provide documentation of state of the art in utilisation of beach well and similar non-surface seawater intake systems; develop improvements in this technology; and develop and verify criteria for installation of this type of seawater intake. Awards are up to max $40 000 for one year. Researchers are strongly encouraged to partner their research activities with multi-national and/or multi-institutional interests (one regional partner is required), in order to promote real capacity building and ensure maximum technology dissemination throughout the scientific community. The research contractor is expected to contribute at least 50% of total project costs. The contribution can be either funding or in-kind matching resources from any sources (including personnel costs).

36723 MEDRC—Innovative Small Desalination Systems

Proposals to encourage development, assessment of feasibilities, testing, and improvement of new designs or concepts for desalination systems or an essential component. Awards are up to max $50 000 for one year. Researchers are strongly encouraged to partner their research activities with multi-national and/or multi-institutional interests (one regional partner is required), in order to promote real capacity building and ensure maximum technology dissemination throughout the scientific community. The research contractor is expected to contribute at least 50% of total project costs. The contribution can be either funding or in-kind matching resources from any sources (including personnel costs).

36724 MEDRC—Material Testing and Certification Program

Proposals to evaluate requirements for materials and corrosion testing and certification program specifically for problems and needs in the desalination technology of Middle East/North Africa region. Awards are $10 000 for 6 weeks of Phase 1. Phase 11 is expected not to exceed 6 months. Researchers are strongly encouraged to partner their research activities with multi-national and/or multi-institutional interests (one regional partner is required), in order to promote real capacity building and ensure maximum technology dissemination throughout the scientific community. Sponsor intends to award service contract to consortium of selected experts from different relevant fields of specialisation, coordinated by a project leader.

36728 MEDRC—Investigation of Small Home-Use RO Units

Sponsor seeks to investigate efficiency of domestic reverse osmosis desalination units and propose potential improvements in produced water recovery with particular reference to needs of Middle East/North Africa region. Awards are a max $35 000 for one year. Researchers are strongly encouraged to partner their research activities with multi-national and/or multi-institutional interests (one regional partner is required), in order to promote real capacity building and ensure maximum technology dissemination throughout the scientific community. The research contractor is expected to contribute at least 50% of total project costs (i.e. the total project cost is $70 000). The contribution can be either funding or in-kind matching resources from any sources (including personnel costs).

36887 AusAID—Private Sector Linkages Program (PSLP)

Includes airfare and living expenses overseas. Aimed at promoting sustainable development and economic growth by harnessing the expertise and capacity of Australian enterprises to work with counterpart organisations in developing countries.

36981 NHMRC—Radiofrequency Electromagnetic Energy Research

Seeking expressions of interest for Australian-based research into health issues associated with mobile phones, mobile phone towers and other communication devices and equipment. Approx. $4m provided over 4 years. Certain research areas are particularly encouraged. Restricted to Australian citizens/permanent residents, but researchers free to collaborate with, and participate in, international studies. Funding from other sources to expand studies acceptable if NHMRC-funded work kept self-contained.

37032 **UCAR—Visiting Scientist in Hydrological/Land-Surfaced Process Model.**

Support provided for visiting scientist to participate in team developing, testing, and operationally implementing national-scale, distributed land-surface /hydrology models. Applicants should have MS or PhD in meteorology, hydrology, physical geography or related field. Duration 2 years, at NOAA Science Center, Maryland, with salary commensurate with experience.

37324 **CIT—Maersk Awards**

Sponsor provides 2 awards each worth £500 for final-year undergraduate topic and post-graduate dissertation/thesis, both of relevance to shipping/intermodal/international trade/transport.

37496 **IOO—Nuclear Engineering Education Research Grant Program**

Department of Energy (US). Support provided to colleges and universities with nuclear engineering degree programs—to support basic research, assist in developing engineering students and contribute to strengthening academic community's nuclear engineering infrastructure. Funds $2.2m for 1 year with 15 grant awards proposed. Proposals from teams of universities encouraged, as is collaboration with DOE labs.

37593 **NCRR—Neurosciences Technology Development**

Program announcement from NIH to encourage applications (new research grants—RO1 and R21) to develop innovative technologies, methodologies, or instrumentation for study of biology of brain. Applications from domestic and foreign organisations.

37692 **University of Leeds—John Henry Garner Scholarship**

Applicants must be undertaking research on matters relating to chemical and biological surveys of rivers/streams and the purification of sewage and trade effluents in West Riding of Yorkshire prior to the boundary changes effective 1/4/1974. One award of academic fees at the UK rate plus a maintenance grant of £5 450.

37758 **RFP—Air Base technology**

Agency announcement that US Air Base Technology Branch is interested in receiving proposals (technical and cost/price) on a list of research areas. Appropriate security clearance for domestic firms is required. Foreign firms should be aware that restrictions may apply which could preclude their participation.

37790 **RFP—C3 Advanced communications/signal processing techniques for smar**

US Air Force Research Laboratory, Rome NY, soliciting white papers for various scientific studies and experiments. Solutions to basic research and engineering using innovative approaches will be sought. Proposals submitted will be evaluated as they are received. Individual awards will not normally exceed 32 months duration, and range from $100K to $1m. Total funding available $10.5m. Foreign-owned offerors advised that participation subject to foreign disclosure review. Work to be performed may require a SECRET facility clearance and safeguarding capability.

37814 **RFP—Imagery exploitation program research and development announceme**

US Air Force Research Laboratory, Rome NY, soliciting white papers for new and creative technical R&D solutions to demonstrate improvements in efficiency and timeliness of generating intelligence information from multiple reconnaissance imaging sensor inputs. Individual awards will not normally exceed 18 months duration, and range from $100 000 to $300 000. Total funding available $2m. Work to be performed may require a SECRET facility clearance and safeguarding capability.

Foreign allied participation at the prime contractor level is authorised for Australia.

37901 **NASA—Mars Instrument Development Program**

Sponsor provides support for R&D to take promising instruments, relevant to surface science goals of Mars 2003 and 2005 missions, from breadboard or lab demonstration phase to point where they can be tested. Sponsor welcomes proposals from outside US, but investigators working outside US are ineligible for NASA funding.

37933 **University of Leeds—Tetley and Lupton Taught Postgraduate Schol.**

Different support for applicants from Canada and those from elsewhere. Stlg 2,000 available to students from any country except EU. Awards are given towards the cost of academic fees for candidates liable to pay tuition fees at the "full-cost" rate for international students. Duration one year.

37971 **OER—Env. Mgmt. Sci. Pgm: Res. Related to High Level Radioactive Wast**

US Department of Energy provides support to investigators in institutions with regard to specific activities for high level radioactive waste. Range from $100 000–
$300 000 per year for 3 years.

38491 **RFP—BAA 98-05-IFKPA expert science and engineering program**

US Air Force Research Laboratory, Rome NY, soliciting proposals under the "Expert Science and Engineering Program", including innovative approaches and basic and exploratory research projects in area of information science and technology. Foreign-owned offerors advised that participation subject to foreign disclosure review.

38904 **Monash University—Logan Research Fellowships**

Five fellowships for applicants with 2–6 years of postdoctoral experience. Appointment for 3 years, expandable to 6. Salary range A$46 269–$51 113, depending on experience. Support grant from A$5 000–$20 000. Return airfares for fellow and dependents. Travel—subsistence and fares for fieldwork, conferences and seminars related to research and, where necessary, consultation with other workers.

38905 **SOM Foundation Structural Engineering Traveling Fellowship Program**

Applicants must have recently completed a Master's or PhD in civil or architectural engineering from a US school. Award $7 500. While candidate must have attended a US school, citizenship is open.

38911 **SOM Foundation Mechanical/Electrical Traveling Fellowship Program**

Support provided to expand vision and imagination of young engineers in design and engineering of building systems. Applicants must have received a Bachelor or Master of Science degree in mechanical or electrical engineering. Award $7 500. Any citizenship, but must be attending US school.

39471 **SDF—Blasker Award for Environmental Science and Engineering**

San Diego Foundation grants award of $250 000 to individual/group for most creative and innovative submission towards solution to predetermined environmental problem. The 1999 award topic is water. No citizenship restrictions.

39508 **DIST—Collab. on Science & Technology: Australia-Indosia (COSIAI)**

Collaborative projects with Indonesia (includes telecommunications, aerospace, clean energy and automotive). DIST may be able to contribute to the funding of travel, living expenses and the cost of conducting workshops.

39605 **DSD—Victoria Fellowship**

Six fellowships to be awarded annually to emerging leaders in fields of science, engineering and technology. $15 000 travel grant to undertake short-term study mission which will assist in career development, enable development of potentially commercial idea or undertake specialist training not available locally. Costs met for national and international travel, accommodation and living expenses, medical/travel insurance and out-of-pocket expenses while overseas. Sources of funds available to applicant should be declared, including source of salary or stipend during the study mission.

40002 **ACIAR—Bilateral Research Program**

International collaboration in research and related activities that develop sustainable agricultural systems and appropriate strategies for natural resource management. Most projects located in SE Asia and South Pacific. 3 years.

40346 **ARC International Researcher Exchange Program (IREX)**

3 elements of program (1) International Fellowships; (2) Asia-Pacific Link Awards; (3) MoU Awards.

40536 **OER—Genome Instrumentation Research Program**

US Department of Energy provides support to scientists with background in biology, chemistry, physics and engineering for substantive improvements to current systems and novel and creative new strategies needed in preparation for needs of biology in next century. Awards range $100 000 to $300 000 for typical 3 year grant. Eligible applicants encouraged to collaborate with researchers in other institutions where appropriate.

40824 **RFP—Advanced Radar Technology Surveillance, Radar Research & Develop**

US Air Force Research Laboratory, Rome NY, soliciting white papers for innovative approaches in area of advanced radar technology. Foreign-owned offerors advised that participation subject to foreign disclosure review. Export controlled data may be involved and only firms on an access list may be allowed to access such data.

41094 **Merrill Lynch—Innovation Grants Competition**

Sponsor provides support to encourage entrepreneurial literacy among academic research community. Cash prizes available for PhD students in all disciplines except business, law or journalism (and certain medical school areas). Examine dissertations in light of commercial potential. Seek also to make academic research more accessible and relevant to public. First prize $50 000; 2nd (2 awards) $20 000 each; 5 university awards and discretionary grants to grand total of $150 000.

41309 **UCAR—Off./Hydrology Visiting Scientist Pgm/River Mechanics Modeling**

Support provided in US for individual to join team conducting applied R&D and implementation of dynamic streamflow routing capabilities using specified operation. Program is for 1–3 years. Applicants must have Masters or PhD in physical or natural science or engineering, with emphasis on hydrology and/or river mechanics. Fixed annual stipend plus health/dental insurance, sick and annual leave, paid holidays, retirement fund contribution and life insurance. Relocation allowance and allowance for scientific travel and other support costs.

41780 **RFA—CA-98-014—Health Communications in Cancer Control**

Up to 8 awards made in area of health communications in cancer control by US National Cancer Institute. Applications submitted by organisations, domestic and foreign, with one person among applicants designated as team leader. Total cost of any one application not to exceed $500 000 in any one-year budget period.

42485 **RFA—DE-98-009—Biometics & Tissue Eng. in the Restor. Of Orofacial.**

Up to 3 awards to develop natural and novel approaches, restoration, and replacement of oral, craniofacial, dental, skin and musculskeletal tissues and organs based on a comprehensive scientific understanding of biological structures and their functions. Particularly interested in supporting collaborative, interdisciplinary teams of scientists from the fields of engineering, chemistry, physics, mathematics, and biology. Range of funding ($600,000 total costs for only 2–3 individual R01s)—R21s must limit requests to $100,000 in direct costs per year for two years.

Agriculture—SPIN programs as of second quarter 1998

Allows overseas research experience/training/career development for young researchers

00117 **Smokeless Tobacco Research Council Research Grants.**
Grant-in-aid for one year with possibility of extension. Eligible expenses include salaries, consultants, supplies, travel and equipment.

00119 **Smithsonian—Graduate Student Flwshps.—Biology/Physical Sciences**
10 weeks only prior to doctoral enrolment—doesn't provide for travel funds to get to the US—must be enrolled as a doctoral student.

00158 **WHOI—Research Fellowships in Marine Policy and Ocean Management.**
Provides in-residence fellowships for a period of one year. Carries a $38,500 stipend plus modest research and travel funds.

00195 **Smithsonian—Predoctoral Flwshps.—Biological/Physical Sciences**
Includes travel allowance to assist with temporary relocation but probably only within US.

00197 **Smithsonian—Postdoctoral Flwshps.—Biological and Physical Sciences**
Includes travel allowance to assist with temporary relocation but probably only within US.

00501 **Center for Field Research Grants**
Postdoc—Earthwatch not mainstream (allowable travel is of principal investigator to and from the field). Minimum size of project has to involve 15 volunteers. Average award $800.

00921 **Lindbergh Foundation Grants**
Funds can't be used for travel.

00922 **Smithsonian—Molecular Evolution Fellowships**
Must have completed PhD. Based at different institutes. Includes travel allowance—wide range of disciplines of some relevance to agriculture.

01033 **NRC—Reg. Resident Associateships in Life, Medical, & Behavioral Sci.**
Based in US government labs. Certain labs don't accept foreign nationals. Attendance at professional meetings encouraged—but limited funds.

01114 **NASA—Johnson Space Center—Unsolicited Proposals**
Awarded to institutions not individuals. Wide range of disciplines including food technology and nutrition.

02004 **Rockefeller Fndn. Bellagio Study & Conf. Ctr.—Intl. Conferences**
Provided for groups. Agriculture one of fields covered. 25 participants per group. B&B but no airfares. 3 days duration.

02026 **Harbor Branch Postdoctoral Fellowships**
Aquaculture plus others. Limited budget for travel.

02227 **Lady Davis Graduate Fellowships**
To study in Israel—priority to Canadians. 9–12 months includes travel costs.

03430 **Lady Davis Postdoctoral Fellowships**
To study in Israel—priority to Canadians (agricultural engineering amongst field supported)

03708 **BBSR Bermuda Biological Station for Research Grants-in-Aid**
Grants don't cover salary, airfare, personal expenses or supplies. Defrays costs of inhouse charges such as boat fees and rental on projects.

03898 **NRC—Research Associateships**
Recent PhDs in natural science or engineering. Emphasis on marine science although soil science, plant biotechnology included. Travel allowance provided. Based in Canada.

04186 **Golda Meir Fund—Fellowships at the Hebrew University of Jerusalem**
Agriculture specified. Grants intended to defray costs of travel for postdoc fellows only.

04255 **Rockefeller Archive Center Travel and Research Grants**
Archival collections of Rockefeller family. Major subjects at the centre include agriculture. Travel grant—successful applicant would need to have access to other funds for support.

11305 **BPFI—James K. Rathmell, Jr. Memorial Schlrshp. To Work/Study Abroad**
1 award of $2000. To a graduate or undergraduate with plans to work outside the US or Canada.

13981 **Rockefeller Fndn. Bellagio Study & Conf. Ctr.—Team Residencies**
3–10 people. 1 week—1 month. Interdisciplinary, innovative collaborations. B&B but no stipend. Sponsor will provide round trip economy airfare only for those from
developing countries.

15749 **Univ. of Melbourne Flwshps. for Women w/ Career Interruption**
Generic—allowance $4000 per year to support field work or attend conferences.

18585 **Monbusho Research Student**
Transportation to and from Japan to study at a Japanese university. Agriculture included. 2 programs—one a year and a half the other two years. Monthly allowance. Field study allowance, arrival allowance and accommodation allowance.

22382 **AAS—Maxwell Ralph Jacobs Fund**
Graduates within Australasia. $3000. May include overseas travel. Any field of forestry science.

22504 **DFRDC Dried Fruits Research**
Eligible applicants institutions and individuals. 'Domestic and overseas travel required to achieve the project outcomes are allowed'.

22538 **FRDC Fisheries Research & Development Investment**
Funding may be used for both domestic and overseas travel. Organisations/individual researchers. R&D projects. Likely that grants are awarded to more established researchers who can include early career researchers as part of the research team.

22545 **ARC Large Research Grants**
ARC has entered into agreements with research agencies overseas in order to facilitate joint-funding of research projects. Austria, France, Germany, Netherlands, Italy and EU.
For the straight Large Grants travel can be outside Australia as long as the project is based in Australia. Also travel and attendance at conferences is permitted. Salaries can be sought for salaried non-tenured post-doctoral personnel.

22546 **ARC Fellowships**
Foster opportunities for pursuing internationally competitive independent research. It is expected that part of funds to be used for field work or conference/symposium associated with or essential to the fellowship.

22547 **ARC Strategic Partnership with Industry Research & Training (SPIRT)**
Projects must be undertaken by investigators including APD Fellows (Industry). Normal travel overseas for field work collaboration, conferences etc is permitted. Nothing in profile regarding travel for students associated with the project.

22549 **ARC Small Grants**
University discretion regarding how small grants allocated and whether or not overseas travel is supported.

22723 **AusAID—International Seminar Support Scheme (ISSS)**
Seminars can be held overseas as well as in Australia. Designed to assist developing countries. Normally only one Australian will be considered for funding assistance.

22735 **Pig Research and Development Corporation—Travel Grants**
Recognises that travel is an essential component of the process of R&D and technology transfer. Financial assistance for researchers to present papers/ reports to recognised R&D forums both nationally and internationally.

22844 **GRDC—Research Grants**
Covers travel where it forms an integral part of the project (not necessarily overseas).

22857 **AAS—Rhone-Poulenc Flw. Under the Bede Morris Flwshp.: France**
Provides funds for professional scientists to visit France. The proposed project should be collaborative and facilitate the development of the applicant's careers.

22861 **GWRDC—Research Grants**
Focus on research on problems and opportunities of national and regional significance to the grape and wine industry. Sponsor will consider applications for travel, study tour, and conference attendance that align with the Corporation's R&D priority areas.

23071 **DPIE—Australia/China Agricultural Co-Operation Agreement**

Provided to cover international travel. Within China, China meets the travel costs. Specifically for agri-business cooperation.

23147 **AW Howard Memorial Trust—Travel Grants**

$3000 to undertake overseas study tours or participate in international conferences related to pasture research. The awards represent a career development opportunity. Preference will be given to scientists who have had little opportunity to travel overseas.

23157 **Asialink Centre—Sir Edward 'Weary' Dunlop Asia Fellowship**

$20,000—citizens 18–40. Variety of disciplines. Fellows must maintain an association with the University of Melbourne through the Asia Link Centre.

23446 **SRDC—Travel/Conference Grants**

Overseas and domestic travel to attend seminars and conferences.

23471 **CRDC—Post-Doctoral Research Fellowships**

Research in Australia but in special circumstances research outside Australia may be approved.

23752 **World Bank—MIGA Summer Employment Program**

Open to students who are nationals of the banks member countries. Summer employment, monthly salary and travel allowances. Must have bachelors degree and be enrolled as a fulltime student in a masters or PhD.

24121 **TRDC—Research and Development Grants**

Overseas travel directly related to the project; travel funding to attend conferences/seminars (unclear as whether tenable os).

24869 **Earthwatch Australia—Dunlop Earthwatch in Asia Fellowships**

$5000. 18–40 age category. Placing paying volunteers in the field to work with scientists and scholars.

25575 **ACU—Development Fellowships**

Needs of developing countries. Provides funding for fellowships tenable for short periods in developed or developing Commonwealth countries. Provides up to 5,000 British pounds, intended to cover: international return airfare at the lowest available economy class rate and by the most direct route; ground travel to home airport and from airport abroad to final destination; medical insurance; local travel abroad; board and lodging; and fees.

27407 **LWRRDC Travelling/Visiting Fellowship Scheme**

Up to four awards. Range of categories of researcher type. One category for early to mid-career researchers. 'Intended to help promising young researchers already part of the research community to work and travel overseas for up to one year'.

28185 **GRDC—Travel/Conference Grants**

Which may cover international or domestic airfares, registration and subsistence.

28235 **PRDC—Postdoctoral Fellowship**

Awarded to a scientist who has already made a some significant contribution to the Australian pig industry. $35,000 plus $5,000 to support the work. Award is not restricted to study in Australian institutions.

28695 **RIRDC—Travel/Conference Funding**

Support travel to conferences or workshops. $3,500 per applicant. Daily subsistence may be considered for some international travel.

28696 **RIRDC—Scholarships**

Postgraduate scholarships $21,500 plus $3,500 for institution (not clear whether this amount can be used for overseas travel).

29352 **GRDC—Grains Industry Post-Doctoral Scholarships**

3 categories. Available at overseas institutes of the CGIAR by Australian researchers. $40,000 plus oncosts.

29355 **GRDC—Grains Industry Research Scholarships**

$21,000 for three years with an additional $5,000 to the supporting institution. The corporation may provide fares and expenses for students to attend conferences and workshops relevant to the project.

29983 **CRDC—Industry Development Awards**

Awards are available for up to 12 months and will assist with the financing of projects and/or to help meet the costs of travel within Australia or overseas.

29985 **CRDC—Travel/Conference Funds**

The Cotton R&D Corpn provides study and/or conference travel for the purposes of developing the skills and knowledge of the researcher or improving technology transfer—to cover all overseas travel and domestic travel that is not an integral part of a research project.

31580 **DFAT Australia-India Council Grants**

The Australia Industry Council supports activities designed to promote a greater awareness of Australia in India and of India in Australia, including visits exchanges between the two countries, and development of institutional links.

33479 **George Alexander Foundation—Grants Program**

7 categories—(7) Travel—to give, predominantly young Australians, the opportunity to gain further experience and to meet their peers in the international scene.

33810 **GRC—Travel Awards**

Grants available for overseas travel and all domestic travel to seminars, symposia or conferences to researchers in Western Australia working in the area of grains research. Eligible travel costs include air fares, other fares, registration fees, and subsistence.

35946 **FWPRDC—Postgraduate Scholarships/Fellowships**

$20,000 is a stipend and $5,000 is for the institution towards project costs. (Unclear as to whether this includes overseas travel).

35948 **FWPRDC—Conference Sponsorships**

$2000 assistance grants to help cover the costs of organising national and international conferences.

35949 **LWRRDC—Postgraduate Research Scholarship**

$20,000 is a stipend and $5,000 for the holder's operating expenses. (Unclear as to whether this includes overseas travel)

36235 **NSERC—Visiting Flwshps. in Canadian Gvt. Labs/Earth Sci. & Ecology**

$35,184 per year, plus travel for up to two years for research at a Canadian government laboratory in the disciplines of the Earth Sciences and Ecology. Two thirds of the awards are to Canadian citizens.

36294 **AAS—Postdoc. Flwshps. in Science & Engineering Republic of Korea**

6–12 months duration for research in universities and government-supported research institutions in Korea. Round trip air ticket, monthly living allowance and overseas travel accident insurance.

36618 **CRDC—Postgraduate Research Fellowships**

Awarded for research within Australia, but in special circumstances, research outside the country may be approved. Awarded for periods of up to three years.

36887 **AusAID—Private Sector Linkages Program (PSLP)**

Includes airfare and living expenses overseas. Aimed at promoting sustainable development and economic growth by harnessing the expertise and capacity of Australian enterprises to work with counterpart organisations in developing countries.

37567 **SRDC—Postgraduate Scholarships**

$22,000 pa plus $3,000 allowance to host institution to cover student's expenses (unclear as whether this includes overseas travel).

37933 **University of Leeds—Tetley and Lupton Taught Postgraduate Schol.**

Different support for applicants from Canada and those from elsewhere. Stlg 2,000 available to students from any country except EU. Awards are given towards the cost of academic fees for candidates liable to pay tuition fees at the "full-cost" rate for international students. Duration one year.

38372 **BPFI—Ed Markham International Scholarship**

One scholarship of $1000 is awarded to either a graduate or undergraduate student. (Bedding Plants Foundation, USA)

39508 **DIST—Collab. on Science & Technology: Australia-Indosia (COSIAI)**

Collaborative projects with Indonesia (includes agricultural biotechnology). DIST may be able to contribute to the funding of travel, living expenses and the cost of conducting workshops.'

40002 **ACIAR—Bilateral Research Program**

International collaboration in research and related activities that develop sustainable agricultural systems and appropriate strategies for natural resource management. Most projects located in SE Asia and South Pacific. 3 years.

40346 **ARC International Researcher Exchange Program (IREX)**
3 elements of program (1) International Fellowships; (2) Asia-Pacific Link Awards; (3) MoU Awards.

41658 **GRDC—Research Grants**
Only limited funding for travel—doesn't specify any restrictions.

41933 **RIRDC/LWRRDC/FWPRDC Jt. Venture Agroforestry Program**
Travel costs supported but doesn't specify any restrictions.

Other—SPIN programs as of second quarter 1998

Allows overseas research experience/training/career development for young researchers

00643 **AAUW International Fellowships**

Stipend of $15,160 for one year to fund full-time graduate or postgraduate research/study in the US for women who are non-residents, non-US citizens, and who will hold the equivalent of a US bachelor's degree. Upon completion of their studies, fellowship recipients must return to their home countries. Preference given to applicants who can verify that they have a definite position awaiting them. Total of 45 fellowships awarded.

01567 **Bunting Institute—Fellowship Program**

8–10 fellowships of $36,500 each support women scholars, researchers, creative writers and visual and performing artists to pursue independent study at the Bunting Institute, Radcliffe College and Study Center. Eligible applicants must have received the PhD or appropriate terminal degree at least 2 years prior to appointment. The term of the fellowship is 10–11 months. Residence in the Boston area and participation in the Institute community are required; however, housing is not provided.

02375 **Smithsonian—National Air and Space Museum Internships**

Internship opportunities for college ug and grad students at the National Air and Space Museum. Duration is a minimum of 10 weeks during the summer semester. No citizenship restrictions. Interns must work full time (40 hours per week). Stipends are available.

02840 **University of Bristol Research Scholarships**

Support is provided for graduate study toward a doctoral degree in any field at the University of Bristol. Eligible applicants are graduate students with a good first degree. Awards provide stipends totaling approx. 5,200 British pounds for year and are tenable for 3 years. Awards provide tuition fees of 2,490 British pounds.

03898 **NRC—Research Associateships**

Research associateships of $39,366 (Canadian) fund two years of research in science and engineering at the sponsor's laboratories in Canada. Must be recent PhD recipients in natural science or engineering or those with recent master's degrees in an engineering field. 'The awards are intended to give promising scientists and engineers an opportunity to work on challenging research problems in fields of interest to the sponsor as a stage in the development of their research careers. Associateships open to nationals of all countries although preference is given to Canadians. A travel allowance for associates and their families is provided.

04255 **Rockefeller Archive Center Travel and Research Grants**

Archival collections of Rockefeller family. Major subjects at the centre include medicine. Travel grant—successful applicant would need other funds to support stay.

10369 **ARO—BAA—Conference and Symposia Grants**

Support is provided for conferences and symposia in special areas of science that bring experts together to discuss research and findings. The sponsor encourages international assemblies, alliances, and conferences. Funding amounts vary.

10982 **Rotary Fndn. Multi-Year Ambassadorial Scholarship**

Provides for 2–3 years of study abroad to individuals who have completed at least two years of university or college coursework. Any field of study. Flat grant of $11,000 per year will be awarded. Ambassadorial aspect major expectation. No allowances for dependents.

11360 **Northwood University—Alden B. Dow Creativity Center Fellowship Pgm.**

Provides four 10-week in residence fellowships each summer on the Midland campus of the Northwood University for individuals in any field or profession who wish to pursue an innovative project or creative idea. Awards include travel, living quarters, board, and a stipend of $750. (Expenses for foreign citizens covered from the point of entry into the continental US).

13981 **Rockefeller Fndn. Bellagio Study & Conf. Ctr.—Team Residencies**

International, interdisciplinary teams of problem-solvers. 3–10 people staying from one week to one month. B&B no travel funding or stipend.

20598 **Univ. of Alberta—Izaak Walton Killam Mem. Postdoctoral Fellowship**

Support provided to doctoral level applicants for research fellowships in most fields of study. For two years, with a salary of $31,200 (Canadian) per year, a $3000 one time research grant, and return airfare.

22547 **ARC Strategic Partnership with Industry Research & Training (SPIRT)**

Collaborative research only plus can seek funds for an APAI or Australian Postdoctoral Fellowship (Industry).

Overseas Industry partners—ARC is prepared to accept overseas organisations as eligible industry partners subject to meeting criteria that : the economic or social benefit of the research is to Australia; and the intended use of the research outcomes is in Australia. Travel is considered a legitimate expense (but doesn't stipulate if this is just domestic).

Associate Investigators—must warrant mention of his/her name on publications arising from the project, but should not be at a level sufficient for the researcher to be eligible as a Team Leader, Chief Investigator or Partner Chief Investigator. Associate Investigators may act as mentors for APD (I)s.

APA (I) stipend at top of APA range.

23067 **British Council—British Chevening Scholarships**

Award offers outstanding graduates and young professionals from all over the world the opportunity to spend a formative part of their lives studying at British universities. One year's duration.

25841 **Churchill Fellowships**

Provides financial support for Australians to undertake overseas study, or an investigative project, of a kind that is not fully available in Australia. Max. period of tenure is 12 months. Award provides return airfares, travel allowances and an overseas living allowance for the Fellow.

25900 **Royal Society of Edinburgh—SOED Personal Research Fellowships**

Up to 3 year fellowships provided for research in any discipline, with preference to topics likely to enhance the transfer of ideas and technology from the research community into wealth creation and improvement of the quality of life in Scotland. Applicants must possess a doctorate or equivalent and normally be under 32 years of age. 16,045–24,600 pounds depending on qualifications, age and experience. In the first year, up to 2,500 pounds towards expenses involved in carrying out the research e.g. support for travel, attendance at approved meetings and the cost of minor equipment. In subsequent years, the amount available will be a maximum of 1,000 pounds. 2 fellowships awarded annually.

26508 **British Council—Partnerships for Excellence**

Provides assistance in a variety of ways (e.g. endorsement of a project; facilitation & brokerage assistance; seed contributions; contributions to underwriting costs) to facilitate collaboration between Australia and the UK in the priority areas of Arts, Science and Education. Preferences to projects with matching/counterpart funding. (Grant support usually in range of A$600–A$2000.

26540 **Univ. of Melbourne Awards for Joint Research**

An award of $15,000 to encourage the development of joint research projects with other universities and research institutions, or with industry. Matching funds, either in cash or in-kind are required. Objectives are 'to facilitate the development and strengthening of links between researchers at the University of Melbourne and researchers in leading Australian and overseas universities, other research institutions and industry; to promote research activities within the framework of exchange agreements with overseas universities and research institutions; and to increase the competitiveness of University of Melbourne researchers when bidding for external collaborative research funding.

26864 **DAAD Research Grants: Short Term Visits**

Sponsor invites PhD candidates and recent PhDs for short term visits (2–6 months) to undertake post-doctoral research or dissertation. Age limit is: 32 yrs for PhD candidates, and 35 yrs for recent PhDs. Grant consists of a monthly installment of DM 1.600, an international travel subsidy of DM 2.500, and a contribution towards health insurance.

26865 **DAAD Study Visits**

Sponsor invites applications from people who are interested in undertaking study visits to German institutions for up to 3 months. Must have at least 2 years post-doctoral teaching experience at a university and/or research experience. A grant is provided in the form of a monthly allowance (DM3.500), international travel is not covered although a travel allowance may be granted.

27413 **Boehringer Ingelheim Fonds Short-Term Fellowships**

Awards short-term fellowships (up to 3 months) to pre- and post-doctoral scientists of any nationality, to be used in Germany or abroad. Pre-doctorate scientists should not be older than 30 years and post-doctorate scientists should not be over 32 years at the time of application. Participation in conferences, symposia and workshops is not sponsored.

28441 **University of Leeds—Tetley and Lupton Scholarships**

Approx. 40 new scholarships equivalent to the UK rate of programme are offered to overseas students who are commencing research degree study. Renewable for a second or third year.

28471 **Finnish Centre for International Mobility (CIMO) Scholarships for Young Researchers & University Teaching Staff**

Scholarships provided for young researchers from all countries in order to promote international cooperation in teaching and research. Monthly allowance of FIM 4,000–6,000 is intended to cover living expenses in Finland for a single person. The scholarship period is 3–12 months. No additional allowance for housing is paid. International travel is not covered.

28472 **CIMO—Bilateral Scholarships**

Scholarships for a)3–9 months of post-graduate academic studies and research; b) study visits of 1–2 weeks for university staff and cultural experts. (Based mainly on bilateral cultural agreements or similar arrangements between Finland and a number of countries—including Australia. Provides for 3–9 months in a Finnish university for postgraduate academic studies or 1–2 weeks for university teaching or research staff members and cultural experts in various fields. Bilateral scholarships consist of a monthly allowance of FIM 4,000 (1996–97). Short term visitors receive a daily allowance (approx FIM 150 in 1996). Accommodation provided for short-term visitors. No travel grants to or from Finland.

28730 **Dept. of Education and Science(Ireland)—Scholarship Exchange Scheme**

30 annual scholarships of Irstg 2,976 to assist students in pursuing study or research in any subject in Ireland. Length of study is 8 months. Australia one of the specific countries listed for the exchange.

28831 **British Institute in E. Africa—Res. Studentships/Grad. Scholarships**

Enables postgraduate students with good degrees to familiarize themselves with current research in the region. Duration normally 6 months. Awards cover return air-fare and subsistence at the sponsor's Nairobi base and in the field. Ecology listed as one of the fields of research covered. Usually covers a return air-fare and subsistence at the sponsor's Nairobi base and in the field.

28983 **ANU—R.G. Menzies Scholarships to Harvard**

Scholarships for study at any graduate school at Harvard. Provides up to A$25,000 to contribute towards tuition fees, living expenses or travel costs. Each Menzies Scholar is encouraged to repay the Scholarship in future years.. Scholarships jointly sponsored by the Harvard Club of Australia, the Sir Robert Menzies Memorial Foundation and the Australian National University. Up to two scholarships awarded annually to a graduate of an Australian tertiary institution.

28989 **UNSW—Vice Chancellor's Postdoctoral Fellowship Program**

Two year fellowships support excellence in full-time research in any school or department of UNSW. Must have held a doctoral degree for no more than 3 years at 7 November 1997. Award includes a stipend of $A40,804 to $A34,801 per annum; a minimum cost return airfare for the Fellow' and an annual allowance of $A1,500 for research materials and conference expenses.

32305 **UNSW—Anthony Mason Fellowships**

Provides for two-way scholarly exchange and collaborative research between UNSW and specified universities in Asia Pacific region. Designed to encourage long-term research linkages, especially between UNSW's established research centres and overseas counterparts at participating institutions. Economy class airfares are provided for Fellows between home and host institution, plus accomodationn and living costs for one month period

33717 **IFUW—CFUW/A Vibert Douglas International Fellowship**

Biennial fellowship of at least 8 months for female enrolled in doctoral studies in any discipline. Closing date 30/9 in Australia and preliminary screening done at national level—each federation allowed to sponsor 3 candidates in final round. Value $6000 Canadian

34227 **Hong Kong Baptist University—Fellowship Program**

Six fellowships yearly of 1 semester, covering all disciplines. Stipend HK$25 000, economy class airfares, short-term medical insurance and university housing. Aims to strengthen and enhance research and teaching and foster research collaboration among local and overseas scholars.

35498 **Univ. of Cambridge Peterhouse Research Studentships**

Open to men/women who have not normally been undergradute members of the College. No more than 3 studentships offered, for 3 years, valued at £5 190 p.a. plus payment of certain approved fees. Applicants must intend to be candidates for a PhD at Cambridge and for July 1998 entry they should be under 25 years of age on 1/12/98, although where a suitable case can be made (e.g. unavoidable career interruption) allowance may be made.

35721 **Univ. of Melbourne Newman College Archbishop Mannix Travelling Schol.**

Originally intended for a Catholic graduate of the University of Melbourne, to pursue postgraduate study abroad, return to Australia and be engaged in academic pursuits. In the event of no supitable candidates the fund is open to male/female graduates of any Australian university for postgraduate study at an overseas university. Scholarhip of not less than $20 000 initially for 2 years, possibility of extension to 3 years. Scholars need to meet various criteria and abide by rules regarding paid work etc.

35803 **Rockefeller Archive Center Special Residencies and Grants**

Sponsor offers 1 month residencies with stipends of US $ 5 000 for postdoctoral or graduate research in archives of Rockefeller University.

36550 **British Council—Fellowships, Scholarships, Programmes and Awards**

Offers large number of fellowships, scholarships, programmes and awards to promote cultural, educational and technical cooperation between Britian and other countries. Amount and duration of awards depends upon the individual award and cooperating country.

36887 **AusAID—Private Sector Linkages Program (PSLP)**

Australian companies, partnerships or consortia may apply for grants of between $25 000 and $250 000 for up to 12 months for activities which promote sustainable development and economic growth by harnessing the expertise and capacity of Australian enterprises to work with counterpart organisations in developing countries. Eligible activity costs include domestic and international economy class airfares (where justified by details) plus daily living rates for Australians overseas and counterpart personnel in Australia.

37195 **London Goodenough Trust for Overseas Graduates**

Provides subsidised collegiate residence for overseas postgraduate students studying in London. Open to graduates of Commonwealth countries, USA and Europe.

37821 **University of Leeds—Annie Redman King Scholarship**

Support is provided for study in any faculty to female candidates who must reside in Tetley Hall and assist the warden with duties in the Hall Libraries and contribute to the cultural and social life of the hall. One award covers academic fees at the UK rate and a maintenance grant of stlg5,450.

38904 **Monash University—Logan Research Fellowships**

Five fellowships yearly to applicants with 2–6 years of postdoctoral experience. Appointment for 3 years, extendable to 6. Salary range

A$ 46 269–$51 113 and research support from A$5 000–$20 000 for first 3 years. Return airfares for fellows and dependents. Subsistence and fares for field work, necessary consultation, conferences/ seminars related to research.

40416 **AFUW—Fellowships**

Biennial fellowships support Australian women graduates enrolled or accepted for a PhD degree by research in any university for a specific project or purpose for research in any field. Value is $4,500, minimum tenure is 6 months.

40422 **German Academic Exchange Service (DAAD) One-Year Scholarships**

Graduate students up to the age of 32 years are invited to apply for a one year scholarship to undertake graduate studies at a German institution. A stipend of DM 1.00 to 1.600 is provided along with airline tickets, health and accident insurance and tuition. A working knowledge of German is required for those studying Arts; others may receive additional language training prior to scholarship.

42054 **AFUW—Beatrice Fincher Scholarship**

Annual scholarship assists a member of AFUW or IFUW in study or research for a higher degree at an Australian or overseas university. Value is $5,000.

42056 **AFUW—Lady Leitch Scholarship**

The biennial scholarship assists a member of AFUW in study or research in any country, on any subject. Valued at $5000.

42633 **British Federation of Women Graduates—Scholarships**

One or more scholarships of 1,000 pounds and some awards of up to 750 pounds are available to women graduates who are of UK nationality or who are studying in the UK.

42637 **British Fed. of Women Graduates—Margaret K. B. Day Memorial Schol.**

Awards are available to women graduates who are UK citizens or who are studying in the UK. One or more awards of up to 1,000 pounds are available.

42963 **DAAD—One-Year Scholarships**

Sponsor supports students who wish to undertake further advanced study or academic or artistic continuing education and training at all state and state-recognised universities and institutions of higher education in Germany. No citizenship restrictions. Funding amounts will vary dependent on proposal. Award may be used for the following purposes: study for a degree to be taken in Germany, advanced study, but not for a degree to be taken in Germany, research for a degree to be taken in the home country or, research but not for a degree. Duration between 10–12 months.

43037 **DAAD—Short Term Research Grants**

Awards are made to foreign graduates who wish to collect material in Germany for an advanced degree in the home country or for the purpose of special studies. The stay may be between one and six months duration and includes a monthly scholarship payment of DM 1,600, travel expenses, health insurance costs and accident and personal liability insurance costs.

43038 AVH—Humboldt Research Fellowships for Foreign Post-Docs

Sponsor enables highly qualified foreign scholars holding doctorates to carry out resarch projects of their own choice in Germany. Applications may be submitted for long term research stays of between six and twelve months. Awards are offered on a world-wide competitive basis. Decisions are based primarily on the quality and feasibility of research projects proposed by candidates as well as their international publications. All disciplines welcomed. Applicants must be under 40 years of age, have a doctorate or comparable academic degree and/or research work over several years, proof of independent research work through recognised academic publications, preferably in international journals, and adequate language abilities. Short-term study tours can not be funded.

43042 DAAD—Study Visits by Foreign Academics and Follow-Up Invitations

Sponsor is able to 'incite' foreign academics who have plans for a clearly defined study or research project i co-operation with German host institutions or colleagues to a study or research stay. Those currently employed at a research institution or higher education establishment are eligible to apply. Stay between one and three months. Award includes a monthly allowance of DM 3,200–DM 3,500 based on academic status to cover the costs of accommodation, board and additional costs, and international travel expenses will be reimbursed for some countries or a lump sum will be paid. If the schedule involves visits to several German higher education institutions, then a lump sum payment of DM 300 will be made.

43161 RFP—A—Neurofibromatosis research program

The allocation for Investigator-Initiated Research Awards, with or without nested postdoctoral traineeships, is approximately $7M. The intent of the awards is to stimulate and reward creative research that may be viewed as speculative, but has the potential for high payoff. Although the proposed research may be inherently risky in nature, the research plan should demonstrate solid scientific judgement and rationale. Nested Post-doctoral Traineeships are being offered as part of Investigator-Initiated proposals. The intent of these nested Post-doctoral Traineeships is to enable recent doctoral degree graduates with limited post-doctoral experience (i.e. less than five years) to either extend ongoing research related to NF or broaden the scope of their research to include work relevant to NF under the guidance of a designated mentor who is submitting an Investigator-Initiated Research proposal. Nested Post-doc Traineeships can be requested for an average of $42,000 per year inclusive of direct and indirect costs for a maximum of $126,000 over three years. Funds may be requested for salary, expenses including research supplies, and travel to scientific meetings. (key words Tumors, neurology, defense technology)

Energy—SPIN programs as of second quarter 1998

Allows overseas research experience/training/career development for young researchers

(NOTE: Listed are only new programs not covered by other discipline profiles)

00393 **Inst. for the Study of World Politics—Dissertation Fellowships**

Fellowships support young scholars whose work will develop knowledge and understanding essential to the resolution of fundamental international issues in the areas of nuclear arms, distribution and management of technology, health/nutrition, and human rights. Doctoral candidates who have completed course work and are conducting dissertation research at a US institution are eligible. Duration 3–9 months. Fellowship amounts vary according to need and may include funds for travel or other field-research costs and may be combined with other grants.

03206 **APS I.I. Rabi Prize**

A $7,500 prize is offered in odd-numbered years to investigators who have held the PhD for less than 10 years for outstanding research in atomic, molecular, and optical physics. Also receive a certificate and an allowance for travel either to the special award session at the sponsor's annual meeting or the meeting at which the prize is presented.

04181 **CISAC Science Fellowships**

Offers in-residence fellowships for scientists and engineers to conduct research in areas relating to arms control, international security, defense planning, and defense conversion. Available for post-doctoral fellows and mid-career professionals. Scientists in academic and research institutions, government, and industry, from the US and abroad are eligible. Stipends awarded for a 12 month period and are determined on a case-by-case basis commensurate with experience and availability of other funds. Health insurance and funds for travel and research-related expenses are available.

29190 **Inst. of Gas Engineers—W H Bennett Travelling Fellowship**

The Institution is offering one fellowship from time to enable the holder to study, either in the UK or overseas, technical developments of interest to the gas industry. Eligible applicants are qualified engineers or technologists within the age group 25 to 35 years. Funding assists with costs of travel in the UK and overseas.

29193 **Inst. of Gas Engineers—Dempster Travelling Fellowship**

The Institution is offering three fellowships from time to time to enable the holder to study, either in the UK or overseas, technical developments of interest to the gas industry. Candidates must note be more than thirty years of age. Funds assist with the costs of travel in the UK or overseas.

29256 **Institution of Mechanical Engineers (IME)—Neil Watson Grants**

The Institution is offering several grants of stlg500 to enable young engineers to attend conferences and seminars and travel abroad to study engineering practices overseas, or to attend suitable training courses in the field of power generation in general and internal combustion engines in particular. Grants open to non-corporate members of the Institution under the age of 30.

36297 **ANSTO—Australian Synchrotron Research Program ASRP Res. Flwshp**

Young Australian scientists who have recently received, or are about to receive, a PhD in a relevant area of science and who wish to pursue their career in a field requiring synchrotron radiation facilities are invited to apply for the fellowship—tenable for up to three years. Salary up to $45,000 and includes an annual research grant. Offering two fellowships in 1998. ASRP provides access for Australian scientists to the Advanced Photon Source, a third generation synchrotron light source at the Argonne National Laboratory in Chicago, USA and to the Photon Factory, a second generation synchrotron source at the KEK laboratory in Tsukuba, Japan.

43098 **ANSTO—ASRP Australian National Beamline Facility**

Australian researchers are offered access to state-of-the-art synchrotron radiation research capabilities at overseas synchrotron light source facilities at the Australian National Beamline Facility at the Photon Factory Tsukuba Science City, Japan. Program provides travel and subsistence funding to Australian researchers using the facilities. Available to any Australian researcher on a peer reviewed proposal basis. Covers return economy airfares to Japan, insurance, Japanese and Australian departure tax, internal travel (buses, taxis), accommodation and means. Maximum grant available is $2,405 per day for 10 days (for one person travelling); $4,380 for 6 days (2 people travelling); and $6,400 for 5 days (3 people travelling).

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