



DISCOVERY— PROJECTS

Funding Rules for applicants

for funding commencing in

2004

Australian Research Council
Discovery—Projects
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Acronyms

The following acronyms are used throughout these guidelines.

AIMS	Australian Institute of Marine Science
ANSTO	Australian Nuclear Science and Technology Organisation
APA	Australian Postgraduate Award
APD	Australian Postdoctoral Fellowship
APDC	Australian Postdoctoral Fellowship (CSIRO)
APDI	Australian Postdoctoral Fellowship (Industry)
APF	Australian Professorial Fellowship
ARC	Australian Research Council
ARF	Australian Research Fellowship
CI	Chief Investigator
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DSTO	Defence Science and Technology Organisation
EAC	Expert Advisory Committee
ECR	Early Career Researcher
GAMS	Grant Application Management System
GA	Geoscience Australia
HECS	Higher Education Contribution Scheme
KCTR	Key Centre for Teaching and Research
NCGP	National Competitive Grants Program
NHMRC	National Health and Medical Research Council
PI	Partner Investigator
QEII	Queen Elizabeth II Fellowship
SRC	Special Research Centres

NOTE: All research proposals should conform to the principles outlined in the Joint NHMRC/AVCC Statement and Guidelines on Research Practice (1997) (at <http://www.nhmrc.gov.au/issues/researchethics.htm>). Proposed research involving humans should conform to the principles outlined in the NHMRC's National Statement on Ethical Conduct in Research Involving Humans (at: <http://www.nhmrc.gov.au/publications/synopses/e35syn.htm>). Proposed research involving animals should conform to the principles outlined in the NHMRC's codes on animal research (at <http://www.nhmrc.gov.au/issues/animalethics.htm>).

Australian Research Council

Discovery—Projects

Funding Rules for Funding Commencing in 2004

1 Introduction

This document sets out the funding rules under the *Australian Research Council Act 2001* for *Discovery—Projects* which is part of the Australian Research Council's National Competitive Grants Program (NCGP). The NCGP comprises two elements, *Discovery* and *Linkage*.

Discovery—Projects, which recognises the importance of fundamental research to the national innovation system, is an application-based program available for individual researchers or research teams.

These Funding Rules are written on the basis that it is the researcher who is the applicant. However, grants from the ARC are made to organisations, not to the individual researchers.

Private researchers may apply for *Discovery—Projects* grants but must nominate the administering organisation to which funds are to be paid if an award is made.

2 Objectives

Discovery—Projects aims to—

- support excellent fundamental research by individuals and teams
- enhance the scale and focus of research in Designated National Research Priorities (refer to section 3.1)
- assist researchers to undertake their research in conditions most conducive to achieving best results
- expand Australia's knowledge base and research capability
- encourage research training in high-quality research environments.

3 Description

Discovery—Projects provides opportunities for a continuum of activities in order to meet the varied needs of researchers in different disciplines and at different stages of their careers. Where appropriate, *Discovery—Projects* emphasises the need for collaboration, and the development of capacity-building partnerships to work on a cohesive research program that will make a major contribution to generating knowledge. It also allows for single projects to be undertaken on an individual basis.

Research Grants and Research Fellowships are available under *Discovery—Projects*. Applicants who apply for a Research Fellowship but not for a Research Grant must demonstrate how their research will be supported. The ARC wishes to ensure that the research proposed by those appointed as Fellows, particularly those appointed at APF level, is among the highest quality supported by the ARC and that their proposed research is adequately funded.

3.1 Types of research supported

Discovery—Projects supports excellent research including—

- *pure basic research* which is experimental and theoretical work undertaken to acquire new knowledge without looking for long-term benefits other than the advancement of knowledge.
- *strategic basic research* which is experimental and theoretical work undertaken to acquire new knowledge directed into specified broad areas that are expected to lead to useful discoveries. It provides the broad base of knowledge necessary to solve recognised practical problems.
- *applied research* which is original work undertaken primarily to acquire new knowledge with a specific application in view. It is undertaken either to determine possible uses for the findings of basic research or to determine new ways of achieving some specific and predetermined objectives.

The Minister for Education, Science and Training has designated the following areas as national research priorities for the 2004 funding round:

- Research Priority 1: An Environmentally Sustainable Australia
- Research Priority 2: Promoting and Maintaining Good Health
- Research Priority 3: Frontier Technologies for Building and Transforming Australian Industries
- Research Priority 4: Safeguarding Australia

These areas of research will be referred to as Designated National Research Priorities. Within each Research Priority is a number of Priority Goals which are listed below:

- Research Priority 1: An Environmentally Sustainable Australia
Priority Goals
 - PG 1 Water – a critical resource
 - PG 2 Transforming existing industries
 - PG 3 Overcoming soil loss, salinity and acidity
 - PG 4 Reducing and capturing emissions in transport and energy generation
 - PG 5 Sustainable use of Australia’s biodiversity
 - PG 6 Developing deep earth resources
- Research Priority 2: Promoting and Maintaining good Health
Priority Goals
 - PG 1 A healthy start to life
 - PG 2 Ageing well, ageing productively
 - PG 3 Preventive healthcare
- Research Priority 3: Frontier Technologies for Building and Transforming Australian Industries
Priority Goals
 - PG 1 Breakthrough science
 - PG 2 Frontier technologies
 - PG 3 Advanced materials
 - PG 4 Smart information use
- Research Priority 4: Safeguarding Australia
Priority Goals
 - PG 1 Critical infrastructure

- PG 2 Protecting Australia from invasive diseases and pests
- PG 3 Protecting Australia from terrorism and crime
- PG 4 Transformational defence technologies

Full descriptions of these Designated National Research Priorities and their associated Priority Goals can be found in Appendix 2, and on the ARC web site (www.arc.gov.au).

3.2 Applicant roles

There are various applicant roles available under *Discovery—Projects*. These are—

- Chief Investigator (CI)
- Partner Investigator (PI)
- Research Fellows—
 - Australian Professorial Fellow (APF)
 - Australian Research Fellow/Queen Elizabeth II Fellow (ARF/QEII)
 - Australian Postdoctoral Fellow (APD).

The role and eligibility requirements for each of these are described below. To be eligible for consideration, each application must have at least one Chief Investigator or Research Fellowship applicant.

4 Eligibility

4.1 Eligibility criteria for Chief Investigators

To be eligible to apply as a Chief Investigator, the applicant must meet the following criteria—

- He/she must be an active researcher who takes intellectual responsibility for the project, its conception, any strategic decisions called for in its pursuit and the communication of results. The applicant must have the capacity to make a serious commitment to the project and cannot assume the role of a supplier of resources for work that will largely be placed in the hands of others. The ARC reserves the right to rule on the question of capacity.
- He/she must reside predominantly in Australia for the full term of the grant. If the applicant does not have permanent resident status he/she must obtain temporary resident status from the Department of Immigration and Multicultural and Indigenous Affairs before taking up the grant.
- He/she must meet at least **one** of the following four criteria—
 - be associated with, or employed by, an Australian higher education institution. The applicant must hold a substantive position at, and/or derive at least 50 per cent of her/his salary from, that institution; or
 - be a continuing or non-continuing adjunct professor or visiting fellow, or equivalent, at an Australian higher education institution who does not have a substantive position or paid appointment elsewhere; or
 - be associated with, or employed by, an Australian publicly funded organisation not directly funded to carry out research but with research-related purposes and objectives (such as a museum). The applicant must hold a substantive position at, and/or derive at least 50 per cent of her/his salary from, that organisation; or

- be a private individual not associated in any formal capacity with an organisation or institution as defined above.

Notwithstanding her/his eligibility under the criteria above, researchers in the following categories are not eligible to apply as a Chief Investigator—

- undergraduate students, or
- postgraduate students (unless eligible to be a CI because of employment and then only for research which lies outside the scope of the postgraduate studies), or
- researchers who derive more than 50 per cent of their salary from organisations outside the higher education sector that are funded primarily for research from State or Commonwealth Government sources. These include, but are not limited to:
 - Defence Science and Technology Organisation (DSTO)
 - Commonwealth Scientific and Industrial Research Organization (CSIRO)
 - Geoscience Australia (GA)
 - Australian Nuclear Science and Technology Organisation (ANSTO)
 - Australian Institute of Marine Science (AIMS)
 - State Research and Development (R&D) organisations

Chief Investigators must have fulfilled all obligations from previous ARC grants (including final and progress reports). Chief Investigators who have not fulfilled all obligations from previous ARC grants are ineligible.

A researcher who is eligible to be a CI is not eligible to be a PI.

4.1.1 *Early Career Researchers*

The ARC has identified funds within *Discovery—Projects* specifically for Early Career Researchers (ECRs) applying individually or in collaboration with other ECRs. This is described as an ECR Only Application and is an application on which all investigators, CIs, PIs and Fellows are ECRs.

The primary definition of an Early Career Researcher is one holding a PhD, or equivalent research doctorate, awarded since 1 March 1998. Applicants not satisfying this definition who wish to claim ECR status must present their case within their application (see *Instructions to applicants for funding commencing in 2004*). Circumstances establishing ECR status beyond the primary definition could include career interruptions due to non-research employment, misadventure or carer responsibilities, or a research career not preceded by the award of a PhD or equivalent research doctorate. The ARC reserves the right to determine the ECR status of applicants. Applications making unsuccessful claims for ECR status will be processed as non-ECR applications.

The assessment criteria and processes for *Discovery—Projects* applications detailed in section 8 apply to ECR Only applications.

A person who is an ECR may apply for funding in association with non-ECR applicants. Such an application is not an ECR Only application.

4.2 Eligibility criteria for Partner Investigators

Researchers who are not eligible to be Chief Investigators but who are providing significant commitment, intellectual input, relevant expertise and significant financial contribution to the project can apply as Partner Investigators. To be eligible to apply as a Partner Investigator, a researcher must—

- be ineligible to be a Chief Investigator, and
- demonstrate a significant contribution of funds (other than salary) or other material resources from the researcher's institution for the proposed project (having regard to the total cost of the project and the relative contribution of each Chief Investigator).

4.3 Eligibility criteria for Fellowships

4.3.1 *General eligibility*

Applicants should hold a PhD or equivalent research doctorate. Applicants for ARF/QEII or APF awards who do not hold a PhD or equivalent research doctorate would need to demonstrate that their research record is equivalent to a PhD or equivalent research doctorate plus the required number of years of postdoctoral experience. Refer to 4.3.5, 4.3.6 and 4.3.7.

Fellows must reside in Australia for the full term of the grant. If the applicant does not have permanent resident status he/she must obtain temporary resident status from the Department of Immigration and Multicultural and Indigenous Affairs before taking up the grant.

Applicants who apply for a Research Fellowship without applying for research funding in addition must demonstrate how their research will be supported.

4.3.2 *Host institutions for Fellows*

All ARC Research Fellowships are tenable at Australian higher education institutions or an Australian publicly funded organisation not directly funded to carry out research but with research-related purposes and objectives (such as a museum).

It is also possible to hold an APD or QEII Fellowship at a research organisation outside the higher education sector that is funded primarily for research from State or Commonwealth Government sources. Researchers who apply for one of these Fellowships at such an organisation may apply only for Fellow salary support and not for additional research funding.

Fellowship applicants must meet the eligibility criteria for Chief Investigators except for applicants for APD or QEII awards who intend to take up the Fellowship at a research organisation outside the higher education sector, which is funded for research primarily from State or Commonwealth Government sources. Researchers who fall into this category and who wish to apply for research funding in addition to the Fellowship salary must apply with an eligible Chief Investigator.

4.3.3 *Request for eligibility exemption*

In some circumstances, an applicant who is seeking a Fellowship may not satisfy the eligibility criteria due to research career interruption. Career interruptions could include, for example, non-research employment, misadventure or carer responsibilities. If this is the case, an applicant must apply for an exemption from the eligibility criteria.

If the applicant requires an eligibility exemption, a request must be lodged in writing, through the institution's Research Office, or the administering organisation's equivalent office, with the Discovery Projects (Program Coordinator) at the ARC by 31 January 2003. The eligibility

exemption request must include a statement justifying the applicant's special circumstances for an eligibility exemption. The applicant will be advised of the decision as soon as possible to allow time for a detailed application to be completed.

If, after reading these guidelines, an applicant is unsure if he/she is eligible for a particular Fellowship, he/she must consult the institution's Research Office in the first instance.

4.3.4 *Specific eligibility*

Each level of ARC Fellowship has specific eligibility criteria. Fellowship applicants must meet the eligibility criteria for their category of Fellowship unless granted an exemption.

4.3.5 *Eligibility criteria for Australian Post-doctoral Fellowships (APD)*

APDs provide opportunities for researchers at the postdoctoral level to undertake research of national and international significance, and to broaden their research experience.

An Australian and overseas researcher may apply for an APD to commence in 2004 if—

- he/she has been awarded a PhD since 1 March 2000, or
- he/she have not yet submitted a PhD thesis but is expected to do so before the end of 2003.

If an APD Fellowship offer is made, it will be contingent upon receiving official confirmation that the thesis has been submitted by 31 December 2003. An APD Fellowship cannot be taken up until formal advice is received that the PhD has been awarded, within a maximum time limit of six months, that is, by 30 June 2004. If these conditions have not been satisfied, the offer will be withdrawn.

4.3.5.1 *Tenure details and support entitlements*

Research Fellowships are tenable only on a full-time basis.

APD Fellowships must commence in the first year of the grant. The ARC notional salary rates for Fellowships are set out in Appendix 1.

APD Fellowships are categorised as training awards and, as such, are tenable at eligible higher education institutions, or research organisations outside the higher education sector that are funded primarily for research from State or Commonwealth Government sources (e.g DSTO, CSIRO, GA, State R&D), or other incorporated organisations which provide an appropriate research training environment.

There is a choice of salary support options for APD Fellowships—

- 100 per cent salary and salary-related on-costs from the ARC for a standard tenure of three years
- 75 per cent salary and salary-related on-costs from the ARC and 25 per cent from the host university over four years (research and teaching option).

The Commonwealth contribution to the four-year research and teaching option will be 75 per cent of the approved APD salary plus 75 percent of salary-related on-costs. In view of resource implications, any intending applicant must discuss the feasibility of this option with her/his Head of Department. Tenure will be continued, provided the ARC receives satisfactory annual progress reports, but will not be extended.

4.3.5.2 Selection

The ARC may give preference to applicants who intend to move to an institution other than the one where their PhD was obtained, in order to take up the Fellowship, and/or who have had research experience at more than one institution. Applicants should provide a justification of their choice of institution, particularly if no change of institution is planned.

In this category, the ARC may give preference to Australian citizens and permanent residents. Overseas applicants will need to demonstrate a higher level of performance than their competitors or be able to offer special expertise, extensive skills or exceptionally high performance levels not available locally and of benefit to Australian research.

An APD fellowship, which means any of the following an APD, an APD(I) (Australian Postdoctoral Fellowship (Industry)) or an APDC (Australian Postdoctoral Fellowship CSIRO), may be awarded to an applicant only once.

4.3.6 Eligibility criteria for Australian Research Fellows (ARF) /Queen Elizabeth Fellows (QE11)

ARFs and QEII provide opportunities for established researchers to undertake research of national and international significance. QEII encourage research in Australia by postdoctoral graduates of exceptional promise and proven capacity for original work.

Applicants must have an excellent academic record and have been awarded a PhD or equivalent research doctorate.

At the time of application, applicants should have more than three years, but not more than eight years, professional experience since the award of their PhD unless they are current ARC APD or APDI or APDCs in the final year of their Fellowship. An APD fellow (or an APDI fellow or an APDC) may apply for an ARF/QEII in the final year of her/his APD or APDI Research Fellowship.

ARFs and QEII Fellows may hold an ARF or a QEII Fellowship only once. They are eligible to apply for an APF in their final year.

4.3.6.1 Tenure details and support entitlements

Research Fellowships are tenable only on a full-time basis.

ARFs/QEII have a standard tenure of five years. Tenure will be continued, provided the ARC receives satisfactory annual progress reports, but will not be extended. The ARC notional salary rates for Fellowships are set out in Appendix 1.

Researchers who have a non-continuing position or no position at the time of application may apply for 100 per cent salary and salary-related on-costs from the ARC.

Researchers who have a continuing position at the time of application may apply for either:

- 50 per cent salary; or
- 100 per cent salary.

In the case of 50:50 salary option, the ARC would enter into an agreement with the Fellow's host institution and each party would provide 50 per cent of the Fellow's salary and salary-related on-costs. Fellows on the 50:50 option still work on their research on a full-time basis.

Applicants who hold a continuing research-only position at any university are not eligible to apply for ARC 50 per cent–50 per cent Fellowships.

In the case of the 100 per cent salary option, successful Fellowship applicants with a continuing position must resign the existing continuing position before taking up the award.

In either case, the Fellow would be expected to work full-time on research and research-related activities. Research-related activities could include supervision of postgraduate students. Research Fellow applicants should note the information regarding the limit on the number of grants which can be held contained in paragraph 4.4.

ARF/QEII Fellowships have a standard tenure of five years. The ARC notional salary rates for Fellowships are set out in Appendix 1.

ARFs are tenable at any eligible higher education institution or other organisation **but are not tenable** at research organisations outside the higher education sector that are funded primarily for research from State or Commonwealth Government sources such as the Defence Science and Technology Organisation (DSTO), Commonwealth Scientific and Industrial Research Organisation (CSIRO), Australian Geological Survey Organisation (AGSO) and State Research and Development (R&D) organisations.

QEII Fellowships are categorised as training awards and, as such, **are tenable** at any eligible higher education institution or at research organisations outside the higher education sector that are funded primarily for research from State or Commonwealth Government sources such as the DSTO, CSIRO, GA, R&D organisations or other incorporated organisations which provide an appropriate research training environment.

4.3.6.2 Selection

Preference may be given to Australian citizens and permanent residents in the ARF category. Overseas applicants will need to demonstrate a higher level of performance than their competitors or be able to offer special expertise, extensive skills or exceptionally high performance levels not available locally and of benefit to Australian research. The competition for QEII Fellowships is open.

The ARC may give preference to applicants who intend to move to an institution other than the one where their PhD was obtained, in order to take up the Fellowship, and/or who have had research experience at more than one institution. Applicants should provide a justification of their choice of institution, particularly if no change of institution is planned.

4.3.7 Eligibility Criteria for Australian Professorial Fellows (APFs)

APFs provide opportunities for outstanding researchers with proven international reputations to undertake research that is both of major importance in its field and of significant benefit to Australia.

Applicants must have more than eight years' professional experience since the award of their PhD or equivalent research doctorate (unless a current ARF/QEII in last year of Fellowship) and must be either:

- Australia-based researchers who have an internationally competitive research record, or
- high-profile non-Australian, or expatriate Australian, researchers who wish to pursue their research in Australia.

4.3.7.1 *Tenure details and support entitlements*

Research Fellowships are tenable only on a full-time basis.

APFs have a standard tenure of five years. Tenure will be continued, provided ARC receives satisfactory annual progress reports, but will not be extended. The ARC notional salary rates for Fellowships are set out in Appendix 1.

Researchers who have a non-continuing position or no position at the time of application may apply for 100 per cent salary and salary-related on-costs from the ARC.

Researchers who have a continuing position at the time of application may apply for either:

- 50 per cent salary; or
- 100 per cent salary.

In the case of 50:50 salary option, the ARC would enter into an agreement with the Fellow's host institution and each party would provide 50 per cent of the Fellow's salary and salary-related on-costs. Fellows on the 50:50 option still work on their research on a full-time basis.

Applicants who hold a continuing research-only position at any university are not eligible to apply for ARC 50:50 Fellowships.

In the case of the 100 per cent salary option, successful Fellowship applicants with a continuing position must resign the existing continuing position before taking up the award.

In either case, the Fellow would be expected to work full-time on research and research-related activities. Research-related activities could include supervision of postgraduate students. Research Fellows should note the information regarding limit on number of grants contained in paragraph 4.4.

APFs are not tenable at research organisations outside the higher education sector that are funded primarily for research from State or Commonwealth Government sources such as the DSTO, CSIRO, GA and State R&D organisations.

4.3.7.2 *Selection*

Preference for APFs may be given to Australian citizens and permanent residents. Non-resident, non-Australian citizen applicants will need to demonstrate a higher level of performance than their competitors or be able to offer special expertise, extensive skills or exceptionally high performance levels not available locally and of benefit to Australian research.

4.4 Number of grants and applications

The following limits apply to grants awarded under the *Discovery—Projects* and the previous Large Research Grants and Fellowships schemes. (Note that for the purpose of these rules a Large Grant awarded before 2002 counts as if it were a *Discovery—Projects* grant.)

The following limits apply to grants awarded under the *Discovery—Projects*:

- a) A researcher may not hold more than two *Discovery—Projects* grants on which he/she is CI or Fellow;

- b) A researcher may not be named as Partner Investigator on more than two *Discovery—Projects* grants (note: A researcher who is eligible to be a CI is not eligible to be a PI);
- c) A researcher may not hold more than one *Discovery—Projects* grant on which he/she is the sole CI or sole Fellow;
- d) A Federation Fellow may apply for and hold up to 2 *Discovery—Projects* grants (one may be as a sole CI), in addition to the Federation Fellowship;
- e) A researcher who is eligible to be a CI or Fellow, may not hold more than one *Discovery—Projects* grant if that researcher also holds NHMRC (National Health and Medical Research Council) program grants, provided this does not duplicate work being funded by the Commonwealth – See section 6.4.

The following limits apply to grants awarded under the previous Fellowships scheme:

- f) An applicant who holds a Fellowship awarded for funding commencing before 2002 may apply for and hold two *Discovery—Projects* grants (one may be as a sole CI), in addition to the existing Fellowship.

The following limits apply to those substantially associated with a Commonwealth-funded centre:

- g) Applicants who are ‘substantially associated with’ a Commonwealth-funded research centre may be eligible to apply for and hold one *Discovery—Projects* grant – See section 6.2.

Applicants may apply for *Discovery—Projects* grants only to the extent that, if all were successful, they would not hold more than the maximum number of grants permitted in 2004.

Submitting initial applications that exceed the above limits will result in the automatic exclusion of all applications involving that applicant as a CI, PI or Fellow.

Every grant must have at least one Chief Investigator or Fellowship holder.

Only one application to *Discovery—Projects* may be submitted in respect of a single project in the same year, regardless of any variation in the applicants and/or proposed administering institution.

Submitting similar or duplicate applications will result in automatic exclusion of all applications involving those applicants. The ARC reserves the right to determine whether applications are duplicates or sufficiently similar to warrant exclusion.

5 Funding

5.1 Level of funding

The minimum grant size is \$20,000 per annum and the maximum is \$500,000 per annum. The ARC reserves the right to determine the level of funding allocated to the project.

The ARC will award very few grants at the higher end of the funding spectrum and these will normally be awarded only for an application that involves a collaborating team of outstanding investigators.

Applicants seeking a Fellowship under *Discovery—Projects* should include a request for a salary component in the budget (see Appendix 1 for 2003 salaries)

5.2 Duration of Funding

Discovery—Projects Grants may be awarded for one to five years. APF, QEII and ARF Awards have a standard duration of five years. APD Awards have a standard duration of three years. A four-year research and teaching option is available for APDs. (Further details about the tenure of Fellowships are provided in Appendix 1.)

Only a small number of five-year project grants will be made available and these are intended for researchers with outstanding track records. Recommendations on the duration of grants rests with the ARC's Expert Advisory Committees and they may recommend project grants for a duration different from that requested.

5.3 Areas of investigation/work not supported

Discovery—Projects does **not** support the following work—

- clinical medicine and dental research and training and public health research and training that are covered by the NHMRC
- activities leading solely to the creation or performance of a work of art, including visual art, musical compositions, drama, dance, designs and literary works, for which Commonwealth Government support is provided through the Australia Council for the Arts
- scholarly investigations that, while important in themselves, do not lead to conceptual advances or discoveries, or to novel practical outcomes or applications. Projects such as uncritical biographical compilations and purely descriptive catalogues or editions that do not involve original research are not funded
- production of teaching materials, even though some research may be involved in their production
- compilation of data, unless an integral part of a project, in which case applicants must provide a statement indicating the research objectives to which the data would contribute
- development of research aids and tools (including computer programs), unless they form an integral part of a project, in which case applicants must provide a statement indicating the research objectives to which these activities would contribute.

5.4 Budget items not supported

Discovery—Projects does **not** support the following budget items—

- *Salaries of Chief Investigators and Partner Investigators*
The Commonwealth will not provide support, in whole or in part, to meet the salaries of Chief Investigators or Partner Investigators under *Discovery—Projects*.

- *Teaching*

Discovery—Projects funding is not provided to fund teaching. However, the Committee may consider a request for teaching relief for a period of not more than six months a year, if such a request is fully justified in terms of achieving a successful outcome for the project. If approved, the funding contribution is limited to the maximum base rate of \$29,666 (2002\$), regardless of the level of appointment of the staff member and is a special condition on the grant. Only funds specifically approved for teaching relief may be used for that purpose.

- *Special Studies Programs*

Funds are not provided for travel or related expenses for researchers when on a Special Studies Program. In well justified cases some specified costs may be supported within a *Discovery—Projects* Grant provided an investigator can show that such expenses are not covered by a Special Studies Program grant and that the research to be undertaken directly relates to the project. In these cases the use of funds needs to be approved as a special condition of the grant.

- *Research support for investigators not resident in Australia*

Funding will not be provided for research costs to an overseas Partner Investigator.

- *International students' fees and Higher Education Contribution Scheme (HECS) liability*

Funds are not provided to pay the fees of international students or of HECS liabilities for Australian students.

- *Computer facilities for molecular analysis*

Applicants for projects involving molecular biology should be aware that the ARC supports the Australian National Genomic Information Service, which provides access to a range of databases and a large suite of analysis programs. As this service is available at modest cost, proposals seeking funding for computer facilities to undertake molecular analysis will have to justify such needs very thoroughly.

- *Basic facilities*

The host institution must certify its agreement to provide the following basic facilities, which will not be funded under *Discovery—Projects*

- accommodation (eg. laboratory and office, suitably equipped and furnished in standard ways)
- access to workshop services (eg machine tools and qualified technicians available to each member of staff, according to need, for research)
- access to a basic library collection
- adequate access to computers (excluding access to high-performance computers)
- standard reference materials or funds for abstracting services
- basic computing, word processing and microfilm reading facilities
- use of photocopiers, telephones, mail, fax, email and internet services.

- *Publication costs*

Publication costs, including page costs, are not funded under *Discovery—Projects*.

6 Cross-program funding

The ARC will not fund research already funded by the Commonwealth. The ARC reserves the right to determine if a proposed research project duplicates research already being funded.

6.1 Cross-program eligibility

If a funding request for any project, salary or equipment is being submitted to any other funding body, each application must be cross-referenced. Applicants must indicate the level of funding obtained, or being sought, from all other programs and must list all existing research funding from all sources. If these processes are not observed, the *Discovery—Projects* application will be excluded.

The ARC may liaise with other funding agencies to discuss any overlap between applications in order to avoid duplication of funding.

6.2 Researchers from Commonwealth-funded Centres

Commonwealth-funded research centres support a program of research consistent with the initial proposal, the funding agreement and/or the Annual Report of the Centre. The ARC will not fund research already funded by a Commonwealth-funded Centre, or which could reasonably be expected to be supported by the Centre given its research program and its level of funding. Any researcher (other than a Federation Fellow) substantially associated with an ARC or other Commonwealth-funded centre, including the Director, is eligible to be a Chief Investigator or Fellow on **one** *Discovery—Projects* grant so long as the following criteria are satisfied—

- The applicant meets all other Chief Investigator eligibility criteria.
- The proposed research does not duplicate work that is funded by or forms part of proposed funded work of the centre as reported in the application, funding deed and/or Annual Report. Each application must be supported by a letter from the Centre Director which describes the relationship between the proposed research and the projects funded by the centre. This should be no longer than one page and must accompany the application.
- The ARC reserves the right to make the final decision on whether a proposal duplicates work funded as part of a Commonwealth-funded Centre. Should the information contained in the application, the Annual Report and the accompanying letter from the Director be found to be inaccurate or misleading in a material way, any grant awarded will be terminated and the Director will be asked to show cause why any ARC funding for the centre should not be terminated.
- Centre Directors are employed full-time to work on Centre and related business. Centre Directors are eligible to apply for a *Discovery—Projects* grant if the proposed research is related and complementary to the centre, does not duplicate work already funded and the applicant meets all other Chief Investigator eligibility criteria.

For the purpose of these rules, the term ‘associated with’ means those who contribute to the work of the centre and whose contributions form part of the output of the centre for annual reporting and evaluation purposes. The term ‘any researcher substantially associated with’ includes and restricts to one DP grant:

- All the CIs, PIs, Director and Deputy Directors in the initial application (as subsequently modified and reported to the ARC), and
- Researchers who receive more than 20 per cent salary from the centre

Subject to rules on duplication and the limit on the number of *Discovery—Projects* grants which can be held (see section 4.4), the following may hold up to 2 *Discovery—Projects* grants:

- ARC fellows who choose to be associated with the centre
- Researchers who are associated with a centre and who receive less than 20% of their salary from the centre.

The ARC reserves the right to determine which researchers are substantially associated with a centre.

6.3 Federation Fellowships

A Federation Fellowship holder is eligible to apply for and hold up to 2 *Discovery—Projects* grants, one of which can be as a sole CI.

6.4 Funding under the ARC or the NHMRC

Researchers holding NHMRC program grants are eligible to be a CI or Fellow on **one** *Discovery—Projects* grant provided this does not duplicate work being funded by the Commonwealth. Applicants must provide details of the relationship between the proposed research project and the work funded through the NHMRC program grant. The ARC will make the final decision on whether a proposal duplicates work funded by the NHMRC. Should the information contained in the application be found to be inaccurate or misleading in a material way, any grant awarded will be terminated.

In some instances, it may not be clear whether an application is more appropriately considered by the ARC or the NHMRC. In these cases, the applicant should forward a two-page summary outlining the proposal through her/his institution's Research Office to the ARC by 31 January 2003. A committee comprising representatives from the NHMRC and the ARC will use the summary to decide which agency is more appropriate for the application. Each applicant will be advised of the decision approximately two weeks after the due date for such requests.

If the applicant fails to meet the above deadline, he/she must submit cross-referenced applications, using the same title, to both the ARC and the NHMRC and must declare the dual submission on the ARC application form. Failure to do so will render the application ineligible. The ARC will determine if it is the appropriate funding agency.

If an application has potential clinical overlap and neither of the above processes is observed, the application will be excluded, regardless of whether or not it falls under the aegis of the ARC.

7 Application process

7.1 Applications

As the application is the prime source of information available to the selection committee, applicants must submit their projects as mature research plans ready for implementation. The application must contain all the information necessary for assessment of the project without the need for further written or oral explanation, or reference to additional documentation, including the World Wide Web, unless requested by the selection committee. All details in the application, particularly concerning any successful grants, must be current.

7.2 Certification

It is the responsibility of the administering institution to obtain signatures of all participants named at Part B of the application form. These signatures are to be retained by the administering institution who must provide these certifications if requested. A pro forma is available for this purpose on the ARC web site (www.arc.gov.au).

7.3 Submission of applications

Applications under *Discovery—Projects* consist of two parts—

- | | | |
|---|------------------|--|
| 1 | Application form | to be completed in Grant Application Management System (GAMS) |
| 2 | Additional text | Section B10, ‘Research Record Relative To Opportunities’; Sections C2 and C3, ‘justifications of funding requested from the ARC’ and ‘details of non-ARC contributions’; Part E, ‘Project Description’.
If applicable, add supporting documentation:
Section A7.2, ‘additional detail’ for any participants associated with a Commonwealth Government-funded Centre
Section D2, ‘reports on ARC grants’ |

7.3.1 Application format

All documents must be written in English and must comply strictly with the format and submission requirements.

All pages should be in black type, use a single column and 12-point font size on white A4 paper, printed on one side only and unbound, with at least 2 cm margins on each side. As applications are scanned electronically, applicants must use a highly legible font type, such as Arial, Courier, Palatino, Times New Roman and Helvetica. Variants such as mathematical typesetting languages may also be used. References may be reproduced in 10-point font size. Colour graphs or colour photographs may be included but they will be reproduced in black and white and the reproduction quality may be degraded.

7.3.2 Application form and instructions to applicants

The application form is produced by the ARC’s web-based GAMS at www.arc.gov.au.

Applicants should note that a separate document, *Discovery—Projects Instructions to Applicants for Funding Commencing in 2004*, will be available from www.arc.gov.au to assist in preparing applications.

7.3.3 Number of copies

An original and **one identical** hard copy only are required. The application must be clipped with NAL clips, not stapled. The application form should be submitted with the additional text, including supporting documentation, interleaved appropriately and the pages numbered consecutively starting at the beginning of the application (see *Discovery—Projects Instructions to Applicants for Funding Commencing in 2004*).

7.3.4 Closing date for applications

Paper originals of the applications for *Discovery—Projects* must be received by the ARC, and the application form completed using GAMS, must be submitted by close of business (AEST) **Friday 7 March 2003**. Applications may be withdrawn but may not be changed after submission. Additions, deletions and modifications will not be accepted after submission. Applications received after close of business (AEST) 7 March 2003 will not be accepted.

7.3.5 How to complete and submit applications

Discovery—Projects application forms are produced using the ARC’s web-based GAMS. Applicants applying through a university should submit their applications through the Research Office by the university’s closing date. University Research Offices have access to GAMS and will allocate GAMS User IDs and passwords to enable applicants at their university to access the system and create application forms. If an applicant has previously been allocated access to GAMS, her/his User ID and password should still be current.

Private researchers and organisations other than higher education institutions should complete their application forms using GAMS. Organisations should identify a GAMS Contact who should contact the ARC directly. The ARC will assist the GAMS Contact to gain access to the system and to create applications. Private researchers should contact the ARC directly for a GAMS User ID and password and assistance with GAMS submission.

University Research Offices, other administering institutions and private researchers should submit the application form in GAMS and forward the full paper application. Applicants who require an alternative means to submitting the form on-line should contact their university’s Research Office or the GAMS Contact in organisations other than universities; private researchers should contact the ARC directly.

Applications should be sent to—

by **mail**, to

Discovery Projects (Program Coordinator)
Disciplines and Programs
Australian Research Council
GPO Box 2702
CANBERRA ACT 2601

by **courier**, to

Discovery Projects (Program Coordinator)
Disciplines and Programs
Australian Research Council
Geoscience Australia Building
cnr Hindmarsh Drive and
Jerrabomberra Avenue
SYMONSTON ACT 2609

8 Selection and approval process

8.1 Selection criteria

8.1.1 Projects

The primary assessment criteria for projects are—

- Investigator(s) (40%)
- Project content
 - significance and innovation (30%)
 - approach (20%)
 - national benefit (10%)

Investigator(s)

- track record relative to opportunities

- capacity to undertake the proposed research

Project Content

Significance and innovation

- does the research address an important problem?
- how will the anticipated outcomes advance the knowledge base of the discipline?
- is the research principally focussed upon a topic or outcome that falls within one of the Designated National Research Priorities and associated Priority Goals, and if so how does it address the Designated National Research Priority?
- are the project aims and concepts novel and innovative?
- will new methods or technologies be developed?

Approach

- are the conceptual framework, design, methods and analyses adequately developed, well integrated and appropriate to the aims of the project?

National benefit

- what is the potential of the research project to result in economic and/or social benefits for Australia from the expected results and outcomes of the project?
- what is the potential for the research to contribute to the Designated National Research Priorities?

8.1.2 Fellowship(s)

The number of fellowships available is restricted. Assessment of fellowship applications is based on the excellence of the applicant's track record and the excellence of the project. Fellowship applicants must provide details, in the text of their application (at Section B10.6), of

- their contribution to the project, and
- the research environment of their host institution.

8.2 Assessment and selection procedure

Assessment of applications is undertaken by one or more of the Expert Advisory Committees, which have the right to make decisions solely on the basis of their expertise, and which may:

- exclude ineligible applications
- assign independent readers/assessors to review the applications
- seek applicants' comments on assessors' reports
- rank each application relative to the others on the basis of the application, the assessors' reports and the applicant's rejoinder/response to these assessments.
- assess and recommend budgets
- prepare funding recommendations that are submitted to the ARC Board for endorsement and then to the Minister for approval.

The ARC has procedures for declaring conflicts of interest and for members to withdraw from considering particular applications.

8.2.1 Assessment process

8.2.1.1 Exclusion

Exclusion of ineligible applications by the Expert Advisory Committee may take place at any time during the selection process. Applications which contravene the guidelines in any way may be excluded. The ARC will determine if the breach of the Funding Rules has a potential material impact on the assessment of the application. If it is so determined the application will be excluded. Grounds for exclusion include:

- failing to submit the application through the appropriate Research Office/Chief Executive Officer for certification
- not meeting the funding threshold when inappropriate budget items are removed
- not meeting the eligibility criteria for a Chief Investigator or Partner Investigator
- exceeding the limits on the number of applications permissible
- not following procedures for ARC/NHMRC coordination
- providing incomplete or misleading information
- designating all or any part of the application as ‘commercial-in-confidence’.

8.2.1.2 *Assignment of assessors*

Each application not initially excluded will be assigned to two Australian-based readers and at least one expert assessor of international standing. Readers for each discipline grouping will be drawn from a range of institutions to avoid potential conflicts of interest. The assessors will be asked to assess the application against the selection criteria and their reports must include written comment.

Although an effort will be made to obtain three assessments, the ARC reserves the right to make decisions based on any number of assessments or solely on the expert assessment of the Expert Advisory Committee.

Applicants may name any person whom they do not wish to assess the application. Detailed written justification, which will be considered by the relevant Expert Advisory Committee, must be submitted through the institution’s research office, in a separate letter, and it **must not** accompany the application. The letter must be received before the closing date for applications and be sent to

Discovery Projects Program Coordinator
Disciplines and Programs
Australian Research Council
GPO Box 2702
CANBERRA ACT 2601

The Expert Advisory Committee will consider the justification put forward by an applicant to exclude any person as an assessor. However, the Committee may not give effect to an applicant’s request.

8.2.1.3 *Applicant rejoinder*

The readers and assessors’ textual comments will be provided to the administering organisation (or in the case of a private researcher, to the applicant) allowing the opportunity for a one-page rejoinder to the comments. To ensure impartiality, the readers’ and assessors’ names are not provided to the applicant. At the same time, the Expert Advisory Committee may add questions to the assessments sent to the applicants for rejoinder. Applicants have 2 weeks in which to submit a rejoinder to the ARC.

8.2.1.4 *Recommendations*

The Expert Advisory Committees may make final checks on eligibility. The EACs rank each application relative to the others on the basis of the application, the readers and assessors' reports and the applicant's rejoinders to these assessments. The EACs assess and recommend budgets. The EACs' funding recommendations are submitted to the ARC Board.

8.2.1.5 *Ministerial approval*

A recommendation from the ARC Board is sent to the Minister for her/his consideration. The Minister determines which applications will be offered funding.

8.3 Offer of grant

The successful administering institution will be notified in a letter of offer that will indicate the funding to be provided and will include any special conditions.

8.3.1 *Funding Contract*

Applicants should familiarise themselves with the draft Funding Contract. This will be available on the ARC website (www.arc.gov.au).

The grantee must accept the Funding Contract and the administering institution must sign the Funding Contract before grant payments can be made.

8.3.2 *Commencement of projects*

Projects must be commenced by 31 July in the first year of the grant. Failure to do so will result in termination of funding.

9 Appeals process

Appeals will be considered only against process issues and not against committee decisions or assessor ratings and comments. Appeals must be made on the appeals form available from the ARC website (www.arc.gov.au).

The form must be lodged through the institution's Research Office to, and be received **within 28 days** of the date on the letter notifying the outcome of applications, by:

The Appeals Officer
Australian Research Council
GPO Box 2702
CANBERRA ACT 2601

10 Grant administration

10.1 Funding Contract

Administering organisations should note that the Funding Contract and post-award management cover the following matters.

10.1.1 *Reporting requirements*

Institutions are required to submit these documents to the ARC—

- *Exceptions Report* on grants that have financial exceptions, by 1 November in the calendar year for which they were granted

- *End-of-year Report* on the expenditure of grant funds, by 31 March in the year following the calendar year for which they were granted
- *Progress Report* on the project, by 31 January in the year following the calendar year for which funds were granted
- *Final Report* on the project, within six months of the completion of the grant
- *Audited Financial Statement*, by 30 June of the year following the year of the grant, in accordance with the appropriate Act.

The ARC reserves the right to suspend payment of further instalments of any current grant until the appropriate reports have been received and assessed as satisfactory.

10.1.1.1 *Failure to provide reports*

Where an institution fails to submit satisfactory reports, as required, the Minister may determine that funds have not been used in accordance with conditions applicable to the grant, and that all or part of the grant must be repaid. In this case, the ARC may withhold the remainder of the institution's payments under the Program for the current year or initiate recovery of grant money.

10.1.2 *Varying the Funding Contract*

Requests to vary the Funding Approval or the Funding Agreement must be forwarded in writing by the institution's Research Office, or equivalent, to the ARC. The Funding Approval may be varied where any of the circumstances described in subsection 55(3) of the *Australian Research Council Act 2001* occurs namely:

- the organisation's involvement with the research program ends;
- the research program changes so that it is no longer consistent with the description in the Funding Approval;
- the person named in the funding approval as the person leading the research program ceases to lead the program.
- any other such circumstances as the ARC may, in its discretion, determine

10.2 *Financial management — payments*

Discovery—Projects operates on a calendar year basis. Subject to appropriations, payment of funds will be made to institutions in instalments, in accordance with approved payment arrangements made under the *Australian Research Council Act 2001*. Funds must be used only for purposes approved under *Discovery—Projects*, otherwise they must be returned through the usual payments system.

10.3 *Privacy of individuals*

Whenever you provide personal information to the ARC it is handled and protected in accordance with the provisions of the *Privacy Act 1988* (the Privacy Act). The Privacy Act sets the minimum standards for the collection, storage, access, use and disclosure of personal information by the ARC.

Persons, bodies and organisations involved in the ARC Discovery Projects Program must abide by the IPPs and the *Privacy Act 1988* when handling personal information collected for the purposes of that program. In brief, persons, bodies and organisations must ensure that:

- personal information is collected in accordance with IPPs 1-3;
- suitable storage arrangements, including appropriate filing procedures are in place;

- suitable security arrangements exist for all records containing personal information;
- access to a person's own personal information held by the organisation is made available to the person at no charge;
- records are accurate, up-to-date, complete and not misleading;
- where a record is found to be inaccurate, the correction is made;
- where a person requests that a record be amended because it is inaccurate but the record is found to be accurate, the details of the request for amendment are noted on the record;
- the personal information is only to be used for the purposes for which it was collected, or for other purposes where expressly allowed by IPP 10; and
- personal information is disclosed only in accordance with IPP 11.

While Privacy complaints can be made directly to the Privacy Commissioner, the Privacy Commissioner prefers that the ARC be given an opportunity to deal with the complaint in the first instance. You can contact the Privacy Commissioner on 1300 363 992.

10.4 Confidentiality

Information contained in applications will be received and treated as confidential by the ARC, institutions and assessors.

10.5 Intellectual property

Applicants must agree to comply with the intellectual property regulations of the administering organisation and with the National Principles of Intellectual Property Management for Publicly Funded Research (available at www.arc.gov.au).

10.6 Incomplete or misleading information

It is a serious offence to provide false or misleading information. If an application is incomplete or contains information that is considered misleading, it may be excluded from any further consideration for funding (see 8.2.1).

If the ARC believes that omissions or inclusion of misleading information are intentional, or if there is evidence of malpractice, the ARC will refer the matter for appropriate legal advice. The Commonwealth Government is committed to protecting its revenue, expenditure and property from any attempt, either by members of the public, contractors, sub-contractors, agents, intermediaries or its own employees to gain financial or other benefits by deceit.

Examples of malpractice include, but are not restricted to—

- providing fictitious track records
- falsifying claims in publications records (such as describing a paper as accepted for publication when it has only been submitted).

10.7 Contact points

For further information, the institution's Research Office should be contacted in the first instance.

Enquiries about *Discovery—Projects* may be addressed to—

Discovery Projects (Program Coordinator)
Disciplines and Programs
Australian Research Council

GPO Box 2702
CANBERRA ACT 2601
Email: ncgp@arc.gov.au
Phone: 02 6284 6600
Fax: 02 6284 6638
Web www.arc.gov.au

ARC NOTIONAL FELLOWSHIP SALARIES FOR 2003 (IN 2003 \$)

	Salary	26% Oncosts	Total
Australian Postdoctoral Fellowship (APD)/			
	\$52,240	\$13,582	\$65,822
Australian Research Fellowship (ARF)			
	\$65,210	\$16,955	\$82,165
Queen Elizabeth II Fellowship (QEII)			
	\$77,497	\$20,149	\$97,646
Australian Professorial Fellowship (APF)			
Step 1	\$89,516	\$23,275	\$112,791
Step 2	\$105,125	\$27,333	\$132,458

* salary scales and stipends will be indexed to 2004 dollars for successful applications

2003 ARC Fellows Relocation (maximum) Allowances

USA	\$15,000
UK/Europe/Asia (Nth Hem)	\$12,000
Asia (Sth Hem)/NZ	\$ 9,000
Australia	\$ 6,000

APPENDIX 2

Descriptions of Designated National Research Priorities and associated Priority Goals

Research Priority 1: An Environmentally Sustainable Australia

Transforming the way we use our land, water, mineral and energy resources through a better understanding of environmental systems and using new technologies

Natural resources have traditionally fuelled our national and regional economies. They have the potential to generate further wealth and employment opportunities in the future.

But our natural resources and biodiversity must be used on a sustainable basis so that the benefits continue to be enjoyed by future generations.

Australia faces significant environmental challenges:

- Efficient and sustainable water use is a critically important issue for our economic and social development;
- Significant land degradation issues, such as salinity, need to be arrested to underpin our agricultural production systems;
- Climate change can be expected to have complex, long term consequences for the environment, and for our agricultural and marine production systems; and
- The cleanliness and efficiency of our energy production systems should be enhanced.

There is substantial effort underway to develop more efficient water utilisation practices, to protect our rivers and groundwater resources, and to protect and remediate our fragile soils.

Our agricultural and mining industries are being transformed through the adoption of new technologies, and the development of new types of foods.

This will help to revitalise our regional communities and generate substantial export earnings for the nation over the coming decades.

The Government is committed to meeting the greenhouse gas emissions target set for Australia at Kyoto.

Australia is well placed to take an international lead in developing new and improved energy technologies and in capturing and 'sequestering' carbon dioxide.

Other opportunities lie in managing and using our unique, rich land- and marine-based biodiversity, and in developing our deep earth resources.

Australia has a strong record of achievement in research in fields such as agriculture, natural resource management, climate change, horticulture, forestry, mining, energy, and marine sciences.

We must build on these strengths to improve our competitive advantages while enhancing our understanding of natural systems and the interplay of human activities.

To understand and manage these complex interactions better will require significant collaboration within the research community and with other stakeholders.

Priority goals for research fall in the six areas of water utilisation, transforming resource-based industries, overcoming land degradation, developing cleaner, more efficient fuels and energy sources, managing biodiversity and deep earth resources.

Priority Goals

1 Water – a critical resource

Ways of using less water in agriculture and other industries, providing increased protection of rivers and groundwater and the re-use of urban and industrial waste waters.

Australia is one of the driest continents and is dependent upon access to freshwater supplies for economic and social development. It has a complex geological structure and unique ecosystems, flora and fauna. Enhancing our understanding of the links between water availability and these factors will result in a better understanding of sustainable water management practices.

2 Transforming existing industries

New technologies for resource-based industries to deliver substantial increases in national wealth by reducing environmental impacts on land and sea.

Resource-based industries underpin much of Australia's prosperity and have the potential to do so in the future. For example, Australia remains highly prospective for minerals discoveries and highly attractive for the development of new era foods from agricultural and marine sources. Our competitive advantage will depend on research and new technologies.

3 Overcoming soil loss, salinity and acidity

Identifying causes and solutions to land degradation using a multidisciplinary approach (examples include incorporating hydrology, geology, biology and climatology) to restore land surfaces.

The Australian landscape is fragile: soil salinity, acidity, and nutrient levels pose significant, long term challenges for agriculture and the environment. Research is helping to find solutions to these problems. For example, the *National Land and Water Resources Audit* shows the extent of salinity in the Australian environment and illustrates Australia's leading edge in national mapping of critical resource data.

4 Reducing and capturing emissions in transport and energy generation

Alternative transport technologies and clean combustion and efficient new power generation systems and capture and sequestration of carbon dioxide.

Australia is well positioned to produce world class solutions to reduce and capture greenhouse gas emissions and the Government is committed to meeting the emissions target set for Australia at Kyoto. We are also well placed to develop alternative energy technologies and ecologically sustainable transport and power generation systems.

5 Sustainable use of Australia's biodiversity

Managing and protecting Australia's terrestrial and marine biodiversity to develop long term use of ecosystem goods and services ranging from fisheries to ecotourism.

Australia has a unique and rich flora and fauna. Our complex ecosystems are resilient and have adapted to events such as drought and fire, and underpin the health of our agricultural, fisheries and tourism industries. There is a need for a more comprehensive understanding of these natural systems and the interplay with human activities.

6 Developing deep earth resources

Smart high-technology exploration methodologies, including imaging and mapping the deep earth and ocean floors, and novel efficient ways of commodity extraction and processing (examples include minerals, oil and gas).

Many of Australia's known mineral assets may be nearly exhausted within the next decade. New land-based deposits are believed to be buried deeper in the crust and the deep marine areas surrounding Australia are

also largely unexplored. New technologies, such as remote sensing, indicate scientists are on the brink of being able to ‘see’ inside the earth and identify deeply buried deposits.

Research Priority 2: Promoting and Maintaining Good Health

Promoting good health and preventing disease, particularly among young and older Australians

Average life expectancies have increased markedly in recent decades. Australians also expect to lead longer and healthier lives in the future, and to remain productive and independent over an extended period.

Enhancing the health outcomes of Australians will yield economic and social benefits and add materially to national well-being.

Australians expect that their children and grandchildren should have a healthy start to life.

Developing strategies to promote the healthy development of young Australians, and reducing the impact of the genetic, social and environmental factors which diminish their life potential will be critical.

A revolution is also underway at the other end of the life cycle. Australia, like many other developed nations, is undergoing a major demographic shift involving significant growth in the aged population.

To meet this challenge, it will be important to promote healthy ageing by developing better social and medical strategies to ensure that older Australians enjoy healthy and productive lives.

Informed insights into the causes of disease and of mental and physical degeneration will contribute to the achievement of this goal.

All Australians stand to benefit from preventive healthcare through the adoption of healthier attitudes, habits and lifestyles.

Evidence-based preventive interventions may help reduce the incidence and severity of many diseases, including major health problems such as cardiovascular and neurodegenerative diseases, mental ill-health, obesity, diabetes, asthma and chronic inflammatory conditions.

Improvements in the health and well being of the young, of older Australians and in preventive healthcare will be underpinned by research.

However, while Australia has an enviable record in health and medical research, the research effort is spread across the many universities, hospitals and health and medical research institutes, resulting in critical mass only in limited areas of research.

There is also a need to draw on multi-disciplinary approaches that include research contributions from the social sciences and humanities.

This priority is designed to promote health and prevent disease through a more focused and collaborative effort.

Priority goals for research fall in the three areas of a healthy start to life, ageing well, ageing productively, and health promotion and disease prevention healthcare.

Priority Goals

1 A healthy start to life

Reducing the impact of genetic, social and environmental factors predisposing infants and children to ill health and reducing their life potential.

Human health in the developing foetus and in early childhood is absolutely critical to the future well being of the adult. Research shows that health and well being in early childhood is predictive of later positive outcomes, and that health in middle and late childhood is also crucial. This goal fits well with the Government's *National Agenda for Early Childhood* initiative.

2 Ageing well, ageing productively

Developing new and better social and medical strategies to reduce mental and physical degeneration based on greater knowledge and understanding of the causes of disease and degeneration of mind and body.

Australia's population is ageing, with a significant projected increase in the number of people aged over 65 and over 85. While Australia is relatively well placed compared with many other OECD nations, major shifts in cultural expectations and attitude are necessary to respond constructively to ageing, at both an individual and population level. This goal fits well with the Government's *National Strategy for an Ageing Australia*. A healthy aged population will actively contribute to the life of the nation through participation in the labour market or through voluntary work.

3 Preventive healthcare

New evidence-based strategies to promote healthy attitudes, habits and lifestyles and to develop new health-promoting foods and nutraceuticals.

Preventive healthcare research will improve the prediction and prevention of disease and injury through the adoption of healthier behaviours, lifestyles and environments. Research will generate an improvement in the design, delivery and uptake of programmes such as exercise-based rehabilitation. There are several major disease targets amenable to immediate study, such as cardiovascular health, neurodegenerative diseases, mental ill-health, obesity, diabetes, asthma and chronic inflammatory conditions. Research in prevention will emphasise interdisciplinary research, drawing on contributions from the social sciences and humanities, as well as from the health and medical sciences.

Research Priority 3: Frontier Technologies for Building and Transforming Australian Industries

Stimulating the growth of world-class Australian industries using innovative technologies developed from cutting-edge research

Wealth often derives from the unforeseen application of new discoveries.

Australia must be at the leading edge if it is to stay abreast of international developments and take advantage of opportunities.

Our national capabilities in emerging sciences and their underpinning disciplines determine our capacity to develop and implement new technologies.

Australia has a strong base of expertise, skills and technological capacities in the fundamental sciences and key technologies.

Our strengths are in a wide range of areas such as biotechnology, material sciences, information and communications technology (ICT), photonics, nanotechnology and sensor technology.

ICT is currently the critical enabling technology and is a major contributor to national productivity and growth.

But breakthrough science underpins technological advancements in many areas and Australia needs to foster an environment that stimulates creativity and innovation.

Applications for frontier technologies are potentially very large. Australia has the capacity to exploit niche markets for new products and services.

Australia also has an enviable track record as an innovator and developer of advanced materials and must grasp the opportunity to stay ahead.

Smart information use involving improved data management, intelligent transport systems and creative applications for digital technologies provides huge opportunities to improve the performance of key Australian industries.

Australia needs to invest in this research area as it is fundamental to our future competitiveness and well being.

This priority will help to strengthen the capacity of Australian researchers to participate in new areas of research, enhance Australia's international scientific reputation, stimulate local expertise, and help create vibrant new industries.

Enhanced research effort will also be achieved through initiatives that develop a critical mass of researchers in key areas.

Priority goals for research fall in the four areas of breakthrough science, frontier technologies, advanced materials and smart information use.

Priority Goals

1 Breakthrough science

Better understanding of the fundamental processes that will advance knowledge and develop technological innovations (examples include bio-informatics, nano-assembly, quantum computing and geo-informatics).

Breakthrough science underpins technological innovation across a range of industries critical to maintaining Australia's position as a developed country. Some examples include bio- and geo-informatics, nano-assembly and quantum computing. Technological advances are often unexpected and a strong foundation in mathematics and the fundamental sciences will provide an environment that fosters creativity and innovation. Early participation in leading edge areas of research will enable Australian researchers to benefit more fully from international developments.

2 Frontier technologies

Enhanced capacity in frontier technologies to power world-class industries of the future and build on Australia's strengths in research and innovation (examples include nanotechnology, biotechnology, ICT, photonics, genomics/phenomics, and complex systems).

The potential applications of frontier technologies across a range of industries in Australia are vast. Australia has significant capacity to exploit niche markets for new products and services emerging from frontier technologies. Australia has world-class research expertise in many such areas. Some examples include nanotechnology, biotechnology, ICT, photonics, genomics and phenomics. Also important are advanced frameworks such as complex systems in which these technologies are applied. Future directions in this priority area need to target the cutting-edge science critical for each emerging technology.

3 Advanced materials

Advanced materials for applications in construction, communications, transport, agriculture and medicine (examples include ceramics, organics, biomaterials, smart material and fabrics, composites, polymers and light metals).

The development of advanced materials will underpin growth in many areas of industrial and economic activity in Australia. Australia has substantial infrastructure in this area and an enviable track record as

an innovator and developer of advanced materials. The era of advanced materials is just beginning in spite of the tremendous progress in recent years. Substantial scientific and technological challenges remain ahead, including the development of more sophisticated and specialised materials. Some examples include ceramics, organics, biomaterials, smart materials and fabrics, composites, polymers, and light metals.

4 Smart information use

Improved data management for existing and new business applications and creative applications for digital technologies (examples include e-finance, multimedia, content generation and imaging).

ICT applications are providing huge opportunities to deliver new systems, products, business solutions, and to make more efficient use of infrastructure. Examples include e-finance, multimedia, content generation and imaging. Improved data management is central to the future competitiveness of key industries such as agriculture, biotechnology, finance, banking, education, transport, government, health and 'infotainment'. The ability of organisations to operate virtually and collaborate across huge distances in Australia and internationally hinges on our capabilities in this area. Research is also needed to exploit the huge potential in the digital media industry.

Research Priority 4: Safeguarding Australia

Safeguarding Australia from terrorism, crime, invasive diseases and pests, and securing our infrastructure, particularly with respect to our digital systems

The importance of security and safety to Australia has been underscored by recent events.

Australia has to be capable of anticipating and tackling critical threats to society, strategic areas of the national economy and the environment.

The threats can potentially come from within and outside Australia.

The world is now characterised by the widespread and rapid movements of people, digitally coded data, goods and services, and exotic biological agents.

Critical infrastructure in Australia is increasingly dependent on digital technology for its management and integration.

Information protection and the integrity of security systems are now more important than ever before.

It is also necessary to protect the status of Australia as a nation free of many of the diseases affecting primary production around the world.

Terrorism has emerged as a very real global threat and crime is taking a significant toll on Australian society and economy.

Maintaining the operational advantage of Australia's defence forces through superior capabilities is also fundamental to our national security.

Leading edge research in Australia is already yielding high dividends and as a national research priority will improve the effectiveness of that contribution.

Stronger research capabilities will ensure that solutions are tailored to Australia's unique circumstances, reflecting its geographic features and small population.

Greater collaboration within the research community and with other stakeholders will allow us to better understand and manage potential threats to Australia.

Harnessing the knowledge and capabilities across Australia offers us the best chance of developing innovative and rapid solutions to serious threats.

Australia's international relations and its regional influence will be strengthened through new science and technologies that enhance security and safety.

The heightened interest in personal and electronic security across the world also provides opportunities for Australian solutions.

Priority goals for research fall in the four areas of critical infrastructure, protecting Australia from invasive diseases and pests, protecting Australia from terrorism and crime, and transformational defence technologies.

Priority goals

1 Critical infrastructure

Protecting Australia's critical infrastructure including our financial, energy, computing and transport systems.

Protecting our critical infrastructure is important to national security and to the social and economic well being of Australia. An important aspect of this priority goal is e-security which is an enabler of e-commerce. Maintaining a critical mass of research in e-security will be essential in providing Australia with the tools to protect our way of life.

2 Protecting Australia from invasive diseases and pests

Counteract the impact of invasive species through the application of new technologies and by integrating approaches across agencies and jurisdictions.

Australia is free of many of the pests and diseases affecting primary production around the world. This status needs to be protected as the introduction of exotic species has the potential to adversely affect our exports and the environment. Australia already has strong skills and expertise in this area of research and further work will offer immediate benefits to the community. A greater level of coordination of our research effort will mean that Australia can more effectively develop innovative and rapid solutions to serious threats.

3 Protecting Australia from terrorism and crime

By promoting a healthy and diverse Research and Development system that supports core competencies in modern and rapid identification techniques.

Protecting Australia from terrorism is now more important than ever before in light of recent events and our involvement in the 'war on terror'. Crime takes a significant toll on Australian society and economy. The June 2000 report from the Prime Minister's Science, Engineering and Innovation Council estimated that crime costs Australia at least \$18 billion per annum. Personal identification, information protection and the integrity of security systems are fundamental towards ensuring the national security of Australia. An effective solution will include building on Australia's existing strengths in rapid detection using new analytical technologies and managing significant data collections.

4 Transformational defence technologies

Transform military operations for the defence of Australia by providing superior technologies, better information and improved ways of operation.

Australia has a small defence force to protect a large continent and a substantial maritime region of responsibility. Its operational advantage has been maintained through a superior capability which is dependent on leveraging innovative technologies. Although some benefits can be gained from overseas research, Australia has to conduct its own research to address uniquely Australian demands. A systems approach which harnesses the research capabilities of all stakeholders is essential to the successful development and introduction of innovative technologies.