



Australian Government

Australian Research Council

Super Science Fellowships Funding Rules
for funding commencing in 2010 and 2011

Australian Research Council Act 2001

I, CRAIG EMERSON, Acting Minister for Innovation, Industry, Science and Research, having satisfied myself of the matters set out in section 59 of the *Australian Research Council Act 2001*, approve these Funding Rules under section 60 of that ARC Act.

Dated 15th October 2009

CRAIG EMERSON
Acting Minister for Innovation, Industry, Science and Research

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Acronyms

AEDT	Australian Eastern Daylight Saving (Summer) Time
ARC	Australian Research Council
AVCC	Australian Vice-Chancellors' Committee
CI	Chief Investigator
CRC	Cooperative Research Centre
FTE	Full-time equivalent
GAMS	Grant Application Management System
GST	Goods and Services Tax
NCGP	National Competitive Grants Program
NHMRC	National Health and Medical Research Council
PDF	Portable Document Format
RMS	Research Management System
SSF	<i>Super Science Fellowships</i>
UA	Universities Australia
URL	Universal Resource Locator

Key dates

Rounds One and Two

Closing time for submission of Round One and Round Two Proposals	5.00 pm (AEDT) Wednesday, 25 November 2009
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Contacts

Requests for information about the *Super Science Fellowships* scheme, including how to apply, should be directed to the Research Office or equivalent in your organisation.

Enquiries regarding the *Super Science Fellowships* scheme must be addressed and sent:

by mail to:

or

by courier to:

Super Science Fellowships
Coordinator
Australian Research Council
GPO Box 2702
CANBERRA ACT 2601

Super Science Fellowships
Coordinator
Australian Research Council
1st Floor, 8 Brindabella Circuit
CANBERRA AIRPORT ACT 2609

Email: SuperScience@arc.gov.au

Phone: +61 2 6287 6600

Fax: +61 2 6287 6638

Website: <http://www.arc.gov.au>

Appeals must be addressed and sent:

by mail to:

or

by courier to:

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

The Appeals Officer
Australian Research Council
1st Floor, 8 Brindabella Circuit
CANBERRA AIRPORT ACT
2609

RMS IDs:

Phone: +61 2 6287 6789

Email: rms@arc.gov.au

1. Name of Funding Rules

These Funding Rules are the Australian Research Council *Super Science Fellowships* Funding Rules for funding commencing in 2010 and 2011.

2. Commencement

These Funding Rules shall take effect upon registration on the Federal Register of Legislative Instruments.

3. Definitions

In these Funding Rules, unless the contrary intention appears:

Administering Organisation means an Eligible Organisation which submits a Proposal for funding under the *Super Science Fellowships* scheme and which will be responsible for the administration of the funding if the proposed project is approved for funding.

Applicant means the Administering Organisation. Funding under *Super Science Fellowships* is provided to Administering Organisations, not to individual researchers.

ARC means the Australian Research Council, as established under the *Australian Research Council Act 2001*.

ARC Act means the *Australian Research Council Act 2001*.

ARC Centre means a research centre wholly or partly funded by the ARC. This includes *ARC Centres of Excellence*, *ARC Centres* and *ARC Special Research Centres* and co-funded Centres such as the Australian Centre for Plant Functional Genomics (ACPGF), the Australian Stem Cell Centre (ASCC), the National ICT Australia (NICTA), and the National Centre for Groundwater Research and Training.

ARC Fellow means a researcher whose salary is funded wholly or partly under an ARC Fellowship.

ARC Fellowship means a position held by a researcher where the salary is funded wholly or partly by the ARC and the researcher has been awarded an ARC Fellowship in one of the following ARC schemes: Australian Postdoctoral Fellowship (APD), Australian Research Fellowship (ARF), Australian Research Fellowship-Indigenous (ARF-I), Queen Elizabeth II Fellowship (QEII), Australian Professorial Fellowship (APF), Australian Postdoctoral Fellowship (Industry) (APDI), Linkage Industry Fellowship (LIF), ARC Centre Fellowship, ARC International Fellowship (ARCIF), Federation Fellowship, ARC Future Fellowship, Australian Laureate Fellowship, Indigenous Researcher Fellowship (IRF) and Super Science Fellowship (SSF).

ARC website is <http://www.arc.gov.au>.

Centre Director means the person appointed to direct the programs of a Commonwealth-funded Research Centre.

Chief Investigator means a researcher who satisfies the eligibility for a Chief Investigator.

Commonwealth means the Commonwealth of Australia.

Commonwealth-funded Research Centre means a research centre substantially funded from Commonwealth competitive research funding sources and includes ARC Centres, Commonwealth Research Centres (CRCs) and National Health and Medical Research Council (NHMRC) Program Grants and Centres of Clinical Research Excellence. It does not include Research Networks funded by the ARC.

Conflict of Interest means an actual or perceived conflict between a person's public duty and their private or personal interest.

Eligible Organisation means an organisation that is eligible to apply for and receive funding under the *Super Science Fellowships* Funding Rules as specified in Section 6.1.

Fellow means a researcher whose salary is funded under the *Super Science Fellowships* scheme.

GST has the meaning as given in section 195-1 of the *A New Tax System (Goods and Services Tax) Act 1999*.

Funding Agreement means the agreement entered into between the ARC and the Administering Organisation if the Administering Organisation's Proposal is approved for funding. This Agreement sets out the terms and conditions under which the Commonwealth is to provide funding and the Administering Organisation is to be responsible for administration of the funding and the conduct of the project.

Funding Rules means this document.

Host Organisation means another research organisation at which a Fellow may undertake some of her/his research while holding a Super Science Fellowship. A Super Science Fellow may spend a period or periods of up to 12 months in total, over the life of the fellowship conducting research at one or more Host Organisations.

Minister means the Minister from time to time responsible for the administration of the ARC Act, or the Minister's delegate.

National Research Priority means a national research priority detailed in Appendix E.

Project means a project, including individual fellowships, approved by the Minister for funding.

Project Leader means the first-named researcher nominated on a Proposal who is a Chief Investigator.

Proposal means a request to the ARC for the provision of financial assistance for a research project which is submitted in accordance with Funding Rules approved by the Minister.

Research Office means a business unit within an organisation that is responsible for administrative contact with the ARC regarding research proposals and research projects.

Special Condition means a special condition specified in a Funding Agreement which governs the use of the funding provided by the ARC.

Super Science Fellowship means an ARC Fellowship awarded under the *Super Science Fellowships* scheme.

Super Science Fellowships Coordinator means the occupant, from time to time, of the position of Scheme Coordinator (*Super Science Fellowships*) in the ARC, or any other person to whom the administration of the *Super Science Fellowships* scheme may be allocated.

4. Introduction

4.1 Overview and NCGP objectives

- 4.1.1 This document sets out the Funding Rules for the *Super Science Fellowships* scheme which is funded under the ARC National Competitive Grants Program (NCGP), and complies with the requirements of the ARC Act.
- 4.1.2 All parties involved in Proposals should read and understand the Funding Rules and draft Funding Agreement (which will be available at the ARC website) before submitting a Proposal to the ARC. Applicants are responsible for ensuring that their Proposals are complete and accurate.
- 4.1.3 Funding under the *Super Science Fellowships* scheme is provided to Administering Organisations, not to researchers. That is, the ARC will accept a Proposal only from an Eligible Organisation and not from any individual researchers.
- 4.1.4 These Funding Rules are current as at August 2009 and have been prepared in accordance with the requirements of the ARC Act in force then. These Funding Rules are subject to change at any time, for reasons including any subsequent amendment, replacement or supplementation of the ARC Act.
- 4.1.5 The ARC is a Commonwealth Statutory Authority established under the ARC Act. The primary functions of the ARC, as specified by the ARC Act, are to make recommendations regarding the funding of research programs, to administer funding to support research programs and to provide policy advice relating to research.
- 4.1.6 The ARC has established a range of competitive funding schemes for the support of research and research training under the framework of the NCGP. A list of current NCGP funding schemes is available on the ARC website.
- 4.1.7 By the operation of a range of funding schemes under the NCGP, the ARC aims to:
 - a. maintain and build on existing research and research training;

- b. build the scale and focus of research and research training;
- c. encourage cross-disciplinary approaches to research and research training;
- d. facilitate collaborative approaches to research and research training; and
- e. support research and research training of national benefit, including in the following National Research Priorities:
 - i. An Environmentally Sustainable Australia;
 - ii. Promoting and Maintaining Good Health;
 - iii. Frontier Technologies for Building and Transforming Australian Industries; and
 - iv. Safeguarding Australia.

4.1.8 Descriptions of these National Research Priorities and their associated Priority Goals can be found in Appendix E, and at the ARC website.

4.2 *Super Science Fellowships* scheme

4.2.1 The *Super Science Fellowships* scheme provides fellowship support for early-career researchers to ensure that the most promising young researchers continue to have opportunities to work in three areas of national significance.

4.2.2 The objectives of the *Super Science Fellowships* scheme are to:

- a. attract and retain outstanding early-career researchers;
- b. strengthen collaboration in the targeted disciplines across research institutions and organisations;
- c. support research in the disciplines of:
 - i. Space science and astronomy;
 - ii. Marine and climate science; and
 - iii. Future industries research-biotechnology and nanotechnology; and
- d. strengthen Australia's research capacity by supporting innovative, internationally competitive research.

4.2.3 The *Super Science Fellowships* scheme encourages Proposals from eligible organisations to support outstanding early-career researchers.

4.2.4 Up to 50 fellowships in Round One may be awarded for funding commencing in 2010. A further 50 fellowships in Round Two may be awarded for funding commencing in 2011.

4.2.5 One call for submissions for the *Super Science Fellowships* scheme will be made by the ARC. Proposals for both Round One and Round Two must be submitted within this call.

4.2.6 A maximum of three Super Science Fellowships may be requested for each targeted discipline, Administering Organisation and round.

4.3 Selection criteria

4.3.1 All *Super Science Fellowship* Proposals will be assessed and merit ranked using the following criteria:

a. **Project Quality** (50%)

- Do the Proposal's aims and concepts have intellectual merit?
- How will the anticipated outcomes advance the international knowledge base of the targeted discipline?
- How does the Proposal build Australia's capacity within the targeted discipline and what contribution will the Fellows make?
- Are the project outcomes clearly identified?
- Are the conceptual framework, design, methods and analyses adequately developed, well integrated and appropriate to the aims of the project?

b. **Administering or Administering/Host Organisation(s) Team** (30%)

Evidence by the organisation(s) team for:

- Demonstrated research strength of the team in the organisation(s) within the targeted discipline.
- International/national leadership of the team within the Proposal's research area.
- Record of high quality research outputs by the team.
- Record of postdoctoral supervision and mentoring within the team.
- Strong collaboration amongst the researchers of the organisation(s) within the targeted discipline of research.

c. **Administering or Administering/Host Organisation(s) Support and Commitment to the Proposal** (20%)

- A detailed description of the collaborative arrangements for the organisation(s) and team.
- Is there evidence that the organisation(s) is committed to, and supports the research project in the targeted discipline, and provides facilities and supervision to the Fellow(s)?
- Will the proposed research encourage, develop and strengthen strategic research alliances within or between the organisation(s)?
- Does the Proposal describe suitable administrative arrangements for the Fellow(s)?
- Are there adequate facilities to support the project (physical, technical, access to infrastructure, etc.)?
- A description of the financial support provided for the Fellow(s) by the organisation(s), including the minimum financial contribution.

4.4 Conflict of Interest

- 4.4.1 All parties involved in or associated with Proposals and ARC-funded research projects are required to disclose to the ARC, and the other parties involved in the Proposal/project (including Host Organisation(s), any Conflict of Interest that has the potential to influence, or appear to influence, the request for funding, or the research and activities, publications and media reports related to the Proposal/project. Such conflicts must be disclosed to the ARC at the time of the submission of a Proposal and in reporting on ARC-funded research projects, and notified to the other parties as soon as practicable after the Conflict of Interest is identified.
- 4.4.2 If, in the opinion of the ARC, any party involved in or associated with a Proposal has failed to disclose a Conflict of Interest, the ARC may in its absolute discretion decide to not recommend for approval any or all Proposals involving that party.
- 4.4.3 If a Conflict of Interest exists or arises, the Administering Organisation must have established processes in place and documented for managing the Conflict of Interest for the duration of the project. Such processes must comply with the NHMRC/ARC/UA *Australian Code for the Responsible Conduct of Research (2007)* and any relevant successor document. In the event of any inconsistency between the original and any successor document, the latter document will apply.

5. Funding

The ARC will fund up to three Super Science Fellowships for each targeted discipline, Administering Organisation and round.

5.1 Level of funding

- 5.1.1 All amounts referred to in these Funding Rules are to be read as exclusive of GST (if any), unless expressly stated otherwise.
- 5.1.2 The level of salary that will be provided by the ARC for each Super Science Fellowship is AUD\$72,500 per annum for three years plus 28 per cent on-costs.
- 5.1.3 The ARC only supports the cost of salary and salary-related (on-cost) funding for fellows, as set out in Appendix D.
- 5.1.4 The Administering Organisation and/or Host Organisation(s) must provide each Super Science Fellow with a minimum of AUD\$20,000 cash for each of the three years of the fellowship, to support the research project.
- 5.1.5 The ARC reserves the right to recommend funding for a project at levels that may differ from those requested in the Proposal.

5.2 Period of funding

- 5.2.1 Funding may be payable under these Funding Rules for the *Super Science Fellowships* projects in respect of the financial year 2010-11 (for Round One Proposals) and 2011-12 (for Round Two Proposals) and any subsequent years to which the ARC Act applies. Funding for approved projects will commence with effect from 1 July 2010 (for Round One Proposals) and 1 July 2011 (for Round Two Proposals), unless other arrangements are approved by the ARC.
- 5.2.2 Projects are funded for three years on a full-time basis only, subject to sufficient funding being available for the *Super Science Fellowships* scheme, the provisions of the ARC Act and continued satisfactory progress of the project.
- 5.2.3 For the purposes of these Funding Rules, the term of a researcher's fellowship is determined by the date that the researcher commenced the fellowship. In the case of fellowships awarded under these Funding Rules, the commencement date will be 1 July 2010 (for Round One Proposals) and 1 July 2011 (for Round Two Proposals), unless the commencement date has been deferred to a later date approved by the ARC.

5.3 Types of research supported

- 5.3.1 Subject to Section 5.4, the *Super Science Fellowships* scheme supports excellent research by early-career researchers, in the targeted disciplines including:
- a. 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.
 - b. 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. Such research provides the broad base of knowledge necessary to solve recognised practical problems.
 - c. Applied research, which is original work undertaken primarily to acquire new knowledge with a specific application in view. Such research 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.

5.4 Areas of investigation/work not supported

- 5.4.1 The *Super Science Fellowships* scheme does not support:
- a. Medical and Dental Research;
 - b. activities leading solely to the creation or performance of a work of art including visual art, musical compositions, drama, dance, film, broadcasts, designs and literary works;
 - c. projects such as uncritical compilations and purely descriptive catalogues or editions that do not involve original research;

- d. production of teaching materials, even though some research may be involved in their production;
 - e. compilation of data unless this is an integral part of the project and is judged to be necessary, in which case the Proposal must include a statement indicating the research objectives to which the data would contribute; and/or
 - f. development of research aids and tools (including computer programs), unless they form an integral part of the Proposal, in which case the Proposal must include a statement indicating the research objectives to which these activities would contribute.
- 5.4.2 If the ARC considers that a Proposal seeks funding for any of the items not permitted under Section 5.4, then to that extent part or all of the Proposal will not be recommended or approved for funding. However, if the ARC considers that other parts of the proposed project remain worthy of support, the ARC may recommend that a reduced amount of funding be approved for the Proposal.

5.5 Number of Proposals

- 5.5.1 Only one call for submissions for the *Super Science Fellowships* scheme will be made by the ARC. Proposals will be accepted for both rounds, within this call. Fifty Super Science Fellowships will be available in each of the two rounds.
- 5.5.2 A maximum of three (3) Super Science Fellowships may be requested by an Administering Organisation in a single Proposal for each targeted discipline and round.
- 5.5.3 Administering Organisations requesting Super Science Fellowships in both rounds must submit separate Proposals including separate but complementary projects.
- 5.5.4 For the purpose of applying these limits, the number of Proposals per Administering Organisation is evaluated as at the closing time of submission of Proposals for the single call, regardless of any subsequent change in, or withdrawal of Proposals. Submitting Proposals that exceed this limit may result in all Proposals involving the relevant Administering Organisation not being recommended or approved for funding.

6. Organisational Types, Roles and Eligibility

6.1 Eligible Administering Organisations

- 6.1.1 A Proposal may be submitted only by an Eligible Organisation linked to existing Super Science funding (for example, National Collaborative Research Infrastructure Scheme funding within a theme area); and/or be involved in an ARC Centre of Excellence, strategic priority of a Publicly Funded Research Agency and/or CRC within a relevant theme area.

- 6.1.2 Appendix C specifies Eligible Organisations for the *Super Science Fellowships* scheme, but the organisation may only apply for a Super Science Fellowship if they meet the criteria specified in subsection 6.1.1 of these Funding Rules.
- 6.1.3 Each Proposal must identify the Administering Organisation. A Proposal may involve two or more organisations (an Administering Organisation and one or more Host Organisations) for the proposed project.
- 6.1.4 A Proposal must certify that the proposed project can be accommodated within the general facilities of the Administering Organisation or Host Organisation(s) specified in a Proposal, including those items mentioned in 6.1.5.
- 6.1.5 The Administering Organisation and, where relevant, the Host Organisation(s) must agree to provide the following basic facilities:
- a. qualified supervision to support the Super Science Fellow's research;
 - b. suitable accommodation (e.g. laboratory and office, suitably equipped and furnished);
 - c. access to workshop services (if required by the project);
 - d. access to a basic library collection;
 - e. standard reference materials or funds for abstracting services;
 - f. provision of computers, including laptops (excluding access to high-performance computers or other specialised applications) and basic computing facilities such as printers, word processing and other standard software; and
 - g. use of photocopiers, telephones, mail, fax, email and internet services.

6.2 Host Organisation(s)

- 6.2.1 Each Proposal may also identify one or more Host Organisations which may or may not be an Eligible Organisations listed in Appendix C. The Host Organisation(s) must, in the opinion of the ARC, provide a suitable research environment for the Fellow.
- 6.2.2 The Proposal must describe the extent of the collaboration between the Administering Organisation and the Host Organisation(s).
- 6.2.3 The Proposal must also describe the Host Organisation(s) capacity to support high quality research in the targeted discipline(s) and a willingness to provide facilities and qualified supervision.
- 6.2.4 The Proposal should describe the proposed administrative arrangements between the Administering Organisation and the Host Organisation(s) to accommodate the fellowship.
- 6.2.5 Fellows may conduct research at one or more Host Organisations other than the Administering Organisation for a period or periods of up to 12 months in total, over the life of the fellowship.

6.2.6 Basic facilities, as described in subsection 6.1.5, must be provided by a Host Organisation.

6.3 Role and eligibility for Chief Investigators

6.3.1 A Proposal must nominate at least one Chief Investigator.

6.3.2 A maximum of five Chief Investigators may be nominated per Proposal.

6.3.3 The first-named Chief Investigator on a Proposal must be a full-time employee of the Administering Organisation.

6.3.4 The first-named Chief Investigator nominated on a Proposal will be considered the 'Project Leader'.

6.3.5 The Chief Investigator(s) must take significant intellectual responsibility for the proposed project, its conception, strategic decisions in its pursuit and the communication of results. The Chief Investigator(s) must have the capacity to make a serious commitment to supervise the fellowship recipients. The ARC reserves the right to determine whether a person has the requisite capacity to perform the role.

6.3.6 At the closing time of submission of Proposals, all obligations regarding previously funded projects involving the Chief Investigators must have been fulfilled to the satisfaction of the ARC. Such obligations include the provision of satisfactory progress and final reports.

7. Selection of Super Science Fellowships

7.1 Introduction

7.1.1 Once successful proposals for the *Super Science Fellowships* scheme have been approved and announced, the successful Administering Organisations must then undertake a process of competitive national and international recruitment for Round One of the *Super Science Fellowships* scheme. Recruitment and selection processes must include the following features:

- Positions must be clearly advertised in a national newspaper and in at least two international publications. In addition, electronic advertising is encouraged.
- Each potential candidate must be provided with adequate details of the approved project, the expected project outcomes, the team, the facilities available at the Administering Organisation and, where applicable, the Host Organisation(s).
- The closing date for potential candidates' applications must be at least one-month from the date of the last published advertisement.
- The selection criteria should be consistent with the successful *Super Science Fellowships* Proposal; focus on the Fellows' research and publications that will enhance the project; and be open to all competitive applicants (national and international).

- The selection committee should include at least one external - to the Administering and Host Organisation(s) - member, have gender balance and follow best practice equity processes.
- The selection committee should select the most competitive candidates to fill the 2010 Fellow(s) and create a reserve list (where appropriate).
- The recommendations of the committee must be used by the Administering Organisation to fill the 2010 fellowship(s) and allow for replacements in the case of resignations or extended leave for up to 12 months from the date of the selection committee's recommendation.
- The process and the recommended Fellows (and reserves) must be signed-off by the Deputy Vice-Chancellor/Pro Vice-Chancellor or Vice-Chancellor.
- The details of the selection and appointment process, commencement date and Curriculum Vitae of the successful Fellows must be forwarded to the ARC for its auditing processes.
- The Administering Organisation will be required to report every 12 months on the Fellows (budget and progress), and any variations to the conditions of employment, resignations, extended leave, etc.

7.1.2 The process mentioned in 7.1.1 must be repeated for recruitment of the second round of fellowship candidates prior to June 2011.

7.2 Role and eligibility for Super Science Fellows

7.2.1 Fellows must take significant intellectual responsibility for the progress of their fellowship project against the proposed outcomes of the project, and be involved with the project team in the communication of results. The ARC reserves the right to determine whether a person has the requisite capacity to perform the role.

7.2.2 Fellows must be outstanding early-career researchers who conduct high quality innovative research. They must have a record of significant research outputs relative to the opportunities of the current stage of their career, and evidence to work across industry and/or research institutions and/or disciplines. They should be qualified to work in research programs in the targeted disciplines that will deliver significant intellectual, economic, environmental, social, health or cultural benefits to Australia.

7.2.3 Fellows are required to pursue research that is both collaborative and outstanding in their field at the Administering/Host Organisations.

7.2.4 Fellows are required to participate in science engagement, education and outreach activities over the life of their fellowships where such activities are consistent with their research project.

7.2.5 Super Science Fellows must:

- a. be an Australian citizen or have obtained permanent or temporary resident status from the Department of Immigration and Citizenship prior to the fellowship commencing;

- b. have been awarded a PhD at a recognised institution, in a targeted discipline not more than three years before the commencement date for the Super Science Fellowship with the exception indicated in 7.2.6; and
 - c. ensure that their involvement in the proposed project does not generate or represent a Conflict of Interest (see subsection 4.4) regarding the circumstances where conflicts may arise and the potential for exemptions/relaxation of this requirement to be granted by the ARC.
- 7.2.6 The ARC may, in its absolute discretion, determine the validity and date of effect for the attainment of PhD-equivalent status for researchers for the purpose of determining the eligibility of fellowship recipients and whether to relax the timing requirements once the details have been submitted to the ARC.
- 7.2.7 Fellows must reside predominantly in Australia for the duration of the fellowship.
- 7.2.8 Fellows may spend no more than 0.05 Full-Time equivalent (FTE) of their time on teaching activities that are closely related to their research project.
- 7.2.9 Fellows must relinquish any responsibilities associated with any pre-existing appointments, fellowships, and administrative/management responsibilities prior to the commencement of the Super Science Fellowship, and focus on research associated with the fellowship.
- 7.2.10 Fellows may, with the approval of the ARC, receive up to two-years extension to the deadline of the PhD award for maternal responsibilities.
- 7.2.11 Proposals requesting a fellowship must be made on the basis that the Fellow's research will be carried out on a full-time basis only. Nevertheless, if a fellowship Proposal is successful the Fellow may, during the term of the fellowship, request approval from the ARC for conversion of the fellowship to part-time status for limited periods of time.

8. Cross-scheme issues

8.1 Cross-scheme eligibility

- 8.1.1 If a researcher nominated as a Chief Investigator on a Proposal is named in a funding request for any proposed research project (including fellowship, salary or equipment) that has been submitted or approved under any other ARC scheme or to any other Commonwealth funding body, the Proposal must contain details of the request and summary details of all other funding. If these processes are not observed or the ARC determines that incomplete, misleading or inaccurate details were included in the Proposal, the ARC may in its absolute discretion decide to recommend that the *Super Science Fellowships* Proposal not be approved for funding.

8.2 Cross-scheme funding

8.2.1 The ARC will not duplicate financial assistance for research already funded by the Commonwealth or which is likely to be funded from other Commonwealth funding sources (including under other ARC funding schemes). The ARC reserves the right to determine if a Proposal duplicates or is likely to duplicate research being funded by another Commonwealth source. In such circumstances the ARC may in its absolute discretion decide to recommend that the Proposal not be approved for funding.

8.3 Funding of Medical and Dental Research

8.3.1 Pursuant to subsection 5.4.1.a and Section 8.3, the ARC does not fund Medical and Dental Research under the *Super Science Fellowships* scheme. The ARC reserves the right to determine conclusively whether the proposed research involves Medical and Dental Research.

8.3.2 The ARC reserves the right to determine at its absolute discretion conclusively whether:

- a. proposed research involves Medical and Dental Research; and
- b. the expected outcomes of a proposed project are likely to have significant relevance or application beyond the medical and dental context.

8.3.3 For the purposes of these Funding Rules, the definition of Medical and Dental Research can be found at the ARC website.

9. Application process

9.1 Eligibility Exemption and Eligibility Advice

9.1.1 Formal Eligibility Exemption and Eligibility Advice processes do not apply to Proposals for *Super Science Fellowships* scheme.

9.2 Proposals

9.2.1 A Proposal should be submitted as a mature research plan ready for implementation. The Proposal must contain all the information necessary for its assessment without the need for further written or oral explanation, or reference to additional documentation, unless requested by the ARC.

9.2.2 All details in the Proposal must be current at the time of submission.

9.2.3 In submitting a Proposal, the Administering Organisation and the Chief Investigators nominated in the Proposal are consenting to the Proposal being assessed under the ARC peer assessment procedures and agree to the release of the Proposal to third parties for assessment purposes.

10. Submission of Proposals

10.1 Submission of Proposals in RMS

10.1.1 Administering Organisations must submit Proposals through the ARC online Research Management System (RMS) unless otherwise advised.

10.2 Proposal Content

10.2.1 Proposals consist of an on-line form, which must be completed and submitted in the RMS, accessible via the ARC website. The RMS online form may include the following additional text which, if included, must be attached in PDF format to the online version of the Proposal:

- a. Project Description;
- b. Justification of funding requested from the ARC;
- c. Ten career-best publications; and
- d. Research support.

10.3 Format in RMS

10.3.1 All documents must be written in English and must comply strictly with the format, content and submission requirements as specified in these Funding Rules and the Super Science Fellowships Instructions to Applicants for Funding Commencing in 2010 and 2011 document issued by the ARC. If a Proposal fails to meet any format, content or submission requirements, the ARC may in its absolute discretion decide to not recommend the Proposal for approval.

10.3.2 All pages of additional text must be uploaded in PDF format. Text must be in black type, use a single column and 12 point font size, with all margins being at least two cm. A highly legible font type must be used, such as 12 point Times New Roman, Arial, Courier, Palatino, and Helvetica subject to their being equivalent to Times New Roman 12 point font. Variants such as mathematical typesetting languages may also be used. References may be reproduced in 10 point font size. Colour graphs or colour photographs should not be included as they will be reproduced in black and white and the reproduction quality may not be optimal. Finely detailed graphics and grey scale may also not be precisely reproduced. Additional text attachments may appear slightly reduced in size due to the RMS system formatting the attachments to include page numbers. Attached PDFs should be directly generated rather than scanned to maximize the quality of reproduction.

10.4 How to complete and submit a Proposal in RMS

10.4.1 Administering Organisations must complete and submit their Proposal using the online form within RMS, which is accessible via the ARC website.

10.4.2 A Super Science Fellowships Instructions to Applicants document will be available on the ARC website. This document specifies a range of requirements for Proposals and also assists parties in preparing Proposals.

- 10.4.3 Research Offices with RMS access will approve request for RMS User Accounts, along with the ARC, to enable researchers at their organisations to access RMS and prepare Proposals. If a researcher has previously been allocated access to GAMS, and cannot access RMS, they should email rms@arc.gov.au for assistance.
- 10.4.4 If a researcher does not have a Research Office or equivalent unit, he/she should email rms@arc.gov.au for assistance.
- 10.4.5 If an Eligible Organisation does not have a Research Office unit, they should email rms@arc.gov.au for assistance.

10.5 Closing time for Proposals in RMS

- 10.5.1 The online form completed using the RMS, must be submitted by 5.00 pm (AEDT) Wednesday 25 November 2009.
- 10.5.2 Proposals may be withdrawn but additions, deletions and modifications will not be accepted after the closing date for submissions in RMS, unless invited by the ARC.
- 10.5.3 Applicants should note that Administering Organisations may have internal closing times for each submission round which precede ARC closing times.

10.6 Certification in RMS

- 10.6.1 The Administering Organisation must certify Proposals online in RMS. Research Offices should ensure that the Research Office delegate role is authorised in RMS to certify and submit Proposals for their organisation.
- 10.6.2 The Administering Organisation must obtain the agreement of all parties necessary to allow the proposed project to proceed using the form available on the ARC website Super Science Fellowships Certification Form. This signed certification must be attested to by hand-written signatures and certifications from all relevant persons involved in the Proposal. This form does not need to be submitted via RMS with the Proposal but must be provided to the ARC if requested. If the Administering Organisation fails to provide this material upon request, the ARC may in its absolute discretion decide to not recommend the Proposal for approval.
- 10.6.3 Proposal must be submitted through the appropriate Research Office. If a Proposal has not been submitted through the appropriate Research Office/Chief Executive Officer for certification, the Proposal will be recommended not to be approved for funding

11. Selection and approval process

11.1 Assessment and selection procedure

- 11.1.1 There are a limited number of Super Science Fellowships available for funding. The recommending of fellowships is at the discretion of the ARC,

having regard to the criteria in subsection 4.3.1 and the matters at subsections 4.2.3 and 4.2.4.

- 11.1.2 Assessment of Proposals is undertaken by the ARC, which has the right to make recommendations solely on the basis of its expertise, and which may:
- a. consider if a Proposal satisfies the eligibility criteria set out in these Funding Rules;
 - b. identify and consider any other matters that these Funding Rules state may result in the ARC recommending that a Proposal not be approved for funding;
 - c. assign assessors to review Proposals;
 - d. rank each Proposal relative to the others on the basis of the Proposal and any assessors' reports;
 - e. assess and recommend funding to be made available for a Proposal; and/or
 - f. prepare funding recommendations.
- 11.1.3 The ARC Selection Advisory Committees may assist with the assessment of Proposals. The ARC has procedures for managing organisational and personal Conflicts of Interest experienced by members of the Selection Advisory Committees, other ARC committees, other assessors and ARC staff. The ARC also has procedures for enabling individuals to withdraw from the assessment process for particular Proposals where an actual or perceived conflict may exist.
- 11.1.4 In addition to assessment by the ARC, a Proposal may, at the ARC's absolute discretion, be assessed by external assessors. Assessors may be drawn from a range of organisations to reduce the potential for conflicts of interest. Proposals will be assessed against the criteria set out in these Funding Rules and the reports by the assessors may include written comments.
- 11.1.5 The ARC reserves the right to make recommendations for funding to the Minister based on any number of assessments or solely on the assessment of the ARC.

11.2 Rejoinder

- 11.2.1 Rejoinder processes do not apply to Proposals submitted to the *Super Science Fellowships* scheme.

11.3 Recommendations and offer of funding

- 11.3.1 In accordance with the ARC Act,

the ARC's recommendations will be submitted to the Minister for consideration. The Minister will determine which Proposals will be approved and the amount and timing of financial assistance to be paid to Administering Organisations for approved Proposals.

- 11.3.2 Under the ARC Act, the Minister must not approve for funding any Proposal that fails to meet the eligibility criteria set out in these Funding Rules.
- 11.3.3 Administering Organisations whose Proposals are approved will be notified in a letter of offer that will indicate financial assistance to be offered and provided with a copy of a Funding Agreement for signing.

11.4 Exclusion of Proposals

- 11.4.1 The ARC will not recommend for funding, and the Minister will not approve for funding, any Proposal that fails to satisfy the eligibility criteria set out in these Funding Rules, including:
- a. if the Proposal seeks funding for projects of the type referred to in subsection 5.4 and the ARC considers no other part of the proposed project worthy of support;
 - b. if the Proposal is not submitted by an Eligible Organisation (Section 6.1);
 - c. if the ARC considers that a candidate nominated in the Proposal does not meet the eligibility criteria for a Chief Investigator as specified in Section 6.3;
 - d. if a Proposal has not been submitted through the appropriate Research Office/Chief Executive Officer for certification; or
- 11.4.2 The ARC may in its absolute discretion decide not to recommend for funding a Proposal if:
- a. in the opinion of the ARC, a Chief Investigator nominated in the Proposal has caused or has significantly contributed to the failure of an organisation to meet its obligations under any current or previous Funding Agreement with the ARC or all obligations regarding previously funded projects involving the candidate have not been fulfilled to the satisfaction of the ARC (subsection 6.3.6);
 - b. in the opinion of the ARC, any party involved in or associated with a Proposal or ARC-funded research project has failed to disclose to the ARC, or any of the other parties involved in the Proposal, any Conflict of Interest which has the potential to influence, or appear to influence, the research and activities, publications and media reports, or requests for funding related to the Proposal (subsection 4.4.2);
 - c. the limits on the number of Proposals submitted are exceeded (subsection 5.5.2);
 - d. in the opinion of the ARC, the Proposal duplicates or is likely to duplicate research already being funded, or which is likely to be funded, by the Commonwealth (subsection 8.2.1);
 - e. where required the Proposal does not include details of other funding or funding requests (subsection 8.1.1);
 - f. the ARC considers that incomplete, inaccurate or misleading material has been provided in relation to the Proposal or if the Administering Organisation and/or Chief Investigator(s) nominated in the Proposal has

provided the ARC with incomplete, inaccurate or misleading information in relation to the provision of advice relating to, or in the reporting of progress of, a funded project (subsection 8.2.1, Appendix A subsections A1.8.2 and A1.8.3);

- g. when requested, the Administering Organisation fails to provide the signed certifications and agreements of all parties necessary to allow the proposed project to proceed (Section 10.6);
- h. if the online part of the Proposal is not submitted via RMS by the closing time (Section 10.5);
- i. the Proposal fails to meet any format and other submission requirements (Section 10).

12. Appeals process

- 12.1.1 Appeals will be considered only against administrative process issues and not, for example, against committee recommendations or assessor ratings and comments.
- 12.1.2 Appeals must be made on the appeals form available at the ARC website. The form must be lodged by the Administering Organisation and must be authorised by a Deputy Vice-Chancellor (Research), Chief Executive Officer or equivalent. Appeals must be received by the ARC within 28 days of the date on the letter notifying the outcome of Proposals.
- 12.1.3 Appeals must be addressed and sent to the address advised under 'Contacts' at the beginning of these Funding Rules.

Other Matters

Fundamental principles and requirements

A1.1 Ethics and research practices

A1.1.1 The NHMRC website, <http://www.nhmrc.gov.au>, provides a series of publications that outline principles of ethical conduct in research. All Proposals and ARC-funded research projects must, unless otherwise approved by the ARC, conform to the principles outlined in the following and their successor documents:

- a. NHMRC/ARC/UA *Australian Code for the Responsible Conduct of Research (2007)*;
- b. as applicable, the NHMRC/ARC/AVCC *National Statement on Ethical Conduct in Human Research (2007)*; and
- c. as applicable, codes on animal research promulgated by the NHMRC.

A1.1.2 If there is any conflict between a successor document and its predecessor, then the successor document prevails to the extent of any inconsistency.

A1.2 Acknowledging ARC support

A1.2.1 The Funding Agreement requires that any ARC contribution to research and other activities funded by the ARC be appropriately acknowledged. When, at any time during or after completion of a project, the researcher or any other party publishes or produces material such as books, articles, newsletters or other literary or artistic works which relate to the research project, the Administering Organisation must ensure (wherever possible) that the ARC contribution and support of the project is acknowledged in a prominent place and in an appropriate form. This acknowledgement should include the mention of the ARC as a Commonwealth funding body. Similar efforts should be made to acknowledge ARC support when participating in television and radio programs, when interviewed by the print media and when otherwise speaking publicly about the project.

A1.2.2 Advice on acceptable forms of acknowledgement and use of the ARC logo is provided on the ARC website.

A1.3 Dissemination of research outputs

A1.3.1 The Commonwealth invests in research to support and improve the wellbeing of our society. To maximise the benefits from research, findings need to be disseminated as broadly as possible to allow access by other researchers and the wider community.

A1.3.2 The ARC acknowledges that researchers take into account a wide-range of factors in deciding on the best outlets for publications arising from their

research. Such considerations include the status and reputation of a journal or publisher, the peer review process of evaluating their research outputs, access by other stakeholders to their work, the likely impact of their work on users of research and the further dissemination and production of knowledge. Taking heed of these considerations, the ARC endeavours to ensure the widest possible dissemination of the research supported under its funding, in the most effective manner and at the earliest opportunity.

- A1.3.3 The ARC encourages researchers to consider the benefits of depositing their data and any publications arising from a research project in an appropriate subject and/or institutional repository. If a researcher is not intending to deposit the data from a project in a repository within six months of the completion of the research, he/she should include the reasons in the project's Final Report. Any research outputs that have been or will be deposited in appropriate repositories should be identified in the Final Report.

A1.4 Applicable law

- A1.4.1 The ARC is required to comply with the requirements of the *Privacy Act 1988* and the *Freedom of Information Act 1982*.

A1.5 Confidentiality

- A1.5.1 The ARC will treat information contained in a Proposal as confidential. The ARC may disclose information contained in a Proposal, or otherwise provided to the ARC, to the extent that the information is:
- a. disclosed by the ARC to its advisers (including external assessors), officers, employees or other third parties in order to assess, evaluate or verify the accuracy or completeness of a Proposal;
 - b. disclosed to ARC personnel to enable effective management or auditing of the Super Science Fellowships scheme or any Funding Agreement;
 - c. disclosed by the ARC to the Minister;
 - d. shared by the ARC within the Agency, or with another Commonwealth Department or Agency, where this serves the Commonwealth's legitimate interests;
 - e. authorised or required by law to be disclosed;
 - f. disclosed in accordance with any other provision of these Funding Rules or the Funding Agreement; or
 - g. in the public domain for a reason other than a breach by the ARC of any obligation of confidence.
- A1.5.2 Where information contained in a Proposal is made available to third parties for evaluation or assessment purposes the ARC will require the third parties to maintain the confidentiality of the material.
- A1.5.3 Notwithstanding the above, and in addition to the exemptions listed at Appendix A subsection A1.5.1, the ARC may publicise and report offers or awards of funding, including information about the proposed research; the

name of the Fellows and their organisations; the name of the Administering Organisation and any other parties involved in or associated with the project; the title and summary descriptions of the project and its intended outcomes (including the national/community benefits that are expected to arise from the research); and the level and nature of financial assistance from the ARC. Administering Organisations should ensure that information contained in the project title and summaries would not, if released, compromise their own requirements for confidentiality (such as future protection of intellectual property).

A1.6 Project description

A1.6.1 In making public information about a Proposal that has been approved for funding, the ARC may use a project description, including title and summary, which may differ from that provided in the Proposal.

A1.7 Intellectual property

A1.7.1 The ARC does not claim ownership of any intellectual property in a Proposal or which is created or developed from the conduct of a project funded under Super Science Fellowships scheme.

A1.7.2 However, all Proposals become the property of the ARC on submission. Administering Organisations submit their Proposals on the basis that the ARC may copy, modify and otherwise deal with information contained in a Proposal (and allow any external assessor or other third party to do the same) for any purpose related to:

- a. the evaluation and assessment of Proposals;
- b. verifying the accuracy, consistency and adequacy of information contained in a Proposal, or otherwise provided to the ARC;
- c. the preparation and management of any Funding Agreement; or
- d. the administration or management of the NCGP.

A1.7.3 If a Proposal contains information belonging to a third party, the Administering Organisation must ensure that it has in place all necessary consents to allow the ARC to deal with that information in accordance with these Funding Rules, prior to the Administering Organisation submitting its Proposal.

A1.7.4 Except with written approval from the ARC, all Proposals and ARC-funded research projects must comply with the *National Principles of Intellectual Property Management for Publicly Funded Research* (available on the ARC website) and accord with any intellectual property policies of the researcher's organisations.

A1.8 Incomplete or misleading information

A1.8.1 It is a serious offence to provide false or misleading information to the Commonwealth.

- A1.8.2 If the ARC considers that a Proposal is incomplete, inaccurate or contains false or misleading information, the ARC may in its absolute discretion decide to recommend that the Proposal not be approved for funding.
- A1.8.3 If an Administering Organisation and/or the researcher nominated in a Proposal as a fellowship candidate has provided the ARC with incomplete, inaccurate or misleading information in relation to any Proposal for, or in the provision of advice relating to, or reporting of progress of, a project funded by the Commonwealth, the ARC may in its absolute discretion decide to not recommend the Proposal for funding and/or terminate projects involving that organisation/person if funded and require the Administering Organisation to repay some or all of the funding.
- A1.8.4 If the ARC considers that omissions, or inclusion of misleading information, are intentional, or if there is evidence of misconduct, the ARC may refer the matter for investigation with a view to prosecution under Commonwealth criminal law. The Commonwealth is committed to protecting its revenue, expenditure and property from any attempt, by members of the public, contractors, sub-contractors, agents, intermediaries or its own employees, to gain financial or other benefits by deceit.
- A1.8.5 Examples of misleading information and misconduct are, but are not restricted to:
- a. providing fictitious track records;
 - b. making false claims in publications records (such as describing a paper as accepted for publication when it has only been submitted); or
 - c. failing to disclose to the ARC the existence, and nature, of actual or potential Conflicts of Interest of any of the parties involved in the Proposal/project (such as any affiliations or financial interest in any organisation that has a direct interest in the matter or outputs of the project).

A1.9 Insurance and liabilities

- A1.9.1 Administering Organisations are subject to the liability, indemnity and insurance provisions of the Funding Agreement.

Administration of funding

Administration of funding

B1.1 Funding Agreement

B1.1.1 All parties involved in a Proposal should familiarise themselves with the draft Funding Agreement, but only the Administering Organisation and the ARC will be parties to the Funding Agreement. Parties involved in a funded project must accept the terms of the Funding Agreement and the Administering Organisation must sign the Funding Agreement before the ARC will commence payments.

B1.1.2 Projects must commence as required by the Funding Agreement. Failure to do so may result in termination of the Funding Agreement.

B1.1.3 Administering Organisations should note that the Funding Agreement covers the post-award management, including reporting requirements and financial management. The draft Funding Agreement can be viewed on the ARC website.

B1.2 Varying the Funding Agreement

B1.2.1 Requests to vary the Funding Agreement must be forwarded in writing by the Administering Organisation's Research Office to the ARC. Forms are available on the ARC website. Amendment of any clauses of the Funding Agreement will be at the absolute discretion of the ARC.

B1.3 Varying the funding approval

B1.3.1 Requests to vary the funding approval must be forwarded in writing by the Administering Organisation's Research Office to the ARC.

B1.3.2 The funding approval may be varied in regard to the amount of financial assistance, the period of financial assistance, and/or the name of the organisation receiving financial assistance.

B1.3.3 The Minister may vary the funding approval if:

- a. any of the organisations involved in the project end, or substantially change, their involvement with the project;
- b. the research project changes so that it is no longer consistent with the description in the funding approval as previously approved or as otherwise varied;
- c. the desirable period of funding for a project is not consistent with the period in the funding approval as previously approved or as otherwise varied; or

- d. the ARC considers and recommends that the particular circumstances of the project warrant variation of the funding approval, providing such variation is reasonably justified upon the facts of the case and any variation or change to the project accords with the *Super Science Fellowships* scheme objectives.

B1.4 Reports

- B1.4.1 Administering Organisations are required to submit reports concerning funded projects to the ARC in the format and by the due dates detailed in the Funding Agreement.

Eligible Organisations

C1.1 Higher Education Organisations

New South Wales

Charles Sturt University
Macquarie University
Southern Cross University
The University of New England
The University of New South Wales
The University of Newcastle
The University of Sydney
University of Technology, Sydney
University of Western Sydney
University of Wollongong

Victoria

Deakin University
La Trobe University
Melbourne College of Divinity
Monash University
Royal Melbourne Institute of Technology (RMIT University)
Swinburne University of Technology
The University of Melbourne
University of Ballarat
Victoria University

Queensland

Bond University
Central Queensland University
Griffith University
James Cook University
Queensland University of Technology
The University of Queensland
University of Southern Queensland
University of the Sunshine Coast

Western Australia

Curtin University of Technology
Edith Cowan University
Murdoch University
The University of Notre Dame Australia
The University of Western Australia

South Australia

Flinders University
The University of Adelaide
University of South Australia

Tasmania

University of Tasmania

Northern Territory

Batchelor Institute of Indigenous Tertiary Education
Charles Darwin University

Australian Capital Territory

Australian Institute of Aboriginal and Torres Strait Islander Studies (AIATSIS)
The Australian National University
University of Canberra

Multi-State

Australian Catholic University

C1.2 Other Eligible Organisations

C1.2.1 Public research institutions may submit Proposals for *Super Science Fellowships* funding if, in the opinion of the ARC, the organisation provides an appropriate research training environment for the targeted disciplines and is predominantly funded by the Commonwealth or a State/Territory Government.

Examples of such organisations include, but are not limited to:

- a. Australian Antarctic Division (AAD);
- b. Australian Institute of Marine Science (AIMS);
- c. Anglo-Australian Observatory (AAO)
- d. Australian Nuclear Science and Technology Organisation (ANSTO);
- e. Commonwealth Scientific and Industrial Research Organisation (CSIRO);
- f. Defence Science and Technology Organisation (DSTO); and
- g. Geoscience Australia (GA).

Notional Super Science Fellowships salary

Notional* Super Science Fellowship salary for funding commencing in 2010 and 2011

* The figure in the table below is based on the 2010 level of funding and will be subject to variation (for example, due to annual indexation). Updated rates will be available on the ARC website.

Super Science Fellowship salary rates	Salary	On-costs 28%	Total 2010 \$
Super Science Fellowship (1.0 FTE)	\$72,500	\$20,300	\$92,800

National Research Priorities and associated Priority Goals

Research Priority 1: An Environmentally Sustainable Australia

Transforming the way we utilise our land, water, mineral and energy resources through a better understanding of human and environmental systems and the use of 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, for our agricultural and marine production systems and for communities; 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.

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 in the natural sciences, such as agriculture, natural resource management, climate change, horticulture, forestry, mining, energy, and marine sciences, as well as in the social sciences and humanities.

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

In particular, there needs to be an increased understanding of the contributions of human behaviour to environmental and climate change, and on appropriate adaptive responses and strategies.

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 seven areas of water utilisation, transforming resource-based industries, overcoming land degradation, developing cleaner, more efficient fuels and energy sources, managing biodiversity, deep earth resources and responding to climate change and variability.

Priority Goals

- **Water – a critical resource**

Sustainable ways of improving water productivity, 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, a highly variable climate, unique ecosystems, flora and fauna and a distinctive indigenous and settler history. Enhancing our understanding of the links between these factors and water availability will result in a better understanding of sustainable water management practices.

- **Transforming existing industries**

New technologies for resource-based industries to deliver substantial increases in national wealth while minimising 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 and national well being will depend on research and on the development and adoption of new technologies.

- **Overcoming soil loss, salinity and acidity**

Identifying causes and solutions to land degradation using a multidisciplinary approach 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, soil erosion and soil acidification in the Australian environment and illustrates Australia's leading edge in national mapping of critical resource data. Further multidisciplinary effort is required to develop sustainable land management practices that are appropriate for Australian conditions and mitigate major land degradation processes and increase biodiversity.

- **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. We are also well placed to develop alternative energy technologies and ecologically sustainable transport and power generation systems.

- **Sustainable use of Australia's biodiversity**

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

Australia has a unique and rich flora and fauna. Many of our complex ecosystems – on which our agricultural, fisheries and tourism industries depend - have adapted to events such as drought and fire, and have been shaped by indigenous and settler management practices. There is a need for a more comprehensive understanding of these natural systems and the interplay with human activities, and the effects of management and protection measures.

- **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) while minimising negative ecological and social impacts.

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.

- **Responding to climate change and variability**

Increasing our understanding of the impact of climate change and variability at the regional level across Australia, and addressing the consequences of these factors on the environment and on communities.

Australia already has a highly variable climate, and climate change can be expected to have further significant impacts. It is important to enhance our understanding of the consequences of climate change and variability at the regional level across Australia, and the implications for the environment and for communities. It is also important to explore beneficial adaptation strategies to climate change and variability to ensure ongoing social, economic and environmental well being.

Research Priority 2: Promoting and Maintaining Good Health

Promoting good health and well being for all 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.

Enabling individuals and families to make choices that lead to healthy, productive and fulfilling lives 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 addressing the causes 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. These could include interventions that reduce exposure to contamination of the physical environment (eg air pollution).

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 multidisciplinary 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 four areas of a healthy start to life, ageing well, ageing productively, preventive healthcare and strengthening Australia's social and economic fabric.

Priority Goals

- **A healthy start to life**

Counteracting the impact of genetic, social and environmental factors which predispose infants and children to ill health and reduce their well being and life potential.

Human health in the developing foetus and in early childhood is 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.

- **Ageing well, ageing productively**

Developing better social, medical and population health strategies to improve the mental and physical capacities of ageing people.

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 OECD nations, major shifts in cultural expectations and attitudes about ageing are necessary to respond constructively, at both an individual and population level. A healthy aged population will contribute actively to the life of the nation through participation in the labour market or through voluntary work.

- **Preventive healthcare**

New ethical, evidence-based strategies to promote health and prevent disease through the adoption of healthier lifestyles and diet, and the development of health-promoting products.

Preventive healthcare research will improve the prediction and prevention of disease and injury for all Australians 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 on prevention will emphasise interdisciplinary approaches, including research on ethics, drawing on contributions from the social sciences and humanities, as well as from the health and medical sciences. It will also focus on developing new health promoting foods and nutraceuticals.

- **Strengthening Australia's social and economic fabric**

Understanding and strengthening key elements of Australia's social and economic fabric to help families and individuals live healthy, productive, and fulfilling lives.

Living in today's society involves a complex web of choices, yet many of the traditional support structures are weaker than they have been in the past. Enabling people to make choices that lead to positive pathways to self reliance and supportive family structures is more important than ever. The interactions between the social safety net, social and economic participation, financial incentives and community and private sources of support are critical in helping people maximise their potential and achieve good, healthy, lifetime outcomes. In the decade ahead, it will be vital to understand and support the drivers for workforce participation and the broader social and economic trends influencing Australian families and communities. Research in this area will emphasise interdisciplinary approaches, drawing on contributions from the economic, behavioural and social 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.

Progress and wealth often derive 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 digital media to develop 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.

A better understanding of the conditions that are conducive to innovation will ensure that Australia's investment in research will maximise the benefits for Australia.

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 five areas of breakthrough science, frontier technologies, advanced materials, smart information use, and promoting an innovation culture and economy.

Priority Goals

- **Breakthrough science**

Better understanding of the fundamental processes that will advance knowledge and facilitate the development of technological innovations.

Breakthrough science underpins technological innovation across a range of industries critical to maintaining Australia's position as a developed country. Some examples include bio-, cultural- 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.

- **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.

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.

- **Advanced materials**

Advanced materials for applications in construction, communications, transport, agriculture and medicine.

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.

- **Smart information use**

Improved data management for existing and new business applications and creative applications for digital technologies.

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, multi-media, 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, and health and 'info-tainment'. The ability of organisations to operate virtually and collaborate across huge distances in Australia and internationally hinges on our capabilities in this area. The media and creative industries are among the fastest growing sectors of the new economy. Research is needed to exploit the huge potential in the digital media industry.

- **Promoting an innovation culture and economy**

Maximising Australia's creative and technological capability by understanding the factors conducive to innovation and its acceptance.

Understanding the factors that lead to highly creative and innovative ideas and concepts, and the conditions that lead to their introduction, transfer and uptake is critical for any nation that aspires to lead the world in breakthrough science, frontier technologies, and in other forms of innovation. Promoting an innovation culture and economy requires research with a focus on developing and fostering human talent, societal and cultural values favourable to creativity and innovation, and structures and processes for encouraging and managing innovation.

Research Priority 4: Safeguarding Australia

Safeguarding Australia from terrorism, crime, invasive diseases and pests, strengthening our understanding of Australia's place in the region and the world, and securing our infrastructure, particularly with respect to our digital systems.

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.

Enhancing our nation's understanding of social, political and cultural issues will help Australia to engage with our neighbours and the wider global community and to respond to emerging issues.

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 collaborative approaches and 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 five areas of critical infrastructure, understanding our region and the world, protecting Australia from invasive diseases and pests, protecting Australia from terrorism and crime, and transformational defence technologies.

Priority goals

- **Critical infrastructure**

Protecting Australia's critical infrastructure including our financial, energy, communications, 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.

- **Understanding our region and the world**

Enhancing Australia's capacity to interpret and engage with its regional and global environment through a greater understanding of languages, societies, politics and cultures.

Social, cultural and religious issues are of growing significance due to the insecurities of globalisation and the increasing role of non-state players in the security environment. Australia's capacity to interpret and engage with its regional and global environment will be substantially improved by enhancing its research base in apposite languages, societies and cultures. An approach that enhances Australia's capacity to interpret itself to the rest of the world is also needed.

- **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.

- **Protecting Australia from terrorism and crime**

By promoting a healthy and diverse research and development system that anticipates threats and supports core competencies in modern and rapid identification techniques.

This threat requires a more sophisticated response which should harness Australia's research capabilities, and which will focus on all phases of counter-terrorism; prevention, preparedness, detection, response and recovery. Crime takes a significant toll on Australian society and economy. 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.

- **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.