



Australian Government

**Department of Innovation
Industry, Science and Research**

Australian Space Research Program

Discussion Paper

June 2009

PURPOSE OF THIS PAPER

This Discussion Paper has been prepared by the Department of Innovation, Industry, Science and Research (the Department) to provide key details of the proposed operation of the *Australian Space Research Program*. Stakeholder feedback on this paper will be used to inform the design of the Program and its final guidelines.

The Program's operational arrangements, as proposed in this discussion paper, may change as a result of the consultation process. It should not be assumed that any implementation proposal included in this discussion paper will carry forward into the Program Guidelines. Further, it is possible that aspects of the Program Guidelines may not have been included in this Discussion paper.

STAKEHOLDER CONSULTATION

This Discussion Paper provides key details of the proposed implementation and operation of the Program and seeks suggestions to contribute to its final design. The Program will be delivered by the Department.

There are two ways for interested persons and organisations to present their views on the design of the Program:

- through attendance at a series of public consultations on the Program at key centres around Australia in late June 2009. Interested persons and organisations are encouraged to attend. Details of the consultations will be available at www.space.gov.au
- written comments in response to issues raised in this Discussion Paper or on any other aspects of the Program can be submitted via email to:

The Manager
Australian Space Research Program
space@innovation.gov.au

Comments on the design of the Program are due by **close of business 3 July 2009**.

Some indicative dates in the further development of the Program are:

Consultation based on this Discussion Paper with stakeholders on the design of the Program	End of June 2009
Program design finalised	July 2009
Program launched and call for applications	August 2009

BACKGROUND

On 12 May 2009, the Australian Government announced the *Australian Space Science Program* to coordinate Australia's national and international civil space activities, and to support space research, innovation and skills development in areas of national significance.

The *Australian Space Science Program* includes:

- \$8.6 million to establish a Space Policy Unit, which will provide whole-of-Government advice on space and industry development

- \$40 million for a new *Australian Space Research Program* (the Program) to support space research, innovation and skills development in areas of national significance.

The Program will provide \$40 million over four years through a competitive, merit-based grants program. It will support projects and education activities, and coordinate relevant Australian public and private research and development organisations—linking them with industry and international space agencies and organisations where appropriate.

The objective of the Program is to gain national and international recognition of Australia’s niche space capabilities through the support and development of space research, innovation and skills in areas of national significance.

The Program will provide competitive grants in two streams.

STREAM A - SPACE EDUCATION DEVELOPMENT GRANTS

Grants of up to \$1 million will support student space projects and educational activities, including international educational opportunities and the establishment of national space education programs and centres of expertise.

The intention of this stream is to provide grants to university-led consortia to build a significant program of student-led and/or student-focused space activity around Australia.

STREAM B - SPACE SCIENCE AND INNOVATION PROJECT GRANTS

Grants of up to \$5 million will be available to eligible consortia for collaborative space research and development projects that link to strategic national priorities and niche capability.

Examples of some of the types of activities which could be funded by these grants are outlined later in this paper.

Question 1. What should the minimum value of a grant be under Stream A?

Question 2. What should the minimum value of a grant be under Stream B?

HOW WILL THE PROGRAM BE ADMINISTERED?

The day to day administration of the Program will be undertaken by the Department, including the monitoring of the performance of participants against their funding agreements, confirmation of payments and reporting to Parliament on performance.

The Program’s operational framework will be defined in Program Guidelines and associated documentation such as the Application Form and Customer Information.

WHO WILL THE PROGRAM SUPPORT?

The Program can be accessed through two streams (A and B) as described previously in this paper:

- **Stream A - Space Education and Development** grants will be open to eligible consortia comprising at least one university and at least one other partner. The university must be the lead applicant.
- **Stream B – Space Science and Innovation Project** grants will be open to eligible consortia comprising at least one university or research institution and at least one industry partner (for the purposes of the Program an industry association is not considered to be a business).

For both streams, the number of additional partners is not limited. International collaboration will be encouraged. Overseas collaborators (universities, research institutions, commercial entities, space agencies) may be members of the consortium.

For Stream A, other partners may include Australian or international universities, tertiary or secondary schools, further education institutions, public sector education service providers (for the purposes of the Program, museums and CSIRO are public sector education service providers) or industry.

To be eligible to apply for a grant:

- an application must be from a consortium
 - (Stream A only) the lead applicant must be a university
- the lead applicant must be an Australian institution or company
- an applicant must demonstrate that it can fund the costs of the proposed project which are additional to the grant sought by the applicant
- an applicant must demonstrate that it has access to, or the beneficial use of, any intellectual property necessary to carry out the project
- an applicant must demonstrate that the project will comply with all relevant legislation
- (Stream A only) an application must be for a grant of up to \$1 million
- (Stream B only) an application must be for a grant of up to \$5 million.

Question 3. Are the proposed eligibility criteria appropriate?

Question 4. Are there any other eligibility issues that should be considered?

WHAT ACTIVITIES WILL BE SUPPORTED?

Stream A - Space Education Development Grants

Proposed eligible activities include:

- **Student education activities** – university-led activities aimed at improving the understanding, skills and qualification of students in space-related sciences and disciplines.
- **Linkage activities** - the development and delivery of activities which link Australian space education programs with industry and space-related agencies (both national and international).

Examples of the kinds of projects that might be supported under Stream A include:

- a program of student-led activities involving space technologies and systems. There could also be the potential to launch and operate such technologies and systems.
- Australian universities and other educational organisations could model their own centre of space capability on (or indeed collaborate with) international universities that have space expertise, such as the University of Toronto Space Flight Laboratory, or the University of Surrey – Surrey Satellite Technology.
- universities could develop undergraduate and graduate programs in space engineering.
- collaborations between universities and secondary or other education institutions to encourage student participation in space related activities

Applications for Stream A will be assessed according to the level of innovation, alignment with national priorities and education and skills development outcomes.

Question 5. What other kinds of projects could be funded under Stream A?

Stream B - Space Science And Innovation Project Grants

Proposed eligible activities include:

- **Research and development activities** - the systematic, investigative and experimental activities that involve innovation that will enable development of new products, processes and services with in a clear link to space related activities or a space application, this may also include some proof of concept activities
- **Demonstration and adaptation activities** - the steps necessary to demonstrate how new products, processes or services that have been proven in one context can be adapted into a new Australian context to support national research priorities and enhance niche capabilities
- **Implementation activities** - the systematic work necessary for installing and establishing tools, processes, systems, facilities and services to implement innovation to support Australia's national research priorities and enhance niche capabilities
- **Collaborative activities** - the development of collaborative activities linking Australian researchers with industry and space-related agencies (both national and international), with partnerships encouraged with international commercial operators.

Examples of the kinds of projects that might be supported under Stream B include:

- development of software and support systems for mapping, analysis, tracking or monitoring purposes from space-based information
- development of new applications software and satellite payloads (sensors) to gain an improved understanding of strategic issues, for example climate change
- development of small satellites to complement existing disaster management hardware and systems or for testing and demonstration purposes.

Applications for Stream B will be assessed according to the level of innovation, alignment with national priorities and degree of national and international collaboration.

It is proposed that skills transfer, technology diffusion and collaboration activities associated with the above activities, particularly where international partners are involved, would be treated as eligible expenditure under the Program.

For both streams, a project may also involve activities other than eligible activities. The applicant can pursue these other activities but will have to fund the full costs of pursuing them.

Question 6. What other kinds of projects could be funded under Stream B?

Question 7. What level of Program contribution would be appropriate, if any, to the establishment of facilities?

Question 8. What level of university/research organisation involvement would be reasonable under Stream B?

Definition of a Space Education and Development project

A space education and development project relates specifically to space related activities or space applications and covers:

- strengthening education in the fundamental space-related sciences and disciplines, such as physics, mathematics, engineering, earth sciences, material sciences and relevant life sciences, social sciences and space law
- providing opportunities for students to participate in Australia's space-related activities
- enhancing knowledge, training, and skills development to encourage and support participation in Australia's space-related workforce
- developing linkages between Australian and international space-related education and training programs.

It is proposed that projects for both space research and space education would include an interdisciplinary approach. Projects would be university-led.

Question 9. What else could be included in the definition of a space education development project? What should be excluded?

Definition of a Space Science and Innovation project

A space science and innovation project relates specifically to space related activities or space applications and covers:

- satellite-based services such as communications, position navigation and timing and earth observation
- space technology for sensors, instruments, satellites and vehicles
- space flights (for example launching and operating civil satellites)
- development of new technologies resulting from space-related endeavours
- development of linkages
- space related innovation projects.

Question 10. What else could be included in the definition of a space science and innovation project? What should be excluded?

Definitions of eligible activities

The terms R&D, education and innovation are fairly broad in nature and encompass a wide range of undertakings including, for instance, applied research, IP protection and management, product testing and development, experimental development or prototyping.

R&D activities are defined as systematic, investigative or experimental activities that involve innovation, technology transfer into Australia or technical risk and result in new knowledge or new or improved materials, products, devices, processes or services. R&D may also include some proof of concept activities.

Activities can be seen as innovative if they have an appreciable degree of novelty, such as:

- seeking previously undiscovered phenomena, structures or relationships
- attempting to apply existing knowledge or techniques in a new way or
- the results are expected to be patentable.

Similarly, activities involving technical risk may be expected to have reasonable uncertainty about:

- the results
- which of several alternatives is technically feasible or
- whether the outcome will meet a desired technical specification.

Education activities could be defined as student-led and/or student-focused activities involving, designing, building, testing and operating (and potentially launching) of space-related hardware or systems for investigation of space vehicle & platform technology, applications of space systems, space research, earth observation and space-based services including telecommunications, position navigation and timing. The features of the activities should include a well defined study or research program, addressing identified skills/needs/shortages, with the potential for students to:

- participate at a high level in the academic, business or wider space community
- foster ongoing collaboration and cooperation within Australia
- have ongoing links to international space-related organisations and agencies.

Innovation activities include:

- demonstration and adaptation. This covers the demonstration of new products, processes or services that have been proven in one context can be implemented to benefit the Australian space industry or research community
- implementation activities. This includes the systematic work necessary for installing and establishing tools, processes, systems and services to implement innovation in the Australian space industry or research community.

Question 11. Are there any additional activities that could be included or excluded under eligible activities?

WHAT MERIT CRITERIA WILL BE USED TO ASSESS APPLICATIONS?

The assessment of applications will take account of the innovative, technological, commercial and environmental merits of the application. It is proposed that applications for the Program will be assessed against four merit criteria.

Criterion 1: Capacity and capability

An applicant must demonstrate that it has the technical, financial and management capacity and capability to undertake the project within the proposed budget, timeframe and risk profile. This should include a discussion of the facilities and infrastructure available to the applicant and the capabilities of personnel involved.

In respect of this merit criterion, the following factors will be considered:

- is the applicant an appropriate entity to enter into the agreement for the conduct of the project and to receive Program funding
- the availability of sufficient resources (i.e. facilities, equipment and expertise) required to deliver the proposal
- the project budget is realistic and reasonable
- the financial resources and management capacity of the applicant (or consortium members if appropriate) to successfully complete the project
- any significant risks or issues to overcome and how the applicant intends to do this
- the spread of financial risk across the consortium members
- the governance structure overseeing consortium activity
- (Stream A only) the applicant's ability to deliver a quality education project to students.

An applicant must demonstrate the need for the funding. That is, will the grant funding induce new or additional innovation or activities relative to the situation where no grant funding was provided?

An application must detail the proposed budget for the proposed project, and specify the sources and amounts of funding for the project:

- to be provided by the applicant or other sources, including funding provided or sought from other Commonwealth, state or territory government programs
- sought from the Commonwealth as a grant under the Program.

For Stream B only, it is proposed that the Program will generally contribute one dollar of grant funding for every dollar (cash or in-kind equivalent) contributed by the applicant, although there may be scope to vary the ratio in some circumstances. As a non-exhaustive guide only, the Commonwealth may consider applications involving a different investment ratio according to:

- the risk profile of the proposed project or
- the strategic benefits of the proposed project for Australia's space research, niche capabilities and/or the broader Australian economy.

Question 12. What percentage of a total project should be funded by the Program (eg 75%, 50% or 25%)? Please provide some justification.

Criterion 2: Project merit

An applicant must demonstrate that the proposed project has high project merit. This should include a discussion of the technical aspects of the proposed activities and how the project would impact on Australia's space research innovation and skills development in areas of national significance.

In respect of this merit criterion, the following factors will be considered:

- the extent to which the proposed activities contribute to the Program goals for the relevant stream
- the contribution to the area(s) of national significance the project would target
- whether the proposed activities include activity that is new and different for the applicant in Australia
- the degree of innovation evident in the proposed activities
- the technical elements of the project are feasible and technical risks are appropriate
- the level of detail and evidence of claims made are commensurate with the size of the project
- the extent to which the proposed activities are world class in nature
- the level of technical risk associated with the proposed activities and the robustness of strategies to manage that risk
- (Stream A only) the education and skills development opportunities expected to be generated under the project and the number of students targeted
- (Stream A only) the potential to contribute to a national space education program or centre of expertise
- (Stream B only) the potential for commercial outcomes from the project.

Criterion 3: Partnerships and collaborations

An applicant must demonstrate that the proposed project builds collaborations and partnerships with, for example, public and private education, research and business operators in Australia's space sector. This should describe the scope and nature of the collaboration the applicant intends to establish to conduct the project and any opportunities for international linkages.

In respect of this merit criterion, the following factors will be considered:

- the partnership/consortium membership is appropriate to the project identified in the application and there is an appropriate balance of contributions from each partner/consortium member
- the quality of partners/consortium members – their educational, research or commercial capabilities and track record
- the involvement of partners/consortium members in the strategic planning process for the project

- how the existing and proposed partnerships and collaborations contribute to the applicant's business strategy
- the extent to which the applicant proposes to extend existing, or forge new partnerships and collaborations
- the extent that partnerships will result in the development of infrastructure and/or co-location of partners in Australia, the sharing of intellectual property and/or royalties and the sharing and/or transfer of skills and technology in Australia
- the potential for ongoing international linkages
- the nature of the university-industry linkage (for tertiary level projects)
- the potential for students to participate in space research or the commercial space sector
- (Stream A only) the nature and extent of linkages with other education institutions
- (Stream B only) the nature of the researcher-industry linkage
- (Stream B only) the number, value and form of existing R&D partnerships and collaborations (including contractual arrangements and joint venture partnerships)
- (Stream B only) the nature and scope of skills development and transfer between partners/consortium members.

Consideration will be given to whether each applicant has established, or proposes to establish, an appropriate range of partnerships and collaborations between themselves and educational or research institutions, local or international space sector companies and agencies, and the nature of those partnerships and collaborations.

The application assessment will consider the extent to which the applicant's existing and proposed partnerships and collaborations contribute to the applicant's project strategy, and benefit the Australian space sector overall. This could be through the transfer of skills and technology; the development of infrastructure and/or co-location of partners; and the generation and sharing of intellectual property and/or royalties.

In relation to partnerships and collaborations that are proposed or still to be finalised, applicants must provide evidence of the intended partnership or collaboration. This may include letters of intent, draft agreements or memoranda of understanding from potential partners or collaborators describing the nature, timing and scope of the arrangements.

Criterion 4: National benefits

An applicant must demonstrate the proposed activities have strong potential to generate benefits for the wider Australian industry and community. This should include a discussion of the anticipated improvements in Australian education and skills, research capability and opportunities for commercial applications arising from the project.

Merit may be established in a proposal by clearly demonstrating the potential national benefits from the project to the beneficiaries and in particular to Australian industry, research capability, educational opportunities and the broader community. National benefit from the project may be demonstrated in terms of:

- the improvements in national skills, productivity and economic growth
- increased collaboration between Australian businesses and/or research institutions
- diffusion of knowledge, skills and know-how to other parts of the Australian economy
- enhanced international cooperation
- potential 'flow-on' economic or industry benefits
- generation of social, community and/or environmental benefits

- the international or strategic relevance of the project, including relevance to the national research priorities
- (Stream A only) the nature of the university-industry linkage (for tertiary level projects)
- (Stream B only) a quantitative analysis of the economic potential of the national benefits.

As part of the assessment, the level of benefit to the Australian economy from the proposed activities proposed by each applicant will be considered, including the contribution to the development of Australia's space industry and research capabilities.

Question 13. Are the proposed merit criteria appropriate?

Question 14. Are there any other issues that could be considered?

TYPICAL INFORMATION TO BE FURNISHED BY GRANT APPLICANTS

Application forms will be tailored to the particular stream. The following information is indicative of what might be sought in a typical application:

- the applicant's name, corporate information (eg address, ABN, ownership), financial status, role in the project, and capabilities relevant to the project
- information about other key parties involved in the project, including their role, contribution, capabilities, and how they will benefit
- a detailed description of the project, including the innovations and eligible activities occurring in the context of the project and the locations of where such innovations and activities will occur
- the benefits of the project, including on the skills, employment, competitiveness and sustainability of Australia's space-related industries and research organisations
- business (including; R&D, IP management and commercialisation plans) and financial plans pertaining to the project, including: detailed costs; cash flow; timelines and milestones; sources and amounts of project investment to be provided by the applicant and other parties; the approval status of the project within the applicant's firm or project group; how, where and when the innovation(s) may be commercialised in the context of the project; a project risk assessment (including technological risks and, any related dependencies and assumptions)
- the amount of Program assistance sought, the reason that assistance is required, a proposed grant milestone payment schedule, and the implications for the project if the assistance is not forthcoming
- information on other forms of assistance provided by, or sought from, Commonwealth, state or territory governments relevant to the applicant and the project
- the implications, if any, of the project on Australia's international obligations including compliance with international treaties on the uses of space.

GRANT DURATION

It is proposed that grant projects will be limited to a maximum of three years duration at the time of application. If successful, extensions of time of up to an additional six months may be considered if the need for the extension could not have been anticipated prior to the project commencing. All agreed projects must be completed within the current funding period which concludes in June 2013.

APPLICATION AND ASSESSMENT PROCESS

The Program will be administered by the Department. It is proposed that an independent assessment panel be established to assist the Department in assessing applications. It is expected that two rounds will be held each year for the two Program streams.

Eligibility of applications will be assessed by the Department and only eligible applications will proceed to be assessed. Ineligible applications will not be assessed and will automatically be rejected, with feedback offered to applicants.

All eligible applications will be assessed with the assistance of the Space Policy Unit (a Section of the Department) and external advisers as required. Advice to the Program Delegate (a Departmental officer appointed as the Minister's delegate) about the merit of applications assessed under the Program. The Program Delegate will make a decision on the success of applications.

The applicant must meet all costs associated with preparing applications and providing information to the Department.

Successful applicants will enter into a funding agreement with the Commonwealth, represented by the Department. The performance of grantees will be monitored the Department.

Question 15. What is the best time of year to hold funding rounds, taking into consideration school terms, exam periods, etc?

Question 16. What is the estimated minimum amount of time required to put together an application?

ELIGIBLE EXPENDITURE

It is proposed that expenditure under the following headings be eligible to attract grant funding if it is directly related to eligible project activities (R&D, proof of concept, innovation and research):

- **labour** - including salaries and labour on-costs for personnel directly employed on the core elements on the agreed project. Such expenditure will only be eligible to the extent that it relates to these activities. It will not include factory employees engaged solely in the installation or construction of plant or prototypes, or any personnel performing an administrative function within the organisation as these costs are covered separately below
- **project administration** - calculated as 35% of project salary costs plus on-costs to cover expenditure on office space hire, lighting, heating, administrative consumables, computing and communication facilities, stationery, accounting and bank charges, communication activities, travel, accommodation, and living expenses, meeting costs and any other costs associated with maintenance of the project consortium, including legal and financial advice relating to the project
- **contractor expenditure** - covering the cost of agreed activities to be performed by an organisation or individual other than the funding recipient. It may include consultancy fees for expert advice or payment of other contract staff working on the project.
- **international flights** - limited to 50% of an economy class airfare (per person)
- **international accommodation** - limited to 50% of the equivalent cost of a 4 star hotel (per person)
- **plant and equipment** – includes:
 - the cost of depreciation of newly constructed, purchased or pre-existing plant, equipment, tools or infrastructure used to pursue the agreed project
 - the cost of hiring or leasing plant, equipment, tools or infrastructure used to pursue the agreement project

- the cost of consumables used in the conduct of the project, other than administrative consumables
- **acquisition of new and leading-edge technologies (for adaptation in the agreed project)**
It is proposed that eligible expenditure on this activity include:
 - the purchase of technology
 - technology audit fees
 - network membership fees
 - expert advice fees
 - process or systems changes to take into account the new technology
 - information dissemination relating to technology acquisition that is part of the project
- **development of prototypes** - is eligible expenditure only where the construction and use of the prototype in the agreed project contributes directly to proving the technical concepts underpinning the project or where adaptation to the Australian context is required. Prototype expenditure includes the cost of materials used in testing a process or prototype.
- **IP protection** - applicants must ensure they have access to and sufficient rights in any IP necessary to carry out the project including any IP developed as part of the project. Reasonable costs associated with ensuring access to and sufficient rights in IP necessary to carry out and commercialise the project can be claimed as eligible expenditure where that expenditure was incurred on or after the project commencement date. The cost of defending IP rights is not eligible expenditure, with the exception of legal expenses insurance as it relates to IP. IP protection expenditure that can be claimed as eligible expenditure will be limited to the lesser of 10 % of total eligible expenditure or \$200,000.
- **collaborative project expenditure** - may involve for example, businesses, research organisations, industry associations or individuals. Eligible collaboration expenditure may include:
 - partnering/negotiation costs—such as brokering licensing or distribution agreements and establishment of consortia arrangements
 - expert advice fees—such as for alliance formation
 - travel costs—limited to accommodation and transport for purposes of collaboration and includes accommodation and transport for chain partners where identified
 - whole-of-chain quality management audits
 Costs associated with initiating and maintaining a collaborative partnership may also be claimed as eligible expenditure where the collaboration is likely to contribute to the successful completion of an agreed project and where the initiating costs are occurred on or after the project commencement date.

Other miscellaneous expenditure, if directly related to eligible project activities, may be eligible.

The Program will not provide retrospective funding—if a grant is offered, only the costs of project activities performed on or after the approved project start date attract grant funding.

To be eligible, the grantee must incur expenditure on or after the project commencement date, which cannot be before the date the Program Delegate accepts the application for assessment, and on or before the project completion date, with the exception of final audit costs which can be incurred within three months of the project completion date.

In addition, where proposed projects under the Program receive other Commonwealth or State Government assistance or funding, the value of that contribution will be deducted for the purposes of determining the value of a grant under the Program.

The following are not proposed to be eligible activities:

- the design and installation of financial management systems
- market research, market testing, market development or sales promotion (including customer surveys)
- routine quality control
- management studies or efficiency surveys
- routine collection of information (other than for the purpose of research and development)
- the protection of industrial property rights by legal action
- test and evaluation once a prototype becomes a production model
- staff selection systems.

Question 17. Are there any additional items that should be included or excluded under eligible expenditure?