NATIONAL SCIENCE FOUNDATION PROGRAMMES SUPPORTING UNITED STATES SCIENTISTS MAKE INTERNATIONAL LINKAGES

AN INFORMAL GUIDE FOR AUSTRALIAN SCIENTISTS

PURPOSE OF THE PAPER

Disclaimer: This paper is produced in the Embassy of Australia, Education and Science Office as a summary guide to major programmes of interest. It is not endorsed by the NSF. This paper complements an additional paper produced by the Education and Science Office of a guide for Australian Scientists on key U.S. Defence research agencies.

The seven National Science Foundation (NSF) programs identified in this paper are the most internationally focussed NSF programs and Australia is a nominated partner in two of the seven programs.

This paper provides an initial guide for Australian scientists hoping to collaborate with US partners and how US collaborators might access NSF programs and associated funding.

Australian scientists are ***not*** eligible for direct funding from these NSF programs, however to benefit from NSF funding they should:

- make their current or potential US partner investigators aware of these programs; and
- encourage the US partner investigator to include Australian research collaborations in their applications

Feedback on this paper is welcome.

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GENERAL INFORMATION: NATIONAL SCIENCE FOUNDATION

The National Science Foundation (NSF) is an 'independent (USA) Federal agency created by the National Science Foundation Act of 1950'. (National Science Foundation Guide-Introduction: NSF 14-1 February 2014). The Act proposed, amongst other areas, that the NSF was to promote scientific progress and is unique in that it is responsible for all aspects of science and engineering disciplines in addition to the supply of those responsible for research and education.

Funding is considered for science and engineering disciplines (including Biomedical Engineering) amongst colleges, universities, school, business and informal scientific organisations **based in the United States of America**. The Foundation supports cooperative research between universities and industry as well as US participation in international science and engineering research work.

The NSF is structured similarly to university faculty with grants-funding divisions/offices for the various science disciplines. The foundation uses a variety of management techniques to coordinate research and is supported by scientific and engineering advisors serving on formal advisory committees. It is through this system, coupled with NSF staff members who are experts in their field, that proposals are considered for award recommendations.

NSF details procedures for obtaining awards in the Proposal & Award Policies & Procedures Guide. The proposal and award process consists of two parts – Part I being proposal preparation and submission. Part II being guidance on managing and monitoring the award, grant administration and cooperative agreements with the Foundation. NSF enhanced the FastLane System in March 2013 which enables automated compliance checking for all required sections of full proposals and standardizes the proposal preparation requirements.

The following pages provide basic information regarding 7 international programs, with further information being available on the NSF website.

Useful websites are provided in the Appendix to this document.

IRES (International Research Experience for Students)

This programme supports international research for students who are US Citizens or permanent residents studying at an Undergraduate or Graduate level. Students are enrolled to study in science or engineering disciplines at a US based University or college, or associated with a non-profit, non-academic institution eg non-profit museum, observatory, and research laboratory. Emphasis is placed on the academic and international research broadening of the US students who are recruited in the US. Research is conducted at overseas sites that collaborate with a compliant US facility. Appropriate foreign research mentorship is required to ensure US students receive high-quality research experiences coupled with appropriate support in the foreign placement location. Reciprocal arrangements for foreign students can be made but these are not funded by NSF.

Eligibility is restricted to students who are US Citizens or permanent residents. Australian scientists may not apply directly for funding from the IRES program on behalf of the eligible US citizen student, however they should make their current or potential US partner investigators aware of the program and encourage them to include Australian research collaborations in their applications. Research projects funded through IRES must be of total 3 years duration and no fewer than three separate student cohorts in a foreign placement during each of the three years is required. Research projects may be of US summer length but it is recognised that these may vary dependent on the area of research.

The NSF IRES program has defined fields of study and further information can be located within the IRES information document under the title “Catalogue for Federal Domestic Assistance” (see Appendix for details).

Proposals for awards need to be completed by a US facility and submitted for Standard Grant or Continuing Grant. Proposals are submitted online by either the FastLane or Grants websites (see Appendix for details).

EAPSI (East Asia and Pacific Summer Institutes)

for US Graduate Students

With an expectation of future professional collaboration with foreign counterparts, the EAPSI program provides for US Graduate students in science, engineering and education to undertake first hand research; be introduced to science, science policy and scientific structure of the location; and orientation to the society, culture and language of a host country within East Asia and the Pacific region. Eligible students must be US Citizens or permanent residents and are required to be enrolled in Masters or PhD research oriented programs, or have completed the undergraduate component of a Bachelor/Master Degree program. Australian scientists may not apply directly for funding from the EAPSI program on behalf of the eligible US citizen student; however they should make their current or potential US partner investigators aware of the program and encourage them to include Australian research collaborations in their applications.

The NSF collaborates with selected foreign counterpart science and technology agencies, to sponsor specific international research institutes and awards grants to US Graduate students enabling study within Australia, China, Japan, Korea, New Zealand, Singapore or Taiwan. Study periods are between June and August each year with the typical Australian duration being eight weeks. Students apply individually to a Summer Institute and propose host locations, host scientist, research project applicable to the host site and duration of visit prior to submitting their application for an Award.

The Australian partner up to and including 2014 is Australian Academy of Science which is supported by the Federal Dept of Education.

The NSF EAPSI program has defined fields of study and further information can be located within the EAPSI information document under the title “Catalogue for Federal Domestic Assistance” (see Appendix for details).

Proposals for awards need to be completed by the respective Graduate Student once study criteria as above have been met. Proposals are submitted online by either the FastLane or Grants websites (see Appendix for details).

GROW (Graduate Research Opportunities Worldwide)

With the globalisation of research excellence, international research experience is an integral part of outstanding graduate education. GROW provides NSF Graduate Research Fellows with increased opportunity to further their professional development via research collaboration at top-calibre science and engineering research sites overseas. Opportunities have recently opened in Australia, Brazil, Chile, India, Ireland, The Netherlands and Switzerland in addition to Denmark, Finland, France, Japan, Korea, Norway, Singapore and Sweden.

Australian partnership with the program is Universities Australia and Australian universities associated with this group are eligible for collaborative research. The duration of research is between three and twelve months.

Eligibility for the GROW program is restricted to active awardees of the NSF GRFP (Graduate Research Fellowship Program) who are within five years of their Fellowship term. Prospective applicants must be enrolled at US institutions and be Masters or PhD seeking Fellows who have completed one year of their academic program. The NSF GRFP awardees must be US graduate students. Australian scientists may not apply directly for funding from the GROW program on behalf of the eligible active awardee of the NSF GRFP (Graduate Research Fellowship Program student; however they should make their current or potential US partner investigators aware of the program and encourage them to include Australian research collaborations in their applications.

The Graduate Research Opportunities Worldwide (GROW) – Australia Information sheet notes that 'support of A$2,500 per month for accommodation and basic living expenses is provided'. The Graduate Research Opportunities Worldwide (GROW) – Australia Information sheet also notes that 'all international students must have health insurance while in Australia. Health insurance can be provided by Overseas Student Health Cover (OSHC) which provides medical and hospital insurance'.

Specific information regarding the GROW program in Australia is available at the GROW Australia website (see Appendix for details).

Proposals are submitted via the (GRFP) FastLane module.

SAVI (Science Across Virtual Institutes)

SAVI is both an innovative and flexible means to improve interactions between US Scientists, Engineers and Educators with their international counterparts. Acknowledging international excellence in research and education of the STEM (science, technology, engineering, mathematics) fields, the virtual institutes provide opportunity for advancement in these areas to be accelerated by international collaboration. SAVI upholds the primary objective of bringing together leading STEM researchers/educators from different countries, both physically and virtually, to work on problems of common interest, building relationships initiated by NSF supported teams of researchers. Such international collaboration can have a significant impact on research and education which in turn may positively impact on economic growth, prosperity and well being.

SAVI is intended to be supplemental funding for maintenance of the synergy in an area of research – it is not primary funding - hence SAVI can be linked to research and education of existing NSF Awards or as part of a larger, new proposal to an NSF disciplinary program. Examples of cooperative activities with the program are:

- collaborative research and educational activities
- collaborative team meetings
- focussed workshops
- seminars
- college-level courses
- co-mentoring of students and postdocs

Eligibility for funding is open only to US participants – international partners can be supported by their own national or regional funding sources. Applications must be from teams of investigators who are working with an existing NSF centre/institute awardee. Participants of a virtual centre/institute who are recipients of individual awards in a common research/education field may also apply. For students participating in SAVI, generally the country sending the students pays for travel to and expenses in the receiving country. This is applicable for both US and foreign students. Australian scientists may not apply directly for funding from the SAVI program on behalf of the eligible US or foreign citizen scientists; however they should make their current or potential US partner investigators aware of the program and encourage them to include Australian research collaborations in their applications.

Proposers for the SAVI award can obtain information from the SAVI website (see Appendix).

CNIC (Catalyzing New International Collaborations)

The CNIC Program supports the NSF mission of collaboration between US and international researchers. This Program intends to accelerate and open new scientific directions between researchers of different international institutions enabling existing US researchers to enhance their career level and to assist future US researchers to obtain professional overseas experience early in their career. Professional development is encouraged for all researchers of the STEM (Science, Technology, Engineering, Mathematics) disciplines i.e. undergraduates, graduates and early-career postdoctoral researchers.

Funding, under CNIC, is only available for the initial phase of international collaboration with an expectation that future research is funded by other NSF Programs. Examples of areas covered by this Program include: research planning visits, initial data gathering activities, small workshops, proof of concepts and single or multiple visits supporting the research. It is anticipated such activities will last a maximum of 12 months. CNIC has a maximum budget of US $75,000.

Eligibility is for persons that are US based. Awards are granted by the Office of International and Integrative Activities (OIIA) via the International Science and Engineering (ISE) section. Australian scientists may not apply directly for funding from the CNIC program on behalf of the eligible US citizen researcher; however they should make their current or potential US partner investigators aware of the program and encourage them to include Australian research collaborations in their applications.

The NSF CFDA (Catalogue for Federal Domestic Assistance) website notes the areas of study available for consideration. (See Appendix for website information). It should be noted that emphasis is placed on new, previously unfunded scientific areas for the principal investigator.

Proposals are submitted online by either the FastLane or Grants websites (see Appendix for details).

RCN (Research Co-ordination Networks)

Continuing in the mode of fostering international partnerships and addressing interdisciplinary topics, the RCN Program has a goal to both advance and create new directions in particular fields of research or education though innovative networking. Support is provided by enabling groups of investigators to foster new collaborations, communicate and co-ordinate their research, develop community standards, and training and educational activities across disciplinary, organisational, geographic and international boundaries. The Program does not support existing networks, existing collaboration activities or primary research.

Proposed networking activities by program should have a theme eg broad research questions or particular technologies and/or approaches within the following Core Programs.

- Biological Sciences
- Geosciences
- Engineering
- Social Behavioural and Economic Sciences
- Offices of Cyberinfrastructure
- Polar Programs
- Education and Human Resources
- Mathematics and Physical Sciences
- Office of International Science and Engineering

An example question (per NSF RCN website) is:' how vulnerable are regional socio-economic systems to unpredictable natural events, altered hydrological regimes, and loss of biodiversity'. It is recommended that Proposers contact the appropriate NSF Program Directors to discuss suitability of proposed ideas prior to lodging applications. Further information can also be obtained from the CFDA (Catalogue of Federal Domestic Assistance) – see Appendix for website.

Eligibility is limited to universities and colleges (two and four year colleges) accredited in and with campuses in the United States of America. Non-profit, non-academic organisations eg independent museums, observatories and research laboratories located in the US are also eligible to submit proposals. Australian scientists may not apply directly for funding from the RCN program on behalf of the eligible US researchers; however they should make their current or potential US partner investigators aware of the program and encourage them to include Australian research collaborations in their applications.

Proposals are submitted online by either the FastLane or Grants websites (see Appendix for details).

PIRE (Partnerships for International Research and Education)

PIRE is an NSF wide program supporting international research activities across varying NSF supported disciplines to address critical science and engineering questions. The primary goal of the program is to support high quality projects where advances in research and education require high level international collaboration. To this end, the program encourages high-risk/high-award activities which may lead to potentially transformative ideas.

Eligibility for funding is limited to US academic institutions with PhD-granting programs that have been awarded doctoral degrees within the proceeding academic years. A further limitation requires that the institution has conducted research within areas supported by the NSF. Institution eligibility maybe confirmed on the NSF website. (See appendix for details). In addition, it should be noted that the maximum period of study is 5 years. Australian scientists may not apply directly for funding from the PIRE program on behalf of the eligible US students; however they should make their current or potential US partner investigators aware of the program and encourage them to include Australian research collaborations in their applications.

Many countries are specific PIRE partners with specific arrangements to match PIRE funding or share peer review and other processes. Foreign collaborators may need to consult their relevant country funding agencies to determine if a separate proposal requires submission to that particular agency and the requirements surrounding eligibility. Australia is not currently a formal PIRE partner; however US scientists are still able to nominate Australian collaborators in their PIRE applications, assuming the Australian scientist can commit to their matching funding.

Individual Australian scientists have successfully participated in collaboration with their US counterpart in two of the last three funding solicitations through the PIRE program. Further information can be obtained from the NSF website. Project titles are as follows:

2005: Australia and Norway in association with US

Developing international protocols for offshore sediments and their role in Geohazards: characterisation, assessment and mitigation (Field of Engineering/Chemical, Bioengineering, Environmental and Transport Systems)

2010: Australia, France, Germany, India, Italy, Netherlands and UK in association with US

An international Pulsar Timing Array for Gravitational Wave Detection (Field of Astronomical Sciences)

2010: Australia and New Zealand in association with US

Wildfire feedbacks and consequences of altered fire regimes in the face of climate and land-use change in Tasmania, New Zealand and Western US (Field of Earth Science/Behavioural and Cognitive Science/Environmental Biology/Human Resource Development/ Research on Learning in Formal and Informal Settings)

NSF does not usually pay for foreign researchers visiting the US but researcher exchange can be organised with reciprocal housing and living. This will operate on the principal that each side will support equivalent costs. Submission of preliminary proposals is required; a single organization may submit one preliminary proposal as the lead institution. Preliminary proposals must be submitted via the NSF FastLane system, even if full proposals will be submitted via Grants.gov. Full proposals are submitted by invitation only with the Proposal to be submitted via FastLane or Grants.gov

APPENDIX

General website

www.nsf.gov

General NSF Program information

www.nsf.gov/funding/browse_all_funding.jsp

Catalogue for Federal Domestic Assistance

https://www.cfda.gov/

General proposal information

www.nsf.gov/funding/pgm_list.jsp?org=NSF&ord+date

FastLane proposal information

www.nsf.gov/publications/pub_summ.jsp?ods_key=gpg

Grants proposal information

www.nsf.gov/publications/pub_summ.jsp?ods_key=grantsgovguide

GROW Australia

www.nsf.gov/od/iia/ise/grow-country-details-australia.jsp

SAVI website

www.nsf.gov/savi

RCN Website

www.nsf.gov/pubs/2013/nsf13520/nsf13520.html

PIRE eligible institutions

www.nsf.gov/od/oise/pire-2012-eligible-insts.xlsx

BIBLIOGRAPHY AND REFERENCES

National Science Foundation Guide-Introduction NSF 14-1 February 2014

NSF website (www.nsf.gov