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NTEU Submission

to the

Inquiry into Australia's international research collaborations

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NTEU Recommendations

NTEU's recommendations to the *Inquiry into Australia's international research collaborations* are as follows:

Recommendation 1 – As a component of its international research collaboration principles and strategies, the Federal government should consider the significance of contributing to economic and technological cooperation and development in the Asia-Pacific region.

Recommendation 2 – Australia's engagement in international education through research training is highly valuable. The Inquiry should investigate strategies that create opportunities to develop future collaborations with international research students.

Recommendation 3 – Research collaboration embodies research created by individual researchers, research teams and cross-institutional alliances. These activities are all part of existing international research collaborations. It is necessary to maintain flexibility in the current diversity of collaborative arrangements.

Recommendation 4 – The Committee recommends the establishment of a targeted fund to assist staff and higher degree research (HDR) students to meet the real costs associated with undertaking international research collaboration, especially in terms of travel and accommodation costs.

The National Tertiary Education Union (NTEU) represents approximately 26,000 staff employed in Australia's higher education industry. The Union has had a long-standing interest and engagement in international and transnational dimensions of higher education policy and welcomes the opportunity to make a submission to the Inquiry into Australia's international research collaborations and research engagement being conducted by the House Standing Committee on Industry, Science and Innovation.

The Australian higher education sector is in a period of responding to the Federal Government's higher education agenda outlined in *Transforming Australia's Higher Education System* and *Powering Ideas* as well as its expenditure commitments as outlined in the 2009-10 Budget Measures. In the context of the current inquiry, the significance of increased international research collaborations is explored in *Powering Ideas*.

Powering Ideas is committed to providing improved support for international research collaboration. As a national priority and one of six concrete policy ambitions, *Powering Ideas* contains strategies for increasing international collaboration as follows:

- Using ERA to benchmark university research in international contexts;
- Supporting dialogue between researchers, collaborative research projects, and joint research infrastructure;
- Actions to open Australian Research Council (ARC) awards and fellowships to international applicants;
- Increasing multilateral engagement.¹

According to the Department of Industry, Innovation, Science and Research (DIISR) Australia is a net importer of technology and produces only a small proportion of new knowledge in global terms (3%). Government's commitment to supporting international research collaboration is also underpinned by the growing tendency for groups of researchers to span one or more national jurisdictions as well as disciplines and institutions. This is especially prevalent for scientific research. In response, successive governments have promoted the importance of international collaboration and established specific programs to enable bilateral and multilateral engagement.

Australia's international innovation principles and strategies should not be formulated in narrow terms that simply emphasise potential economic returns. With the rapid evolution of open global innovation networks and increasing recognition that science, technology and innovation policies can no longer be limited to national agendas, the Federal government has an opportunity to improve on international best practice in relation to publicly-funded research collaboration strategies. NTEU contends that international research collaboration is an important means of enhancing economic and technological cooperation within the region. Locating national innovation and international collaboration strategies in the broader international context will develop Australia's capacity to take a leadership role in the development of collaboration strategies, especially in areas where Australia has a significant competitive advantage.

Recommendation 1 – As a component of its international research collaboration principles and strategies, the Federal government should consider the significance of contributing to economic and technological cooperation and development in the Asia-Pacific region.

¹ *Powering Ideas: An Innovation Agenda for the 21st Century*, Commonwealth of Australia, 2009, 8, 64.

Part A - Australia's international research activity

Australia's international collaborative research activity ranges from government-to-government bilateral and multilateral programs through to formally established inter-organisational arrangements and informal social networks maintained amongst individual researchers. For the purposes of this submission NTEU also recognises the importance of Australia's engagement in international education, particularly in terms of research training.

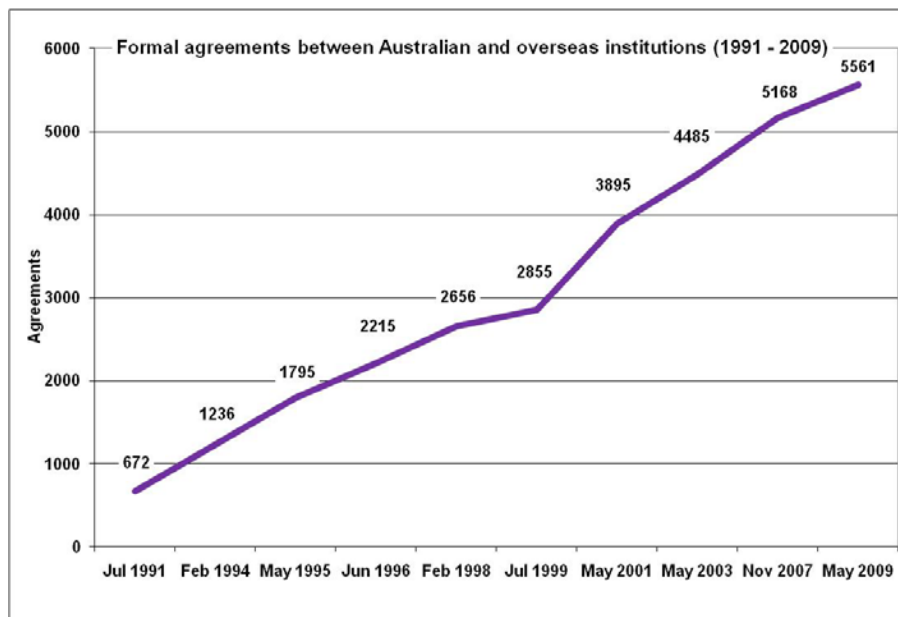
A recent Forum for European–Australian Science and Technology Cooperation (FEAST) discussion paper recognised that 'inter-personal relationships stimulate and mediate collaboration matters greatly' and that social capital built up over time 'is a key risk-reduction mechanism and will, therefore, naturally tend to drive international collaboration patterns'.² NTEU would emphasise that international research collaboration often occurs without direct Government intervention. Government intervention has an important but non-exclusive role in generating research collaboration.

An overview of significant Australian bilateral and multilateral engagements is provided in ATTACHMENT A. This highlights that multilateral research strategies rarely extend to the humanities and social sciences, where potentially collaborative research could advance shared strategic diplomatic and geopolitical goals.

Formal links between Australian universities and overseas institutions

The most comprehensive source of information on international research collaborations undertaken by Australian universities is published by Universities Australia (UA). From time to time UA publishes data on the number and nature of formal agreements Australian universities have with international institutions, the most recent was published in May 2009. Figure 1 illustrates the total number of formal agreements Australian universities had with international institutions over the period 1991 to 2009.

Figure 1



² Mark Matthews, Bev Biglia and Bruce Murphy, *A comparison of Australian and European Union research performance profiles*, FEAST Discussion Paper 2/09, 3.

Source. Universities Australia, *Offshore programs of Australian Universities, May 2009*

The types of formal agreements are those that cover one or more of the following types of arrangements:

- Academic / Research Collaborations,
- Student exchange programs,
- Study abroad programs, and/or
- Staff Exchange programs.

Figure 1 shows a steady and rapid growth in the total number of formal agreements, with the total number increasing more than sevenfold over the period rising from 672 in 1991 to 5561 in 2009.³ These agreements include: 1601 agreements with North-West Europe, 1267 with the Americas, 1218 with North-East Asia, 860 with South-East Asia, 263 with Southern and eastern Europe and 173 with Southern and Central Asia.

However, if one looks at disaggregated data (broken down by agreements containing various types of arrangements) as shown in Table 1 for the period 2001 to 2009, it is evident that the bulk of new formal agreements which Australian universities have entered into with international institutions since 2001 have been related to Study Abroad programs. NTEU believes that is worth exploring why the growth in formal agreements containing research collaboration and/or staff exchange programs has slowed so much in recent years.

Table 1

Nature of Agreements May 2001 to May 2009									
Year	Student Exchange		Study abroad		Staff exchange		Academic / Research Collaboration		Total
	No.	% Total	No.	% Total	No.	% Total	No.	% Total	
May 2001	2878	73.9%	615	15.8%	2777	71.3%	3089	79.3%	3895
May 2003	3229	72.0%	852	19.0%	2772	61.8%	3054	68.1%	4485
Nov 2007	3482	67.4%	1120	21.7%	2922	56.5%	3421	66.2%	5168
May 2009	3489	62.7%	1319	23.7%	2821	50.7%	3493	62.8%	5561
% Change	21.2%		114.5%		1.6%		13.1%		42.8%

Source. Universities Australia, *Offshore programs of Australian Universities, May 2009*

International Education

In terms of recognising the interpersonal relationships which stimulate and mediate international research collaborations, it is important to highlight Australia's role in the delivery of education services to international students. Australia is the third largest exporter of education services worldwide. International student places play a much larger role in Australia than any other OECD country. Australia also has a much larger educational engagement with Asia than any other nation with European heritage.

³ Universities Australia, *International Links of Australian Universities: Formal links between Australian universities and overseas institutions*, May 2009.

International student enrolments in higher education grew by 5% in 2008 to 182,770 due to strong growth in commencements (up 12% to 78,070). Higher education enrolments constituted 34% of all international student enrolments in 2008, down from 39% in 2007. Two source countries – China and India – made up more than 43% of all higher education enrolments in 2008.⁴ The next eight source countries contributed another 31% of enrolments. The five countries providing the largest growth in enrolments in 2008 were China, India, Vietnam, Nepal and Saudi Arabia, while the five countries showing the greatest fall in enrolments in 2008 were Bangladesh, Thailand, Japan, Indonesia and Hong Kong. International education activity contributed \$15.5 billion in export income to the Australian economy in 2008, up 23.4 per cent from the previous year.

Over the 10 years to 2008, education exports have grown at an average annual rate of 15 per cent, compared with an average annual rate of 6 per cent across all services exports. Of the total export income generated by education services in 2008, \$15.0 billion was from spending on fees and goods and services by onshore students, and a further \$505 million was from other offshore education services such as distance education student fees and education consultancy services. Education services remain Australia's largest services export industry.⁵ A Centre for International Economics report recognised that although the United States is the most important destination economy in the APEC region, Australia is relatively important in Southeast Asia. Australia has large inflows from China, as well as Malaysia and Singapore.⁶

Recommendation 2 – Australia's engagement in international education through research training is highly valuable. The Inquiry should investigate strategies that create opportunities to develop future collaborations with international research students.

Part B - An Assessment of Australia's International Research Collaborations

Publications

Co-authorship of research publications provides one direct measure of collaboration. Co-authorship may involve researchers in the same institution, in the same country, or in two or more countries. Based upon the share of research papers involving authors from more than one country, international research collaboration in Australia is growing strongly. In 2008, 43 per cent of all papers with an Australian author possessed an international co-author, which was 37 per cent higher than it was in 2001.⁷

⁴ Australian Education International (AEI), 'Export income from education services by the top 50 nationalities', *Research Snapshot No.45*, March 2009.

⁵ Australian Education International (AEI), 'International Student Enrolments in Higher Education in 2008', *Research Snapshot No.49*, May 2009.

⁶ Centre for International Economics, *APEC and international education*, January 2008, 16. See also Simon Marginson, *Australian Higher Education and the World: Has the Bradley Report got it right?*, NTEU Breakfast Forum 21 April 2009.

⁷ *International Science Engagement Fact Sheet* (29 May 2009), <http://www.innovation.gov.au/Section/AboutDIISR/FactSheets/Pages/InternationalScienceEngagementFactSheet.aspx>, Retrieved 1 June 2009.

A UK report led by Jonathan Adams in 2007 looked at citation data based upon the author's location and their subsequent citations by later publications.⁸ It noted that Australia's commitment to international links is evident with average growth in collaboration being 1.68 compared to 1.5 for the G7. This growth was substantial with a significantly greater volume of collaboration, for instance, than documented for India. A 2009 FEAST discussion paper also highlighted that the proportion of Australian publications in the Science Citation Index with international co-authorship had increased from almost 21% in 1991 to over 44% of total publications in 2005. The output of internationally collaborative papers is growing at almost double the rate of purely domestic papers.⁹

Patent Applications

According to the 2009 OECD Science, Technology and Industry Scoreboard, the co-invention of patents also represents a measure of the internationalisation of research, as it provides an indicator of formal R&D co-operation and knowledge exchange among inventors in different countries.¹⁰ For the OECD, international co-invention is measured as the number of patents by country (with at least one inventor located abroad) as a share of total domestic patents. According to this data Australia does not figure as competitively, with only 14.97% of patent applications having co-inventors located abroad between 2004 and 2006.

The assessment of international research collaboration through publications and patent applications reinforces the point that building innovation capacity relies upon the creation of network relationships. This includes macro-dimensions of government-to-government bilateral and multilateral relations that develop and support research programs and projects. This also captures micro-dimensions through inter-organisational arrangements such as R&D alliances and informal social relations among members of different organisations, institutions or research teams bound by discipline, field, location or research network.

The relevance of inter-organisational and social networks for research and the nature of knowledge creation is that it is rooted essentially in the work of academics and researchers. A key principle in supporting international research engagements must be an acknowledgement that knowledge production takes place both by the formal building of channels of communication as well as support for researchers embedded in more diffuse communities of practice.

Recommendation 3 – Research collaboration embodies research created by individual researchers, research teams and cross-institutional alliances. These activities are all part of existing international research collaborations. It is necessary to maintain flexibility in the current diversity of collaborative arrangements.

Part C - Impediments faced by Australian researchers

A 2005 International Association of Universities (IAU) report on the internationalisation of higher education institutions provides significant insight into the practices occurring across

⁸ John Adams, K. Gurney and S. Marshall, *Patterns of International Collaboration for the UK and Leading Partners (Summary Report)*. A report commissioned by the UK Office of Science and Innovation, Evidence Ltd, June 2007.

⁹ Dr Mark Matthews, Mrs Bev Biglia, Dr Kumara Henadeera, Mr Jean-François Desvignes-Hicks, Dr Rado Faletic, Mrs Olivia Wenzholz, *A Bibliometric Analysis of Australia's International Research Collaboration in Science and Technology: Analytical Methods and Initial Findings*, FEAST Discussion Paper 1/09.

¹⁰ *OECD Science, Technology and Industry Scoreboard 2009*, http://www.oecdilibrary.org/oecd/sites/sti_scoreboard-2009-en/04/01/index.html, Retrieved 18 January 2010.

the higher education sector internationally, and indicates what might be prioritised in terms of policies and strategies that would promote collaboration. The study noted a marked difference between the level of importance given to internationalisation by institutions (73%) in comparison to national government bodies (46%).¹¹ Importantly, the study also showed that international research collaborations represent one of five major common internationalisation policy strategies adopted by universities worldwide (Table 2). Of the other five most important strategies or policies it is interesting to note that in addition to institutional agreements, student and staff mobility were seen as critical elements to promoting overall international engagement.

Table 2 Common elements of internationalisation policy/strategy

Element of Internationalization Policy/Strategy	Ordinate ranking
International institutional agreements/networks	1
Outgoing mobility opportunities for students	2
International research collaboration	3
Outgoing mobility opportunities for faculty/staff	4
Visiting international scholars	5
International/intercultural dimension of curriculum	6
Area studies, foreign language, internationally focused courses	7
International development projects	8
Recruitment of fee-paying foreign students	9
Joint/Double/dual degrees	10
Recruitment of foreign faculty/researchers	11
International/inter-cultural extra-curricular activities	12
Recruitment of non-fee paying foreign students	13
Liaison with community based cultural and international groups	14
Distance education	15
Delivery of education programs abroad	16
Establishment of branch campuses abroad	17

Source. IAU Global Survey on Internationalization of Higher Education, 2005.

While the importance of formal government-to-government bilateral and multilateral agreements should not be discounted, these should not be prioritised to the exclusion of other important activities. Formal international collaboration agreements between countries tend to focus on particular national interests and prioritise selected areas of research.¹² While such agreements generally provide substantial financial incentives to engage in international collaboration, the allocation of these funds is generally based on a competitive bidding process where the merits of international projects and/or researchers is assessed according to criteria determined by government policy priorities and business collaboration.

Principles and strategies for improving international research collaboration should also seek to encourage individual researchers and research students to engage in blue-sky, curiosity-

¹¹ Key results: 2005 IAU Global Survey on Internationalization of Higher Education, International Association of Universities (IAU), 2005.

¹² See ATTACHMENT 1.

driven and risky research. The policy environment must provide incentives to enable distinctive, individual and differentiated collaborative arrangements.

With this in mind, principles and strategies for improving international research engagement should begin with domestic investment in developing research capacity. Simon Marginson has argued, 'In Australia, as in most countries that means government support. Any strategy to sustain comparative global advantage requires substantial public funding in order to attract, hold and service world leading researchers in sufficient number, over a long period'.¹³

Principles and strategies for supporting international research engagement must be underpinned by policies that generate and sustain research expertise in Australia, and which encourage the engagement of Australian 'innovation workers' in research. One of the major issues that will confront Australian universities in coming decades is how they will respond to the ageing of the academic and research workforce. The development of comprehensive workforce development strategies will be an essential first step in sustaining Australia's research capacity, a necessary prerequisite for international collaboration.

Minister Carr has shown a major commitment to increasing the number of government-level international research agreements and the NTEU is highly supportive of this approach. However, in order to ensure that Australian research collaborations maximise the full range of benefits that derive from this collaboration, NTEU would advocate policies that encourage:

- Institutional agreements that include research collaboration,
- Improved international mobility for researchers,
- Greater international mobility for higher degree research students

The data shows that there has been impressive growth in the number of international formal agreements between Australian universities and their international counterparts. It would also appear that the focus of many of these agreements in recent years has concentrated on student exchange programs, whereas the number of agreements that include research collaboration and/or staff exchange programs has not been as prominent.

While there is a clear financial incentive for universities to increase international student numbers, there is no such direct financial incentive to encourage international research collaborations. NTEU would therefore encourage Government to consider new policy initiatives that provide a dedicated source of funding for international research collaborations.

Australian academic and research staff always have and always will be engaged in international research collaboration. While advances in information and computer technologies over the last twenty years has no doubt facilitated the growth of individual researcher-to-researcher collaboration, the international mobility for Australian researchers to collaborate overseas and international researchers to collaborate in Australia should not be discounted.

Most academic and research staff at all Australian universities have the opportunity to apply for what has traditionally been referred to as a sabbatical but which goes by a variety of names such Outside Studies Programs (OSP) or Special Studies Programs (SSP). These programs are designed to enable staff to work outside of their own institution to enhance and develop their scholarly activities.

¹³ Simon Marginson, 'Nation-building universities in a global environment: The case of Australia,' *Higher Education*, 43: 2002: 426-7

Participation in an OSP/SSP is not an automatic right and all universities have rigorous application and vetting processes which includes taking into account the capacity of the university to be able to cover that staff member's teaching (and other) duties. At most universities OSP/SSP would normally require a staff member to have been employed for a minimum of three years and involve being away from their home institution for a minimum of two months and up to a maximum of six months. Many universities strongly encourage staff to take OSP/SSP at overseas institutions, quite often with the specific objective of strengthening international teaching and/or research links.

One of the issues that NTEU members cite as a major impediment to maximising the potential opportunities associated with OSP programs is the failure of university policies to fully fund the costs associated with undertaking a period of extended OSP overseas. Different universities provide varying levels of financial assistance to staff who take up OSP opportunities overseas. This ranges from flat payments for a six month overseas placement to compensation for airfares plus a weekly or monthly living allowance. OSP policies appear to be generally designed to subsidise some of the significant costs associated with a period of overseas placement. Therefore it is not surprising that most staff may experience considerable out-of-pocket expenses to participate in such programs.

In order to assist individual staff in maximising the opportunities afforded by OSP programs the NTEU would encourage Government to consider establishing a specific fund to assist staff engaged in international research to meet the costs of travelling and living overseas. While competitive research grants through internal grants bodies have been made available to international researchers, there is not sufficient support for universities to fully fund the costs incurred by the researcher. NTEU estimates that a sum of \$20m per annum distributed to universities on the basis of total staff numbers would be sufficient to ensure each university would be in a position to meet the real costs of staff on OSP.

The situation faced by staff in meeting the costs associated with international travel for international research collaboration is accentuated in the case of higher degree research students. Ensuring that more higher degree research students are encouraged to actively participate in international research collaborations would be facilitated by ensuring that students in receipt of an Australian Postgraduate Award (APA) have the capacity to access specific grants to help finance such activities. NTEU would advocate providing an additional payment of up to \$10,000 to assist funding a period of research with an international institution.

Recommendation 4 – The Committee recommends the establishment of a targeted fund to assist staff and higher degree research (HDR) students to meet the real costs associated with undertaking international research collaboration, especially in terms of travel and accommodation costs.

ATTACHMENT A

Science and technology collaboration through Australian federal programs

The Australian Government provides support for international research collaboration through dedicated programs such as the *International Science Linkages (ISL)* program and the *Australia-India Strategic Research Fund*, as well as through programs supported by the National Health and Medical Research Council (NHMRC), and through the provision of dedicated staff at Australia's overseas embassies in Brussels, New Delhi and Beijing. To make the most effective and strategic use of its resources for international research collaboration, the Australian Government has focused its efforts upon important bilateral relationships, including those with China, India and the European Union.

For instance, through the ISL program the Australian Government supported international scientific collaboration by funding over 600 projects which has enabled 3,000 Australian researchers to collaborate with leading researchers in 40 countries on diverse topics of strategic importance. The focus of ISL supported activities has been on targeted, strategic activities that can be implemented by the end of 2011. Previously there were 253 projects active totaling \$48.8 million. These projects include collaborative research projects, scientific workshops and symposia, missions, fellowships and access to international research facilities not available in Australia.¹⁴ Originally, funding for the program was to total \$94.5 million over the nine financial years 2002-03 to 2010-11. In the 2009-10 Budget, the Government announced a savings measure which cut ISL funding by \$2 million in 2009-10. It also signaled that there would be no competitive grants round in 2009. At that stage the ISL was scheduled to end in 2011.

From 2 September 2008 the Australian Government decided to also fund \$1 million through the International Science Linkages (ISL) program to support international research engagement for the humanities and social sciences for three years.¹⁵

The 2009 Federal Budget seeks to better support international research collaboration by opening Australian Research Council awards and fellowships to international applicants and by increasing multilateral engagement (for example the Square Kilometre Array radio-telescope project).¹⁶ International collaboration is also supported in terms of the commercialisation of Australian research; for instance, the adoption of the Research and Development Tax Credit which will provide a 40% tax credit to international firms with a turnover of \$20 million or more from 2010-11.¹⁷ The Federal government also is contributing \$3million over five years to the *Access to Major Research Facilities (AMRF)* program which is managed by the Australian Nuclear Science and Technology Organisation (ANSTO), and provides Australian researchers access to offshore research infrastructure in the fields of astronomy, neutron scattering and physics.¹⁸

Australia's major European science and technology linkages

Forum for European–Australian Science and Technology Cooperation (FEAST) is an organisation established by the Australian Government and the European Union to highlight, promote, and facilitate research collaboration between their respective communities. The FEAST Secretariat is hosted by ANU on behalf of the research community to increase the

¹⁴ *International Science Linkages (ISL) Fact Sheet* (29 May 2009), idem.

¹⁵ *\$1 million for Humanities and Social Science Collaboration*, DIISR Media Release, 3 September 2008.

¹⁶ *Powering Ideas*, idem. 8.

¹⁷ *Powering Ideas*, idem. 46.

¹⁸ *\$800,000 for continued access to leading-edge research facilities*, DIISR Media Release, 9 July 2009.

links between European and Australian researchers to better identify, promote, and demonstrate cooperation, to improve the process of providing information on Australian and European programs promoting cooperation between Europe and Australia, to exchange best practices and support cutting edge research and to provide opportunities for present state-of-the-art science and technology.¹⁹

The *Australia-Europe Research Collaboration Fund (Europe Fund)* provides a vehicle for the Australian Government to establish, reinforce and leverage strategic research links and relationships with the European Union, and with European countries as appropriate.²⁰ The Europe Fund enables the Australian Government to support: engagement by Australian researchers with the European Union Framework Programmes; bilateral activities with European countries; Australian participation in European research organisations; and other strategic activities involving the European Union and European countries that meet the objectives of the ISL program. Under the Europe Fund component, \$4 million has been allocated to support activities in the period 2008-9 to 2010-11. This includes:

- \$200,000 (managed by the Australian Academy of Science) to support Australian involvement in the International Research Staff Exchange Scheme (IRSES).
- \$300,000 (managed by National ICT Australia) to support collaboration with European partners, within FP7 projects, in the areas of trustworthy infrastructure and embedded systems.
- \$120,000 (managed by the Australia Academy of Science) to support Australian involvement with European Cooperation in Science and Technology (COST) Actions. COST is one of the longest-running European instruments supporting cooperation among scientists and researchers across Europe and internationally.

The Australian and French governments have also established the *French-Australian S&T Program (FAST)*.²¹ FAST is jointly managed by the DIISR and its French counterparts, the Ministry of Higher Education and Research (MESR) and the Ministry of Foreign and European Affairs (MAEE). The objective of FAST is to promote and support scientific and technological cooperation between Australian and French researchers in both public and private sectors.

Australia's major Asian science and technology linkages

There are three government level agreements on science and technology which are jointly managed by the Australian Department of Innovation, Industry, Science and Research and the Chinese Ministry of Science and Technology (MOST): the Treaty on Cooperation in Science and Technology (1980); MOU on Cooperation in Science and Technology (signed in 1989); MOU on Establishment of a Special Fund for Scientific and Technological Cooperation (signed in 2000, renewed 2005 and 2007). The last of these agreements governs the Australia-China Special Fund for Scientific and Technological Cooperation

¹⁹ *Forum for European-Australian Science and Technology Cooperation (FEAST)*, <http://www.feast.org/>, Retrieved 1 June 2009.

²⁰ *Australia Europe Research Collaboration Fund*, <https://grants.innovation.gov.au/ISL/Pages/Doc.aspx?name=AustraliaEuropeFund.htm>, Retrieved 1 June 2009.

²¹ *French-Australian S&T Program (FAST)*, <https://grants.innovation.gov.au/ISL/Pages/Doc.aspx?name=FranceFund.htm>, Retrieved 1 June 2009.

which provides support for collaborative research between Australian and Chinese scientists.²²

Through the *Australia-China Special Fund for Scientific and Technological Cooperation* the Governments of Australia and the People's Republic of China recognise the importance of strengthening links between the Australian and Chinese science sectors.²³ A Chinese version of the site has been developed by the Chinese Ministry of Science and Technology to assist the Chinese scientists involved in collaborations. Under the Fund the Australian and Chinese Governments co-fund participation in joint research projects. The Fund identifies priority areas for collaboration which are selected and reviewed periodically by the Australia-China Joint Science and Technology Commission (JSTC). Currently the priority areas are: advanced materials, agriculture, biotechnology, the environment, information and communications technology (ICT) and mining and energy.

The *Australia-India Strategic Research Fund (AISRF)* aims to facilitate and support Science and Technology research cooperation between Australia and India and was established as a component of the then Australian Scholarships package,²⁴ with funding of \$20 million over five years commencing in FY 2006/07. The fund assists Australian researchers to increase participation in leading-edge scientific research with Indian scientists, to raise the profile of Australian research, and to support the development of strategic alliances between Australian researchers and Indian researchers. AISRF attracts approximately 150 applications in each round, seeking funds in excess of \$100 million. Bilateral negotiations with the Indian Government for Round Three applications were successfully held on 3-4 March 2009.

University Mobility in Asia and the Pacific (UMAP) was founded in 1993 and is a voluntary association of government and non-government representatives of the higher education (university) sector in the Asia Pacific region.²⁵ UMAP aims to achieve enhanced international understanding through increased co-operation between universities, and especially through increased mobility of university students and staff. Australia is an eligible country that participates in this network. Also, the ARC *Asia Pacific Futures Research Network* provides stimulus for innovative research that makes links across disciplinary and area boundaries to enhance Australia's interactions with and knowledge of the Asia Pacific region.

²² *Science International*, <http://www.innovation.gov.au/ScienceAndResearch/Pages/ScienceInternational.aspx>, Retrieved 1 June 2009.

²³ *Australia-China Special Fund for S&T Cooperation (Australia-China Special Fund)*, <https://grants.innovation.gov.au/ISL/Pages/Doc.aspx?name=ChinaFund.htm>, Retrieved 1 June 2009

²⁴ *Australia-India Strategic Research Fund Overview*, <https://grants.innovation.gov.au/AISRF/Pages/Home.aspx>, Retrieved 1 June 2009.

²⁵ *University Mobility in Asia and Pacific*, <http://www.umap.org/2009/en/home/index.php>, Retrieved 1 June 2009.