



PRIME MINISTER

FOR MEDIA

14 DECEMBER 1992

JOINT STATEMENT WITH THE HON ROSS FREE, MINISTER ASSISTING
THE PRIME MINISTER

The third and final selection round for the Cooperative Research Centres Program was completed today, with the selection of a further seventeen Centres, the expansion of two CRCs established in 1991, and the establishment of a Research Data Network CRC (RDN-CRC).

The Prime Minister, Mr Keating, and the Minister Assisting the Prime Minister, Mr Free, said that the Centres announced today will make a substantial contribution to the international competitiveness of our industries and will provide strong support for the sustainable development of Australia's resources.

A list of the Centres announced today, together with the existing 34 CRCs is attached. Details of each new Centre are also attached.

The new Centres and the extensions to two existing CRCs will enhance Australia's R&D capabilities in a broad range of areas, including manufacturing technologies; information and communications technology; exploration, mining and energy generation; sustainable production and processing of agricultural products; environmental management; and vaccine technology.

All States and Territories, together with important regions such as North Queensland, are represented.

Total resources available to the new and extended Centres will amount to \$872 million over the initial contract period. The CRC Program will provide some \$254 million dollars. The remaining \$618 million will be contributed by business enterprises (\$170 million), universities (\$183 million), Commonwealth departments and agencies including CSIRO (\$178 million), State departments and agencies (\$85 million) and medical research institutes (\$1.7 million).

4901

The Government is pleased with the substantial involvement by all participants. In particular it is delighted at the further increase in industrial commitment to the program. Some 28% of participant funding is from business enterprises, up from 17% in Round 1 and 21% in Round 2.

The industry commitment is unique in the international context. Even the German Fraunhofer Institutes, often cited as the example of good industry/public sector collaboration in research and development, cannot match the Australian CRCs regarding the long term nature and relative size of industry's commitment.

As announced in the Government's recent White Paper on Science and Technology, "Developing Australian Ideas", a Research Data Network CRC is to be established. It will conduct research into telecommunications and computing technologies and services, and have access to experimental broadband facilities essential for the development of the next generation communications networks.

The Centre's research nodes are located in Brisbane, Canberra, Sydney, Melbourne, and Adelaide. The CRC for Broadband Telecommunications and Networking announced today is also expected to collaborate in these developments, thus adding a node in Perth to the network.

The Research Data Network CRC will also provide \$3.4 million for the immediate upgrade of the existing research data network, which links up researchers (including universities) throughout Australia.

This initiative will address one of the major needs for research infrastructure identified by the Australian Science and Technology Council in its report on national research facilities. The importance of the establishment of a high speed data network for innovative R&D in advanced systems engineering, computing software and telecommunications, for use by researchers, was recommended by an expert group to the Prime Minister's Science and Engineering Council earlier this year.

The Prime Minister and Mr Free thanked Professor Slatyer, Chair of the Cooperative Research Centres Committee, and all members of that Committee and the two Expert Panels for the competent and objective advice provided to them since the establishment of the Program.

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**Successful CRC Applications (in bold print) together with
the 34 established Cooperative Research Centres
(by six broad fields of research)**

Name of Cooperative Research Centre	Location of Core Participants	Attachment (a)
Manufacturing Technology		
CRC for Intelligent Manufacturing Systems and Technologies	VIC/NSW/SA	A
CRC for Alloy and Solidification Technology	VIC/QLD	B
CRC for Aerospace Structures	VIC/NSW	
Australian Maritime Engineering CRC	TAS/VIC/WA/NSW	
CRC for Materials Welding and Joining	NSW/SA	
CRC for Polymer Blends	VIC	
CRC for Molecular Engineering and Technology: Sensing and Diagnostic Technologies	NSW	
CRC for Industrial Plant Biopolymers	VIC/NSW	
Information and Communications Technology		
CRC for Broadband Telecommunications and Networking	WA/VIC/NSW	C
CRC for Advanced Computational Systems (ACSys)	ACT/NSW	D
Research Data Network CRC	QLD/ACT/NSW	E
CRC for Intelligent Decision Systems	VIC/SA	
CRC for Robust and Adaptive Systems	VIC	
CRC for Distributed Systems Technology	ACT/NSW/SA	
Australian Photonics CRC	QLD/SA/SA/VIC/NSW	
CRC for Sensor Signal and Information Processing	NSW/VIC/ACT	
	SA/VIC/QLD	
Mining and Energy		
CRC for New Technologies for Power Generation from Low-rank Coal	SA/VIC/NSW	F
Australian Petroleum CRC (Extension)	WA/VIC	G
CRC for Mining Technology and Equipment (Extension)	VIC/QLD	H
Australian Geodynamics CRC	WA/VIC/NSW/ACT	I
CRC for Mining Technology and Equipment	QLD	
G K Williams CRC for Extractive Metallurgy	VIC	
A J Parker CRC for Hydrometallurgy	WA	
Australian Petroleum CRC	VIC/NSW/SA	
CRC for Australian Mineral Exploration Technologies	NSW/WA	

(a) Details on each successful application are provided in the relevant attachment.

Name of Cooperative Research Centre	Location of Core Participants	Attachment (a)
Agriculture and Rural Based Manufacturing		
CRC for Premium Quality Wool	WA/VIC/NSW	J
CRC for the Cattle and Beef Industry (Meat Quality)	VIC/NSW/QLD	K
CRC for Aquaculture	TAS/SA/NSW NT/QLD	L
CRC for Sustainable Cotton Production	NSW/QLD/ACT	M
CRC for International Floriculture	VIC/NSW	N
CRC for Food Industry Innovation	NSW	O
CRC for Legumes in Mediterranean Agriculture	WA	
CRC for Plant Science	ACT	
CRC for Tropical Plant Pathology	QLD	
CRC for Tropical Pest Management	QLD/NSW	
CRC for Temperate Hardwood Forestry	TAS	
CRC for Hardwood Fibre and Paper Science	VIC	
CRC for Viticulture	SA/NSW/VIC	
Environment		
CRC for Ecologically Sustainable Development of the Great Barrier Reef	QLD	P
CRC for Freshwater Ecology	VIC/NSW/ACT	Q
CRC for Southern Hemisphere Meteorology	VIC	R
CRC for Tropical Rainforest Ecology and Management	QLD	S
CRC for Waste Management and Pollution Control	NSW/VIC/WA	
CRC for Soil and Land Management	SA	
CRC for Catchment Hydrology	VIC/ACT	
CRC for Biological Control of Vertebrate Pest Populations	ACT/WA	
CRC for the Antarctic and Southern Ocean Environment	TAS	
Medical Science and Technology		
CRC for Vaccine Technology	VIC/NSW/QLD	T
CRC for Tissue Growth and Repair	SA	
CRC for Cellular Growth Factors	VIC	
CRC for Biopharmaceutical Research	NSW	
CRC for Eye Research and Technology	VIC/NSW/QLD	
CRC for Cochlear Implant, Speech and Hearing Research	VIC/NSW/WA	
CRC for Cardiac Technology	NSW	

(a) Details on each successful application are provided in the relevant attachment.

Successful CRC Applications: Level of Funding and Length of Initial Contract Offered

Name of Cooperative Research Centre	Location of Core Participants	Funding in 2nd and subsequent years (a)	Length of initial offer	Attachment
CRC for Intelligent Manufacturing Systems and Technologies	VIC/NSW/SA	\$2,000,000 p.a.	7 years	A
CRC for Alloy and Solidification Technology	VIC/QLD	\$2,000,000 p.a.	7 years	B
CRC for Broadband Telecommunications and Networking	WA/VIC/NSW	\$1,800,000 p.a.	7 years	C
CRC for Advanced Computational Systems (ACSys)	ACT/NSW	\$2,000,000 p.a.	7 years	D
Research Data Network CRC	QLD/ACT/NSW/VIC/SA	(b)	5 years	E
CRC for New Technologies for Power Generation from Low-rank Coal	SA/VIC/NSW	\$2,000,000 p.a.	7 years	F
Australian Petroleum CRC (Extension)	WA/VIC	\$ 700,000 p.a.	5 years	G
CRC for Mining Technology and Equipment (Extension)	VIC/QLD	\$1,000,000 p.a.	5 years	H
Australian Geodynamics CRC	WA/VIC/NSW/ACT	\$2,400,000 p.a.	7 years	I
CRC for Premium Quality Wool	WA/VIC/NSW	\$2,000,000 p.a.	7 years	J
CRC for the Cattle and Beef Industry (Meat Quality)	VIC/NSW/QLD	\$2,800,000 p.a.	7 years	K
CRC for Aquaculture	NT/SA/NSW/QLD/TAS	\$2,200,000 p.a.	7 years	L
CRC for Sustainable Cotton Production	NSW/QLD/ACT	\$2,000,000 p.a.	7 years	M
CRC for International Floriculture	VIC/NSW	\$1,300,000 p.a.	7 years	N
CRC for Food Industry Innovation	NSW	\$1,700,000 p.a.	7 years	O
CRC for Ecologically Sustainable Development of the Great Barrier Reef	QLD	\$2,000,000 p.a.	7 years	P
CRC for Freshwater Ecology	VIC/NSW/ACT	\$2,000,000 p.a.	7 years	Q
CRC for Southern Hemisphere Meteorology	VIC	\$1,500,000 p.a.	7 years	R
CRC for Tropical Rainforest Ecology and Management	QLD	\$2,000,000 p.a.	7 years	S
CRC for Vaccine Technology	VIC/NSW/QLD	\$2,000,000 p.a.	7 years	T

(a) Funding in the first year will be approximately half the amount indicated in this column.

(b) A total of \$13 million will be made available over 5 years; funding details are provided in Attachment E.

List of Attachments

<u>Name of Cooperative Research Centre</u>	<u>Attachment</u>
CRC for Intelligent Manufacturing Systems and Technologies	A
CRC for Alloy and Solidification Technology	B
CRC for Broadband Telecommunications and Networking	C
CRC for Advanced Computational Systems (ACSys)	D
Research Data Network CRC	E
CRC for New Technologies for Power Generation from Low-rank Coal	F
Australian Petroleum CRC (Extension)	G
CRC for Mining Technology and Equipment (Extension)	H
Australian Geodynamics CRC	I
CRC for Premium Quality Wool	J
CRC for the Cattle and Beef Industry (Meat Quality)	K
CRC for Aquaculture	L
CRC for Sustainable Cotton Production	M
CRC for International Floriculture	N
CRC for Food Industry Innovation	O
CRC for Ecologically Sustainable Development of the Great Barrier Reef	P
CRC for Freshwater Ecology	Q
CRC for Southern Hemisphere Meteorology	R
CRC for Tropical Rainforest Ecology and Management	S
CRC for Vaccine Technology	T

CRC for Intelligent Manufacturing Systems and Technologies

Core Participants:

ANCA Pty Ltd; Farley Cutting Systems Australia Pty Ltd; Kirby Engineering Pty Ltd; Laser Lab Ltd; Moldflow Pty Ltd; Hoover (Australia) Pty Ltd; Sunbeam Corporation Ltd; Tyree Holdings (Technical Components Pty Ltd); Convex Computers; The Cadds Man Ltd; CSIRO, Division of Manufacturing Technology; RMIT; Swinburne University of Technology; University of NSW; University of Wollongong; Strategic Research Foundation.

Research Focus

The mission of the Centre is to research and develop manufacturing systems and technologies that will assist Australian industry in its pursuit of international competitiveness.

The Centre has three research programs: (i) Enterprise Integration; (ii) System Component Technologies; (iii) Shaping and Finishing and Engineering Components.

The focus of the enterprise integration program will be on the integration of manufacturing operations, human resources and information technology at all levels within Australian manufacturing organisations through developments in machine messaging protocols, concurrent engineering, design for manufacture and work cells. The System Component Technologies program seeks to achieve improvements in the productivity, design, flexibility of machine tools and systems utilising studies in simulation, control, sensors, networking and signal processing. The Shaping and Finishing program is aimed at the development of a new generation of precision fine finishing equipment together with support technologies such as rapid prototyping to achieve lower cost and higher quality manufactured products.

Area of Research Expertise

Manufacturing message protocols, enterprise integration architecture, concurrent engineering, design for manufacture, production simulation and control, sensors, networking, signal processing, cutting and polishing, numerical modelling, rapid prototyping.

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CRC for Alloy and Solidification Technology (CAST)

Core Participants:

The University of Queensland; CSIRO Division of Manufacturing Technology; Comalco Research Centre; Comalco Foundry Products; Australian Automotive Technology Centre; Australian Magnesium Research and Development Project.

Research Focus

CAST will develop technology for light alloy cast engineering components that will help provide a world competitive position for Australian manufacturing industry in this area.

The research of the Centre will primarily be concerned with four key areas: (i) solidification, casting integrity and performance; (ii) process technology for casting; (iii) tooling and prototyping technology; and (iv) alloy development. Within this research program, computer design tools will be developed to improve the design and performance of complex castings as well as continuously cast products, new and cheaper methods for tooling and prototyping will be developed to suit Australian production conditions, improved means for control of casting processes will be developed, new casting processes will be introduced to Australian manufacturers, and improved aluminium and magnesium alloys will be developed. Companies within the automotive sector and casting industry will be encouraged to participate in research projects to be conducted by the Centre. CAST will develop education and training programs to upgrade the technical and managerial skills available to Australian industry in this area.

Area of Research Expertise

Physical metallurgy of solidification, computer modelling of solidification, process technology for casting, tooling design, phase transformations in metals, alloy design.

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CRC in Broadband Telecommunications and Networking

Core Participants:

Australian Telecommunications Research Institute, Curtin University of Technology; QPSX Communications Ltd; ERG Electronics Ltd; Department of Computer Engineering, Edith Cowan University.

Research Focus

The CRC has the mission to provide research and development support that will assist the creation of an Australian design infrastructure in broadband telecommunications and networking. Besides pursuing generic research it will perform design in commercially leading technology of a range of technical solutions as basis for early technology development. It will also engage in continuing education and research training programmes with the aim of creating and maintaining a specialised skill base in telecommunications and network design.

For the immediate the CRC has the dual focus of broadband integrated services digital networks for customer premises and limited distance wireless communications, particularly applicable to confined spaces, notably underground mines. In relation to broadband networking the Centre is creating concepts and systems models, developing technology and studying performance issues. The near term aim is to develop a customer backbone network based on forthcoming public telecommunications network standards. In relation to wireless the aim is to develop appropriate transmitter, receiver and antenna systems and protocols.

Areas of Research Expertise

Networking Architectures, access protocols, protocol implementation, signal processing, transmission systems, system dimensioning analysis and control, network management, signalling and network control, electronic design, application specific chip design, communications software design.

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CRC for Advanced Computational Systems

Core Participants:

Centre for Information Science Research, Australian National University; CSIRO, Division of Information Technology; Computer Power Group Ltd; Digital Equipment Corporation Australia; Fujitsu Australia Ltd; Sun Microsystems Australia.

Research Focus

The Centre's mission is to establish an internationally competitive research capability in high-performance advanced computational systems for the benefit of Australian industry. The Centre will strengthen strategic alliances with industry, government and research organisations through focussed demonstrator systems in three initial areas: Visualisation of complex data, Hypermedia for large scale multi-media databases, and Command Support.

In the area of information services, powerful new hypermedia systems will be prototyped to provide high-speed analysis and navigation of large, multi-media information bases in areas such as parliamentary reporting, census data, newspapers, government reports and corporate and research information. The visualisation demonstrator project will prototype systems for use in the mining industry and for environmental management. Benefits will include faster and more effective processing of geophysical and environmental data, faster and more effective modelling tools, and more flexible and powerful interactive interpretation facilities. The command support demonstrator project will explore the analysis and presentation of information in an interactive terrain-based environment, together with support for decision-making through spatial reasoning, planning and scheduling.

Areas of Research Expertise

High performance parallel computing, advanced systems engineering, human-computer interaction and visualisation, information and knowledge management, algorithms and computation.

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Research Data Network CRC

The Research Data Network (RDN) CRC will conduct research and education programs in areas relating to communications network technologies, applications and services. It will also support network infrastructure development, including the upgrade of the Australian Academic and Research Network, AARNet.

The CRC will be established as a network of nodes, some of which are associated with other CRCs, with a Management Committee to foster cooperation between the different groups, to oversee the funding and reporting requirements of the CRC, and to manage access and connections to experimental broadband network capacity.

Participants

The participants in the research programs include: the CRC for Advanced Computational Systems; the CRC for Distributed Systems Technology; CSIRO Macquarie Joint Research Centre for Advanced Systems Engineering; the Department of Parliamentary Reporting Staff; the South Australian Centre for Parallel Computing; Microsoft Institute; Thinking Machines Corporation; Australian Supercomputing Technology; Softway; Film Australia; CSIRO Division of Information Technology; Fujitsu Australia; AOTC; Siemens; and the Australian Computing and Communications Institute (ACCI). (Not all participants are involved in every research program).

In addition, the Australian Vice Chancellors' Committee and AOTC are expected to participate in the Management Committee in connection with their role as network service providers.

Research Activities

There are four research programs:

The *Distributed Interactive Multimedia Information Services* program and the *Distributed High Performance Computing* program will be established as Demonstration Projects of the CRC for Advanced Computational Systems. The Multimedia program will focus on systems architecture, tools and techniques for interactive multimedia access and navigation. This is an area which is of major importance for future broadband networks. The High Performance Computing program will integrate the high performance computing resources of Australia through broadband connections (as seen in the embryonic national cooperative supercomputer facility), and the management of data on the distributed computer network.

The *Resource Discovery* program will be established as an additional program of the CRC for Distributed Systems Technology. The program aims to develop resource discovery prototypes that enable users to access the vast amounts of information scattered in repositories throughout Australia and the rest of the world.

The *Network Performance* program will involve research and development into the utilisation and performance of high speed telecommunications network technologies such as frame relay, DQDB and ATM. This will assist in the design of the future AARNet.

These four programs will enable an integrated approach to the solving of some important problems, as networks are faced with increasing demands in relation to capacity and services.

Network Infrastructure Development

Funding will be provided for an immediate upgrade of the existing research data network, AARNet, and to assist meeting the projected cost of providing upgraded services over the next few years.

Funding will also be provided to the RDN CRC to fund access to broadband facilities such as the proposed AOTC Experimental Broadband Network, at some 10 sites. This reflects the fact that each of the recommended proposals will investigate technologies and applications which will require access to broadband testbed facilities beyond those available at present. This will make a significant contribution to the development of the next generation of network applications and services.

Funding

The funding provided is as follows (all figures are five year totals):

Proposal	Funding recommended (5 year total)
Multimedia program	\$1.5 million
Distributed High Performance Computing program	\$1.5 million
Resource Discovery program	\$2.0 million
High Speed Network Applications program	\$1.6 million
Funding for AARNet development	\$3.4 million
Provision for broadband network access to CRC nodes	\$3.0 million
TOTAL	\$13.0 million

Contact

Multimedia, and Distributed High Performance
Computing programs

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Resource Discovery program

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Network Applications program

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AARNet

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CRC for New Technologies for Power Generation from Low-Rank Coal

Core Participants:

Monash University, Department of Chemical Engineering and Department of Chemistry;
University of Adelaide, Chemical Engineering Department; SECV, Research and
Development Department; ETSA, Environment and Technology Department; CSIRO,
Division of Mineral and Process Engineering; ICAL Ltd; Lurgi (Australia) Pty Ltd.;
Strategic Research Foundation.

Research Focus

The Centre has three research programs aimed at the development of the science and engineering required to underpin the development of new power generation technologies: (i) Process Design and Optimisation, (ii) Coal Beneficiation and Combustion, and (iii) Fluid Bed Processes.

Process Design and Optimisation studies will be conducted on the most prospective generation systems, with the objective of identifying optimal process and component integration for efficiency, environmental impact and cost-effectiveness. This will provide guidance and targets for the other programs and assist in the development of applications.

Coal Beneficiation and Combustion research will be undertaken to achieve high coal (and energy) loading in a slurry and minimum fouling and corrosion from combustion.

In the Fluid Bed program research will be undertaken on gasification, combustion and drying processes.

Areas of Expertise

The properties and characteristics of low-rank coals; ash formation; the chemistry and physics of coal processing particularly coal drying; slurry production; combustion and gasification; mathematical modelling, technology development and scale-up for conventional and fluid bed processes.

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Australian Petroleum CRC (Extension)

Core Participants:

CSIRO, Divisions of Geomechanics and Exploration Geoscience; Centre for Petroleum Engineering, University of New South Wales; National Centre for Petroleum Geology and Geophysics in Adelaide; Departments of Exploration Geophysics and Petroleum Geochemistry, Curtin University.

Research Focus

The Australian Petroleum CRC (APCRC) was one of the first CRCs to be created in July 1991. It focuses on research into major exploration and production issues which face Australia's upstream oil and gas industry through research programs concerning (i) techniques to predict oil and gas accumulation, including the timescale of basin evolution, and predictive fluid flow modelling; (ii) reservoir properties and characterisation, characterising heterogeneity in reservoirs, including quantification of geology; (iii) improved oil and gas recovery, including pore scale processes responsible for oil recovery in miscible and immiscible gas displacements, and stimulation of tight reservoirs; (iv) basin analysis, including tectonic and depositional history of sub-basins, and type reference sections based on detailed well studies; (v) coalbed methane, covering the targeting and evaluation of potential projects, stimulation and well completion technology, and reservoir simulation recognising description and multiphase flow mechanisms in coal; and (vi) drilling and wellbore engineering including stability of deviated and horizontal wellbores and formation damage.

The APCRC has had a very successful first year and has exceeded its targets. It has now been extended in response to the demand for a presence in Western Australia, which is the industry's greatest growth area, for seismic geophysics research and for an expansion of geochemistry research. Curtin University has joined the original APCRC and a new Petroleum Geophysics program has been created.

Areas of Research Expertise

Organic geochemistry and petrology, reservoir diagenesis, fluid flow modelling, petroleum geology and geophysics, rock mechanics, reservoir simulation, numerical modelling, multiphase pore space physics, wellbore engineering, evaluation and stimulation of tight reservoirs, seismic geophysics.

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CRC for Mining Technology and Equipment – Coal Extension

Core Participants:

Julius Kruttschnitt Mineral Research Centre; University of Queensland; CSIRO, Divisions of Geomechanics, Mineral and Processing Engineering, Manufacturing Technology, Coal and Energy Technology; Australian Mineral Industries Research Association Ltd.

Research Focus

The mission of the extended Centre is to expand the current work in mining and mineral processing and associated equipment development into the same areas in the coal industry. The Coal Extension will build on the successful work of the CRC for Mining Technology & Equipment (CTME) in the fundamental areas of fracture and rock characterisation. The CMTE already has a commitment of \$1 million per year for 5 years from BHP Australia Coal and the new Commonwealth support will significantly increase the amount of basic coal research of the CMTE.

The objectives of the Centre are to: (i) understand the geological and engineering properties of rocks and coal, which are important in mining and processing; (ii) develop mining and mineral and coal beneficiation processes and procedures to solve the technical problems which the Australian mineral industries will encounter during the next 15 years; (iii) identify and provide new and improved technologies for the equipment used in the mining process, including characterisation breakage, transport and processing of rock and coal leading to a mining equipment manufacturing industry in Australia; and (iv) train industry professionals and graduate students at advanced levels to handle the new technologies.

Area of Research Expertise

Fracture and damage mechanics, rock characterisation, continuum and discontinuum mechanics, fragmentation, mining software, comminution, selective liberation of ores, instrumentation, monitoring, mining equipment.

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Australian Geodynamics CRC

Core Participants:

CSIRO, Division of Geomechanics and Exploration Geoscience; Victorian Institute of Earth and Planetary Sciences (Department of Earth Sciences, Monash University; Department of Geology, La Trobe University; School of Earth Sciences, University of Melbourne); The Australian Geological Survey Organisation; Digital Equipment Corporation, Australia.

Research Focus

The Centre will focus on the structural and dynamic processes (the geodynamics) within the Earth's crust, particularly on the tectonic evolution of sedimentary basins and crystalline terrains within Australia. It will involve integration of continental-scale structural geology, geochronology, reflection seismology and 3D tomography as tools for determining the structural architecture of the crust, the timing of major tectonic events and the processes involved in the accumulation of 'world class' mineral end energy deposits. It will also involve the application of non-linear dynamics to geological processes and advanced computing systems for 3D visualisation and geological modelling. The outcome of this research will be a vastly enhanced capacity for Australia's exploration and mining companies to explore for orebodies and energy deposits. It will also aid in differentiating between areas of high and low economic potential as a basis for rational decision making in regard to multiple land use.

Area of Research Expertise

Structural geology, geochronology, seismology and 3D tomography, non-linear dynamics, computer visualisation and geology modelling.

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CRC for Premium Quality Wool

Core Participants:

Department of Animal Science, University of New England; CSIRO Divisions of Animal Production and Wool Technology; Western Australian Department of Agriculture; Department of Animal Science, University of Western Australia; School of Fibre Science and Technology, University of New South Wales; Wool Research and Development Corporation.

Research Focus

The goal of the CRC is to improve the quality and competitive position of Australian wool in the world textile fibre market. The programs are: (i) Genetic Technologies to Improve Wool and Fabric Quality; (ii) Reducing Wool Tenderness; (iii) Fibre Structure and Follicle Function; and (iv) Education.

The Wool and Fabric Quality program will develop genetic technologies which enable manipulation of important determinants of textile fibre quality, especially fibre diameter and at the same time maintain or enhance other economically important aspects of productivity. The Wool Tenderness program will develop new technologies that increase tensile strength of wool especially in mediterranean environments where there are dramatic seasonal variations in feed quality and quantity. The Fibre Structure and Follicle Function program is comprised of strategic research projects concerned with modifying follicle function by genetic engineering, with monitoring effects of fibre growth changes on the composition and structure of the fibre and with determining effects of variation in these traits on processing performance. Underpinning the three research programs is a highly innovative education and technology transfer program designed to meet the requirements of all sectors of the wool industry.

Area of Research Expertise

Genetic engineering, molecular and quantitative genetics, wool metrology, wool biology, wool processing, wool production, textile fibre science.

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4010

CRC for the Cattle and Beef Industry (Meat Quality)

Core Participants:

The University of New England-Armidale; CSIRO Divisions of Animal Production, Animal Health, Food Processing, and Tropical Animal Production; NSW Agriculture; Queensland Department of Primary Industries.

Research Focus

The CRC will develop research (and education) programs to address the major issues of meat quality that hold the key to the beef industry's future. The integrated research program has four objectives: (i) identify and resolve the key meat science issues that constrain Australia's ability to meet domestic and export market specifications for meat quality, at least cost; (ii) develop molecular and quantitative genetic technologies to breed cattle suited to new markets; (iii) design novel feeding and management strategies to meet meat quality objectives in Australia's difficult environments; and (iv) address and resolve major constraints to intensive beef production by eliminating health and welfare concerns and reducing environmental pollution.

The program will address both the northern and temperate beef industry sectors and the grass and grain fed production systems. The Centre will establish Australia's first Chair of Meat Science and will develop postgraduate, diploma and certificate education programs. The Centre will incorporate major research chiller and boner facilities in commercial abattoirs and large numbers of pedigree cattle for a multidisciplinary research program. The CRC will create a minimum of forty new positions for research and technical support staff.

Areas of Research Expertise

Meat science, molecular and quantitative genetics, growth and ruminant nutrition, muscle, fat and connective tissue biochemistry and receptor physiology, animal health and welfare including vaccine technology, stress physiology, animal behaviour, waste management, resource engineering for water, soil and air pollution abatement and ecosystem management, econometric modelling and major meat industry issues.

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CRC for Aquaculture

Core Participants:

University of Tasmania; CSIRO Division of Fisheries; Department of Primary Industry, Queensland; Department of Primary Industry, Fisheries and Energy, Tasmania; NSW Department of Fisheries; James Cook University; University of Technology, Sydney; Australian Institute of Marine Science; SALTAS, Tasmania; Department of Industry and Fisheries, Northern Territory; Darwin Pearl Shell Hatchery; Mossman Central Mill; University of Central Queensland; Northern Territory University; South Australian Research and Development Institute.

Research Focus

This Centre will provide the focus for a coordinated national research strategy for Australian aquaculture and the technological basis for a sustainable industry which is internationally competitive and environmentally acceptable.

The research will be carried out in five related programs: (i) *health protection and maintenance*, investigating the alternatives to chemically dependent disease control and a better understanding of the physiology of Australian aquaculture species; (ii) *nutrition and feed development*, examining the nutritional needs of each species and methods of meeting those requirements from existing and novel sources; (iii) *propagation and genetics*, developing techniques for the control of reproduction and improved product quality through genetic selection; (iv) *production efficiency and environmental management*, optimising stocking densities and obtaining a better understanding of the environmental impact of culture techniques; and (v) *product technology*, determining the aspects of nutrition, harvesting and handling which optimise the quality and marketability of the farmed product.

Area of Research Expertise

Nutrition, feed development, hatchery technology, genetics, reproduction, environmental management, vaccine development, immunology, fish physiology, disease diagnosis, health maintenance, food technology, growout technology.

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CRC for Sustainable Cotton Production

Core Participants:

CSIRO Divisions of Plant Industry, and Entomology; The University of New England, Department of Agronomy and Soil Science; The University of Sydney, School of Biological Sciences, Departments of Agricultural Chemistry, Soil Science, Microbiology and Agricultural Economics; Queensland Department of Primary Industries; NSW Agriculture; Cotton Research and Development Corporation.

Research Focus

The aim of the Centre is to develop and implement sustainable cropping systems for the Australian Cotton industry through four programs: (i) Resource protection; (ii) Crop protection; (iii) Product development; and (iv) Education.

The program protecting the resource base and environment aims to determine the fate of pesticides and develop strategies to minimise contamination of soil and water. Additional research to improve soil structure, soil fertility and water use efficiency will be done. The crop protection program aims to reduce dependence on chemical pesticides by utilising host plant resistance, biological control and biological pesticides. Ecological studies of insects, weeds and diseases will also aid in the derivation of alternative crop protection measures. The product development program will continue to improve yield and crop adaptability through traditional breeding along with an increasing emphasis on genetic engineering for disease and pest tolerance. Increased attention will be directed towards ensuring that the fibre quality of Australian cottons meet market demands. The education program aims to transfer new management strategies to growers through demonstration experiments on farm, through decision support packages and through new courses at University on crop management, particularly for accreditation of private crop consultants. All core partners will supervise post graduate students.

Areas of Research Expertise

Fate of chemical residues, clay soil structure and fertility, pest management, host plant resistance, *Heliothis* ecology, crop breeding, genetic engineering decision support packages.

Contact Person: Dr G A Constable

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CRC for International Floriculture

Core Participants:

Calgene Pacific Pty Ltd; Department of Genetics and Developmental Biology, Monash University; Department of Botany, University of Melbourne; David Syme Faculty of Business, Monash University; Victorian Department of Agriculture/Strategic Research Foundation; Horticulture R&D Corporation.

Research Focus

The objective of the Centre is to establish a world class, industry-led R&D facility for creating proprietary genetic engineering technology for the floriculture industry. This technology will be used to develop new and proprietary plant products possessing 'market driven' characteristics unattainable, or difficult to attain, by conventional breeding.

The research programs will focus on the genetic manipulation of traits that are known to affect consumer choice. These include colour, fragrance, form and post-harvest longevity. The Centre will also develop improved gene transfer methodology and technology for effective containment of the modified germplasm.

Market Research programs will ensure that currently fragmented market information is consolidated and extended to provide an accurate basis for the Centre's product development programs and allow formulation of strategic marketing plans for the industry.

A key aspect of the Centre's strategy will be the promotion of training programs to ensure that the Australian floriculture industry is able to fully exploit the commercial potential of the Centre's technology.

Areas of Research Expertise

Plant secondary metabolism, flower development, molecular genetics of pigment biosynthesis and senescence, pollination biology, post-harvest physiology, plant transformation, agribusiness/international marketing.

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CRC for Food Industry Innovation

Core Participants:

University of New South Wales, Departments of Food Science and Technology and Biotechnology and Schools of Biochemistry and Molecular Genetics and Microbiology and Immunology; CSIRO, Divisions of Food Processing and Human Nutrition; Arnott's; Burns Philp and Mauri Laboratories; and Goodman Fielder Wattie.

Research Focus

The major objective is to provide a coordinated research and educational base to generate improved and novel natural food ingredients, principally through the use of traditional food micro organisms. Natural ingredients which will be produced will improve food flavour and texture, provide substitutes for fats, give natural colours and will improve the quality and nutritional value of stored foods. Certain ingredients, when formulated into foods will have beneficial effects on health and well-being. Development of ingredients will involve a detailed understanding of the molecular and kinetic basis of ingredient production, improvement of productivity using both genetic and physiological procedures, bio process development at laboratory and pilot scale level, ingredient recovery, food formulation, nutrient evaluation and efficacy trials. This program will lead to export growth by Australian food industries, of both ingredients and value-added food products which contain the natural ingredients.

Areas of Research Expertise

Molecular genetics and genetic engineering of food grade micro organisms; cellular physiology and biochemistry, gut microbiology and microbial ecology; laboratory and pilot scale bioprocess engineering; ingredient recovery and purification; ingredient efficacy in food formulation and nutritional evaluation.

Contact Person: Professor G M Wilson

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CRC for Ecologically Sustainable Development of the Great Barrier Reef

Core Participants:

Association of Marine Park Tourism Operators, Australian Institute of Marine Science, Great Barrier Reef Marine Park Authority, James Cook University, Queensland Department of Primary Industries.

Research Focus

The CRC will work with industry and environmental managers to address strategic and tactical issues relating to the ecologically sustainable development and multiple use of the Great Barrier Reef region. The research programs will investigate the status of the Great Barrier Reef environment and its relationship to a wide range of regional and local, external and internal stresses. The CRC also aims to find positive solutions to environmental, social and engineering problems associated with the increasing use of the region by tourist operators and recreational fishermen and to develop models to predict the consequences of various development scenarios. The research outcomes will be transformed into practical improvements via the extension program which will also act as a two way interface with industry. The education program will ensure that the benefits of the collaborative research conducted by the CRC are spread through relevant professional communities.

Area of Research Expertise

Marine ecology, marine chemistry, engineering design, tourism and its socioecological context, hydrodynamic and numerical modelling.

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CRC for Freshwater Ecology

Core Participants:

University of Canberra; ACT Government; Albury-Wodonga Development Corporation; CSIRO Institute of Natural Resources; Melbourne Water; Murray Darling Basin Commission; NSW Fisheries.

Research Focus

The Centre aims to provide the ecological basis for sustainable management of Australian temperate region surface waters. There will be six major program areas within the Centre. These are Flowing Waters, Standing Waters and Eutrophication, Floodplain and Wetland Ecology, Water Quality and Ecological Assessment, Urban Stormwater Management and Fish Ecology and Management. Each program will have elements of short-term applied research and longer term more fundamental research.

The effective resolution of the many applied problems facing water managers in Australia demands a basic understanding of the major processes and organisms involved. Australian water bodies are fundamentally different from many better studied overseas systems. They differ in turbidity, salinity and variability of flow. Australian work is essential if we are to understand these systems and develop appropriate management guidelines.

Areas of Research Expertise

Freshwater ecology, computer modelling, statistics, environmental chemistry, water quality, fish biology, riparian vegetation, microbial ecology, analytical instrumentation.

Contact Person: Professor P Cullen

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 BRUCE ACT 2616
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CRC for Southern Hemisphere Meteorology

Core Participants:

Centre for Dynamical Meteorology, Monash University; Bureau of Meteorology Research Centre; CSIRO, Division of Atmospheric Research; Cray Research (Australia) Pty Ltd.

Research Focus

The Centre will create, for the first time in Australia, a major world-class university centre for meteorological research and graduate training. The Centre has three research programs: (i) Ozone; (ii) Global Transport Modelling; and (iii) Southern Hemisphere Climate Dynamics.

The Ozone program will investigate the mechanisms that control stratospheric ozone, especially in the Australian region; will develop and improved model for long-term (multi-year) ozone modelling and assessment of the impact of stratospheric pollution, and will investigate the effects of ozone depletion on climate change and vice-versa. The Global Transport Modelling program will use modelling and mathematical techniques to infer sources of important atmospheric constituents such as carbon dioxide and methane from observed concentrations, and will develop a new global atmospheric transport model to study global atmospheric pollution. The third research program involves investigation of Southern Hemisphere Climate Dynamics, and is aimed at the delineation of the fundamental mechanisms controlling the general circulation of the southern hemisphere atmosphere and its variability.

An important aspect of the Centre is the creation of a comprehensive graduate program in Meteorology at Monash University, which is possible only through the involvement of all the participants.

Areas of Research Expertise

Dynamical meteorology, atmospheric chemistry and physics, numerical weather and climate modelling, atmospheric general circulation, stratospheric dynamics, data analysis and inverse methods.

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CRC for Tropical Rainforest Ecology and Management

Core Participants:

James Cook University of North Queensland; The University of Queensland; Griffith University; CSIRO Tropical Forest Research Centre; Wet Tropics Management Authority.

Research Focus

The objective of this CRC is to establish a National Centre for Tropical Rainforest Ecology and Management. The Centre will focus on the elucidation of tropical rainforest biodiversity and enhance the world heritage values of Australia's wet tropics; study dynamic processes of rainforest ecosystems and disturbance in order to develop systems for sound and comprehensive management of rainforest heritage; conduct research necessary for rehabilitating degraded land and for ensuring ecologically sustainable uses of rainforest resources in commercial and recreational areas; train students in tropical forest ecology for future research and management; and communicate with rainforest resource managers and local communities.

Area of Research Expertise

Biodiversity, resource dynamics, forest rehabilitation and management, rainforest tourism, education, research support.

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 The University of Queensland
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CRC for Vaccine Technology

Core Participants:

Queensland Institute of Medical Research; CSIRO Division of Animal Health, Animal Production, and Tropical Animal Production; University of Melbourne, Department of Microbiology; The Water and Eliza Hall Institute of Medical Research; CSL Ltd; Biotech Australia Pty Ltd.

Research Focus

The Centre will bring together the Australian vaccine industry with basic and applied research organisations to develop generic technologies for the design and development of future vaccines; assist industry in the application of these strategies to specific medical and veterinary vaccines; and train the scientists and technologists required to strengthen Australia's vaccine industry.

Vaccines are among the most cost-effective measures to protect the health of man and animals. However, while antigens from a number of organisms for which vaccines are sought have been defined, it has proved difficult to induce protective immune responses using these antigens. Industry has defined specific problems which are impeding vaccine development, and to address these problems a strategic research plan containing three programs was developed. These programs are: (i) antigen processing; (ii) delivering and directing the immune response; and (iii) responsiveness and maintenance of the immune response. In these programs specific vaccines will be targeted in both the human and animal fields. However, the benefits of the strategic research plan will flow to many different vaccine programs.

Area of Research Expertise

Molecular and cellular immunology, peptide and protein chemistry, vector biology.

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