

# ***AINSE Annual Report 1998 - Section 2***

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# AINSE Council 1998

## Member Organisations and Representation

(2 Council Meetings held in 1998)

Organisation	Membership Commenced	Councillor	Meetings Attended
ANSTO	1958	Prof Helen Garnett	2
ANSTO, Environment		Prof Ann Henderson-Sellers from Sept'98	2
ANSTO, Materials		Dr Adam Jostsons	2
ANSTO, Engineering		Mr Ken Horlock	0
ANSTO, Physics		Dr Claudio Tuniz	2
ANSTO, Radiopharmaceuticals		Dr Stuart Carr	2
University of Queensland	1958	Prof Ken Collerson	0
University of New England	1958	Prof Rod Gerber to August'98 Prof Brian Stoddart from August'98	0
University of Sydney	1958	Prof Len Lindoy	1
University of New South Wales	1958	Prof Hans Coster	2
Australian National University	1958	Prof Trevor Ophel, President	2
University of Melbourne	1958	A/Prof Ron Cooper	2
University of Tasmania	1958	Prof Garth Paltridge	1
University of Adelaide	1958	A/Prof Gerald Laurence	2
University of Western Australia	1958	Prof Brian Stone	2
Monash University	1961	Dr Trevor Hicks	2
University of Newcastle	1965	Prof Ron MacDonald, Vice President	2
Flinders University of SA	1966	Prof Peter Teubner	2
La Trobe University	1966	Prof Andrew Gleadow	1
Macquarie University	1966	Prof Peter Bergquist	2
James Cook University	1970	Dr Chris Cuff to June'98 Prof Richard Keene from June'98	0
University of Wollongong	1975	Prof Peter Fisher to Sept'98 A/Prof Anatoly Rozenfeld from Sept'98	1
Griffith University	1975	A/Prof Evan Gray	2
Murdoch University	1985	A/Prof Kateryna Longley from Oct'98	1
University of Technology, Sydney	1988	Prof Evan Leitch	2
Royal Melbourne Institute of Technology	1988	Prof Dinesh Sood	2
Curtin University of Technology	1989	Prof Brian O'Connor	1
Central Queensland University	1991	A/Prof Michael Singh to Aug'98 Prof T Stokes from Nov'98	0
University of South Australia	1991	Prof Roger Smart	1
Swinburne University of Technology	1991	Dr Eddie Bakshi	0
Queensland University of Technology	1992	Dr Riaz Akber	2
University of Western Sydney	1993	Dr Robyn Crumby	2
Victoria University	1994	Prof Paul Clark	0
Southern Cross University	1994	A/Prof Bill Boyd	1
University of Auckland	1995	Prof Ralph Cooney	0
Charles Sturt University	1995	Prof Alistar Robertson	0
Northern Territory University (non-voting)	1995	A/Prof Charles Webb	0
Edith Cowan University	1996	Prof Pat Garnett	0
University of Canberra	1996	A/Prof Andrew Cheetham	2
University of Southern Queensland (non-voting)	1996	Prof Malcolm McKay	0
Deakin University	1997	Prof Pip Hamilton	0
University of Ballarat	1997	Dr Dennis Arne	0
Secretary to Council (non-voting)		Dr Dennis Mather, AINSE	2

### Invited to Council Meetings

ANSTO, International Facilities (non-voting) Dr John Boldeman 2

### Alternate Representatives

ANSTO	Dr John Harries	1
University of Auckland	Prof Philipa Black	1
University of Auckland	Dr Peter Roberts (GNS)	1
University of Ballarat	Dr Frank Bierlein	1
Central Queensland University	A/Prof Graham Pegg	2
La Trobe University	Dr Paul Pigram	1
University of New England	Dr Matthew Fewell	2
University of Queensland	A/Prof David Hill	1
University Of Sydney	Prof James Beattie	1
Victoria University	Dr Leo Cussen	2
Edith Cowan University	Dr Geoff Swan	1
Edith Cowan University	Dr Stephen Hinckley	1
Curtin University	Dr Arie van Riessen	1
University of South Australia	Dr Andrea Gerson	1
University of Tasmania	Dr Brian Yates	1

## Executive Committee

(4 Executive Meetings held in 1998)

Councillor	Office/Position	Organisation	Meetings Attended
Prof Trevor Ophel	President	Australian National University	4
Prof Ron MacDonald	Vice President	University of Newcastle	2
A/Prof Ron Cooper		University of Melbourne	4
Prof Helen Garnett		ANSTO	3
Dr Claudio Tuniz		ANSTO	3
Dr John Boldeman		ANSTO	4
Dr Roger Gammon to 31/3/98 Dr Dennis Mather from 1/4/98	Secretary to Committee	AINSE (non-voting)	1 3
<i>Alternate Representative</i> Prof Hans Coster (E1/98)		University of NSW	1

### Invited to attend Executive

Prof Peter Teubner (E2/98)	Flinders University	1
Prof Hans Coster (E4/98)	University of NSW	1
Mrs Irene Parker (E4/98)	AINSE	1

## AINSE Staff and Consultants

Executive Officer Retired 31 March 1998	Dr Roger Gammon BTech, PhD (Brunel), FinstP, Cphys, FAIE, MIEAust, CPEng, FAIM
Scientific Secretary from 1/3/98	Dr Dennis Mather BSc(Hons), PhD (UNSW), DipEd
Secretariat	Mrs Irene Parker Miss Nerissa Dawson Mrs Sandy O'Connor (part-time)
Publications Consultant	Dr Howard Pollard PhD (UNSW), MSc (WA), FAIP, FAAS, Cphys.
Conference Manager	Ms Margaret Lanigan, Conference Overload Pty Ltd

# Specialist Committees for 1998

The Scientific Secretary, AINSE, is an ex-officio (non-voting) member of all Committees

		Meetings Attended
<b>Accelerator Science Specialist Committee</b>		
Prof Trevor Ophel, Convenor	Australian National University	2
Prof Dinesh Sood	RMIT	2
Dr Rob Elliman	Australian National University	2
Dr Claudio Tuniz	Director, Physics Division, ANSTO (ex officio)	1
Dr David Cohen	Physics Division, ANSTO	1
Dr John Boldeman	Director, ASRP Facility, ANSTO	2
Dr Nick Dytlewski (a)	Physics Division, ANSTO	1
Dr Peter Evans (a)	Physics Division, ANSTO	1
<b>Accelerator Mass Spectrometry Specialist Committee</b>		
Prof Allan Chivas, Convenor	University of Wollongong	2
Prof Eric Colhoun	University of Newcastle	2
Prof Ken Collerson	University of Queensland	0
Dr Claudio Tuniz	Director, Physics Division, ANSTO (ex officio)	1
Dr Ewan Lawson	Physics Division, ANSTO	1
Dr Mike Barbetti (invited AMS 2/98)	University of Sydney	1
Dr David Fink (invited AMS 2/98)	Physics Division, ANSTO	1
<b>AMS Advisory Group</b>		
Prof John Dodson	University of Western Australia	
Prof Dan Potts	University of Sydney	
Dr Karl Heinz-Wyrwoll	University of Western Australia	
Dr Ian Davidson	University of New England	
Dr Bill Budd	University of Tasmania	
Dr Peter Nixon	University of Queensland	
Dr Mike Barbetti	University of Sydney	
Dr David Fink	Physics Division, ANSTO	
<b>Radiopharmaceuticals &amp; Neutron Irradiation Specialist Committee</b>		
Prof Leon Kane-Maguire, Convenor	University of Wollongong	2
Dr Roger Martin	University of Melbourne	2
Prof Ian McDougall	Australian National University	1
Prof Andrew Gleadow	La Trobe University	2
Mr Eric Hetherington	Radiopharmaceuticals, ANSTO (ex-officio)	2
Dr Andrew Katsifis	Radiopharmaceuticals, ANSTO	2
Mr Ken Suter	Financial Manager, ARI, ANSTO (representing the	1
Dr Stuart Carr	Director, ARI) (ex officio)	
	Director, Radiopharmaceuticals, ANSTO (ex-officio)	1
<b>Engineering, Materials &amp; Nuclear Technology Specialist Committee</b>		
Prof Roger Smart, Convenor	University of South Australia	2
Prof Brian Stone,	University of Western Australia	2
Prof Barry Muddle	Monash University	2
Dr Adam Jostsons	Director, Materials Division, ANSTO (ex officio)	2
Dr Geoff Durance	Materials Division, ANSTO	2
Mr George Malosh	Director, Nuclear Technology, ANSTO (ex officio)	1
Mr Ken Horlock	A/Director, Nuclear Technology, ANSTO (ex officio)	1
<b>ENG Advisory Group</b>		
Dr Dan Perera	ANSTO	

## Environmental Science Specialist Committee

A/Prof Gerald Laurence, Convenor	University of Adelaide	2
A/Prof David Smith	University of Melbourne	2
A/Prof Rod Buckney	University of Technology, Sydney	1
(alternate Dr Bill Maher)	University of Canberra	-
Dr John Harries	Acting Director, Environment, ANSTO (ex officio)	1
Prof Ann Henderson-Sellers	Director, Environment Division, ANSTO (ex officio)	1
Dr Richard Lowson	Environment Division, ANSTO	1
Dr David Garnett	Becquerel Laboratories (ex officio)	2
Dr Paul Brown (a)	Environment, ANSTO	1
Dr Rob Elliman (invited ENV 2/98)	Australian National University	1
<b>Advisory Group</b>		
Dr Kathryn Prince	Environment Division, ANSTO	2
Dr Henk Heijnis	Environment Division, ANSTO	1
Dr David Cohen	Physics, ANSTO	1

## Neutron Scattering Specialist Committee

Dr Trevor Hicks, Convenor	Monash University	2
Prof Brian O'Connor	Curtin University	1
Prof John White	Australian National University	-
Dr Evan Gray	Griffith University	2
Dr Claudio Tuniz	Director, Physics Division, ANSTO (ex officio)	-
Dr Margaret Elcombe	Physics Division, ANSTO	2
Dr Brett Hunter (a)	Physics Division, ANSTO	1
Dr Shane Kennedy (invited NS 1/98)	Physics Division, ANSTO	1
Dr Brendan Kennedy (for NS 2/98)	University of Sydney	1

## Plasma Fusion Specialist Committee

Dr Andrew Cheetham, Convenor	University of Canberra	2
Prof Robin Storer	Flinders University	2
A/Prof Rod Cross	University of Sydney	2
Dr Jeffrey Harris	Australian National University	0
(alternate Dr John Howard)	Australian National University	1

## Radiation Science Specialist Committee

A/Prof Ron Cooper, Convenor	University of Melbourne	2
Mr David Sangster	AINSE (Honorary Fellow)	2
A/Prof David Hill	University of Queensland	2
Dr David Webb	Australian Radiation Laboratory	2
Dr Claudio Tuniz	Director, Physics Division, ANSTO (ex officio)	0
Dr Wayne Garrett	Physics Division, ANSTO	2
Dr Dimitri Alexiev	Physics Division, ANSTO	
<b>Radiation Advisory Group</b>		
A/Prof Jan Gebicki	Macquarie University	
A/Prof Doug Moore	University of Sydney	
Dr Roger Martin	University of Melbourne	
Dr Bob Anderson	University of Auckland	

# Conference Planning Committees

## **AINSE Winter School at ANSTO - July 1998**

Dr Ken Doolan	Convenor	University of Western Sydney
A/Prof Ron Cooper		University of Melbourne
A/Prof Gerald Laurence		University of Adelaide
Dr Ewan Lawson		ANSTO
Dr Peter Evans		ANSTO
Dr Graham Bailey		ANSTO
Dr Richard Lowson		ANSTO
Dr Kathryn Prince		ANSTO
Dr David Sangster		AINSE Honorary Fellow
Dr Margaret Elcombe		ANSTO
Dr Henk Heijnis		ANSTO
Dr Andrew Katsifis		ANSTO
Mr Robert Chisari (a)		ANSTO
Dr Dennis Mather		AINSE
Mrs Irene Parker		AINSE

## **17<sup>th</sup> AINSE Nuclear and Particle Physics Conference – September/October 1998**

Dr Roger Gammon	to March'98, Convenor	AINSE
Dr Dennis Mather	from April'98	AINSE
Prof Brian O'Connor		Curtin University
Dr Brian Robson		Australian National University
Prof George Dracoulis		Australian National University
Dr Andrew Stuchbery (a)		Australian National University
A/Prof Lawrence Peak		University of Sydney
Dr Stuart Tovey		University of Melbourne
Dr John Boldeman		ASRP Facility, ANSTO
Promaco Conventions	P/L	Conference Managers

## **Radiation'98 – November 1998**

A/Prof Ron Cooper	Conference Chairman	University of Melbourne
Dr John Baldas		Australian Radiation Laboratory
Dr Wayne Garrett		ANSTO
Dr Suzanne Smith		ANSTO
Dr Robert Anderson		University of Auckland
Dr Roger Martin		Peter McCallum Institute
Dr David Sangster		AINSE Honorary Fellow
Dr Dave Hill		University of Queensland
Dr Dennis Mather		AINSE
Mrs Margaret Lanigan	Conference Manager	AINSE

## **40<sup>th</sup> AINSE Anniversary Conference – December 1998**

Prof Trevor Ophel	Conference Chairman	Australian National University
Prof Ron MacDonald		University of Newcastle
A/Prof Ron Cooper		University of Melbourne
Prof Helen Garnett		ANSTO
Dr Claudio Tuniz		ANSTO
Dr John Boldeman		ANSTO
Dr Dennis Mather		AINSE
Mrs Margaret Lanigan	Conference Manager	

## **Plasma'99 – February 1999**

A/Prof Andrew Cheetham, Conference President	University of Canberra
A/Prof Robin Storer	Flinders University
Dr Rod Boswell	Australian National University
Dr John Howard	Australian National University
Dr Boyd Blackwell	Australian National University
Dr Brian James	University of Sydney
Dr Renaldo Castillo	University of Western Sydney
Dr George Collins	ANSTO
Dr Dennis Mather	AINSE
Mrs Margaret Lanigan, Conference Manager	AINSE

## **5<sup>th</sup> Symposium Advances in Radiopharmaceuticals – February 1999**

Prof Leon Kane-Maguire	University of Wollongong
Dr Roger Martin	Peter McCallum Institute
Dr Eric Hetherington	ANSTO
Dr Andrew Katsifis	ANSTO
Dr Suzanne Smith	ANSTO
Dr Dennis Mather	AINSE
Mrs Margaret Lanigan, Conference Manager	AINSE

## **First SANS and X-ray Scattering Workshop**

A/Prof Evan Gray, Chair	Griffith University
??	ANU
Dr Jonathon Watson	ANSTO
??	ANU
Dr Dennis Mather	AINSE

## **11<sup>th</sup> Conference on Nuclear Techniques of Analysis and 6<sup>th</sup> VSA Congress**

Dr David Cohen, Conference Chairman	ANSTO
Prof Ron MacDonald	University of Newcastle
Dr Rob Elliman	Australian National University
Dr Peter Johnston	Royal Melbourne Institute of Technology
Dr David Jamieson	University of Melbourne
Dr Soey Sie	CSIRO
Ms Irene Parker	AINSE
Dr Dennis Mather	AINSE

## **ICRR 2003 Conference - August 2003**

Prof Martin Lavin	Queensland Inst of Medical Research
A/Prof Ron Cooper	University of Melbourne
Dr Roger Martin	Peter McCallum Cancer Institute
Dr Dieter Asmus	University of Notre Dame
Dr Suzanne Smith	ANSTO
Dr Dennis Mather	AINSE

# ***AINSE Postgraduate Research Awards***

Eight new AINSE postgraduate research projects supported by an award commenced during 1998. Through its post-graduate research award scheme, AINSE has now helped train 158 students in aspects of nuclear science and associated techniques of analysis. Many more students have been assisted with their PhD research by gaining access to Lucas Heights facilities through AINSE Grants awarded to their supervisors. Council believes that one of the most valuable roles fulfilled by AINSE is the provision of these AINSE post-graduate awards.

The stipend is \$7500 pa and \$5500 is provided towards the costs involved in using Lucas Heights facilities. Travel and accommodation costs are also awarded to enable students to work at Lucas Heights.

In addition to providing a student with a tax-free supplement for up to 3 years, the award gives additional access to ANSTO's world-class facilities and expertise. Usually 6 to 7 awards are made each year. To nominate for one of these awards, an applicant must hold an Australian Postgraduate Award (APA) or equivalent scholarship.

## ***Projects Supported During 1998***

*Free radical degradation of organic pesticides*

**Mr Karl Cornelius** Chemistry, University of Adelaide

Commenced 1 March 1995

*The development of metallo-fullerene nanostructured materials: A new application for nuclear medicine*

**Mr Phillip Jackson** Chemistry, University of New South Wales

Commenced 1 January 1995

*Order in two dimensional magnetic systems*

**Darren Goossens** Physics, Monash University

Commenced 4 March 1996

*An investigation of the formation & early annealing of fission tracks in apatite*

**David Belton** Earth Sciences, La Trobe University

Commenced 4 March 1996

*Structural integrity & remaining life of welded structures under creep*

**Michael Law** Materials Science, University of Technology Sydney

Commenced 25 March 1996

*Neutron scattering studies of metal-H/D systems*

**Mark Pitt** Science & Technology, Griffith University

Commenced 1 February 1996

*Structural evolution during the preparation & heating of nanophase zirconia*

**Peter Southon** Materials Science, University of Technology Sydney

Commenced 1 February 1996

*Molecular modelling & experimental studies of mineral flotation systems*

**Anthony O'Dea** Ian Wark Research Institute, University of South Australia

Commenced 16 January 1996

*Investigation of microstructure & dynamics of polymer gels by scattering methods*

**Jdranka Travas-Sejdic** Chemistry, University of Auckland

Commenced 1 March 1997

*Surface modified carbon for the femoral head & acetabular components of the hip prosthesis*

**Jari Hyvarinen** Biomedical Engineering, University of New South Wales

Commenced 16 January 1997

*Geochemistry of ochres & rock art paints in the Selwyn Ranges, North West Queensland*

**Malcolm Ridges** Archaeology & Palaeoanthropology, University of New England

Commenced 1 July 1997

*The hydrogen bonding & structure of bis-aminoacidato-metal(II)*

**Sandra Moussa** Inorganic Chemistry, University of Sydney

Commenced 11 March 1997

*Chronology of contaminated sediments in Sydney Harbour*

**Stuart Taylor** Environmental Geology & Geophysics, University of Sydney

Commenced 1 January 1997

*A long term terrestrial palaeoenvironmental record from isotope ratios of organic deposits*

**David Wheeler** Geosciences, University of Wollongong

Commenced 1 January 1997

*Characterisation of reduced polypyridyl ruthenium species*

**Bradley Patterson** Chemistry & Chemical Engineering, James Cook University

Commenced 1 March 1998

*Donor-acceptor compounds as potential radiation activated cytotoxins*

**Alison Funston** Chemistry, University of Melbourne

Commenced 2 February 1998

*An environmental record of the last quarter of a million years from eastern Australia*

**Nicola Franklin** Geography, University of Sydney

Commenced 2 March 1998

*Dynamic susceptibility of transition metal alloys by neutron scattering*

**David Robinson** Physics, Monash University

Commenced 9 February 1998

*The self assembly of phospholipid dispersions*

**Karen Gunton** Chemistry, University of Queensland

Commenced 2 March 1998

*Fundamental mechanisms in rf & dc nitriding plasmas*

**Jayson Priest** Physics & Electronics Engineering, University of New England

Commenced 1 February 1998

*Fine resolution AMS <sup>14</sup>C chronology for the Greater Lake Bolac lunette-lake sediment sequence*

**Ellyn Cook** Geography & Environmental Science, Monash University

Commenced 1 March 1998

**(Special Grant Award)**

*Neutron depolarisation study of flux pinning in HTSC*

**Todd Green** Materials Engineering, University of Wollongong

Commenced 1 March 1998

**(Special Grant Award)**

*CONTINUING WITHOUT STIPEND*

(Note the following students have completed their studies and are in the process of writing up)

*Studies of disordered magnetic systems by neutron diffraction*

**Mr Davyd Norris** Physics, Monash University

Commenced 19 February 1990

*Ion beam analysis of III-V semiconductor materials produced by MOCVD*

**Mr Scott Walker** Physics, Royal Melbourne Institute of Technology

Commenced 18 April 1992

*Oxygen dynamics in single crystals of  $YBa_2Cu_3O_7$  grown using KCl/NaCl flux*

**Mr Stephen Bosi** Physics, University of New South Wales

Commenced 1 March 1991

*Photoreactivity of titania sol-gel coatings*

**Miss Tracey Hanley** Physical Chemistry, University of New South Wales

Commenced 1 February 1993

*The quaternary environmental history of tropical Australia*

**Mr Matthew Fischer** Geography, University of New England

Commenced 17 January 1994

*Rhenium based pharmaceuticals as anti-sense ligands for anticancer drugs*

**Miss Leanne Ellis** Inorganic Chemistry, University of Sydney

Commenced 11 April 1994

*Investigation of the mechanisms responsible for the surface hardening of steels by rf plasma nitriding*

**Mr Matthew Baldwin** Physics, University of New England

Commenced 1 February 1995

*Late quaternary history of Lord Howe Island calcarenite*

**Mr Brendan Brooke** Geography, University of Wollongong

Commenced 28 February 1995

## ***Financial Statements***

***as at 31 December 1998***

*The following financial statements for the year ended 31 December 1998 have been prepared by ANSTO and audited by Gardner Escott & Co. The auditor's Report, dated 12 March 1998 were approved by the AINSE Council at its Annual Meeting on 28 May 1998.*

*A copy of these statements may be inspected in the AINSE office.*

## AUDITORS' REPORT

### TO THE MEMBER OF THE AUSTRALIAN INSTITUTE OF NUCLEAR SCIENCE AND ENGINEERING INCORPORATED

#### SCOPE

We have audited the attached special purpose financial report of the Institute for the financial year ended 31 December, 1998 as set out on schedules 1 to 10. The Institute's Executive Committee is responsible for the preparation and presentation of the financial report and the information contained therein, and have determined that the basis of accounting used is appropriate to the needs of the members. We have conducted an independent audit of the financial report in order to express an opinion to the members of the Institute on its preparation and presentation. No opinion is expressed as to whether the basis of accounting used is appropriate to the needs of the members.

The financial report has been prepared for distribution to members for the purpose of fulfilling the Executive committee's accountability requirements under the Institute's constitution. We disclaim any assumption of responsibility for any reliance on this report or on the financial report to which it relates to any person other than the members, or for any purpose other than that for which it was prepared.

Our audit has been conducted in accordance with Australian Auditing Standards. Our procedures included examination, on a test basis, of evidence supporting the amounts and other disclosures in the financial report and significant accounting estimates. These procedures have been undertaken to form an opinion as to whether, in all material respects, the financial report is presented fairly in accordance with the basis of accounting described in Note 1 to the Financial Statements. (These policies do not require the application of all Accounting Standards and UIG Consensus Views).

The audit opinion expressed in this report has been formed on the above basis.

#### AUDIT OPINION

In our opinion the financial report presents fairly, in accordance with Accounting policies described in note 1 to the financial statements, as well as the provisions of the Associations Incorporation Act 1984, the financial position of the Institute, as at 31 December, 1998 and the results of its operations and cash flows for the year then ended.

Gardner Escott & Co  
Chartered Accountants



P R Escott  
Partner

Sydney, dated this

12<sup>TH</sup>

day, of

MARCH

1999

## AUSTRALIAN INSTITUTE OF NUCLEAR SCIENCE AND ENGINEERING EXECUTIVE COMMITTEES REPORT

The Executive Committee of the Australian Institute of Nuclear Science and Engineering Incorporated submits the financial accounts of the Institute for the financial year ended 31 December 1998

### COMMITTEE MEMBERS

Professor Ron McDonald, President  
Assoc. Professor Ron Cooper, Vice President  
Professor Hans Coster  
Professor Helen Garnett  
Dr John Boldeman  
Dr Claudio Tuniz  
Dr Dennis Mather, Scientific Secretary

### PRINCIPAL ACTIVITIES

The Principal activities of the Institute during the financial year were :-

- To carry out research and investigations in connection with matters associated with nuclear science and engineering;
- To arrange for the training of scientific research workers and the establishment and award of scientific research studentships in matters associated with nuclear science and engineering;
- To collect and distribute information relating to nuclear science and engineering.

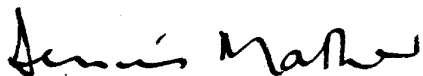
### SIGNIFICANT CHANGES

No significant change in the nature of these activities occurred during the year.

### OPERATING RESULT

The surplus for the year amounted to \$276,395.

Signed in accordance with a resolution of the Members of the Committee.



Dr Dennis Mather  
Public Officer & Scientific Secretary

Dated this 12<sup>th</sup> day of March 1999.

**THE AUSTRALIAN INSTITUTE OF NUCLEAR SCIENCE AND ENGINEERING INCORPORATED**  
**BALANCE SHEET**  
**AS AT 31ST DECEMBER 1998**

	Notes	31 Dec 1998 \$	31 Dec 1997 \$
<b>Current Assets</b>			
Cash	2	173,625	243,124
Receivables	3	24,166	28
Investments	4	2,844,843	2,494,067
Other	5	16,916	15,560
<b>Total Current Assets</b>		<u>3,059,550</u>	<u>2,752,779</u>
<b>Non-Current Assets</b>			
Plant and Equipment	6	46,108	50,836
<b>Total Non-Current Assets</b>		<u>46,108</u>	<u>50,836</u>
<b>Total Assets</b>		3,105,658	2,803,615
<b>Current Liabilities</b>			
Creditors	7	365,728	113,424
External Grants Received in Advance	8	232,356	411,085
Membership Subscriptions Received in Advance		8,200	35,300
Provisions for Employee Entitlements	9	10,423	13,265
<b>Total Current Liabilities</b>		<u>616,707</u>	<u>573,074</u>
<b>Non-Current Liabilities</b>			
Provisions for Employee Entitlements	9	7,105	25,090
<b>Total Non-Current Liabilities</b>		<u>7,105</u>	<u>25,090</u>
<b>Total Liabilities</b>		623,812	598,164
<b>NET ASSETS</b>		<u><u>2,481,846</u></u>	<u><u>2,205,451</u></u>
<b>Equity</b>			
Grants Reserve	17	1,460,181	1,133,400
Long Term Projects Reserve	17	500,000	500,000
Accumulated results of operations		521,665	572,051
<b>TOTAL EQUITY</b>		<u><u>2,481,846</u></u>	<u><u>2,205,451</u></u>

The accompanying notes form an integral part of these accounts.

**THE AUSTRALIAN INSTITUTE OF NUCLEAR SCIENCE AND ENGINEERING INCORPORATED**  
**INCOME AND EXPENDITURE STATEMENT**  
**FOR THE PERIOD ENDED 31ST DECEMBER 1998**

	Notes	31 Dec 1998 \$	31 Dec 1997 \$
<b>COST OF SERVICES</b>			
<b>Operating Expenses</b>			
Wages & Salaries		157,521	149,903
Superannuation		24,058	29,207
AINSE Awards			
Students	10	275,429	231,835
Grants	10	822,452	723,095
Conference Subsidies		40,512	32,142
External Grants	12	885,457	826,225
Other Expenses	13	198,993	209,499
Refurbishment of Building 5	15	-	2,352
		<hr/>	<hr/>
<b>Total Operating Expenses</b>		<b>2,404,422</b>	<b>2,204,258</b>
<b>Operating Revenue</b>			
Membership Subscriptions		1,719,500	1,638,300
External Grants	12	803,729	826,225
Interest Received		134,796	151,012
Profit on sale of assets		5,804	-
Other	14	16,988	9,225
		<hr/>	<hr/>
<b>Total Operating Revenue</b>		<b>2,680,817</b>	<b>2,624,762</b>
<b>Surplus for the year</b>		<b>276,395</b>	<b>420,504</b>
Accumulated funds brought forward		572,051	205,247
<b>Funds Available</b>		<hr/> <b>848,446</b>	<hr/> <b>625,751</b>
Less: transfer to Reserves			
Grants Reserve	17	326,781	53,700
Long Term Projects Reserve	17	-	-
		<hr/>	<hr/>
<b>Accumulated results of operations at end of financial year</b>		<b>521,665</b>	<b>572,051</b>

The accompanying notes form an integral part of these accounts.

**THE AUSTRALIAN INSTITUTE OF NUCLEAR SCIENCE AND ENGINEERING INCORPORATED**  
**STATEMENT OF CASH FLOWS**  
**FOR PERIOD ENDED 31ST DECEMBER 1998**

	31 Dec 1998	31 Dec 1997
	\$	\$
Notes	Inflows/(Outflows)	Inflows/(Outflows)
<b>CASH FLOWS PROVIDED BY (USED IN) OPERATING ACTIVITIES</b>		
Inflows:		
Receipts from members	1,685,250	1,678,472
Receipts from grants	625,000	610,000
Interest received	134,796	154,306
	<u>2,445,046</u>	<u>2,442,778</u>
Outflows:		
Grant expenditures	(1,673,850)	(1,813,297)
Payments to suppliers and employees	(482,602)	(495,891)
	<u>(2,156,452)</u>	<u>(2,309,188)</u>
Net cash flows provided by (used in) operating activities	18 <u>288,594</u>	<u>133,590</u>
<b>CASH FLOWS PROVIDED BY (USED IN) INVESTING ACTIVITIES</b>		
Outflows:		
Plant and equipment	(7,317)	(26,335)
Net cash flows provided by (used in) investing activities	<u>(7,317)</u>	<u>(26,335)</u>
<b>Net increase in cash held</b>	<b>281,277</b>	<b>107,255</b>
Cash at beginning of reporting period	<u>2,737,191</u>	<u>2,629,936</u>
<b>Cash at end of reporting period</b>	<b><u>3,018,468</u></b>	<b><u>2,737,191</u></b>

For the purposes of the Statement Of Cashflows, the cash balance as at 31st December 1998 comprises Cash-Operating Money Market and Other Deposits. A reconciliation of cash at the end of the reporting period to the Balance Sheet is set out as follows:

Balance Sheet	Cash	173,625	243,124
	Investment	2,844,843	2,494,067
Cash Flow Statement		<u>3,018,468</u>	<u>2,737,191</u>

**THE AUSTRALIAN INSTITUTE OF NUCLEAR  
SCIENCE AND ENGINEERING INCORPORATED**

**NOTES TO AND FORMING PART OF THE ACCOUNTS**

**1. Statement of accounting policies**

**(a) Basis of accounting**

These financial statements are a special purpose financial report prepared in order to provide accounts which satisfy the requirements of the Institute's constitution and the Associations Incorporation Act NSW to prepare accounts. The Executive Committee has determined that the Institute is not a reporting entity and therefore, as there is no requirement to apply Accounting Standards and other mandatory professional reporting requirements (Urgent Issues Group Consensus Views) in the preparation and presentation of these statements, they have been adopted only to the extent shown in Note 1 to the accounts.

The statements have been prepared in accordance with the requirements of the Associations Incorporation Act. The statements are prepared on an accrual basis of accounting. They are based on historic costs and do not take into account changing money values, or except where specifically stated, current valuations of non-current assets.

The Executive Committee has, however prepared the financial report in accordance with all Australian Accounting Standards with the following exceptions:

- AAS1 Profit and Loss or other operating statements
- AAS22 Related party disclosures
- AAS30 Accounting for employee entitlements

The accounting policies have been consistently applied, unless otherwise stated. The following is a summary of the significant accounting policies adopted by the Institute in the preparation of the financial statements.

**(b) Depreciation of property, plant and equipment**

Property, plant and equipment are stated at cost and depreciated over their useful lives using the straight line method.

**(c) Employee Entitlements**

Recreation Leave and Long Service Leave entitlements are provided for annually.

**(d) Inventories**

As at 31st December 1998 AINSE did not hold any inventory.

**(e) Membership subscriptions**

Membership subscriptions are paid to the Institute by its members.

**(f) Grants**

All grant monies received have been treated as a balance sheet item under the heading of 'Grants Received In Advance'. As money is expended on the grants the equivalent amount of expenditure is drawn down from the balance sheet to grants income.

## Notes to the Financial Statements

	31 Dec 1998 \$	31 Dec 1997 \$
<b>2. CASH</b>		
Operating Account	173,125	242,624
Petty Cash	500	500
	<u>173,625</u>	<u>243,124</u>
<b>3. RECEIVABLES</b>		
Membership Receivables	24,166	28
	<u>24,166</u>	<u>28</u>
<b>4. INVESTMENTS</b>		
Money Market Account	2,844,843	2,487,067
Other Deposits	-	7,000
	<u>2,844,843</u>	<u>2,494,067</u>
<b>5. OTHER CURRENT ASSETS</b>		
Prepayments	4,067	4,789
Interest Accrued	12,849	10,771
	<u>16,916</u>	<u>15,560</u>
<b>6. PLANT AND EQUIPMENT</b>		
<b>Plant &amp; Machinery</b>		
Costs	59,585	42,005
Additions/Disposals	4,733	17,580
Accumulated Depreciation	37,014	23,503
Closing Written Down Value	<u>27,304</u>	<u>36,082</u>
<b>Motor Vehicles</b>		
Costs	21,600	21,600
Additions/Disposals	134	-
Accumulated Depreciation	2,930	6,846
Closing Written Down Value	<u>18,804</u>	<u>14,754</u>
<b>Total</b>	<u>46,108</u>	<u>50,836</u>

Notes to the Financial Statements

	31 Dec 1998 \$	31 Dec 1997 \$
<b>7. CREDITORS</b>		
Accruals - ISIS	350,000	-
Accruals - Others	15,728	113,424
	<u>365,728</u>	<u>113,424</u>
<b>8. EXTERNAL GRANTS RECEIVED IN ADVANCE</b>		
AINSE ARC AMS Grant '98 - UWA	47,450	-
AINSE ARC AMS Grant '95 - UNSW	4,020	9,380
AINSE ARC AMS Grant '96 - UWA	1,701	1,701
AINSE ARC AMS Grant '97 - UWA	-	298,937
AINSE ARC N/S Grant '96	21,947	61,586
AINSE ARC N/S Grant '98	150,000	-
AINSE ARC SIMS Grant '96	7,238	39,480
	<u>232,356</u>	<u>411,084</u>
<b>9. PROVISIONS FOR EMPLOYEE ENTITLEMENTS</b>		
<b>Current</b>		
Recreation Leave	<u>10,423</u>	<u>13,265</u>
<b>Non-Current</b>		
Long Service Leave	<u>7,105</u>	<u>25,090</u>
	<u>17,528</u>	<u>38,355</u>
<b>10. AINSE AWARDS</b>		
<b>AINSE AWARDS - Students</b>		
Lucas Heights Costs	96,765	69,355
University Travel and Equipment	23,643	21,144
Stipends	131,250	116,794
Ainse Winter School	23,771	24,542
	<u>275,429</u>	<u>231,835</u>
<b>AINSE AWARDS - Grants</b>		
Lucas Heights Costs	724,222	611,051
Minor Equipment and Materials	20,458	3,821
Travel and Accommodation	77,262	94,206
University Costs	415	-
Other Costs	95	14,017
	<u>822,452</u>	<u>723,095</u>
<b>11. SEGMENT REPORTING</b>		
The Institute operates in the research sector providing funds for research to members within Australia and New Zealand.		

Notes to the Financial Statements

	31 Dec 1998 \$	31 Dec 1997 \$
<b>12. EXTERNAL GRANTS</b>		
<u>AINSE ARC AMS Grant '94 - Sydney</u>		
Grant Revenue	-	21,640
Grant Expenditure		
Lucas Heights Costs	-	21,640
Total Expenditure	-	21,640
<u>AINSE ARC AMS Grant '95 - UNSW</u>		
Grant Revenue	5,360	117,013
Grant Expenditure		
Lucas Heights Costs	5,360	117,013
Total Expenditure	5,360	117,013
<u>AINSE ARC AMS Grant '96 - UWA</u>		
Grant Revenue	-	298,069
Grant Expenditure		
Lucas Heights Costs	-	260,850
University Travel and Accomodation	-	804
Contract Labour/Consultancies	-	36,415
Total Expenditure	-	298,069
<u>AINSE ARC AMS Grant '97 - UWA</u>		
Grant Revenue	298,937	1,063
Grant Expenditure		
Lucas Heights Costs	325,190	-
University Travel and Accomodation	305	1,063
Contract Labour/Consultancies	30,170	-
Total Expenditure	355,665	1,063
<u>AINSE AMS Grant '98 - UWA</u>		
Grant Revenue	102,550	-
Grant Expenditure		
Lucas Heights Costs	102,550	-
Total Expenditure	102,550	-
<u>AINSE ARC N/S Grant '96</u>		
Grant Revenue	39,639	105,721
Grant Expenditure		
Equipment and Materials	39,639	69,203
Contract Labour/Consultancies	-	36,518
Total Expenditure	39,639	105,721

Notes to the Financial Statements

	31 Dec 1998 \$	31 Dec 1997 \$
<b>12. EXTERNAL GRANTS (cont.)</b>		
<u>AINSE ARC SIMS Grant '96</u>		
Grant Revenue	32,242	32,719
Grant Expenditure		
Equipment and Materials	-	-
Contract Labour/Consultancies	32,242	32,719
Total Expenditure	32,242	32,719
<u>AINSE ARC ISIS Grant '98</u>		
Grant Revenue	325,000	-
Grant Expenditure		
Lucas Heights Costs	350,000	-
Total Expenditure	350,000	-
<u>AINSE ARC Fusion Grant '97</u>		
Grant Revenue	-	250,000
Grant Expenditure		
Equipment and Materials	-	250,000
Total Expenditure	-	250,000
<u>Reconciliation</u>		
Total External Grants Revenue	803,729	826,225
less transferred to Grants Received In Advance (Balance Sheet)	-	-
<b>External Grant Revenue (Income &amp; Expenditure Statement)</b>	<b>803,729</b>	<b>826,225</b>
Represented by:		
<b>Total Grant Expenditure (Income &amp; Expenditure Statement)</b>	<b>885,457</b>	<b>826,225</b>
Amount to be met by AINSE	(81,728)	-
External Grants Expenditure	803,729	826,225

## Notes to the Financial Statements

	31 Dec 1998 \$	31 Dec 1997 \$
<b>13. OTHER EXPENDITURE</b>		
Conference Management	<u>36,622</u>	<u>30,161</u>
Publications and Promotions	<u>12,225</u>	<u>13,728</u>
Meetings and Committees	<u>60,089</u>	<u>61,377</u>
AINSE Secretariat		
Audit Fees and Bank Charges	3,703	3,734
Depreciation	17,850	16,139
Advertising and Printing	9,459	13,613
Office Supplies	4,683	3,756
Postage and Telephone	6,787	6,121
Insurance	8,681	8,982
Entertaining	2,553	394
Books and Software	1,674	3,252
Office Equipment Repairs	9,388	6,962
Administration and Staff Training	3,026	2,251
Other Travel	8,512	6,834
Building Maintenance	43	1,896
Vehicle Expenses	3,924	2,243
Consultant Fees	-	9,615
Loss on disposal of assets	-	1,880
Miscellaneous	<u>9,774</u>	<u>16,561</u>
Total AINSE Secretariat	<u>90,057</u>	<u>104,233</u>
Total Other Expenditure	<u>198,993</u>	<u>209,499</u>
<b>14. OTHER INCOME</b>		
Conferences	16,185	8,809
Miscellaneous	<u>803</u>	<u>416</u>
	<u>16,988</u>	<u>9,225</u>
<b>15. ABNORMAL ITEMS</b>		
Refurbishment of Building 5 - Free of Charge	<u>-</u>	<u>2,352</u>
<b>16. OTHER COMMITMENTS</b>		
Operating expenditure commitments which have not been provided for in the accounts:		
Payable no later than 1 year - grants	<u>326,005</u>	<u>92,085</u>
	<u>326,005</u>	<u>92,085</u>
<b>17. MOVEMENT IN RESERVES</b>		
Grants Reserve		
Transfer 1999 research grants committed	<u>326,781</u>	<u>53,700</u>
Long Term Projects Reserve		
Transfer from accumulated funds	<u>-</u>	<u>-</u>

Notes to the Financial Statements

	31 Dec 1998 \$	31 Dec 1997 \$
<b>18. RECONCILIATION OF OPERATING RESULT WITH CASHFLOWS FROM OPERATIONS</b>		
Surplus for the year	<u>276,395</u>	<u>420,504</u>
Movements in Balance Sheet		
(Increase)/Decrease in Receivables	(24,138)	1,647
Increase/(Decrease) Creditors	252,304	(131,309)
(Increase)/Decrease Accrued Interest	-	3,294
(Increase)/Decrease Prepayments	(1,357)	623
Increase/(Decrease) Employee Entitlements	(20,827)	5,497
Increase/(Decrease) Other Current Liabilities	(27,100)	29,300
Increase/(Decrease) Grants Received in Advance	(178,729)	(216,225)
	<u>153</u>	<u>(307,173)</u>
Non-Cash Items		
Depreciation	17,850	16,139
Sale/Trade-in of asset	-	2,240
Loss on sale of asset	-	1,880
Gain on sale of asset	(5,804)	-
	<u>12,046</u>	<u>20,259</u>
<b>Net cash provided by (used in) operating activities</b>	<u><u>288,594</u></u>	<u><u>133,590</u></u>

Supplementary Information to the Financial Statements				
Life to date Grant Reconciliation				
as of 31 December 1998				
GRANT	B/Fwd LTD	YTD	(Journal) ADJUST	C/Fwd LTD
<b>ARC AMS GRANT '98 - UWA</b>	aingrt			
Grant Debtors				-
External Grants Received in Advance	-	(150,000.00)	102,550.00	(47,450.00)
Revenue	-	-	(102,550.00)	(102,550.00)
Expenditure				
University Costs	-	-		-
Lucas Heights Costs	-	102,550.00		102,550.00
Total	-	102,550.00	-	102,550.00
Grant (gain)/loss	-	102,550.00	(102,550.00)	-
<b>ARC AMS GRANT '95 - UNSW</b>	aingri			
Grant Debtors				-
External Grants Received in Advance	(9,380.00)	-	5,360.00	(4,020.00)
Revenue	(257,713.00)	-	(5,360.00)	(263,073.00)
Expenditure				
University Costs				-
Lucas Heights Costs	257,713.00	5,360.00		263,073.00
Total	257,713.00	5,360.00	-	263,073.00
Grant (gain)/loss	-	5,360.00	(5,360.00)	-
<b>ARC AMS GRANT '96 - UWA</b>	aingrj			
Grant Debtors				-
External Grants Received in Advance	(1,700.80)		-	(1,700.80)
Revenue	(298,299.20)			(298,299.20)
Expenditure				
University Costs	1,034.20			1,034.20
Lucas Heights Costs	260,850.00			260,850.00
Contract Labour/Consultancies	36,415.00			36,415.00
Total	298,299.20	-	-	298,299.20
Grant (gain)/loss	-	-	-	-
<b>ARC AMS GRANT '97 - UWA</b>	aingrk			
Grant Debtors				-
External Grants Received in Advance	(298,937.36)	102,815.00	196,122.36	-
Revenue	(1,062.64)	(102,815.00)	(196,122.36)	(300,000.00)
Expenditure				
University Costs	1,062.64	305.00		1,367.64
Lucas Heights Costs		325,190.00		325,190.00
Equipment and Materials				-
Contract Labour/Consultancies		30,170.00		30,170.00
Total	1,062.64	355,665.00	-	356,727.64
Grant (gain)/loss	-	252,850.00	(196,122.36)	56,727.64
<b>ARC N/S GRANT '95</b>	aingro			
Grant Debtors				-
External Grants Received in Advance	-			-
Revenue	(181,418.00)			(181,418.00)
Expenditure				
Equipment and Materials	146,210.77			146,210.77
Contract Labour/Consultancies	35,207.23			35,207.23
Total	181,418.00	-	-	181,418.00
Grant (gain)/loss	-	-	-	-
<b>ARC N/S GRANT '96</b>	aingrp			
Grant Debtors				-
External Grants Received in Advance	(61,586.40)		39,639.31	(21,947.09)
Revenue	(163,413.60)		(39,639.31)	(203,052.91)
Expenditure				
Equipment and Materials	126,896.02	39,639.31		166,535.33
Contract Labour/Consultancies	36,517.58			36,517.58
Total	163,413.60	39,639.31	-	203,052.91
Grant (gain)/loss	-	39,639.31	(39,639.31)	-
<b>ARC N/S GRANT '98</b>	aingrq			
Grant Debtors				-
External Grants Received in Advance	-	(101,405.59)	(48,594.41)	(150,000.00)

Supplementary Information to the Financial Statements  
Life to date Grant Reconciliation  
as of 31 December 1998

GRANT	B/Fwd LTD	YTD	(Journal) ADJUST	C/Fwd LTD
Revenue	-	(48,594.41)	48,594.41	-
Expenditure				
University Costs				-
Lucas Heights Costs				-
Equipment and Materials	-			-
Contract Labour/Consultancies	-			-
Total	-	-	-	-
Grant (gain)/loss	-	(48,594.41)	48,594.41	-
<b>ARC SIMS GRANT '96</b> aingrs				
Grant Debtors				-
External Grants Received in Advance	(39,480.24)		32,242.21	(7,238.03)
Revenue	(170,519.76)		(32,242.21)	(202,761.97)
Expenditure				
Equipment and Materials	132,154.89			132,154.89
Contract Labour/Consultancies	38,364.87	32,242.21	-	70,607.08
Total	170,519.76	32,242.21	-	202,761.97
Grant (gain)/loss	-	32,242.21	(32,242.21)	-
<b>ARC FUSION GRANT '96</b> aingrf				
Grant Debtors				-
External Grants Received in Advance				-
Revenue	(120,000.00)			(120,000.00)
Expenditure				
Equipment and Materials	120,000.00			120,000.00
Total	120,000.00	-	-	120,000.00
Grant (gain)/loss	-	-	-	-
<b>ARC FUSION GRANT '97</b> aingru				
Grant Debtors				-
External Grants Received in Advance	-	-	-	-
Revenue	(250,000.00)	-	-	(250,000.00)
Expenditure				
University Costs				-
Lucas Heights Costs	250,000.00	-		250,000.00
Equipment and Materials				-
Contract Labour/Consultancies				-
Total	250,000.00	-	-	250,000.00
Grant (gain)/loss	-	-	-	-
<b>ARC ISIS GRANT '98</b> aingrx				
Grant Debtors				-
External Grants Received in Advance	-	(253,000.00)	253,000.00	-
Revenue	-	(72,000.00)	(253,000.00)	(325,000.00)
Expenditure				
Lucas Heights Costs	-	350,000.00		350,000.00
Total	-	350,000.00	-	350,000.00
Grant (gain)/loss	-	278,000.00	(253,000.00)	25,000.00
<b>TOTAL</b>				
Grant Debtors	-	-	-	-
External Grants Received in Advance	(411,084.80)	(401,590.59)	580,319.47	(232,355.92)
Revenue	(1,442,426.20)	(223,409.41)	(580,319.47)	(2,246,155.08)
Expenditure				
University Costs	2,096.84	305.00	-	2,401.84
Lucas Heights Costs	768,563.00	783,100.00	-	1,551,663.00
Equipment and Materials	525,261.68	39,639.31	-	564,900.99
Contract Labour/Consultancies	146,504.68	62,412.21	-	208,916.89
Total	1,442,426.20	885,456.52	-	2,327,882.72
Grant (gain)/loss	-	662,047.11	(580,319.47)	81,727.64

# Summary of AINSE Grants 1998 - Go to Grants List

The primary purpose of AINSE Grants is to enable university researchers to meet costs associated with the use of nuclear science and technology facilities, travel and accommodation during periods of attachment. These awards are principally in the form of "credits" against which payments are made by AINSE on behalf of the award holder on receipt of appropriate invoices. In this manner, some allowance can be made for the uncertainties associated with research and enables AINSE to achieve a high degree of flexibility and control needed to ensure the allocation of time on the facilities is fully utilised. AINSE Grants are very often the valuable initial support which leads to additional external funding, estimated to have been worth several million dollars to member organisations. *[1997 note: These grants were a major mechanism for assisting research and training in nuclear science and engineering and in any field requiring the use of nuclear techniques or facilities].*

The disciplines involved during 1998 included the following branches of science and engineering:

- physics** applied, electronic materials, mathematical, nuclear and high energy, plasma,.
- chemistry** applied, biochemistry, chemical technology, polymer science.
- engineering** chemical, electrical, mechanical, microelectronics.
- biology** biological science, biomaterials, biomedical science and engineering, biophysics, genetics.
- environmental & earth sciences** environmental biology, environmental geology, geochemistry, geography, information, coastal management, marine science.
- medicine** medical and health physics, nuclear, positron emission tomography
- plus** Aboriginal and Torres Strait Studies, Antarctic and Southern Ocean studies, anthropology, applied geology, archaeology, botany, cultural studies, earth sciences, geology, geophysics, geomorphology, materials science and engineering, microscopy and microanalysis, natural history, resource science and management, safety science, zoology.

The list of projects and awards for 1998 are shown in the accompanying tables arranged in order of university, department and project number. The total amount of the grants for each university is also shown. Nearly all of these projects involved close cooperation between university people and ANSTO staff and required substantial use of the reactor, accelerators and other facilities at the Lucas Heights Research Establishment.

Progress reports are published in Volume II of the Annual Report.

During 1998 174 projects were awarded to a value of \$1,326,065 involving 32 Australian universities. The following table shows the distribution of awards by university and by specialist areas.

University	Specialist Committee									University Total
	ACC	AMS	ARC	BIO	ENV	MAT	NS	PLA	RAD	
MON	1	3	1	1	1		4			11
ADE				2	1				1	4
AKL	1		1		4	1				7
ANU	1	1	7	2			1	1		13
BAL					2					2
CBR	1							1		2
CQU								1		1
CUR						1	3			4
FLI	1	1	1			1				4
GRI					1		3		1	5
JAM	1	3	5				1		1	11
LAT		1			2				1	4
MAC	1				1					2
MEL				2			1		3	6
NCT		1	2		2	1	2			8
NSW	5	1		2	3	2	3		1	17
NTU					1					1
QLD			1				1		2	4
QUT						3				3
RMI	5									5
SCU	1	2	1		1					5
SWI							1			1
SYD	5		3	1	1	1	3	1	3	18
TAS	1	1	1	2	1					6
UNE	1					1				2
USA					1	1				2
UTS	1			2	1	1				5
UWA	2									2
UWS	1							1		2
UWSN									1	1
VIC							2			2
WOL		1	3	4	2	2	2			14
Total	29	15	26	18	25	15	27	5	14	174

# AINSE Grants List

## *Australian National University*

### **Archaeology & Anthropology**

98/003	Sourcing of prehistoric obsidian from Anir, Papua New Guinea	\$9,300
	<b>Dr Glenn Summerhayes</b>	
98/137R	Cross-checking the suitability of Celtis sp seeds in dating archaeological sites	\$4,690
	<b>Professor Matthew Spriggs</b>	
98/145R	The dating of significant artefacts & economic indicators in Lao & Sarawak prehistory	\$4,690
	<b>Dr Peter Bellwood</b>	

### **Archaeology & Natural History**

98/138R	Dating early agriculture in Melanesia	\$7,370
	<b>Professor Jack Golson</b>	
98/140R	Indonesia; Leang Lemdubu & Nabule Lisa	\$5,360
	<b>Dr Susan O'Connor</b>	
98/141R	AMS dating of mud nests & tufa formations in northwestern Australia	\$5,100
	<b>Professor Rhys Jones</b>	
98/150R	Improvement of chronologies of tropical palaeoclimatic records	\$4,690
	<b>Dr Geoff Hope</b>	

### **Chemistry**

98/002	Biological studies metal ion cage complexes	\$6,780
	<b>E/Professor Alan Sargeson</b>	
98/004	Dopant stabilised -Bi <sub>2</sub> O <sub>3</sub> related phases	\$11,275
	<b>Dr Ray Withers</b>	

### **Earth Sciences**

98/001	High latitude soils : the missing CO <sub>2</sub> sink?	\$7,980
	<b>Dr Michael Bird</b>	
98/005	<sup>40</sup> Ar/ <sup>39</sup> Ar age determination of rocks	\$6,070
	<b>Professor Ian McDougall</b>	

### **Geology**

98/139R	Dating of arid events during the Holocene as recorded at Blue Lake Snowy Mountains NSW	\$4,690
	<b>Dr Patrick De Deckker</b>	

### **Plasma Research Laboratory**

98/006	Collaborative program of research on the H-1NF heliac	\$5,000
	<b>Dr John Howard</b>	
		\$82,995

## *Central Queensland University*

### **Applied Physics**

98/007	Fast DSP based pre-processing system for passive doppler shift spectroscopy diagnostics on H-1NF	\$4,180
	<b>Dr Xuehue Shi</b>	
		\$4,180

## ***Curtin University of Technology***

### **Applied Physics**

98/008	Thermal shock character of alumina-spodumene ceramics	\$7,520
	<b>Professor Brian O'Connor</b>	
98/009	High temperature neutron diffraction studies of structural transformations during the oxidation of sulphide minerals	\$6,210
	<b>Professor Brian O'Connor</b>	
98/010	Characteristics of layered & graded alumina/calcium hexaluminate composites	\$12,175
	<b>Dr It-Meng Low</b>	
98/173S	Multiple small angle neutron scattering (MSANS) on materials with high porosity	\$3,210
	<b>Dr Craig Buckley</b>	
		\$29,115

## ***Flinders University***

### **Archaeology**

98/146R	AMS radiocarbon dating of bone collagen: establishing a chronology for the Swanport Aboriginal burial ground SA	\$6,800
	<b>Dr Donald Pate</b>	

### **Chemistry**

98/012	Large scale STM investigations of DNA on graphite	\$3,440
	<b>Dr Joseph Shapter</b>	

### **Earth Sciences**

98/092	Investigation of Carbon-14 as a tracer of circulation processes & mineralisation in groundwater discharge areas, Wtn Murray Basin	\$7,215
	<b>Dr Corinne Le Gal La Salle</b>	

### **Physics**

98/011	Rutherford backscattering studies of Cu overlayers on Si	\$4,200
	<b>Dr Michael Ford</b>	
		\$21,655

## ***Griffith University***

### **Microelectronic Engineering**

98/016	SIMS analysis of oxynitride & nitride dielectrics on silicon & silicon carbide	\$4,500
	<b>Dr Denis Sweatman</b>	

### **School of Science**

98/013	Colossal magnetoresistance materials	\$4,075
	<b>Dr Evan Gray</b>	
98/014	Structure of metal deuterides	\$21,355
	<b>Dr Evan Gray</b>	
98/015P	Neutron irradiation induced order in a CuMn alloy	\$9,115
	<b>Dr Evan Gray</b>	
98/017	Effect of chain ends & block size on radiation sensitivity of polymers & block copolymers of methyl methacrylate	\$2,870
	<b>Dr Senake Perera</b>	
		\$41,915

## **James Cook University**

### **Anthropology & Archaeology**

98/021	Trace element chemistry of laminated rock surface crusts	\$9,215
	<b>Dr Alan Watchman</b>	
98/159R	Environmental change in Sahul rock shelters	\$6,750
	<b>Dr Alan Watchman</b>	
98/160R	Bridging Sunda & Sahul: the prehistory of the Aru Islands Maluku Indonesia	\$6,700
	<b>A/Prof Peter Veth</b>	

### **Chemistry & Chemical Engineering**

98/022P	Neutron diffraction & modelling studies of supramolecular complexes	\$9,500
	<b>Dr Ian Atkinson</b>	
98/125	Characterisation of reduced polypyridyl ruthenium species	\$2,205
	<b>Professor Richard Keene</b>	

### **Earth Sciences**

98/018	Development of an integrated high-resolution chronology for post-glacial marine sedimentation in Great Barrier Reef Pro	\$3,350
	<b>Dr Ken Woolfe</b>	
98/019	Queensland trough, Holocene geochronology	\$2,010
	<b>Professor Bob Carter</b>	
98/020	Cosmogenic <sup>10</sup> Be & <sup>26</sup> Al in the Cape Flattery silica sand deposit	\$9,350
	<b>Dr Bernd Lottermoser</b>	
98/143R	Last glacial maximum stratigraphy on the GBR continental slope	\$4,690
	<b>Professor Bob Carter</b>	
98/157R	Age of a holocene diatom sediment lake-fill Toomba North QLD	\$2,680
	<b>Dr Jon Stephenson</b>	
98/158R	Development of an integrated high-resolution chronology for post-glacial marine sedimentation in the Gt Barrier Reef Lagoon	\$5,360
	<b>Dr Ken Woolfe</b>	
		\$61,810

## **La Trobe University**

### **Earth Sciences**

98/023	Revisiting the oldest landscape on earth: a cosmogenic nuclide & fission track study of the Ashburton surface Central Australia	\$13,685
	<b>Dr Barry Kohn</b>	
98/136	The application of fission track analysis to fundamental problems in the Earth Sciences	\$5,500
	<b>Professor Andrew Gleadow</b>	

### **Physics**

98/024	Diffusion & doping in ZnSe epilayers grown on GaAs substrates	\$8,640
	<b>A/Professor John Riley</b>	
98/025P	Surface properties of barium titanate ceramic materials with potential applications as corrosion inhibitors for titanium based all	\$3,765
	<b>Dr Paul Pigram</b>	
		\$31,590

## ***Macquarie University***

### **Chemistry**

98/026	PIXE/PIGME investigation of chlorine & other contaminants in automotive catalysts	\$10,800
	<b>Professor Noel Cant</b>	

### **Earth Sciences**

98/027	Glacial transport half distance Bunger Hills Antarctica	\$1,640
	<b>Dr Damian Gore</b>	
		\$12,440

## ***Monash University***

### **Earth Science**

98/028	Late quaternary/holocene chronostratigraphic study of King Island, Bass Strait	\$12,060
	<b>Professor Patricia Vickers-Rich</b>	

### **Geography & Environmental Science**

98/029	36C1 exposure dating of basalt flows in Western Victoria	\$6,800
	<b>A/Professor James Peterson</b>	
98/034	U/Th dating of palynological records from western & eastern Victoria	\$10,025
	<b>Professor Peter Kershaw</b>	
98/035	Telephone canyon shelter	\$6,700
	<b>Dr Bruno David</b>	
98/151R	Plasma-chemical extraction technique: cave paintings Palmerville Station	\$9,420
	<b>Dr Bruno David</b>	

### **Physics**

98/030P	Distribution of magnetic moment in superparamagnets & spin glass	\$33,190
	<b>Dr Trevor Hicks</b>	
98/031P	Distribution of dynamics of moments in disordered materials	\$24,960
	<b>Dr Trevor Hicks</b>	
98/032	Distribution of moment in disordered materials with magnetic long range order	\$18,400
	<b>Dr Trevor Hicks</b>	
98/033P	Neutron diffraction investigation of unusual long range magnetic order behaviour in manganese oxide perovskites	\$23,235
	<b>A/Professor Trevor Finlayson</b>	
98/036P	Structure & bonding in sorbed metal species, films & poorly crystalline materials	\$1,720
	<b>A/Professor John Cashion</b>	
98/127P	Proton irradiation of polymethylmethacrylate (perspex) samples	\$3,010
	<b>Dr Robert Fleming</b>	
		\$149,520

## ***Northern Territory University***

### **Maths & Physical Sciences**

98/037	Catchment impact of mining in the Adelaide River region of the Northern Territory	\$7,455
	<b>Dr David Parry</b>	
		\$7,455

## ***Queensland University of Technology***

### **Physical Sciences**

98/038P	The structure of intercalated kaolinities	\$995
	<b>Dr Ray Frost</b>	
98/039	Titania gel-ceramic transition	\$8,925
	<b>Dr Ray Frost</b>	
98/040P	Chemistry of peptisation of alumina sols	\$16,050
	<b>Dr Ray Frost</b>	
		\$25,970

## ***Royal Melbourne Institute of Technology***

### **Applied Physics**

98/041	Recoil spectrometry of ferroelectric & related materials	\$8,520
	<b>Dr Peter Johnston</b>	
98/042	Multiple scattering & energy loss straggling studies of heavy ions in condensed matter for application in heavy ion elastic ....	\$16,870
	<b>Dr Peter Johnston</b>	

### **Chemical & Metallurgical Engineering**

98/045P	Effects of ion implantation on the properties & structure of pvd TiN films	\$10,590
	<b>Dr Rafael Manory</b>	

### **Communication & Electronic Engineering**

98/043P	Ion beam modification & characterisation of thin films of TiB <sub>2</sub> , NdFeB & Sm Co	\$22,855
	<b>Professor Dinesh Sood</b>	
98/044	Nano-phases produced by ion implantation in materials, their characterisation & improvements in corrosion behaviour at high temps	\$25,910
	<b>Professor Dinesh Sood</b>	
		\$84,745

## ***Southern Cross University***

### **Resource Science & Management**

98/046	The quaternary palaeoenvironment of Eurimbula National Park, Central QLD: a geoarchaeological investigation of landscape evolution	\$6,030
	<b>A/Professor William Boyd</b>	
98/047	Prehistoric & historic sedimentation rates within a Holocene estuarine system of the Richmond River, Nthn NSW	\$4,180
	<b>Mr Stephen Cotter</b>	
98/048	Obsidian typology: A contribution to a geochronology experiment in West New Britain PNG	\$10,540
	<b>A/Professor William Boyd</b>	
98/049	Sulphur isotopes & sulphur cycling in coastal holocene sediments	\$9,600
	<b>Dr Leigh Sullivan</b>	
98/161R	Age & evolution of the iron age "moats" of NE Thailand	\$4,020
	<b>A/Prof William Boyd</b>	
		\$34,370

## ***Swinburne University of Technology***

### **Biophysical Sciences**

98/050P	To investigate techniques for high frequency neutron beam modulation	\$4,785
	<b>Dr Edward Bakshi</b>	
		\$4,785

## ***University of Adelaide***

### **Chemistry**

98/053	Radiation chemistry of organic pesticides	\$7,400
	<b>Dr Mark Buntine</b>	

### **Nuclear Medicine**

98/051	The development of Iodine-123 labelled radiopharmaceuticals for the study of the NMDA receptor system	\$12,000
	<b>Dr Christopher Rowe</b>	
98/052	The development of sub-type selective radiotracers for the study of muscarinic(m2) receptors	\$10,450
	<b>Dr Christopher Rowe</b>	

### **Physics/Mathematical Physics**

98/108P	Radioactive disequilibrium in low level uranium determinations & trace elements in natural quartz	\$1,400
	<b>E/Professor John Prescott</b>	
		\$31,250

## ***University of Auckland***

### **Anthropology**

98/054	Modelling social interaction in Island Melanesia	\$10,090
	<b>Dr Peter Sheppard</b>	

### **Chemistry**

98/055	Molecular ion formation in SIMS	\$5,375
	<b>A/Professor James Metson</b>	
98/056P	Composition & properties of TiOxNy solar absorber films	\$25,700
	<b>A/Professor James Metson</b>	
98/058	Characterisation of nitrogen alloyed surfaces on nickel base superalloys	\$7,780
	<b>A/Professor Graham Wright</b>	

### **Geography**

98/057	U/Th dating of peat & ferricrete from mid-Pleistocene cover bed sequences North Island NS	\$3,000
	<b>Dr Paul Augustinus</b>	
98/142R	Timing of environmental change Macquarie Harbour	\$5,360
	<b>Dr Paul Augustinus</b>	
98/166	Variations in the sedimentary & geochemical record in Ahuriri Estuary, New Zealand	\$4,255
	<b>Dr Scott Nichol</b>	
		\$61,560

## ***University of Ballarat***

### **School of Science**

98/059	Rare earth element concentrations of hydrothermally altered metaturbidites assoc with mesothermal gold mineralisation	\$5,490
	<b>Dr Frank Bierlein</b>	
98/164	Biogeochemistry of Central Victorian gold deposits	\$1,900
	<b>Dr Dennis Arne</b>	
		\$7,390

## ***University of Canberra***

### **Information Sciences & Engineering**

98/060	Australian fusion research group collaboration	\$5,520
	<b>A/Professor Andrew Cheetham</b>	

### **Physics**

98/061P	Studies in the conservation of materials of cultural heritage significance	\$4,510
	<b>Professor Dudley Creagh</b>	
		\$10,030

## ***University of Melbourne***

### **Chemistry**

98/065	Induced dissociation of cobalt & chromium complexes	\$9,600
	<b>A/Professor Peter Tregloan</b>	

### **Chemistry**

98/066	Irradiation chemical degradation of halocarbon contaminated waters	\$6,225
	<b>A/Professor Ronald Cooper</b>	

### **Genetics**

98/063	Use of copper radioisotopes to investigate copper metabolism in normal & mutant cultured cells	\$7,440
	<b>Dr James Camakaris</b>	

### **Physics**

98/062	Investigation of magnetic ordering in Ca <sub>4-x</sub> LaxMn <sub>3</sub> O <sub>10</sub>	\$4,795
	<b>Dr Peter Goodman</b>	

### **Trescowthick Research Laboratories**

98/064	Pulse radiolysis studies with DNA binding radioprotectors	\$5,915
	<b>Dr Roger Martin</b>	
98/169S	Molecular modelling of DNA binding radioprotectors	\$2,965
	<b>Dr Roger Martin</b>	
		\$36,940

## ***University of New England***

### **Archaeology & Palaeoanthropology**

98/067P	Sourcing agate & carnelian ornaments from Southeast Asia with PIXE/PIGME analysis	\$5,955
	<b>Dr Peter Grave</b>	

## Physics & Electronics Engineering

98/068 Temperature effects in nitriding with a low pressure rf-plasma \$16,575  
Dr Matthew Fewell

\$22,530

## University of New South Wales

### Advanced Electronic Materials

98/074 Lattice dynamical studies of HTSC cuprate materials \$7,000  
A/Professor Graeme Russell

### Biological Science

98/069 Dating the pre-glacial lake clays at Mountain Lagoon \$1,340  
Dr Helene Martin

### Biomedical Engineering

98/080P Surface modified carbon for the remoral head & acetabular components of the HIP \$6,075  
prosthesis  
Professor Klaus Schindhelm

### Bone Biomaterial Unit

98/071P The effect of ion beam modified biomaterials on skeletal tissue & its cells \$7,600  
Professor Rolfe Howlett

### Civil & Environmental Engineering

98/171S Investigation of macromolecular & colloidal aggregation kinetics using light scattering \$8,050  
techniques  
Professor David Waite

### Electrical Engineering

98/077P SIMS characterisation for solar cell applications \$7,500  
Dr Alistair Sproul

98/167S Experimental investigation of material quality effects upon recombination & transport in \$7,500  
multilayer thin film silicon solar cells  
Dr Mark Keevers

### Materials Science & Engineering

98/078P SIMS analyses of concentration profiles in bulk & thick film ceramics \$3,600  
Professor Charles Sorrell

### Physics

98/072 Study of light emitting Si with ion beam techniques \$13,400  
Professor Dan Haneman

98/073P Sydney aerosol characteristics especially absorption coefficient \$11,200  
Dr Gail Box

98/079 Determination of doping profiles using SIMS \$6,000  
Professor Michael Gal

98/081 High speed mossbauer investigation of rare earth based materials \$1,480  
Dr Glen Stewart

98/082 Applications of nuclear magnetic resonance on oriented nuclei (NMRON) to solids \$1,330  
Dr Wayne Hutchison

## Physics (ADFA)

98/075	Magnetic structures of novel rare-earth intermetallic compounds	\$7,635
	<b>A/Professor Stewart Campbell</b>	
98/076P	Mechanochemical synthesis - structural transformations in iron oxides	\$11,845
	<b>A/Professor Stewart Campbell</b>	

## Polymer Science

98/083	New interpenetrating polymer networks	\$3,200
	<b>A/Professor Robert Burford</b>	

## Safety Science

98/070P	Subthreshold fission resonances of thorium 232	\$20,500
	<b>Dr Ronald Rosen</b>	

\$125,255

## University of Newcastle

### Chemistry

98/086P	Neutron diffraction study of lithiated manganese oxides	\$9,770
	<b>Professor Geoffrey Lawrance</b>	
98/089P	Clusters of sulfur & silicon	\$1,175
	<b>A/Professor Ellak von Nagy-Felsobuki</b>	

### Geography & Environmental Science

98/084	Glacial interglacial climate & vegetation changes of the Clarence Lagoon-Lake St Clair region	\$6,700
	<b>Professor Eric Colhoun</b>	
98/147R	Ages of vestfold glaciation Antarctica & Cradle Mountain glaciation Tasmania	\$8,040
	<b>Professor Eric Colhoun</b>	

### Geomorphology & Quaternary Science

98/087	U-Th dating of freshwater stromatolites from Mt Gambier	\$3,600
	<b>Dr Russell Drysdale</b>	
98/088	Late quaternary travertines & speleothems from Cleifden NSW	\$4,285
	<b>Dr Russell Drysdale</b>	
98/148R	High resolution AMS 14C dating of freshwater stromatolites Mt Gambier South Australia	\$8,040
	<b>Dr Russell Drysdale</b>	

### Mechanical Engineering

98/085P	In-situ study of ceramics under load and/or at high temperature	\$24,655
	<b>Dr Erich Kisi</b>	

\$66,265

## University of Queensland

### Anthropology & Sociology

98/144R	Pleistocene people-land relations in north Queensland dry rainforests	\$6,700
	<b>Dr Harry Lourandos</b>	

### Chemistry

98/090	Radiation effects in models for natural & synthetic polymers	\$3,310
	<b>A/Professor David Hill</b>	

98/091	Single electron transfer reactions of multi-redox centre complexes <b>Dr Paul Bernhardt</b>	\$6,820
98/172	Single crystal structure analysis using neutron diffraction <b>A/Professor Colin Kennard</b>	\$9,915
		\$26,745

## ***University of South Australia***

### **Ian Wark Research Institute**

98/093	Development of data analysis protocols in SIMS studies of adsorption & reaction at minerals surfaces <b>Professor Roger Smart</b>	\$8,740
98/094	Polymer additives to inhibit sodium aluminosilicate crystallisation <b>Dr Jonathan Watson</b>	\$1,260
		\$10,000

## ***University of Sydney***

### **Archaeology**

98/098P	Changing systems of intra-regional trade in the Talasea region Papua New Guinea <b>Dr Peter White</b>	\$19,800
98/099	Tin in the Ancient near East <b>Professor Daniel Potts</b>	\$9,000
98/152R	AMS dating of a collective bronze age burial <b>Professor Daniel Potts</b>	\$3,350

### **Archaeology, Main Quadrangle**

98/095P	Characterisation of South Italian ceramics by PIXE-PIGME analysis <b>Dr Edward Robinson</b>	\$9,000
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### **Biomedical Physics Research Unit**

98/163S	Reactor & accelerator neutron source for epithermal boron neutron capture therapy <b>Prof Barry Allen</b>	\$450
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### **Chemical Engineering**

98/103P	Age of selenium contamination in Lake Macquarie <b>A/Professor John Barford</b>	\$7,240
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### **Chemistry**

98/105	Gamma radiation induced polymerisation & grafting <b>Professor Donald Napper</b>	\$1,400
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### **Chemistry F11**

98/100P	Structural & magnetic properties of doped Sr-Ru oxides <b>Dr Brendan Kennedy</b>	\$24,800
98/101	Substitutional effects on the structure of synthetic lead-hydroxyapatites <b>Dr Ronald Fenton</b>	\$10,700
98/102	Influence of strontium substitution in components of Portland Cement <b>Dr Brendan Kennedy</b>	\$8,195
98/106	Polymerisation of rubbery & water soluble polymers <b>Professor Robert Gilbert</b>	\$2,800

98/168	Bioreductive alkylating properties of dimeric pyranonaphthoquinones <b>Dr Margaret Brimble</b>	\$4,055
<b>Classical Archaeology A14</b>		
98/097P	Characterisation of prehistoric Jordanian ceramics (ca.5500-500 BC) <b>Dr Stephen Bourke</b>	\$5,400
<b>Geosciences</b>		
98/153R	A 250 000 yer environmental record from southeast Australia <b>Dr Stephen Gale</b>	\$4,020
<b>Microscopy &amp; Microanalysis</b>		
98/096P	Tribological & structural investigation of metal implanted polymers <b>Dr Dougal McCulloch</b>	\$5,600
<b>Nuclear Medicine</b>		
98/104	Synthesis of 123I B-CIT & 123I Epidepride for the study of pre& post synaptic dopaminergic neurons <b>Dr George Larcos</b>	\$6,000
<b>NWG Macintosh Centre</b>		
98/162R	Pilot study of bomb-test 14C in annual tree rings of plantation-grown pinus taeda (loblolly pine) from NSW <b>Dr Mike Barbetti</b>	\$10,200
<b>Physics</b>		
98/107	University of Sydney - H-1 Major National facility collaborations <b>A/Professor Brian James</b>	\$5,565
		\$137,575
<b>University of Tasmania</b>		
<b>Antarctic &amp; Southern Ocean Studies</b>		
98/165	Appearance of toxic dinoflagellates at Port Lincoln <b>Dr Andrew McMinn</b>	\$2,100
<b>Antarctic CRC &amp; IASOS</b>		
98/109	Holocene sea-level history & coastal evolution in Samoa <b>Dr Ian Goodwin</b>	\$4,020
98/149R	Holocene sea-level history & coastal evolution in Samoa (continuing from project 98/109) <b>Dr Ian Goodwin</b>	\$6,700
<b>Chemistry</b>		
98/111	Calculations on technetium ligands for the dopamine transporter <b>Dr Brian Yates</b>	\$4,000
98/112	Modelling of ligands for dopamine transporters <b>Dr Brian Yates</b>	\$5,420
<b>Geology</b>		
98/110P	Chemical composition & paramagnetic defects of quartz <b>Dr Jan Cent van Moort</b>	\$21,420
		\$43,660

## ***University of Technology Sydney***

### **Chemistry**

98/115	New macrocyclic ligands for radiolanthanides	\$8,600
	<b>A/Professor Anthony Baker</b>	
98/116	Development of A 57Ni/57Co generator for imaging	\$7,700
	<b>A/Professor Anthony Baker</b>	

### **Materials Science**

98/113P	Metallisation of polymers assisted by ion implantation	\$10,560
	<b>Dr Ziqiang Rao</b>	
98/114	Improving Cs & Sr retention in cemented waste forms	\$8,620
	<b>Dr Abhi Ray</b>	
98/117Pef	Defect healing by hot isostatic pressing in pressure diecast aluminium valve housing for safety critical automobile applications	\$1,400
	<b>Dr Anup Mukerji</b>	
		\$36,880

## ***University of Western Australia***

### **Zoology**

98/118	Measurement of body protein in native animals by ion-beam analysis	\$6,455
	<b>Professor Don Bradshaw</b>	
98/119	Determination of 100 by activation in a particle accelerator	\$10,855
	<b>Professor Don Bradshaw</b>	
		\$17,310

## ***University of Western Sydney***

### **Chemistry**

98/120	Archaeometallurgy of the Ancient world: Chemical analysis of ancient metallurgical remains from the near East	\$9,000
	<b>Dr Richard Thomas</b>	

### **Physics**

98/121	Laser plasma interaction	\$1,135
	<b>Dr Reynaldo Castillo</b>	
		\$10,135

## ***University of Western Sydney Nepean Campus***

### **Chemistry**

98/122	The effect of additives on the grafting of poly(methyl methacrylate) onto wool in the presence of gamma radiation	\$3,710
	<b>Dr Loo-Teck Ng</b>	
		\$3,710

## ***University of Wollongong***

### **Chemistry**

98/128	Labelled neurotransmitter transporter ligands for SPECT	\$13,780
	<b>Professor John Bremner</b>	

98/170S	Novel routes to fluorinated radiopharmaceuticals <b>Dr Stephen Pyne</b>	\$7,350
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## Geosciences

96/119	Determination of erosion vs slope relationships for agricultural land adjacent to a reference soil near Goulburn NSW <b>A/Professor Brian Jones</b>	
98/123	Sedimentation patterns in the Shoalhaven delta & the origin of potential acid sulphate soils <b>A/Professor Colin Woodroffe</b>	\$6,700
98/126	Sedimentation patterns in the Minnamurra River estuary: lead & caesium chronology <b>A/Professor Colin Woodroffe</b>	\$1,800
98/154R	Reef-Island formation foraminifera taphonomy & soil development Kiribati: relationships with sea-level & El Nino <b>A/Professor Colin Woodroffe</b>	\$9,380
98/155R	Environment & sea-level changes in the Gulf of Carpentaria <b>Professor Allan Chivas</b>	\$6,030
98/156R	Comparative isotope profiles of peat cores - establishment of chronostratigraphy <b>Professor Allan Chivas</b>	\$4,020

## Materials Engineering

98/124P	Structure of electrode materials for rechargeable batteries <b>A/Professor Hua Kun Liu</b>	\$9,115
98/129	Detailed structural analysis of RE:1113. Superconducting systems: with neutron diffraction <b>Professor S Dou</b>	\$5,600
98/130	Uranium doping & neutron irradiation of Ag/Bi-2223 superconducting tapes for improved critical current density <b>Professor S Dou</b>	\$2,000
98/131	Enhancing the flux pinning in Li6 doped Bi2CaSr2Cu2O8 systems by fast neutron irradiation - continuation <b>Professor S Dou</b>	\$2,000
98/132	Degradation of steelmaking refractories <b>Dr Sharon Nightingale</b>	\$2,000
98/133	Hot compaction on nanostructural powders produced by mechano-chemical synthesis <b>Dr Andrzej Calka</b>	\$5,200
		\$74,975

## Victoria University of Technology

### Applied Physics

98/134	Investigation of the (001) diffuse peak in Mn rich gamma MnCu alloys <b>Dr Leo Cussen</b>	\$4,690
98/135	Investigation of the magnetic properties of MnV alloys <b>Dr Leo Cussen</b>	\$6,620
		\$11,310
		\$1,326,065

## **Publications**

### **[Go to Publications List](#)**

*Notification of the following papers and extended progress reports incorporating results from AINSE projects were received by AINSE in 1998. This list may not be a comprehensive list of all publications arising from AINSE supported work. Advice concerning the availability of these papers and reports can be obtained from the AINSE office.*

*The publications are listed in university order under the name of the Chief Investigator, who is not necessarily the first author on the paper. Publications arising from AINSE Postgraduate Research Awards (PGRA) are also listed.*

*The references are as supplied by the Chief Investigator in the annual Progress Report and other notification provided to AINSE. The Progress Reports for 1998 are published in Volume III of the Annual Report.*

# AINSE Publications List

Project Number	Chief Investigator (Co-Authors)	Title of Publication	Reference
<b>AUSTRALIAN NATIONAL UNIVERSITY</b>			
94/044	<b>McDougall I</b> Dunlap WJ; Teyssier C; Baldwin S	Thermal and structural evolution of the intracratonic Arltunga Nappe complex, central Australia	Tectonics <b>14</b> 1182-1204 1995
94/044	<b>McDougall I</b> Leakey MG; Feibel CS; Walker A	New four-million-year-old hominid species from Kanapoi and Allia Bay, Kenya	Nature <b>376</b> 565-571 1995
94/044	<b>McDougall I</b> Kent AJR	<sup>40</sup> Ar- <sup>39</sup> Ar and U-Pb age constraints on the timing of gold mineralisation in the Kalgoorlie gold field, Western Australia	Economic Geology <b>90</b> 845-859 1995
97/055	<b>Chappell BW</b> King PL; White AJR; Allen CM	Characterisation & origin of aluminous A-type granites from the Lachlan fold belt, SE Australia	Petrology <b>38 (3)</b> 371-391 1997
97/055	<b>Chappell BW</b> Bryant CJ; Arculus RJ	Clarence River supersuite: 250 Ma cordilleran tonalitic I-type intrusions in eastern Australia	Petrology <b>38 (8)</b> 975-1001 1997
97/061	<b>McDougall I</b> Leakey MG; Feibel CS; Ward C; Walker A	New specimens and confirmation of an early age for <i>Australopithecus anamensis</i>	Nature <b>393</b> 62-66 1998
98/003	<b>Summerhayes GR</b> Bird R; Gosden C; Specht J; Torrence R	Application of PIXE-PIGME to archaeological analysis of changing patterns of obsidian use in West New Britain, Papua New Guinea	<i>Advances in Archaeological Volcanic Glass Studies</i> 129-158 1998 Shackley (ed) New York 0 306 45804 7
98/005	<b>McDougall I</b> Baldwin SL; Lister GS	Thermochronology of the South Cyclades Shear Zone, los Greece: effects of ductile shear in the argon partial retention zone	Geophysical Research <b>103</b> 7315-7336 1998
98/005	<b>McDougall I</b> Fossen H; Dunlap WJ	Timing and kinematics of Caledonian thrusting and extensional collapse, southern Norway: Evidence from <sup>40</sup> Ar/ <sup>39</sup> Ar thermochronology	J Structural Geology <b>20</b> 765-781 1998
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98/075	<b>Campbell SJ</b> Harker SJ; Cadogan JM; Stewart GA; Kennedy SJ; Edge AVJ	A structural and magnetic study of $Nd(Ni,Fe)_{8.5}Si_{2.5}$	Magnetism & Magnetic Materials <b>183</b> 101-110 1998
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98/075	<b>Campbell SJ</b> Hofmann M; Smith RI; Kennedy SJ; Zhao XL; Edge AVJ	Competing magnetic interactions in $La_{0.8}Y_{0.2}Mn_2Si_2$	Materials Science Forum 278-281 1998
98/075	<b>Campbell SJ</b> Zhang H; Wu E; Kennedy SJ; Li HS; Studer AJ; Bulcock SR	Structural study of the rare-earth transition-metal intermetallic compound $Nd_3Ni_{29}Si_4B_{10}$	Alloys and Compounds <b>278</b> 239-245 1998
98/076P	<b>Campbell SJ</b> Kaczmarek WA	Mössbauer and neutron studies of mechanochemically treated materials	Inter Symposium on Metastable, Mechanically alloyed and Nanocrystalline Materials K-15 1998 Wollongong Australia
98/076P	<b>Campbell SJ</b> Wu E; Kaczmarek WA; Hofmann M; Kennedy SJ	Mechanochemical treatment of haematite - neutron diffraction investigation	Proc ISMANAM98 1998 Wollongong NSW Australia
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98/080P	<b>Schindhelm</b> Hyvarinen JP; Walsh WR; Wielunski LS; Clissold RA; Swain MV	Ion irradiated pyrolite as a joint replacement material	58th Annual Scientific meeting AOA 1998
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97/100	<b>Kisi EH</b> Crossley AA; Myhra S; Barsoum MV	Structure and crystal chemistry of $Ti_3SiC_2$	Phys Chem Solids <b>59 (9)</b> 1437-1443 1998
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98/098	<b>White P</b> Torrence R; Summerhayes GR	Sociality and the short distance trade: intra-regional obsidian exchange in Willaumez region, Papua New Guinea	Archaeology Oceania <b>32</b> 74-84 1997
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98/100P	<b>Kennedy BJ</b> Hunter BA	High temperature phases of SrRuO <sub>3</sub>	Physical Review B <b>58</b> 653-658 1998
98/100P	<b>Kennedy BJ</b>	Structural trends in pyrochlore type oxides	Physica B Condensed Matter <b>241-3</b> 303-310 1998
98/107	<b>James BW</b>	Measurement of electric fields in plasmas using laser induced fluorescence	Symposium on Plasma Science for Materials 56 1998 Sydney Australia
PGRA	<b>Taylor SE</b> Jenkinson A; Birch GF; Heijnis H	Historical pollutant trends in Port Jackson estuary Sydney Australia	SPERA98 Environmental Radioactivity and its application in Environmental Studies 1998 Conference Handbook Christchurch NZ
PGRA	<b>Matthai C</b> Birch GF; Jenkinson A; Heijnis H	The use of size-normalisation technique in the interpretation of radiometric data	SPERA98 Radioactivity & the Environment 1998 Conference Handbook Christchurch NZ
PGRA	<b>Moussa SM</b> Fenton RR; Kennedy BJ	Studies of the crystalline forms of bis(glycinato)copper(II)	Materials Science Forum <b>278-281</b> 912-917 1998
PGRA	<b>Matthai C</b> Birch GF; Jenkinson A; Heijnis H	Sediment resuspension on the middle continental shelf adjacent to Sydney Australia - evidence using <sup>210</sup> Pb	SPERA98 Radioactivity & the Environment 1998 Conference Handbook Christchurch NZ
PGRA	<b>Taylor SE</b> Jenkinson A; Birch GF; Heijnis H	Temporal sediment contaminant concentration changes & decreasing contaminant influx into Port Jackson estuary Sydney Australia	SPERA98 Environmental Radioactivity & its application in Environmental Studies 1998 Conference Handbook Christchurch NZ
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96/076	<b>van Moort JC</b> Stott CL; Xu L; Butt CRM; Bailey GM	Gold & associated elements in the lateritic regolith at Jim's Find South, Tanami Desert, NT Australia	30th International Geological Congress <b>19</b> 241-256 1997
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97/079	<b>van Moort JC</b> Allen NR	A new low-intensity magnetic separator which employs rotating magnetic fields to reduce particle entrapment	Sixth Mill Operators Conference <b>3</b> 171-175 1997 Australasian Institute of Mining & Metallurgy Carlton Vic Australia
97/079	<b>van Moort JC</b> Xu L	EPR characterisation of gold mineralisation in weathered terrain, Jim's Find South, Tanami Desert	1st Asia-Pacific EPR/ESR Symposium 141-148 1998 Springer, Singapore 981 3083 23 9
97/079	<b>van Moort JC</b> Russell DW	EPR as an exploration tool to assess quartz reefs, Beaconsfield Gold Mine, Tasmania Australia	1st Asia-Pacific EPR/ESR Symposium 295-303 1998 Springer Singapore 981 3083 23 9
97/137	<b>McMahon PJ</b> Treimer W	The geometric origin of asymmetric small angle neutron scattering from an elastically bent double crystal diffractometer	Cryst Research & Technology <b>33 (4)</b> 625 636 1998
97/137	<b>McMahon PJ</b> Treimer W; Wagenfeld H	Small angle neutron scattering of porous glassy carbon	BENSC Experimental Reports 265-266 1997 Kirschaum Y & Michaelsen R eds. Berlin Neutron Scattering Center Berlin 0936 0891

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98/110P	<b>van Moort JC</b> Pwa A	Application of rock geochemistry in search of volcanic-hosted massive sulphide deposits, Mount Read Volcanics Western Tasmania. New Developments in research for ore deposit exploration	Geological Society 44:58 1997 Australia
98/110P	<b>van Moort JC</b> Russell WD	EPR as an exploration tool to assess quartz reefs, Beaconsfield gold mine Tasmania Australia	Modern applications of EPR/ESR from biophysics to materials science 295-303 1998 Rudowicz CZ (ed) Springer Singapore
98/110P	<b>van Moort JC</b> Li X; Butt CRM	Electron paramagnetic resonance (EPR) as a tool in gold exploration	Engineering & Environmental Geophysics for the 21st Century 206-212 1997 He Zhenhua (ed) Chengdu
98/112	<b>Yates BF</b>	New hope for people with Parkinson's disease	Chemistry in Australia 41 1998
98/112	<b>Yates BF</b> Bruno R; Graham D	Computational methods for predicting biological activity	Chemistry in Australia 12-15 1998
<b>UNIVERSITY OF TECHNOLOGY SYDNEY</b>			
98/114	<b>Ray A</b> Stevens MG; Knight PS; Stevenson K; Mapson C; Aldridge LP	The retention of caesium and strontium in cemented zeolites	40th AINSE Anniversary Conference 1998 Sydney Australia
98/114	<b>Ray A</b> Stevenson K; Stevens MG; Knight RS; Aldridge LP	Retention of radioactive ions in cemented zeolites	Inter Ceramic Conference AUSTCERAM 1998 Melbourne Australia
98/115	<b>Baker AT</b> Orsini S; Di Bartolo N; Smith SV	Complexation behaviour of DACDA and DAPDA with <sup>166</sup> Dy/ <sup>166</sup> Ho parent-daughter system and its potential for use in radioimmunotherapy	AINSE Radiation Conference – Radiation'98 1998 Melbourne Australia 0 9598472 8 6
98/116	<b>Baker AT</b> Du T; Smith SV	Potential of <sup>57</sup> Ni/ <sup>57</sup> Co generator system for radiolabelling proteins for imaging	AINSE Radiation Conference – Radiation'98 1998 Melbourne Australia 0 9598472 8 6
PGRA	<b>Southon PD</b> Bartlett JR; Woolfrey JL; Stevens MG	Evolution of the structure of aqueous zirconia gels during preparation and heating	Sol-Gel Processing of Advanced Materials Ceramics Transactions <b>81</b> 75-80 1998
PGRA	<b>Southon PD</b> Bartlett JR; Finnie KS; Woolfrey KS; Ben-Nissan B; Kannangara GSK	The formation of zirconium hydroxide nanoparticles from aqueous nitrate solutions	Australasian Ceramic Society in press
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98/119	<b>Bradshaw SD</b> Bonnet XA; Vacher M; Naulleau G	Reproductive investment in snakes: investigations using nuclear magnetic resonance.	Energetics of Reproduction in Birds, Mammals & Reptiles: Exploring New Technologies 3-4 1996 PJ a R Drent CNRS Centre d'Etudes Biologiques de Chize
98/119	<b>Bradshaw SD</b> Bonnet XA; Shine R	Capital versus income breeding: an ectothermic perspective	Oikos <b>83</b> 333-342 1998
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98/119	<b>Bradshaw SD</b> Bonnet XA; Naulleau G	Are body reserves important for reproduction in male dark green snakes (Colubridae, <i>Coluber viridiflavus</i> )?	Herpetologica <b>52</b> 137-146 1996
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# Performance Indicators for AINSE

1. **Objective (1): to provide a mechanism for users in member organisations of AINSE to have access to major nuclear science and engineering and associated facilities at ANSTO and other agreed sites for research purposes**

(for example, meet an acceptable level of the Universities' demand for access to such facilities.)

## Key Performance Indicator KPI(1)

*Percentage of the demand for access to facilities and services required by the Universities which is met through the award of AINSE Grants.*

where:

“demand” is determined by the number of eligible projects applying for AINSE Grants.

[The number of eligible projects is determined by the number of applications for AINSE Grants after ineligible projects (as specified in the guidelines for preparing applications) have been taken out by the Secretariat.]

“facilities and services required by the Universities” is the list recommended by the AINSE Specialist Committees and approved by Council (the list is published each year in the Guidelines for preparing AINSE Grant applications).

"Universities" is taken to include all higher education institutions which are members of AINSE.

KPI(1) = (Number of projects awarded AINSE Grants for use of LHSTC facilities and services) divided by (number of eligible projects requesting use of LHSTC facilities and services) expressed as a percentage.

## Past performance

Year	1993	1994	1995	1996	1997	1998
No. of applications	183	204	228	248	247	172
Grants awarded	153	173	201	207	201	147
KPI(1)	84%	85%	88%	83%	81%	83%
KPI(1) (excl. RIEF)		70%	69%	64%	66%	87%

Note: KPI(1) reflects to a large extent AINSE's policy of providing some support for every worthy project without disadvantaging the best projects by under-funding them. It assumes that the AINSE Grants awarded are sufficient to achieve meaningful research outcomes in all cases. The AINSE Specialist Committees, in particular, have the responsibility of ensuring that all projects recommended for support are “worthy”. That is, they satisfy AINSE as to their high scientific merit, their scientific and technical feasibility, and the adequacy of plans, personnel and resources for their execution (ref: Guide-lines for the preparation of applications for AINSE Grants, Section 5). The Council has the ultimate responsibility for ensuring all Specialist Committees maintain these standards. The inclusion of projects funded under the RIEF Program should possibly be excluded since RIEF Grants are for developing research infrastructure. These Grants are included in the KPI for Objective 4.

Other Performance Indicators for Objective 1:

Number of applications and Grants awarded as a percentage of the number of member universities (including RIEF funded grants)

Year	1993	1994	1995	1996	1997	1998
No. of universities	26	28	31	34	36	35
Applications/uni	7.0	7.3	7.4	7.3	6.9	6.9
Grants/uni	5.9	6.2	6.5	6.1	5.6	5.0

**2 Objective (2) to facilitate graduate and undergraduate education and training experience utilising major nuclear science and technology facilities at ANSTO and other agreed sites**

(for example, make a significant contribution to postgraduate training in nuclear science and technology.)

**Key Performance Indicator KPI(2)**

*The number of University students awarded AINSE Postgraduate Research Awards as a percentage of those applying.*

where:

Number of postgraduate students is determined by the number of eligible applications for AINSE PGRAs.

KPI(2) = (Number of University students awarded AINSE APRAs) divided by (Number of University students applying for AINSE APRAs) expressed as a percentage.

Note: Many other postgraduate and Honours Year students gain training experience through AINSE Grants awarded to their supervisors but the degree of training is varied (significant supervision and training from qualified staff at the facilities is not guaranteed when students use the facilities and services) and the outcomes unknown. Expenditure on the undergraduate AINSE Winter School at ANSTO program is small in comparison with the AINSE PGRA scheme. The prime objective of the program is to encourage more students to undertake postgraduate education - which should be reflected in the number of future applications for AINSE PGRA's. The AINSE Postgraduate Research Award provides about the only measure of performance and outcome (ie: a PhD having a significant content of nuclear science and technology).

Past performance

Year	1993	1994	1995	1996	1997	1998
No. of PGRA applications	22	20	14	13	13	23
No. of PGRA's awarded	6	7	4 + 2*	6 + 3*	6 + 2*	6 + 2*
KPI(1)	27%	35%	43%	69%	62%	35%

(Note\*: Special graduate student awards without stipend)

**Other Performance Indicators**

*The number of University students awarded AINSE Postgraduate Research Awards per member university of AINSE.*

Year	1993	1994	1995	1996	1997	1998
No. of universities	26	28	31	34	36	35
Applications/uni	0.85	0.71	0.45	0.38	0.36	0.66
PGRA's/uni	0.23	0.25	0.19	0.26	0.22	0.23

*The total number of students completing PhD theses who have used facilities and services made available through AINSE.*

Information on the number of students completing PhD theses that used facilities through AINSE Grants awarded to their supervisors is now being sought in the annual progress reports. The numbers could possibly be expressed as a percentage of the total number of PhDs completed in the physical and biological sciences.

**3 Objective (3) to encourage collaboration and cooperation between member organisations of AINSE in areas primarily related to nuclear science and engineering and their applications** (for example, the number of meaningful collaborations arising from AINSE-supported projects).

Note: Meaningful collaborations can be measured by the number of joint publications. However, unless AINSE has been provided with a copy of the publication it is not always possible to identify the affiliations of the authors. It is intended to seek this information in the future by means of the annual Progress Reports. In the interim, since the main purpose of Objective (3) is to encourage collaborations between University researchers and ANSTO staff, a measure of collaboration (of a sort) can be obtained from the number of collaborative projects identified from application forms for AINSE Grants.

**Key Performance Indicator KPI(3)**

Interim KPI(3) = (Number of collaborative projects each year) divided by (Total number of AINSE supported projects) expressed as a percentage.

Where:

“collaborative projects” refers to AINSE Grants involving ANSTO and university staff as joint investigators (obtainable from Grant application forms).

**Past performance**

Year	1994	1995	1996	1997	1998
Collaborative projects	Not known	115	124	135	137
Total no. of projects	173 (Priority A)	201	207	201	174
KPI(3)		57%	60%	67%	79%

(Note: This indicator can be "forced" by giving preference to AINSE Grants that are collaborative - which is a condition in the case of RIEF grants for AMS projects and for use of the SIMS.)

Future performance indicator for objective 3

Number of papers naming ANSTO and university staff as joint authors published in refereed journals and conferences with ISBN numbers, etc. expressed as a percentage of Grants and PGRAs awarded.

**4 Objective (4): to sustain and support the development of major nuclear science and technology facilities at ANSTO and other agreed sites for shared use by member organisations of AINSE** (for example, funds raised for the development of facilities).

**Key Performance Indicator KPI(4)**

*Funds raised for constructing and developing major nuclear science and technology facilities in Australia accessible to member organisations through AINSE expressed as a percentage of AINSE membership subscriptions.*

Where:

"Funds" in this context mean grants from external sources (such as RIEFP Grants) paid into the AINSE bank account. It excludes the value of in-kind contributions and funds administered through member organisations. It also excludes joint ANSTO/University Large Grants (for research equipment at ANSTO) originating from AINSE/ANSTO collaborations, etc. In the future, it will include contributions from the Long Term Projects Reserve.

KPI(4) = Total value of external grants for constructing and developing major facilities divided by annual membership subscriptions from ANSTO and the universities (expressed as a percentage).

## Past performance

Year	1993	1994	1995	1996	1997	1998
External grants	\$ 201,000	\$ 540,000	\$ 445,000	\$ 795,000	\$610,000	\$600,000
Subscriptions	\$1,304,700	\$1,361,500	\$1,430,700	\$1,470,600	\$1,638,300	\$1,719,300
KPI(4)	15 %	40 %	31 %	54 %	37%	35%

### Other Performance Indicators

New major nuclear science and technology facilities in Australia for shared use by member organisations of AINSE developed with the support of AINSE (such as the \$8.7 million National Plasma Fusion Research Facility) but not paid into the AINSE bank account.

## 5 OVERALL PERFORMANCE INDICATOR

*The tangible benefits (expressed in financial terms) received by member universities of AINSE in return for membership subscriptions paid.*

The indicator that has been used for many years by AINSE is the benefit/subscription ratio for determining subscriptions each year. This indicator incorporates the expenditure by AINSE in support of all activities undertaken by the universities under Objectives 1) to 4). It includes some measure of efficiency on a year to year basis in as much as AINSE does not generally pay ANSTO or the service provider until the access to facilities (or the results of sample analyses, etc.) have been provided. Since it does not reflect actual time on facilities or actual samples measured etc., it relies on the Specialist Committees, the Executive Committee and ultimately, Council, to ensure that the costs for use of facilities etc. are acceptable to the universities. It also incorporates decisions on how AINSE income is spent. For example, money spent on developing facilities at ANSTO is considered as a benefit shared equally between all universities.

**AINSE KPI =** Sum of [(Actual expenditure on AINSE Grants) + (Expenditure on Fellowships and PGRAs) + (expenditure on conference subsidies) + (expenditure on development of facilities)] divided by (Total Subscriptions paid by Universities).

Excluded from the KPI is expenditure on all administrative functions such as Secretariat operations (including salaries and superannuation), Council and committee meetings, conference management, publications and promotions, funds transferred to reserves, etc.

[Note: Many of the activities excluded from the KPI, such as Council meetings and publications, provide useful outcomes including networking and dissemination of knowledge. However, these outcomes are not easy to quantify and do not provide Councillors with tangible evidence that membership subscriptions are justified. They are therefore excluded. There is a strong incentive to keep administrative costs down. A balance has to be made between maintaining financial reserves earning enough interest to meet Secretariat salaries, etc, and drawing on those reserves to meet AINSE objectives defined by the KPI target.

The latest figures for this index are reproduced below.

Year	1992	1993	1994	1995	1996	1997	1998
<b>AINSE KPI</b>	<b>3.31</b>	<b>3.09</b>	<b>2.67</b>	<b>2.75</b>	<b>3.86</b>	<b>3.35</b>	<b>3.57</b>
KPI (without RIEF)	2.67	2.63	2.08	2.17	2.29	1.83	2.01
5 year average	-	3.00	2.96	2.91	3.15	3.16	3.81

(Note: The 5 year average for each university is used for determining its membership subscription and relates to the preceding 5 years.)

**An acceptable benefit subscription ratio is 3.00 : 1.**

**The benefit subscription ratio should not be less than 2.00 : 1.**

# ***University Codes***

<b>Code</b>	<b>University</b>	<b>Code</b>	<b>University</b>
ADE	University of Adelaide	NCT	University of Newcastle
AKL	University of Auckland	NSW	University of New South Wales
ANS	ANSTO	NTU	Northern Territory University
ANU	Australian National University	QLD	University of Queensland
BAL	University of Ballarat	QUT	Queensland University of Technology
CBR	University of Canberra	RMI	Royal Melbourne Institute of Technology
CQU	Central Queensland University	SCU	Southern Cross University
CSU	Charles Sturt University	USQ	University of Southern Queensland
CUR	Curtin University of Technology	SWI	Swinburne University of Technology
DEA	Deakin University	SYD	University of Sydney
ECU	Edith Cowan University	TAS	University of Tasmania
FLI	Flinders University	UNE	University of New England
GRI	Griffith University	USA	University of South Australia
JAM	James Cook University	UTS	University of Technology Sydney
LAT	La Trobe University	UWA	University of Western Australia
MAC	Macquarie University	UWS	University of Western Sydney
MEL	University of Melbourne	VIC	Victoria University of Technology
MON	Monash University	WOL	University of Wollongong
MUR	Murdoch University		

## ***Specialist Committees***

ACC	Accelerator Science
AMS	Accelerator Mass Spectrometry
BIO	Radiopharmaceuticals & Neutron Irradiation
ENG	Engineering, Materials & Nuclear Technology
ENV	Environmental Science & Becquerel
NS	Neutron Scattering
PLA	Plasma Fusion
RAD	Radiation including ARL & Auckland