

Section 2

Contents

AINSE Council	2
Executive Committee	3
AINSE Staff and Consultants	3
Specialist Committees	4
Conference Planning Committees	5
Financial Statements	6
AINSE Postgraduate Research Awards	17
Summary of AINSE Awards	20
Summary of Experiments at ISIS	35
Publications	38
Performance Indicators for AINSE	60
University Codes	63
Specialist Committee Codes	63

AINSE Council 2003

Member Organisations and Representation

2 Council Meetings held in 2003

Organisation	Membership Commenced	Councillor	Meetings Attended
ANSTO	1958	Prof Helen Garnett	0
ANSTO, Environment		Prof Ann Henderson-Sellers	1
ANSTO, Materials		Dr George Collins	2
ANSTO, Nuclear Technology		Mr Jack Dillich	2
ANSTO, Radiopharmaceuticals		Dr Stuart Carr	2
ANSTO, Bragg Institute		Dr Robert Robinson	2
The University of Queensland	1958	Dr Paul Meredith	1
The University of New England	1958	Dr Peter Grave	2
The University of Sydney	1958	A/Prof Brendan Kennedy	2
The University of New South Wales	1958	Prof Hans Coster, President	2
The Australian National University	1958	Prof John White, Vice President	
The University of Melbourne	1958	Prof Jim Camakaris	1
University of Tasmania	1958	Prof Allan Canty	2
The University of Adelaide	1958	A/Prof Gerald Laurence	2
The University of Western Australia	1958	Prof Brian Stone	2
Monash University	1961	Dr Trevor Hicks	1
The University of Newcastle	1965	A/Prof Bruce King	1
Flinders University of SA	1966	Prof Peter Teubner	2
La Trobe University	1966	Dr Paul Pigram	1
Macquarie University	1966	Prof James Piper	1
James Cook University	1970	Prof Richard Keene	1
University of Wollongong	1975	Prof Allan Chivas	2
Griffith University	1975	A/Prof Greg Hope	2
Murdoch University	1985-1997 rejoined 1998	A/Prof Stephen Thurgate	2
University of Technology, Sydney	1988	E/Prof Evan Leitch	2
RMIT University	1988	Prof Peter Johnston	2
Curtin University of Technology	1989	Prof Brian O'Connor	1
Central Queensland University	1991	Dr David Druskovich	2
University of South Australia	1991	Dr Namita Choudhury	1
Swinburne University of Technology	1991	Dr Anthony Bartel	2
Queensland University of Technology	1992	Dr Riaz Akber	2
University of Western Sydney	1993	Dr Robyn Crumbie	2
Victoria University	1994	Prof Albert McGill	0
Southern Cross University	1994	A/Prof Bill Boyd	2
The University of Auckland	1995	Prof Jim Metson	2

Charles Sturt University	1995	A/Prof Michael Antolovich	2
Charles Darwin University	1995	A/Prof David Parry	2
Edith Cowan University	1996	Prof Patrick Garnett	0
University of Canberra	1996	Prof Mohamed Khadra	0
The University of Southern Queensland	1996	Prof Malcolm McKay	0
Deakin University	1997	Prof Pip Hamilton	0
University of Ballarat	1997	Mr Stafford McKnight	1
Australian Catholic University	2001	Dr Neil Saintilan	2
Secretary to Council (non-voting)		Dr Dennis Mather, AINSE 2	
Alternate Representatives and other attendees			
University of Canberra		Prof Bill Maher (a)	1
Edith Cowan University		Dr Stephen Hinckley (a)	2
Monash University		Prof Rob Norris (a)	1
University of Western Australia		Dr Jasmine Henry (invited for C2)	1
The University of Melbourne		A/Prof Ron Cooper	2
Macquarie University		Dr Scott Butcher (a)	1
La Trobe University		Dr John Webb (a)	1
Edith Cowan University		Dr Stephen Hinckley	2
La Trobe University		A/Prof John Webb	1

Executive Committee

Four Executive Committee Meetings held in 2003

Councillor	Office/Position	Organisation	Meetings Attended
Prof Hans Coster	President	The University of New South Wales	4
Prof John White	Vice – President	The Australian National University	4
Prof Brian O'Connor		Curtin University of Technology	4
A/Prof Ron Cooper	Past President	The University of Melbourne	3
Dr George Collins		ANSTO	1
Dr Stuart Carr		ANSTO	1
Dr Robert Robinson		ANSTO	4
Prof Ann Henderson-Sellers		ANSTO	2
Prof Helen Garnett		ANSTO	1
Dr Dennis Mather		AINSE	4

AINSE Staff

Scientific Secretary Dr Dennis Mather

Mrs Irene Parker	until 24 October
Mrs Nerissa Phillips	on leave
Miss Tanya Irvine	on leave until 27 August 03
Mr Andrew Henriksen	until 13 August 03
Ms Rachael Bell	17 February to 24 December
Mr Ben Thompson	from 24 November
Mrs Sandy O'Connor	part-time

Specialist Committees for 2003

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

(a) indicates 'alternate'

		Meetings Attended
Archaeology and Geosciences Committee		
Prof Allan Chivas, Convenor	University of Wollongong	2
A/Prof Bill Boyd	Southern Cross University	2
Dr Peter Grave	The University of New England	2
Dr David Garnett	Becquerel Laboratories (ex officio)	1
Dr David Fink	Physics, ANSTO	2
Dr Henk Heijnis	Environment, ANSTO	1
Ms Helen Waldron (a)	Becquerel Laboratories (ex officio)	1
Biomedical Science and Biotechnology Committee		
Dr Andrew Katsifis, Convenor	Radiopharmaceuticals, ANSTO	2
Dr Rey Casse	University of Adelaide, Queen Elizabeth Hospital	1
Prof Hans Coster	The University of New South Wales	2
Dr George Larcos	The University of Sydney	1
Dr Roger Martin	University of Melbourne, Trescowthick Research Laboratory	2
Dr Stuart Carr	Director, Radiopharmaceuticals, ANSTO	2
Environmental Sciences Committee		
Prof Andrew McMinn, Convenor	University of Tasmania	2
Dr Riaz Akber	Queensland University of Technology	2
Prof Don Bradshaw	University of Western Australia	2
Dr Derry McPhail	The Australian National University	2
Dr Geraldine Jacobsen	Physics, ANSTO	2
Dr Andrew Smith	Physics, ANSTO	2
Materials - Structures and Dynamics Committee		
Dr Brendan Kennedy, Convenor	The University of Sydney	2
Dr Craig Buckley	Curtin University of Technology	2
Dr Ian Gentle	The University of Queensland	2
Dr Trevor Hicks	Monash University	1
Dr Robert Robinson	Director, Neutron Scattering, ANSTO (ex officio)	2
Dr Wim Klooster	Physics, ANSTO	2
Prof John White (a)	Australian National University	1
Materials - Materials – Properties and Engineering Committee		
Dr Paul Pigram, Convenor	La Trobe University	1
A/Prof Ron Cooper	University of Melbourne	0
Prof Anatoly Rozenfeld	University of Wollongong	1
Dr Andrew Whittaker	University of Queensland	0
Dr David Cohen	ANSTO	1
Dr Kathryn Prince	ANSTO	1
Dr Dan Perera	ANSTO	1

Conference Planning Committees

15th International Symposium of Radiopharmaceutical Chemistry 11 -14 August 2003

Dr Andrew Katsifis ANSTO

Mr Bill Burch ANSTO

Ms Pam Keenan ANSTO

Dr Stuart Carr ANSTO

Dr Suzanne Smith ANSTO

Dr Therese Donlevy ANSTO

Dr Dennis Mather AINSE

Ms Fiona Driver, Karen Leis Tourhosts

International Congress of Radiation Research 2003 Conference – 17 - 22 August 2003

Prof Lester Peters, Conference President Peter McCallum Cancer Institute

Prof Martin Lavin, Conference Chairman Queensland Institute of Medical Research

A/Prof Ron Cooper The University of Melbourne

Dr Roger Martin Peter McCallum Cancer Institute

Dr Graeme Dickie Royal Brisbane Hospital

Dr Suzanne Smith ANSTO

Mr Alex Zapantis Environment Australia

Dr Dennis Mather AINSE

Ms Lidia Dalton ICMS

2nd AINSE Symposium on Small-Angle Scattering and Reflectometry 25-26 June 2003

25th & 26th June, AINSE Theatre, Lucas Heights

Dr Jamie Schulz Bragg Institute

Dr Michael James Bragg Institute

Dr Richard Garrett ASRP, Bragg Institute

Dr Robert Knott Bragg Institute

Prof Brian O'Connor Curtin University of Technology

Dr Robert Robinson Bragg Institute

A/Prof Greg Warr University of Sydney

Prof John White Australian National University

Dr Dennis Mather AINSE

3rd Quaternary Dating Workshop AINSE Theatre, Lucas Heights, Sydney 1 and 2 October 2003

Prof Allan Chivas, University of Wollongong

Dr David Fink, ANSTO

Dr Henk Heijnis, ANSTO

Dr Dennis Mather, AINSE

13th Nuclear Techniques of Analysis & 8th Vacuum Society of Australia Congress 26-28 November 2003

A/Prof David Jamieson The University of Melbourne

A/Prof Bruce King The University of Newcastle

Prof Rob Elliman The Australian National University

Dr Andreas Markwitz Institute of Geological & Nuclear Science

Dr David Cohen ANSTO

Dr Chris Ryan CSIRO

Dr Dennis Mather AINSE

Mrs Irene Parker AINSE

Workshop on *Data Visualisation, Reduction and Analysis* at Australia's Replacement Research Reactor

30 and 31 March 2004

Dr Nick Hauser ANSTO

Dr Jamie Schulz ANSTO

Dr Shane Kennedy ANSTO

Dr Robert Robinson ANSTO

Dr Dennis Mather AINSE

Workshop on *Data Visualisation, Reduction and Analysis* at Australia's Replacement Research Reactor

30 and 31 March 2004

Dr Nick Hauser ANSTO

Dr Jamie Schulz ANSTO

Dr Shane Kennedy ANSTO

Dr Robert Robinson ANSTO

Dr Dennis Mather AINSE

Auditors' Report

To the Members 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, 2003 as set out on schedules 1 to 9. 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.

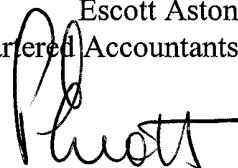
Our audit has been conducted in accordance with Australian Auditing Standards. Our procedures included examination, on a test basis, of evidence supporting the amounts and other disclosures in the financial report and significant accounting estimates. These procedures have been undertaken to form an 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, 2003 and the results of its operations and cash flows for the year then ended.

Escott Aston
Chartered Accountants



P R Escott
Partner

Sydney, dated this 21st day, of April 2004

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 2003.

Committee Members

Professor Hans Coster, Vice President
Professor John White
Associate Professor Ron Cooper, Immediate Past President
Dr George Collins
Dr Stuart Carr
Dr Robert Robinson
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.

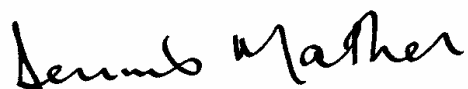
Significant Changes

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

Operating Result

The surplus for the year amounted to \$68,921.

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



Dr Dennis Mather
Public Officer & Scientific Secretary
Dated this 21st day of April 2004

Balance Sheet

Schedule 1

as at 31 December 2003

	Notes	31-Dec-03 \$	31-Dec-02 \$
Current Assets			
Cash	2	165,704	388,098
Receivables	3	72,989	86,332
Investments	4	2,372,695	2,771,234
Other	5	27,199	168,854
Total Current Assets		2,638,587	3,414,518
Non-Current Assets			
Plant and Equipment	6	2,723,550	2,714,485
Total Non-Current Assets		2,723,550	2,714,485
Total Assets		5,362,136	6,129,003
Current Liabilities			
Creditors	7	506,351	956,594
External Grants Received in Advance	8/9	1,013,755	1,267,278
Other Payments Received in Advance	8/9	1,073,000	1,186,373
Provisions for Employee Entitlements	10	29,260	29,755
Total Current Liabilities		2,622,366	3,440,000
Non-Current Liabilities			
Provisions for Employee Entitlements	10	6,926	25,080
Total Non-Current Liabilities		6,926	25,080
Total Liabilities		2,629,292	3,465,080
NET ASSETS		2,732,845	2,663,923
Equity			
Awards Reserve	16	2,520,936	2,520,936
Long Term Projects Reserve	16	500,000	500,000
Accumulated results of operations		(288,092)	(357,013)
TOTAL EQUITY		2,732,844	2,663,923

Income and Expenditure Statement

Schedule 2

For The Period Ended 31 December 2003

	Notes	31-Dec-03 \$	31-Dec-02 \$
COST OF SERVICES			
Operating Revenue			
Payments from members		2,139,288	2,057,103
External Grants	13	470,680	494,090
Interest Received		136,920	209,664
Other	15	934,682	4,860
Total Operating Revenue		3,681,578	2,765,717
Operating Expenses			
Wages & Salaries		197,579	201,356
Superannuation		31,693	26,020
AINSE Awards			
Students	11	440,434	413,957
Research Awards	11	1,256,888	1,676,662
Conference Subsidies		74,436	53,670
External Grants	13	413,690	643,381
Other Expenses	14	1,197,937	149,063
Total Operating Expenses		3,612,657	3,164,109
Surplus/(Deficit) for the year		68,921	(398,392)
Accumulated funds brought forward		(357,013)	42,396
Funds Available		(288,092)	(355,996)
Add(Less): transfer to Reserves			
Grants Reserve	16		1,017
Accumulated results of operations at end of financial year		(288,092)	(357,013)

Statement of Cash Flows

Schedule 3

For Period Ended 31 December 2003

	Notes	31-Dec-03 \$ Inflows/(Outflows)	31-Dec-02 \$ Inflows/(Outflows)
CASH FLOWS PROVIDED BY (USED IN) OPERATING ACTIVITIES			
Inflows:			
Receipts from members and conferences		2,973,940	2,186,916
Receipts from grants		217,164	543,872
Interest received		133,146	226,649
		3,324,250	2,957,437
Outflows:			
Grant expenditures		(2,185,448)	(2,787,670)
Payments to suppliers and employees		(1,735,829)	(361,845)
		(3,921,276)	(3,149,515)
Net cash flows provided by (used in) operating activities	17	(597,026)	(192,078)
CASH FLOWS PROVIDED BY (USED IN) INVESTING ACTIVITIES			
Outflows:			
Plant and equipment		(23,907) *	(1,831,863)
Net cash flows provided by (used in) investing activities		(23,907)	(1,831,863)
Net increase in cash held		(620,933)	(2,023,941)
Cash at beginning of reporting period as at 31/12/02*		3,159,332	5,183,272
Cash at end of reporting period		2,538,399	3,159,331

For the purposes of the Statement of Cashflows, the cash balance as at 31 December 2003 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	165,704	388,098
	Investment	2,372,696	2,771,233
Cash Flow Statement		2,538,399	3,159,331

* Amendment to Comparative Figures

The comparative figures used in the Statement of Cash Flows for the year have been amended so as to transfer the deposit on the Tandem Accelerator of \$856,996 which was paid in the 2001 year, from Cash Flows used in Operating Activities to CASH Flows used in Investing Activities.

Notes to and Forming Part of the Accounts

Schedule 4

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 2003 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

Schedule 5

	31-Dec-03 \$	31-Dec-02 \$
2. CASH		
Operating Account	165,204	387,598
Petty Cash	500	500
	165,704	388,098
Commitments for Expenditure		
Tandem	500,000	506,418
ISIS	8,750	25,000
Trade Creditors	506,351	992,179
EA/IRMS	84,999	210,099
Awards and Studentships Awarded in 2003 for payment in 2004 Note A	2,122,000	2,520,936
	3,222,100	4,254,632
Note A		
Invoices for membership fees are raised in January and payment is subsequently received over the first three quarters.		
Grant reserve was established in line with advice from the auditors.		
Accordingly, funds received from membership fees in 2003 are used for grants and studentships during 2004.		
Existing studentships at 31 December 2003 and committed for years 2004 and 2005 amount to \$622,297		
3. RECEIVABLES		
Trade Debtors	32,907	3,527
Grant Receivables	-	-
Other Receivables	40,082	82,806
	72,989	86,333
4. INVESTMENTS		
Cash Deposit Account	343,032	771,234
Term Deposit Account	2,029,663	2,000,000
	2,372,695	2,771,234
5. OTHER CURRENT ASSETS		
Prepayments	(0)	145,429
Interest Accrued	27,199	23,425
	27,199	168,854
6. PLANT AND EQUIPMENT		
Plant & Equipment		
Costs	95,476	94,065
Additions/(Disposals)	-	-
Accumulated Depreciation	78,084	83,833
Closing Written Down Value	17,392	10,232
Plant & Equipment Accruals		
Asset Under Construction	2,680,065	2,680,065
Motor Vehicles		
Costs	28,465	27,382
Additions/(Disposals)	-	-
Accumulated Depreciation	2,372	3,195
Closing Written Down Value	26,093	24,187
Total	2,723,550	2,714,485

Notes to the Financial Statements Schedule 6

	31-Dec-03 \$	31-Dec-02 \$
7. CREDITORS		
AINSE - Trade Creditors	2,421	1,121
Other Creditors	3,226	67,403
GST Collected on Outputs	-	-
Accrued Charges - ISIS	-	405,631
Accrued Charges - Other	500,705	482,439
	<u>506,351</u>	<u>956,594</u>
8. EXTERNAL GRANTS RECEIVED IN ADVANCE		
AINSE ARC N/S Grant '99	-	-
AINSE ISIS Grant 2003	-	245,509
AINSE Grant ARC Tandem	1,013,755	,021,769
	<u>1,013,755</u>	<u>1,267,278</u>
9. OTHER PAYMENTS RECEIVED IN ADVANCE		
Member Tandem Contribution	1,073,000	1,154,998
Other		1,375
	<u>1,073,000</u>	<u>1,186,373</u>
10. PROVISIONS FOR EMPLOYEE ENTITLEMENTS		
Current		
Accrued Salary & Wages	-	2,326
Recreation Leave	20,569	27,247
Long Service Leave	8,692	183
	<u>29,260</u>	<u>29,756</u>
Non-Current		
Long Service Leave	6,926	25,080
	<u>36,186</u>	<u>54,836</u>
11. AINSE AWARDS		
AINSE AWARDS - Post Graduate Awards		
Lucas Heights Costs	162,428	162,530
University Travel and Equipment	34,973	29,088
Stipends	237,110	216,818
AINSE Winter School	5,924	5,521
	<u>440,434</u>	<u>413,957</u>
AINSE AWARDS - Awards		
Lucas Heights Costs	1,167,172	1,582,752
Minor Equipment and Materials	3,157	600
Travel and Accommodation	74,548	85,775
University Costs	-	4,000
Other Costs	12,011	3,535
	<u>1,256,888</u>	<u>1,676,662</u>

12. SEGMENT REPORTING

The Institute operates in the research sector providing funds for research to members within Australia and New Zealand.

Notes to the Financial Statements

Schedule 7

	31-Dec-03 \$	31-Dec-02 \$
13. EXTERNAL GRANTS		
AINSE ARC ISIS Grant		
Grant Revenue	380,675	380,361
Grant Expenditure		
External Payments	405,675	409,652
Equipment and Materials	-	-
Contract Labour/Consultancies	-	-
Total Expenditure	405,675	409,652
AINSE N/S Grant '99		
Grant Revenue	-	13,729
Grant Expenditure		
External Payments	-	233,729
Equipment and Materials	-	-
Contract Labour/Consultancies	-	-
Total Expenditure	-	233,729
Grants - ARC Tandem		
Grant Revenue	90,013	-
Grant Expenditure		
External Payments		
Equipment and Materials	8,015	-
Contract Labour/Consultancies		
Others		
Total Expenditure	8,015	-
Reconciliation		
Total External Grants Revenue	470,688	494,090
less transferred to Grants Received In Advance (Balance Sheet)	-	-
External Grant Revenue (Income & Expenditure Statement)	470,688	494,090
Represented by:		
Total Grant Expenditure (Income & Expenditure Statement)	413,690	643,381
Amount to be met by AINSE	(25,000)	(149,291)
External Grants Expenditure	388,690	494,090

Notes to the Financial Statements

Schedule 8

	31-Dec-03 \$	31-Dec-02 \$
14. OTHER EXPENDITURE		
Conference Management	782,402	92
Publications and Promotions	12,295	13,938
Meetings and Committees	76,109	62,255
EA/IRMS	239,802	
AINSE Secretariat		
Audit Fees and Bank Charges	7,184	7,396
Depreciation	14,842	14,152
Non AINSE Equipment Purchases	-	-
Advertising and Printing	3,608	200
Office Supplies	406	1,870
Postage and Telephone	2,329	3,755
Insurance	7,125	9,772
Entertaining	2,190	1,415
Books and Software	527	560
Office Equipment and Repairs	10,094	4,248
Administration and Staff Training	1,672	1,299
Travel and Accommodation	12,296	13,706
Building Maintenance	-	-
Vehicle Expenses	8,144	5,032
Publications and Promotions	-	-
Staff Recruitment	9,441	
Loss on disposal of assets	2,805	2,205
FBT Expense & Payments	3,514	4,115
Miscellaneous	1,152	3,052
Total AINSE Secretariat	87,329	72,777
Total Other Expenditure	1,197,937	149,062
15. OTHER INCOME		
Sponsorships:		-
Inter Congress Radiation Research	277,002	
NTA Conference	7,400	
Quaternary Science	2,600	
SANS Symposium	5,600	
Conference Registrations	636,604	
Other	1,276	4,860
	934,682	4,860
16. MOVEMENT IN RESERVES		
Awards Reserve		
Transfer 2002/2001 research grants committed	-	1,017
Long Term Projects Reserve		
Transfer from accumulated funds	-	-

Notes to the Financial Statements

Schedule 9

17. RECONCILIATION OF OPERATING RESULT WITH CASHFLOWS FROM OPERATIONS

	31-Dec-03	31-Dec-02
	\$	\$
Surplus/(Deficit) for the year	68,921	(398,392)
Movements in Balance Sheet		
(Increase)/Decrease in Receivables	13,343	(18,420)
Increase/(Decrease) Creditors	(450,242)	130,525
(Increase)/Decrease Accrued Interest	(3,774)	16,985
(Increase)/Decrease Prepayments	(711,567) *	(142,322)
Increase/(Decrease) Employee Entitlements	(18,649)	12,238
Increase/(Decrease) Other Current Liabilities	(113,373)	143,373
Increase/(Decrease) Grants Received in Advance	(253,523)	49,782
	(1,537,785)	192,161
Non-Cash Items		
Depreciation	14,842	14,152
Gain on sale of asset	-	-
	14,842	14,152
Net cash provided by (used in) operating activities	(1,454,022)	(192,079)

* Amendment to Comparative Figures

The comparative figures used in the Statement of Cash Flows for the year have been amended so as to transfer the deposit on the Tandem Accelerator of \$856,996 which was paid in the 2001 year, from Cash Flows used in Operating Activities to CASH Flows used in Investing Activities.

AINSE Postgraduate Research Awards

To nominate for one of these awards, an applicant must hold an Australian Postgraduate Award (APA) or equivalent scholarship.

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. The stipend is \$7500 pa and \$5500 pa 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.

Eleven new AINSE postgraduate research projects were supported by an award commenced during 2003. Through its post-graduate research award scheme, AINSE has now helped train 198 students in aspects of nuclear science and associated techniques of analysis. Many more students have been assisted with their research by gaining access to Lucas Heights facilities through AINSE Awards made to their supervisors. Council believes that one of the most valuable roles fulfilled by AINSE is the provision of these AINSE post-graduate awards.

Projects supported during 2003

Synthesis and development of radiolabelled MMP inhibitors for imaging and therapeutic applications in the treatment of metastatic tumours

Mark Alexander Chemistry The University of Sydney 1/7/02

Corals as biomonitors of Darwin Harbour health

Yasmin Antwertinger Health and Science Charles Darwin University 1/7/03

Self-assembly of porphyrins in monolayer films

Kellee Baines Chemistry The University of Queensland 1/7/03

The impact of residue returns with varying breakdown rates on soil carbon fractions, carbon sequestration and the physical fertility of soils

Nelly Blair Agronomy and Soil Science The University of New England 1/2/00

Covalent anchoring of lipid bilayers to solid supports for studies of molecular interactions at biological membranes

Till Böcking Biophysics The University of New South Wales 01/01/01

Fate of metal pollutants released from the Rum Jungle uranium/copper mine into the Finnis River, NT Australia

Jennifer Brazier Education Health and Science Charles Darwin University 1/7/02

Bulk and grain boundary transport kinetics of TiO₂-based ceramics

Tristan Burg Materials Science and Engineering The University of New South Wales 01/02/01

Negative thermal expansion in molecular framework materials

Karena Chapman Chemistry The University of Sydney 1/7/03

The palaeoecological basis of prehistoric settlements, agricultural development and climate change in the South Caucasus during the Holocene

Simon Connor Anthropology, Geography & Environmental studies The University of Melbourne 1/7/02

Utilising a heavy ion probe in the development of semiconductor nanodosimetry for radiation oncology

Iwan Cornelius Engineering Physics University of Wollongong 1/1/00

Trace-element mapping of tropical carbonates using the high-energy heavy-ion microprobe
Karen Durand Geography The University of Newcastle 1/7/03

Gold processing using thiosulfate lixivants
Adam Fischmann Chemistry Monash University 1/7/03

An environmental record of the last quarter of a million years from eastern Australia
Nicola Franklin Geography The University of Sydney 2/3/98

The impact of igneous intrusions on coal mining and the alienation of coal reserves
Alexandra Golab Geosciences University of Wollongong 1/3/00

Site formation processes of prehistoric mounds, Upper Mun River Floodplain, north-east Thailand
Jeremy Habberfield-Short Resource Science and Management Southern Cross University 1/1/01

Macromolecular orientation induced by injection molding processes
John Healy Physics and Materials Engineering Monash University 1/7/03

Human response to shifts in environmental boundaries in the Sydney Basin during the Holocene
Rosalind James Human & Environmental Studies The University of New England 3/2/00

Removal of arsenic and other heavy metals associated with mine wastewater by dissimilatory sulfate and metal reduction
Tony Jong Science Information, Technology Education Charles Darwin University 31/3/01

Quantification of the contribution of fossil fuel and biomass combustion to air pollution using radiocarbon analyses
Timothy Jordan Chemistry University of Tasmania 1/7/02

Development of electrolyte material for solid oxide ionic conductor applications
Catherine Kealley Applied Physics Curtin University of Technology 1/7/03

Crucible corrosion in the melt processing of ceramic oxide superconductors
Nigel Kirby Applied Physics Curtin University of Technology 21/2/00

Spatial and temporal uptake of trace metals in heart urchin tests: use as an indicator of environmental contamination and relationship to organism growth and structural deformity
Alison Lane Institute Antarctic & Southern Ocean Studies University of Tasmania 30/12/03

ZnO thin films doped by ion implantation
Jim Lee Chemical and Materials Engineering The University of Auckland 1/7/03

Investigation of crystallisation of scale in the Bayer process
Jennifer Lowe Applied Chemistry Curtin University of Technology 1/4/00

A palaeoecological reconstruction of the lower Snowy River, East Gippsland: environmental response to climate change, land use and river regulation
Angus MacGregor Geographical & Environmental University of Adelaide 1/7/03

Investigation of Interaction of artificial pinning centres with magnetic flux lines in high temperature superconductors
Damian Marinaro Institute for Superconducting & Electronic Materials University of Wollongong 8/1/99

Trace element variability in speleothems: a total system model for palaeoclimatic reconstruction based on stalagmites and karst systems from central NSW
Janece McDonald Geography and Environmental Science The University of Newcastle 26/2/01

Hydrogen in metallic and metal-like systems
Keith McLennan School of Science Griffith University 17/1/00

The surface chemistry of DNA recognition interfaces
Freya Mearns Chemical Sciences The University of New South Wales 1/7/02

Elucidation of the biophysical behaviour of Quadramet (samarium-EDTMP) as a therapeutic radiopharmaceutical
Danielle Meyrick Science and Engineering Murdoch University 1/1/01

New proxies for the climate debate: AMS dates and stable carbon isotopes of peat deposits from NE Queensland
Joanne Muller Earth Sciences James Cook University 1/7/03

Removal of trace contaminants using membrane technology
Long Nghiem Environmental Engineering University of Wollongong 1/7/03

Transition alumina structure determination from first principle calculations
Gianluca Paglia Applied Physics Curtin University of Technology 31/3/01

The identification of temporal changes to palaeo-vegetation types and prehistoric human land-use in the Numundo region of West New Britain, PNG, integrating fossil phytolith and starch grain analysis
Jeffrey Parr Resource Science and Management Southern Cross University 1/1/01

Environmental analysis using ion-selective electrodes
Bobby Pejic Applied Chemistry Curtin University of Technology 8/3/00

Protein behaviour at interfaces
Adam Perriman Chemistry Australian National University 1/7/03

Characterisation of Sr binding with the hydration products of cementitious systems cured at elevated temperatures
Vanessa Peterson Materials, Chemistry & Forensic Science University of Technology Sydney 21/2/00

Elemental structure of fine particulates from the Asian continent under differing meteorological conditions
Fiona Rae Geography and Environmental Science The University of Newcastle 1/3/01

Floodplain wetland evolution and dynamics in the Macquarie Marshes, NSW
Timothy Ralph Physical Geography Macquarie University 1/7/02

Dynamic susceptibility of transition metal alloys by neutron scattering
David Robinson Physics Monash University 9/2/98

Immobilising sol gel technology for biomining and biocatalysis
Lisa Rodgers Biotechnology & Biomolecular Sciences The University of New South Wales 1/7/02

Interfacial bonding in alkali-activated aluminosilicate polymers
Matthew Rowles Applied Physics Curtin University of Technology 1/7/02

Disordered and low dimensional magnetic systems
Kirriily Rule Physics Monash University 4/3/00

Processing of TiO₂ based semiconducting ceramics
Leigh Shepherd Materials Science & Engineering The University of New South Wales 1/7/03

Hydrogen adsorption in intercalated graphite: comparison between experiment and simulation
Drew Sheppard Applied Physics Curtin University of Technology 1/7/03

Predictive modelling of the response of estuarine environments to changing environmental conditions using biostratigraphical and sedimentological evidence preserved in barrier estuaries on the NSW south coast
Craig Sloss Geosciences University of Wollongong 1/7/02

Development of stable magnetic photocatalysts for the solar detoxification of organic polluted water
Timothy Tan Chemical Engineering & Industrial Chemistry The University of New South Wales 28/2/00

Experimental charge density studies of hydrogen bonding
Mark Waller Chemistry The University of Sydney 1/7/03

Ab initio structure determination of minerals and inorganic materials by powder x-ray and neutron diffraction
Kia Wallwork Chemistry, Physics and Earth Sciences Flinders University 7/2/01

Geoarchaeological interpretation of sandstone landscapes in the Keep River region, Northern Territory
Ingrid Ward Geosciences University of Wollongong 1/7/00

A long term terrestrial palaeoenvironmental record from isotope ratios of organic deposits
David Wheeler Geosciences University of Wollongong 01/01/97

Obtaining atomic displacement parameters for hydrogen atoms from multi-temperature x-ray diffraction data
Andrew Whitten Chemistry The University of New England 1/7/02

Summary of AINSE Awards

The primary purpose of AINSE Awards is to facilitate access by university researchers and research students to the nuclear science and technology facilities at Lucas Heights and other AINSE supported facilities, including 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 the high degree of flexibility and control needed to ensure the allocation of time on the facilities is fully utilised. AINSE Awards very often provide the valuable initial support which leads to additional external funding, estimated to have been worth several million dollars to member organisations.

The disciplines involved during 2003 included the following disciplines

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

Awards for 2003 are shown on the following pages in order of university, department and surname to highlight the diversity of institutions and disciplines within which projects occur. This includes arrangements for general research students' access to Lucas Heights facilities but does not include access arrangements for AINSE postgraduate scholars, see page 17. Awards marked with an asterix (*) have industry linkages. The total amount of the awards 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.

For information on particular facilities utilised, see progress reports are published on our home page. <http://www.ainse.edu.au>.

During 2003 186 projects were awarded to a value of \$1,843,662 involving thirty-three of the thirty-seven member universities. The following table shows the distribution of awards by university and by specialist areas.

University**	Specialist Area**					Total
	A	B	E	M	N	
ACU			2			2
ADE		2	4		2	8
AKL	1	2	1	2	2	8
ANU	6		2	1	2	11
BAL			2			2
CBR	1					1
CQU			2			2
CUR				1	6	7
DEA				1		1
ECU				2		2
FLI	1	1		1		3
GRI				3	2	5
JAM	4		2			6
LAT	1		1	1		3
MAC	2	1	1		1	5
MEL	3	6	1	1	2	13
MON	2		2	2	6	12
MUR			1			1
NCT	2		3		3	8
NSW		1	2	4	7	14
QLD				1	2	3
QUT	2		1	1		4
RMI				3		3
SCU			3			3
SWI				2		2
SYD	8	4	3	3	7	25
TAS	1		3			4
UNE	1					1
USA					3	3
UTS				3		3
UWA		1		2		3
UWS	1			1	1	3
WOL	6	2		5		13
Total	42	20	36	40	46	184

** see abbreviations on page 66

Australian Catholic University

Arts and Sciences, NSW

03/102 « Dr Neil Saintilan
Comparison of contemporary and historic rates of sedimentation in saltmarsh environments \$7,577

03/171 « Dr Neil Saintilan
Radiocarbon dating of mangrove root remains and sediment: application and comparison \$5,455

Australian Catholic University Total \$13,031

Australian National University

Archaeology & Natural History

03/050 Dr Simon Haberle
Late Holocene fire regimes in the central highlands of Tasmania \$9,272

03/120 « Dr Alan Watchman
Dating and investigation of rock-art and archaeological sites, Daly River Aboriginal Land Trust, Northern Territory \$2,100

03/121 « Dr Alan Watchman
Giant mural rock art of Baja California: new regional archaeological perspectives \$3,945

03/122 « Dr Alan Watchman
Investigations into the origins and ages of rock surface coatings associated with rock art, Bhopal, India \$2,450

Electronic Materials Engineering

03/095P Dr Mark Ridgway
Nanocavity formation mechanisms in Si substrates studied with in-situ transmission electron microscopy \$4,601

Geology

03/028 Dr Patrick De Deckker
AMS radiocarbon dating of organic-walled dinoflagellate cysts: a new dating technique \$6,227

Research School of Chemistry

03/145 Dr Lasse Noren
Temperature dependent structural study of ferro-elastic/ferro-electric elpasolite alkali oxy-fluorides \$23,798

03/144 « Professor John White
Macromolecular surfactant structure at the oil-water interface \$44,912

Research School of Earth Sciences

03/035 Dr William Dunlap
⁴⁰Ar/³⁹Ar dating of minerals and rocks: determining ages of cooling, crystallisation or recrystallisation \$15,000

AINGRA04003 Dr Derek Fabel
Constraining neotectonic movement using cosmogenic burial dating \$4,483

03/130 Dr Jonathan Wynn
Validation of the Century model of soil organic carbon (SOC) dynamics with AMS C-14 data \$7,327

Australian National University Total \$124,116

Central Queensland University

Centre for Environmental Management

03/003P « Dr Leonie Andersen
Transplanted oysters and resident mud crabs as biomonitors to assess metal and fluoride concentrations in an estuary \$5,376

« industry linkages

Biological and Environmental Sciences

03/119	A/Professor Kerry Walsh	Use of PIXE for localisation of nickel, as a function of drought resistance, in the Ni-hyperaccumulating plants, <i>Stackhousia tryonii</i> and <i>Alyssum murale</i>	\$6,861
Central Queensland University Total			\$12,237

Curtin University of Technology

Applied Chemistry

03/029	A/Professor Roland De Marco	A SIMS study of the cadmium chalcogenide glass electrochemical sensor	\$6,911
03/030	A/Professor Roland De Marco	A SANS study of nanoparticles in iron chalcogenide glass electrochemical sensors	\$7,854
03/147P	« A/Professor Roland De Marco	A neutron reflectometry study of ordered corrosion inhibitor films	\$3,729

Applied Physics

03/146	« Dr Joan Connolly	The structure of mudcake formed on a rock substrate using commercially viable drilling fluids	\$1,685
03/176	A/Professor It-Meng Low	A comparative study of the thermal stability of aluminium titanate in air and in argon	\$6,200
03/089	E/Professor Brian O'Connor	Diffraction-based modelling of crystallite strain fields in sintered MgO microstructures using high-quality laboratory x-ray, synchrotron radiation and neutron diffraction data	\$12,648

Chemical Engineering/Centre for Fuels and Energy

03/132	« Professor Dong-ke Zhang	A dynamic neutron diffraction study of bismuth-molybdate catalysts for partial oxidation of propylene to acrolein	\$9,545
Curtin University of Technology Total			\$48,572

Deakin University

Engineering and Technology

03/143	Dr Georgina Kelly	Lubricant-tool coating interactions during sliding wear	\$9,527
Deakin University Total			\$9,527

Edith Cowan University

Physics Program, School of Engineering & Mathematics

03/060	Dr Stephen Hinckley	Ion-implanted junction structures in silicon	\$6,872
03/061P	Dr Stephen Hinckley	Optical analysis of chemically-deposited CdS thin films	\$5,190
Edith Cowan University Total			\$12,061

Flinders University

Chemistry

03/105	« Dr Joseph Shapter	AFM of carbon nanotubes	\$3,431
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Earth Sciences

03/072 **Dr Corinne Le Gal La Salle**
Investigate of the use of carbon-14 and tritium to estimate groundwater residence time and stress in a multilayered confined aquifer \$9,435

Flinders Medical Centre

03/141 **Dr Pamela Sykes**
Effect of low dose-rate radiation on somatic intrachromosomal recombination \$17,000

Flinders University Total **\$29,865**

Griffith University

Microelectronic Engineering

03/051 « **Dr Jisheng Han**
An investigation of p-channel MOSFET based on 4H-SiC by Al implantation \$6,084

Science

03/148 **A/Professor Evan Gray**
In-situ diffraction study of deuterium absorption by graphite intercalation compounds \$24,000

03/049 **A/Professor Evan Gray**
Site occupancy of H and D in palladium \$24,000

03/055 **A/Professor Peter Healy**
Solid state NMR and NQR of copper(I) complexes with phosphine and nitrogen ligands \$7,514

03/062P **A/Professor Greg Hope**
SIMS investigation of sulfide leaching \$6,446

Griffith University Total **\$68,044**

James Cook University

Earth Sciences

03/005 « **Dr Timothy Baker**
Porphyry-related carbonate alteration in the Ertsberg District, Irian Jaya, Indonesia \$9,813

03/022 **Dr Lucy Chapman**
New insights into environmental conditions of formation of complex carbonate grains in sediment-hosted Zn-Pb-Ag mineralisation systems based on intragranular $\delta^{18}\text{O}$ and $\delta^{13}\text{C}$ isotopic variations \$9,813

03/056 **Dr Paul Hearty**
Radiometric calibration of amino acid kinetic pathways: a means to unravel sea-level and sediment dynamics \$13,200

03/075 « **Dr Bernd Lottermoser**
Geochemistry and biogeochemistry of the Radium Hill uranium mine site during the late Quaternary \$1,625

Geology & Geophysics

03/017 **Professor Bob Carter**
Mid-latitude climate change in the southwest Pacific Ocean (0-50 ka): comparison of the New Zealand record with the Vostok Ice Core \$16,909

Tropical Environment Studies

03/107 **Dr Scott Smithers**
Dating the onset of lacustrine deposition and closure of a coastal lagoon, South Beach, Orpheus Island \$5,455

James Cook University Total **\$56,815**

La Trobe University

Archaeology

03/167	Dr Phillip Edwards	Qasr al-Buleid: a fortified Roman settlement on the Dead Sea Plain, Jordan	\$2,818
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Earth Sciences

03/124	Dr John Webb	Understanding rates of change in a salinised local groundwater system, using isotopic techniques	\$6,333
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Physics

03/096P	A/Professor John Riley	Diffusion of impurities in semiconductors	\$6,351
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La Trobe University Total **\$15,502**

Macquarie University

Nuclear Medicine

03/026	Dr John Chu	Preparation and use of I-123-PE2I for SPECT imaging of dopamine transporter in patients with Parkinson's disease and Parkinsonian-like syndrome	\$18,550
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Physics

03/014P	Dr Kenneth Butcher	SANS characterisation of the nanoporous architecture of silica templated by biogenic diatoms	\$11,586
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Physical Geography

03/048	Dr Damian Gore	Exposure age dating the glacial Quaternary history of Framnes Mountains and Loewe Massif, East Antarctica, using AMS	\$9,982
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03/001	Dr Geoff Humphreys	Soil mantle production rates determined from cosmogenic ¹⁰ Be and ²⁶ Al in the Blue Mountains	\$9,545
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03/112	Dr Mark Taylor	Metalliferous pollution of channel and floodplain sediments of the East Branch of the Finniss River, Northern Territory - pollution dispersal and channel recovery	\$2,610
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Macquarie University Total **\$52,273**

Monash University

Geography & Environmental Science

03/135	Dr Bruno David	Human colonisation and landscape dynamics in Torres Strait	\$12,273
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AINGRA04005	Professor Peter Kershaw	The temporal and spatial dynamics of tall open forest	\$6,764
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Geosciences

03/018	A/Professor Ian Cartwright	Groundwater recharge and ages in a dryland salinity area, Benalla, Northern Victoria	\$6,101
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03/127	Dr Andy Wilde	Source of metals in Zn-Pb deposits of the Lennard Shelf	\$5,000
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Physics & Materials Engineering

03/019	A/Professor John Cashion	Structure, bonding and magnetic properties of sorbed metal species and novel materials	\$1,698
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03/023P	Dr Yi-Bing Cheng	Microstructural evolution and phase transformations in Sialon ceramics during post-sintering heat treatment	\$3,418
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03/037	A/Professor Trevor Finlayson	<i>In-situ</i> microstructural studies of yttria-stabilised zirconia ceramics under tensile loading	\$14,751
03/134	A/Professor Trevor Finlayson	Studies of phase transformations in shape-memory alloy single crystals	\$18,523
03/150	A/Professor Trevor Finlayson	Determination of the positions of the H atoms above and below the ferroelectric phase transition in tri-glycine sulphate (TGS)	\$15,688
03/058	Dr Trevor Hicks	Possible chirality of magnetic excitations in a re-entrant spin glass system	\$15,116
03/149	Dr Trevor Hicks	Neutron spectroscopy of heavy fermion systems near quantum critical points	\$3,770
03/166	Dr Trevor Hicks	Neutron spectroscopy of heavy fermion systems near quantum critical points	\$12,826
Monash University Total			\$115,929

Murdoch University

Physics

03/173	Professor Philip Jennings	Naturally occurring radionuclides in drinking water supplies in the south-west of Western Australia and their impact on human health	\$5,013
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Murdoch University Total **\$5,013**

Queensland University of Technology

Built Environment and Engineering

03/008P	A/Professor John Bell	Development of dye-sensitised titania solar cell electrode by evaporation techniques	\$10,297
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Natural Resource Sciences

03/123	Dr Gregory Webb	Dating Pleistocene megafauna extinction, Darling Downs, south-eastern Queensland: megafaunal holdouts well into the C-14 dating window	\$7,209
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03/125	Dr Gregory Webb	Reservoir correction for C-14 dating of Holocene corals using U/Th couplets, Heron Reef, Great Barrier Reef	\$4,773
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Physics

03/084P	Dr Lidia Morawska	Spatial and vertical distribution of excess Pb-210 at selected locations in southeast Queensland	\$11,251
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Queensland University of Total **\$33,529**

RMIT University

Applied Physics

03/064	Professor Peter Johnston	Compton scattering from inner-shell electrons of heavy elements	\$2,100
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03/065P	Professor Peter Johnston	Plural scattering and energy loss straggling studies of heavy ions in condensed matter	\$6,527
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Electronic & Computer Systems Engineering

03/108	Professor Dinesh Sood	SPM study of nano-clusters produced by ion implantation in silicon	\$8,323
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RMIT University Total **\$16,949**

Southern Cross University

Environmental Science and Management

03/110P	A/Professor Leigh Sullivan	Sulfidic sediments and salinisation in the Murray Darling Basin: an isotope study of sulfur mineralisation in a salinised inland river	\$12,506
03/111	« Dr Kathryn Taffs	Environmental history of Tuckean Swamp, northern NSW	\$5,318

Resource Science and Management

03/137	Dr Amanda Reichelt-Brushett	Using the radioisotope ¹⁰⁹ Cd to measure the partitioning between Cd uptake in coral tissue, the symbiotic zooxanthellae and transfer into the skeleton	\$9,772
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Southern Cross University Total **\$27,595**

Swinburne University of Technology

Industrial Research Institute

03/044P	« Dr Muralidhar Ghantasala	Characterisation of laser micromachined thin film coatings on silicon	\$12,789
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Engineering & Science

03/034P	« Professor Derry Doyle	Tribological and mechanical properties of nitrided surfaces	\$5,569
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Swinburne University of Technology Total **\$18,358**

The University of Auckland & GNS

ACSRC

03/052	Dr Michael Hay	Reduction potentials of DNA-targeted 1,2,4-benzotriazine 1,4-oxides	\$3,600
03/053	Dr Michael Hay	Reduction potentials of novel nitrobenzindoline hypoxia-selective antitumour agents	\$2,800

Chemistry

03/011	Professor Graham Bowmaker	Solid state nuclear magnetic resonance spectroscopy	\$9,298
AINRA03082	A/Professor Jim Metson	Amorphous gallium nitride thin films	\$13,341
03/151	A/Professor Jim Metson	Structural refinement of transition aluminas	\$11,320

Geology

03/004	Dr Paul Augustinus	Dating long, high resolution records of environmental change from Auckland maar craters	\$9,659
04/001	Dr Paul Augustinus	Why do the shapes of glacial valleys vary?	\$11,338

GNS

NZ Ion Beam Analysis Group

03/076	Dr Andreas Markwitz	Characterisation of conducting polymers with time of flight heavy ion elastic recoil detection analysis	\$7,016
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The University of Auckland & GNS Total **\$68,372**

The University of Melbourne

Anthropology, Geography & Environmental Studies

03/114	Dr Ian Thomas	Evidence for post-colonial anthropogenic impacts from Lake Bantic, Tasmania	\$3,706
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Chemistry

03/142	Dr Paul Mulvaney	Assembly of core-shell nanocrystals by SANS	\$16,543
03/117	A/Professor Peter Tregloan	Redox properties of molybdenum and tungsten polyoxoanions	\$4,320
03/152	Dr Michelle Gee	Polymeric micelle adsorption as a potential targeted drug delivery method	\$12,643

Classics and Archaeology

03/101	A/Professor Antonio Sagona	Cultural Interaction in late prehistoric Trans-Caucasus and Eastern Anatolia	\$5,164
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Earth Sciences

03/046	Professor Andrew Gleadow	The application of fission track analysis to fundamental problems in the earth sciences	\$11,320
03/092	Dr David Phillips	$^{40}\text{Ar}/^{39}\text{Ar}$ dating of geological samples	\$2,250

Genetics

03/015	A/Professor James Camakaris	Use of radiocopper in studying proteins of copper homeostasis, Alzheimer's disease and a molecular mechanism for cisplatin resistance	\$10,910
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Nuclear Medicine and Centre for PET

03/059P	Professor Rod Hicks	The synthesis and development of [^{18}F]fluoroethylflumazenil a tracer for imaging the central benzodiazepine receptors in epilepsy using PET	\$8,732
03/097	Dr Christopher Rowe	Imaging the effect of acetyl choline esterase (AChE) inhibition on synaptic ACh levels through displacement of I-123 iododexetimide (IDEX)	\$13,185
03/098P	Dr Christopher Rowe	Diagnosis of diffuse lewy body dementia with ^{123}I - η -CIT SPECT	\$15,460

Trescowthick Research Centre

03/077	A/Professor Roger Martin	DNA damage by ^{123}I -labelled DNA ligands	\$5,000
03/078	A/Professor Roger Martin	Pulse radiolysis studies with DNA-binding radioprotectors	\$6,428

The University of Melbourne Total **\$115,660**

The University of New England

Human and Environment Studies

03/140	Dr Peter Grave	Identifying global atmospheric events from annual tree rings of exotic species in the New England Tablelands: an INAA pilot study	\$6,250
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The University of New England Total **\$6,250**

The University of New South Wales

Biotechnology & Biomolecular Sciences

03/040	Dr Leslie Foster	Characterisation of the nanomolecular architecture of PHA inclusion bodies using SANS	\$11,161
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Biological, Earth & Environmental Sciences

03/083	Dr Scott Mooney	A reconstruction of the fire history of coastal eastern Australia using fire scars on Xanthorrhoea: pre- and post-European fire frequency	\$4,091
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Centre of Excellence for Advanced Silicon Photovoltaics and Photonics

03/027P	Dr Gavin Conibeer	SIMS analysis of silicon dioxide, silicon carbide and silicon / silicon dioxide superlattices for photovoltaic applications	\$11,649
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Chemical Engineering & Industrial Chemistry

03/012P	A/Professor Michael Brungs	Sol-gel processing for porous silica antireflective coatings and macroporous silicate films	\$2,425
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Medical Sciences

03/031	Dr Neil Donoghue	Synthesis and evaluation of radiolabelled ligands based on GSAO as potential probes for the diagnosis and therapy of tumours	\$23,650
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Pathology

03/133P	Dr Hala Zreiqat	Mechanisms of bone tissue interaction with prosthetic materials modified with divalent cations	\$5,700
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Physics

03/178	Dr Gail Box	Chemical analysis of PM2.5 and PM10 aerosols in Sydney, Australia	\$9,300
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Physics, UNSW at ADFA

03/016	Professor Stewart Campbell	Magnetic diffuse scattering from nanostructured ZnFe ₂ O ₄	\$34,147
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03/155	Professor Stewart Campbell	Critical valence and magnetic transitions in YbMn ₂ Si _{2-x} Ge _x	\$24,728
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03/063	Dr Wayne Hutchison	Rare earth magnetism studies using nuclear hyperfine probe techniques	\$1,473
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03/153	Dr Wayne Hutchison	Investigation of the magnetic structure of TbNiAl ₄	\$12,316
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03/109	Dr Glen Stewart	¹⁶⁹ Tm Mössbauer investigation of two rare earth intermetallics	\$1,875
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03/154	Dr Glen Stewart	The crystallographic and magnetic structures of hole-doped Tm _{1/3} Ca _{1/3} MnO ₃	\$10,050
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03/156	Dr Glen Stewart	Evaluation of the effectiveness of LONGPOL for crystal field investigations when it is operated at 2.55 Å	\$14,414
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The University of New South Total			\$166,978
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The University of Newcastle

Chemistry

03/013P	Dr Robert Burns	Anomalous unit cell dimensions and structures in alkali metal heteropolyoxometalates of the type M ₃ [PMo ₁₂ O ₄₀], where M = Li ⁺ to Cs ⁺	\$13,374
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03/079P	Dr Adam McCluskey	Radiocarbon dating of illicit drug samples	\$11,273
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Environmental and Life Sciences

04/004 **Dr Gregory Hancock**
Determination of soil development rates using cosmogenic isotopes \$4,773

Geography & Environmental Science

03/090P **Dr Stuart Pearson**
Dating tree rings in Callitris using dendrochronology and the radiocarbon bomb pulse \$9,109

04/006 **Dr Stuart Pearson**
Dating contaminants and significant species in stick-nest rat middens in arid Australia \$6,818

Geosciences

03/047 **Dr Ian Goodwin**
Late Holocene sea-level and climate history of the Southern Cook Islands from coral microatolls \$6,818

Mechanical Engineering

03/157 **Dr Jenny Forrester**
In-situ neutron diffraction study of the novel ferroelectric PZN-PT polycrystalline ceramics \$24,332

03/070P **A/Professor Erich Kisi**
In-situ neutron diffraction study of materials in extreme service environments \$28,680

The University of Newcastle Total **\$105,176**

The University of Queensland

Chemistry

03/043 **A/Prof Ian Gentle**
Neutron reflectivity study of phospholipid-porphyrin layers at the air-water interface \$11,446

Chemical Engineering

03/170 **Dr Peter Sopade**
SANS investigation of starch gelatinisation in the presence of plasticisers \$11,843

Physics

03/081 **Dr Paul Meredith**
Ion implanted conductive polymers for soft electronic applications \$23,068

The University of Queensland Total **\$46,357**

The University of Sydney

Aerospace, Mechanical and Mechatronic Engineering

03/174 **Professor Lin Ye**
Determination of polymer optical fibre molecular structure arrangement and chain alignment \$2,580

Anatomy & Histology

03/179 **Dr Denise Donlon**
Analysis of trace elements in 19th century children's teeth \$6,000

Archaeology

03/002 **Dr Mark Allon**
The dating of the British Library's collection of ancient birch bark Buddhist scrolls from Afghanistan \$3,836

03/136 **Dr Alison Betts**
PIXE/PIGE studies of 'chocolate on white ware': a ceramic group from the southern Levant (c. 1600-1400 BC) \$2,294

AINGRA04002 **Dr Stephen Bourke**
Dating the first city-state in the Jordan Valley: Pella in the early Bronze Age \$6,818

03/139	Dr Judith Field	Dating megafauna and late Pleistocene Aboriginal sites in the Riversleigh-Lawn Hill region, north-west Queensland	\$11,836
03/039	A/Professor Roland Fletcher	A pilot chronology of Angkor in Cambodia dating the Prei Khmeng site	\$7,977
03/116P	Dr Robin Torrence	Exchange of obsidian artifacts from the Gulu source, West New Britain, Papua New Guinea	\$9,200
Chemistry			
03/045	« Professor Robert Gilbert	Polymerisation of polymer colloids	\$2,627
03/087	« Professor Robert Gilbert	Gamma radiation induced polymerisation	\$1,314
03/068	A/Professor Brendan Kennedy	Spatial distribution of lead and cadmium in teeth; towards a new environmental surveillance tool	\$5,937
03/069	A/Professor Brendan Kennedy	Structural studies of layered bismuth oxides	\$38,282
03/158	A/Professor Brendan Kennedy	Structure and phase transitions in perovskites	\$34,019
03/074	Professor Len Lindoy	Copper-64 radiolabelling of antibodies using linked tetraaza macrocyclic chelators for use in imaging and therapy	\$9,825
03/160	Dr Siegbert Schmid	Investigation of the structures of ceramic materials with commensurate or incommensurate modulated structures	\$9,545
03/161	A/Professor Gregory Warr	Adsorbed layer structure of mixed surfactants on quartz	\$13,636
Geosciences			
03/091P	Dr Dan Penny	The palaeo-environment of Angkor	\$13,527
Molecular and Microbial Biosciences			
03/159	Professor Philip Kuchel	Molecular organisation of crocodilian haemoglobin by small angle neutron scattering	\$13,613
Nuclear Medicine			
03/071P	Dr George Larcos	Nuclear medicine assessment of Parkinsonism with η -CIT	\$28,000
NWG Macintosh Centre			
03/006	A/Professor Mike Barbetti	Atmospheric ^{14}C variations in the tropics during the Little Ice Age: pilot measurements of ^{14}C in tree-rings from Indonesia, AD 1650-1900	\$32,318
03/165	A/Professor Mike Barbetti	Radiocarbon calibration in the Younger Dryas chronozone, 13,000-11,600 years ago: AMS measurements on Huon pine tree rings from Tasmania	\$32,318
Pharmacology			
03/066P	Dr Michael Kassiou	Evaluation of cholinergic radioligands in an animal model of Alzheimer's disease	\$23,470
03/168P	Dr Michael Kassiou	Development and evaluation of a SPECT radioligand for the peripheral benzodiazepine receptor	\$2,730
Physics			
03/010	« Professor Marcela Bilek	Interface engineering of nanostructures	\$16,399

Physiology

03/177	Dr Vlado Buljan	Biochemically mediated phase transitions of microtubules in dilute solution studied by SANS	\$6,763
The University of Sydney Total			\$334,865

The University of Western Australia

Electrical and Electronic Engineering

03/057	Dr Jasmine Henry	Investigation using SIMS of metal-semiconductor Schottky Barrier interfaces as used in photovoltaic applications	\$13,993
03/086	Dr Charles Musca	Investigation of II-VI superlattice structures using SIMS	\$12,821
The University of Western Australia Total			\$26,813

University of Adelaide

Geographical and Environmental Studies

03/041	Dr Peter Gell	Progressive eutrophication of wetlands of the Littoral North, Bahia, Brazil	\$12,631
03/042	Dr Peter Gell	Tareena Billabong: a window to 5000 years of environmental change in the lower Murray River	\$12,631
03/115	Dr John Tibby	Assessing the nature and timing of ecological change at Lake Ainsworth, northern NSW	\$7,796

Geology & Geophysics

03/094	A/Professor Allan Pring	The effects of S fugacity on the kinetics of exsolution in iron nickel sulfides	\$16,782
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Mathematics & Physics

03/093	« Professor John Prescott	Low level uranium and thorium determinations for luminescence dating	\$1,507
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Mechanical Engineering

03/162	Professor Valerie Linton	Residual stresses around friction stir repair welds in aircraft alloys	\$8,915
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Nuclear Medicine/Neurology

03/020	Dr Rey Casse	An I-123 iododexetimide (IDEX) SPECT study of acetylcholine neuro-receptors in post traumatic stress disorder	\$10,000
03/021	Dr Rey Casse	An I-123 iododexetimide (IDEX) SPECT study of acetylcholine neuro-receptors in the medial temporal lobe and cingulate gyri in patients with mild cognitive impairment	\$30,000

University of Adelaide Total			\$100,260
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University of Ballarat

Science & Engineering

03/033	Dr Kim Dowling	Arsenic content of vegetables grown in the Victorian goldfields: characterisation of a backyard hazard	\$4,975
03/126P	« Professor Martin Westbrooke	Age classes of arid woodland trees in relation to regeneration events	\$5,755

University of Ballarat Total			\$10,729
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University of Canberra

Resource Science & Management

03/138	Dr Ken McQueen	Chemical composition and physical properties of quartz as a mineral exploration tool	\$13,194
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University of Canberra Total **\$13,194**

University of South Australia

Ian Wark Research Institute

03/172	Dr Namita Choudhury	Structure evolution during formation of hybrid coating by small angle neutron scattering	\$12,971
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03/036	Dr Naba Kumar Dutta	SANS characterisation of the self-assembly behaviour of multiblock copolymer in selective solvents	\$15,372
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03/163P	Dr Rossen Sedev	Amphiphilic block copolymers at the solid/liquid interface	\$4,881
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University of South Australia Total **\$33,224**

University of Tasmania

Institute of Antarctic & Southern Ocean Studies

03/080	Professor Andrew McMinn	High resolution palaeoclimate analysis of lacustrine systems in the Vestfold Hills	\$10,724
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03/104	Dr Peter Sedwick	Determination of a radiocarbon-age correction for marine sediments from the MacRobertson Shelf, East Antarctica	\$10,909
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Zoology

03/007	Dr Leon Barmuta	Antarctic freshwater lake fauna: palaeobiogeography, palaeoecology and applications to climate change studies	\$6,247
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03/103	Dr Catherine Samson	Changes in Tasmanian estuarine and sheltered marine ecosystems since European settlement: impacts of human activity	\$8,182
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University of Tasmania Total **\$36,061**

University of Technology Sydney

Chemistry, Materials and Forensic Science

03/009P	Dr Besim Ben-Nissan	Encapsulation of enzymes and bacteria in sol-gel matrices	\$11,463
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03/169	Dr Mike Stevens	Ion implantation of polymers for electrochemical applications	\$6,306
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03/113P	Dr Paul Thomas	Elemental analysis of layers in highly banded opals	\$8,736
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University of Technology Sydney Total **\$26,505**

University of Western Sydney

Engineering & Industrial Design

03/032P	Dr Ken Doolan	Ion implantation into thermoplastics	\$6,083
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Science Technology and Environment

03/180	Professor Jann Conroy	Structural changes in wood during the solvent dehydration process studied by small angle neutron scattering	\$11,273
03/175	Dr Saravanamuthu Maheswaran	Determination of arsenic concentration in activated carbon using neutron activation analysis	\$2,000

University of Western Sydney Total **\$19,356**

University of Wollongong

Biomedical Science

03/131	Dr Katerina Zavitsanou	Investigation of muscarinic receptors in the anterior cingulate cortex in schizophrenia	\$15,650
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Chemistry

03/067P	Dr Paul Keller	The development of radiolabelled EGF and VEGF receptor tyrosine kinase inhibitors as antitumour agents	\$8,005
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Engineering Physics

03/038	Professor Peter Fisher	Compensation of B-doped Si by neutron transmutation doping with P and annealing of neutron irradiated Si by ultrasound	\$1,111
03/099	Professor Anatoly Rozenfeld	Preliminary testing of silicon microdosimeters for space applications	\$6,200
03/100	Professor Anatoly Rozenfeld	Investigation of detector grade CZT for the development of room temperature gamma detectors for medical and safeguard applications	\$5,105

Geosciences

03/024	Professor Allan Chivas	Genesis of calcrete in Western Australia	\$4,125
03/025	Professor Allan Chivas	Chemically differentiated sediment sources in the Gulf of Carpentaria	\$11,550
03/054	Mr John Head	New ideas on ¹⁴ C AMS dating of the apatite fraction of bone from arid areas	\$4,727
03/085	Professor Colin Murray-Wallace	Late Quaternary sea-level changes in Gulf St Vincent, South Australia	\$6,818
03/128P	A/Professor Colin Woodroffe	Variability in historical sedimentation rates in Lake Wollumboola	\$4,774
03/129	A/Professor Colin Woodroffe	Depositional chronology of Torres Strait reef islands	\$10,227

ISEM, Faculty of Engineering

03/106	Dr Tania Silver	Increasing the critical current densities in superconductors via fission track pinning of magnetic flux lines	\$3,556
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Physics

03/073	« Dr Michael Lerch	Characterisation of new silicon detectors in the development of portable scintillation imaging modules	\$8,633
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University of Wollongong Total **\$90,481**

Summary of experiments at ISIS

AINSE coordinates funding for Australia's membership of ISIS. This facility, situated in Oxfordshire in the United Kingdom, is the most powerful pulsed neutron source in the world. The membership fee was paid through contributions from the Australian Research Council's Linkage Infrastructure Equipment and Facilities Fund, The Australian National University, Curtin University, Griffith University, The University of Queensland, The University of Sydney, The University of New South Wales, The University of Newcastle, ANSTO and AINSE.

Proposals for experiments are submitted to ISIS for peer group review. The very high success rate that the Australian proposals achieve is well above the international average and attests to their very high quality.

In 2003 there were 25 successful proposals.

		Days allocated on ISIS
T P Blach	School of Science Griffith University <i>In-situ MuSR study of the C24K + H system</i>	5
G Dennis	University of Western Sydney <i>Stabilisation of lipids by block copolymers at the air/water interface</i>	3
I R Gentle	Department of Chemistry University of Queensland <i>Neutron reflectivity study of phospholipid-metal complex monolayers at the air-water interface</i>	3
I R Gentle	Department of Chemistry University of Queensland <i>Conformational changes in synthetic SP-B protein at the air-water interface studied using neutron reflectivity</i>	3
E M Gray	School of Science Griffith University <i>Search for the thermodynamical critical point of the LaNi5-D system</i>	6
E M Gray	School of Science Griffith University <i>In-situ powder diffraction study of deuterium absorption by graphite intercalation compounds</i>	7
E M Gray	School of Science Griffith University <i>Tetrahedral occupancy by D in supercritical Pd-D</i>	7
M E Hagen	Bragg Institute ANSTO <i>Soft mode behaviour at the structural phase transition in KTN</i>	7
T Hicks	School of Physics & Materials Engineering Monash University <i>Magnetic excitations in the quasi-2D honeycomb magnet FePS₃</i>	5
C J Howard	Materials & Engineering Science ANSTO <i>Crystallographic study of orbital ordering in LaMnO₃</i>	3
C J Howard	Materials & Engineering Science ANSTO <i>The plateau effect in Pr_{1-x}La_xAlO₃ perovskites</i>	4
C J Howard	Materials & Engineering Science ANSTO <i>Phase diagram for the perovskite system SrTiO₃-La_{2/3}TiO₃</i>	4
B J Kennedy	School of Chemistry University of Sydney <i>Valence and structural transitions in Ba₂PrRu_{1-x}Ir_xO₆</i>	3
C J Kepert	School of Chemistry University of Sydney <i>Neutron total scattering from a negative thermal expansion molecular framework</i>	2
C J Kepert	School of Chemistry University of Sydney <i>Isotropic negative thermal expansion in a molecular framework</i>	2

C J Keper	School of Chemistry University of Sydney	7
<i>Inelastic neutron scattering from a negative thermal expansion molecular framework</i>		
A Nelson	Bragg Institute ANSTO	2
<i>The formation of polyrotaxanes at surfaces: the changes in polymer conformation on exposure to cyclodextrins</i>		
A Pring	Principal Curator of Minerals South Australian Museum	3
<i>Metal ordering in pentlandite</i>		
J W White	Research School of Chemistry Australian National University	2
<i>Emulsion stability and the liquid/liquid interface</i>		
J W White	Research School of Chemistry Australian National University	2
<i>The crystallisation of supersaturated emulsions</i>		
J W White	Research School of Chemistry Australian National University	2
<i>Stabilisation of high internal phase emulsions by block copolymers</i>		
J W White	Research School of Chemistry Australian National University	2
<i>Self-assembled metal oxide films at the air-water interface</i>		
J W White	Research School of Chemistry Australian National University	2
<i>Model milk fat membranes</i>		
J W White	Research School of Chemistry Australian National University	3
<i>Denaturation of lysozyme and beta-lactoglobulin at the air/liquid interface</i>		
T R Welberry	Research School of Chemistry Australian National University	7
<i>The temperature dependence of diffuse neutron scattering from benzil, C₁₄D₁₀O₂</i>		

Recent Publications

S J Campbell, V Ksenofontov, Y Garcia, J S Lord, S Reiman and P Gutlich
Spin crossover transitions in Fe(II) molecular compounds - Mössbauer and muSR investigations
Hyperfine Interact **5** 363 (2002)

S J Campbell, M Hofmann, W A Kaczmarek and S Welzel
Mechanochemical transformation of ζ -Fe₂O₃ to Fe_{3-x}O₄ - microstructural investigation
J Alloys and Compounds **348** 278-284 (2003)

S J Campbell, M Hofmann and A V J Edge
Valence and magnetic transitions in YbMn₂Si_{2-x}Ge_x
Applied Physics A Mater **74** [suppl1] s713

S J Campbell, G Klingelhöfer, W A Kaczmarek, M Hofmann, R Nagel, G Wang
Mechanochemical transformations of ζ -Fe₂O₃ - ICEMS Study
Hyperfine Interact **139/140** 407 (2002)

S J Campbell, V Ksenofontov, Y Garcia, J S Lord, Y Boland, P Gutlich
Muon spin rotation and Mössbauer investigations of the spin transition in [Fe(ptz)₆](ClO₄)₂
J Phys Chem B **107** 14289 (2003)

H Ehrhardt, S J Campbell, M Hofmann
Structural evolution of ball-milled ZnFe₂O₄
J Alloy Compd **339** 255 (2002)

H Ehrhardt, S J Campbell and M Hofmann
Magnetism of the nanostructured spinel zinc ferrite
Scripta Materiala **48** 1141 (2003)

W K Fullagar, K A Aberdeen, D G Bucknall, P A Kroon, and I R Gentle
Conformational changes in SP-B as a function of surface pressure
Biophys J 2003, **85**, 2624-2632

M J Henderson, D King, J W White
The growth of self-assembled titania-based films at the air-water interface
Aust J Chem 2003 **56** 933-939

M Hofmann, S J Campbell and W A Kaczmarek
Mechanochemical treatment of ζ -Fe₂O₃ - a neutron diffraction study
Applied Physics **A74** S1223-S1235 (2002)

M Hofmann, S J Campbell, K Knorr, S Hull, V Ksenofontov
Pressure-induced magnetic transitions in LaMn₂Si₂
J Appl Phys **91** 8126 (2002)

- M Hofmann, S J Campbell, W A Kaczmarek
 Mechanochemical treatment of ζ -Fe₂O₃ – a neutron diffraction study
 Appl Phys A-Mater **74** [suppl1] s1233 (2002)
- S A Holt, J L Ruggles, J W White, R F Garrett
 Structure development in octadecyl trimethylammonium templated silicate films grown at the air/water interface
 J Phys Chem B **106** 2330 (2002)
- S A Holt, M J Henderson, J W White
 Thermal denaturation of interfacial protein layers
 Aust J Chem **55** 449 (2002)
- S J Kennedy, T Kamiyama, K Oikawa, S J Campbell, M Hofmann
 Mixed magnetic phases in La_{0.85}Y_{0.15}Mn₂Si₂ - high resolution diffraction
 Appl Phys A-Mater **74** [suppl1] s880 (2002)
- P A Reynolds, M J Henderson, S A Holt, J W White
 Interfacial structure of a high internal phase emulsion near a solid surface
 Langmuir **18** 9153 (2002)
- P A Reynolds, D J McGillivray, E P Gilbert, S A Holt, M J Henderson and J W White
 Neutron and x-ray reflectivity from polyisobutylene based surfactants at the air-water interface
 Langmuir **19** 752 (2003)
- D Riley, E H Kisi, E Wu and A McCallum
 Self-propagating high-temperature synthesis of Ti₃SiC₂ from 3Ti/SiC/C reactants
 J Mater Sci Letters **22** 1101 - 1104 (2003)
- J L Ruggles, E P Gilbert, S A Holt, P A Reynolds, J W White
 Expanded mesoporous silicate films grown at the air-water interface by addition of hydrocarbons
 Langmuir **19** 793 (2003)
- M Schmidt, M Hofmann and S J Campbell,
 Magnetic structure of strontium ferrite Sr₄Fe₄O₁₁
 Journal of Physics: Condensed Matter **15** (2003) 8691-8701
- T R Welberry, D J Goossens, W I F David, M J Gutmann, M J Bull, P Heerdegen
 Diffuse neutron scattering in benzil, C₁₄D₁₀O₂, using the time-of-flight Laue technique
 Journal of Applied Crystallography. **36**(Part 6):1440-1447, 2003
- T R Welberry, D J Goossens, W I F David, M J Gutmann, M J Bull, A P Heerdegen
 Diffuse neutron scattering: a powerful technique in the study of molecular crystals
 ANA2003 (Fifth Conference on Nuclear Science & Engineering in Australia), 2003, 183 - 186
 ISBN 0 949188 14 X
- E Wu, E H Kisi, D P Riley and R I Smith
 Intermediate phases in Ti₃SiC₂ synthesis from Ti/SiC/C mixtures studies by time-resolved neutron diffraction
 J Am Ceram Soc **85** 3084 (2002)

Publications

Notification of the following papers incorporating results from AINSE projects were received by AINSE in 2003. This list may not be a comprehensive list of all publications arising from AINSE supported work nor does it necessarily relate to grants held in 2003. 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 notifications provided to AINSE. The Progress Reports for 2003 are published on our home page.

The format of the journal references is as follows: abbreviated name of journal, volume, page number, year of publication.

Award Number	Chief Investigator Co-authors	Title of Publication	Reference
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The Australian National University

01/007	Berry A James M	Refinement of hydrogen positions in natural chondrodite by powder neutron diffraction: implications for the stability of humite minerals	Mineralogical Magazine 66 441-449 2002
00/020	Bulbeck D	Situs-situs arkeologi penting di Ussu/Cerekang The archaeology of major sites in Ussu/Cerekang	La Galigo International Festival and Seminar Pancana Barru 22-23 Makassar Indonesia March 2002
98/139R	De Deckker P Van Der Kaars S	A late Quaternary pollen record from deep-sea core Fr10/95-GC17 offshore Cape Range Peninsula, northwestern Western Australia	Rev Palaeobot Palynol 120 17-39
03/035	Dunlap W	Crystallization versus cooling ages of white micas: dramatic effect of K-poor inclusions on ⁴⁰ Ar/ ³⁹ Ar age spectra	Journal of the Virtual Explorer 13 2003 e-journal
98/138R	Golson J Denham T	Archaeological evidence for mid-Holocene agriculture in the interior of Papua New Guinea: a critical review	In Perspectives on Prehistoric Agriculture in the New Guinea Highlands: A tribute to Jack Golson T P Denham and C Ballard eds 38(3) 159-176 2003
98/138R	Golson J Denham T; Haberle S; Lentfer C; Fullagar R; Field J; Therin M; Porch N; Winsborough B	Origins of agriculture at Kuk Swamp in the highlands of New Guinea	Science 301 189-193 2003
01/061	Goossens D Welberry T; David W; Gutmann M; Bull M; Heerdegen A	Diffuse neutron scattering: a powerful technique in the study of molecular crystals	Abstracts ANA2003 Fifth Conference on Nuclear Science & Engineering in Australia 183-186 2003 ISBN 0 949188 14 X
01/061	Goossens D Welberry T; David W; Gutmann M; Bull M; Heerdegen A	Diffuse neutron scattering in benzil, C ₁₄ D ₁₀ O ₂ , using the time-of-flight Laue technique	J Appl Crystallogr 36(6) 1440-1447 2003
01/067	Haberle S Anderson A; Rojas G; Seelenfreund A; Smith I; Worthy T	An archaeological exploration of Robinson Crusoe Island, Juan Fernandez Archipelago, Chile	Fifty Years in the Field. Essays in Honour and Celebration of Richard Shutler Jr's Archaeological Career. New Zealand Archaeological Association Monograph No 25, Auckland Museum 239-249 2002
01/067	Haberle S	Late Quaternary vegetation dynamics and human impact on Alexander Selkirk Island, Chile	Journal of Biogeography 30 239-255 2003
03//050	Haberle S	Biomass burning and ecosystem dynamics of the Sahulian rainforests	Abstracts INQUA XVI International Congress 33 Reno USA July 2003
03//050	Haberle S Elwood C	Fire dynamics of Australian rainforests determined from fine-resolution pollen, charcoal and tree-ring analysis	Program Abstract INQUA XVI International Congress 51 Reno USA July 2003
03//050	Haberle S Elwood C	Patterns of fire activity and climate change from high resolution sedimentary and tree ring records in Tasmania	PhD Thesis May 2003 Melbourne Australia
98/141R	Jones S Wallis L	Phytoliths and other microfossils in tufa formations as a novel source of palaeoenvironmental data	Terra Australis 19:Phytolith and starch research in the Australian-Pacific-Asian regions: the state of the art 31-42 2003 Canberra Australia
98/141R	Jones S Wallis L	AMS dates and phytolith data from mud wasp and bird nests at Carpenters Gap1, Northern Australia	Australian Archaeology 55 35-39 2002
01/100	McDougall Dunlap W VanderHaeghe O; Teyssier C	Cooling and exhumation of the Shuswap metamorphic core complex constrained by ⁴⁰ Ar/ ³⁹ Ar thermochronology	Geological Society of America Bulletin 115 200-216 2003
01/100	McDougall Dunlap W; Feibel C	Numerical age control for the Miocene-Pliocene succession at Lothagam, a hominoid-bearing sequence in the northern Kenya Rift	In <i>Lothagam: The Dawn of Humanity in Eastern Africa</i> , M G Leakey and J M Harris eds 43-64 Columbia University Press New York 2003

Award Number	Chief Investigator Co-authors	Title of Publication	Reference
01/100	McDougall Dunlap W Spell T	Characterization and calibration of ⁴⁰ Ar/ ³⁹ Ar dating standards	<i>Chemical Geology</i> , 198 , 189-211, 2003
02/081P	McDougall I Stern N; Porch N	FxJ43: a window into a 1.5-million-year-old palaeolandscape in the Okote Member of the Koobi Fora Formation, northern Kenya	<i>Geoarchaeology</i> 17 349-392 2002
02/081P	McDougall I Dunlap W; Wysoczanski R	Thermal evidence for early Cretaceous metamorphism in the Shyok suture zone and age of the Khardung volcanics, Ladakh, India	<i>Journal of Asian Earth Sciences</i> 20 481-490 2002
02/081P	McDougall I McLaren S; Dunlap W; Sandiford M	Thermochronology of high heat-producing crust at Mount Painter, South Australia: implications for tectonic reactivation of continental interiors	<i>Tectonics</i> 21 10.1029/2000TC001275 2002
03/145	Noren L Brink F; Goossens D; <i>et al</i>	A combined diffraction (XRD, electron and neutron) and electrical study of Na ₃ MoO ₃ F ₃	<i>J Solid State Chem</i> 174 450-458 2003
00/120	O'Connor S Aplin K; Spriggs M; Ayliffe L	From savannah to rainforest: changing environments and human occupation at Liang Lemdubu, the Aru islands, Maluku, Indonesia	Bridging Wallace's Line Kershaw A; David B; Tapper N; Penny D; Brown J (eds) <i>Advances in Geoecology</i> 34 279-306 2002 Reiskirchen Germany
01/111	O'Connor S Spriggs M; Veth P	Direct dating of shell beads from Lene Hara Cave, East Timor	<i>Australian Archaeology</i> 5 18-21 2002
99/019	Sargeson A Smith S; Harrowfield J; Di Bartolo N	Cryptate compounds and methods for diagnosis and therapy	Patent PCT/AU00/00003 filed January 2000
99/019	Sargeson A Di Bartolo N; Smith SV	Metal ion cage complexes as imaging agents for cancer cells	Radiation 2000 30 Lucas Heights November 2000
00/135P	Sargeson A Di Bartolo N; Donlevy T; Smith S	Synthesis of a new cage ligand, SarAr, and its complexation with selected transition metal ions for potential use in radioimaging	<i>J Chem Soc Dalton Trans</i> 2303-2309 2000
00/135P	Sargeson A Smith S; Di Bartolo N	Potential of SarAr for radiolabelling peptides and antibody fragments with Cu-64	<i>J Labelled Comp Radiopharm</i> 44 S691 2001
02/118P	Sargeson A Harrowfield J; Smith S; <i>et al</i>	Cryptate compounds and methods for diagnosis and therapy	PCT Patent Application No. PCT/AU00/00003 July 2001
02/118P 00/135P	Sargeson A Di Bartolo N	Radiolabelling antibodies for cancer diagnosis and treatment	PhD Thesis, ANU 2002 Canberra Australia
98/002	Summerhayes G	Modelling differences between Lapita obsidian and pottery distribution patterns in the Bismarck Archipelago	In: Sand C (Ed) <i>Proceedings of the New Caledonian Lapita Conference</i> 139-149 2003 Noumea Noumea
98/002	Summerhayes G	The rocky road: the selection and transport of admiralties obsidian to Lapita communities	<i>Australian Archaeology</i> 57 135-143 2003
00/198S	White J	Expanded mesoporous silicate films grown at the air-water interface by addition of hydrocarbons	<i>Langmuir</i> 19 793-800 2003

Central Queensland University

03/003P	Andersen L Storey A; Sinkinson A; Dytlewski N	Transplanted oysters and resident mud crabs as biomonitors in Spillway Creek	report for Centre for Environmental Management, Central Queensland University 1-30 2003 Gladstone Australia
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Charles Darwin University

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Edith Cowan University

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Flinders University

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Griffith University

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James Cook University

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Macquarie University

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RMIT University

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The University of Adelaide

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98/142R	Augustinus P McMinn A; Barton C	Diatom analysis of late Holocene sediment cores from Macquarie Harbour, Tasmania	Alcheringa 27 135-154 2003
997/160	Augustinus P Duller G	Luminescence and radiocarbon dating of raised beach sediments, Bungee Hills, east Antarctica	Antarctica at the Close of a Millenium Royal Society of New Zealand Bulletin 35 419-429 2002
99/015	Denny W Hay M; Anderson R; Ferry D; Wilson W	Synthesis and evaluation of nitroheterocyclic carbamate prodrugs for use with nitroreductase-mediated gene-directed enzyme prodrug therapy	J Med Chem 46 5533-5545 2003
02/053P	Hay M Gamage S; Kovacs M; Pruijn F; Anderson R; Patterson A; <i>et al</i>	Structure-activity relationships of 1,2,4-benzotriazine 1,4-dioxides as hypoxia-selective analogs of tirapazamine	J Med Chem 46 169-182 2003
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00/149	Taylor G	Isotopic constraints on large-scale Sedex or MVT mineralisation within the Cambrian carbonate cover sequences, northwest Queensland	Roach I C (Ed) Regolith and Landscapes in Eastern Australia 14-16 2002
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03/015	Camakaris J Howie M; Greenough M; Mercer J	Investigation into the molecular basis for successful copper therapy of Menkes disease	Proceedings of the Australian Society for Biochemistry and Molecular Biology 35 31 2003
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94/059	Cooper R Nel P; Martin R	Mechanistic studies of photosensitised DNA strand breakage by iodinated DNA ligands	Abstracts ICRR2003 Conference 365 Brisbane Australia August 2003 0957721773

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02/085	McNiven I Costello A	Prehistoric subsistence at Waddy Point 1 Rockshelter, Fraser Island	BA Honours Thesis The University of Melbourne 2003
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PGRA	Phair J	Compositional effects and microstructure of fly ash based geopolymers	PhD Thesis The University of Melbourne 2001
02/111P	Rowe C Katsifis A; Campbell S; <i>et al</i>	I-123 iododexetimide cannot be displaced from muscarinic receptors with physostigmine <i>in-vivo</i> in humans	Proceedings of the ANZSNM ASM2003 22 2003
01/121 02/113	Rowe C Katsifis A; Dickinson-Rowe K; <i>et al</i>	I-123 η -CIT SPECT is superior to FDG-PET for distinguishing dementia with Lewy bodies from Alzheimer's disease	J Nuclear Medicine 44 :s 18 2003
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PGRA	Ridges M	Numerous indications. The archaeology of regional hunter-gatherer behaviour in north west central Queensland, Australia	PhD Thesis, Univeristy of New England 2003

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98/075; 97/039	Campbell S Zhang H	Crystal structure and magnetic properties of the rare-earth intermetallic compounds $R_3T_{29}Si_4B_{10}$	PhD Thesis The University of New South Wales 1999
01/027P	Campbell S Hofmann M; <i>et al</i>	Mechanochemical transformation of ζ - Fe_2O_3 to $Fe_{3-x}O_4$ – microstructural investigation	J Alloys Comp 348 278 2003
01/027P	Campbell S Hofmann M; Kaczmarek W	Mechanochemical treatment of ζ - Fe_2O_3 : a neutron diffraction study	Appl Phys A74 S123 2002
01/027P	Campbell S Edge A; Hofmann M	Antiferromagnetic to ferrimagnetic transition in $ZnFe_2O_4$	Fifth Seeheim Workshop on Mössbauer Spectroscopy C22 May 2002
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01/027P	Campbell S Ehrhardt H; Hofmann M	Magnetism of the ball-milled spinel $ZnFe_2O_4$	26th Annual Condensed Matter Meeting WA3 Jan-Feb 2002 Wagga Wagga NSW
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03/040	Foster L Holden P; Garvey C; Russell R; Stone D	Intracellular organisation of polyhydroxyalkanoate inclusion bodies: a role for small angle neutron scattering?	Abstracts 2 nd AINSE Symposium on Small-Angle Scattering and Reflectometry, 19 Lucas Heights, 2003 www.ansto.gov.au/ansto/bragg/symposium/prog_abs.pdf
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03/083	Mooney S Maltby E	The late Holocene fire history at Worimi Swamp, New South Wales: a synthesis of two proxy records of fire	Honours Thesis 2003 Sydney Australia
PGRA	Rodgers L Holden P; Knott R; Finnie K; Bartlett J; and Foster L	Effect of sol-gel encapsulation on lipase structure and function: a small angle neutron scattering study	Proceedings XII International Workshop on Sol-Gel Science and Technology Abstract 793 2003
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PGRA	Rodgers L Holden P; Knott R; Finnie K; Bartlett J; Foster L	A Small Angle Neutron Scattering (SANS) study of <i>Candida antarctica</i> lipase B in solution state and immobilised in sol-gel	Abstracts 2 nd Annual BABS Symposium P35 Bondi Australia November 2003
01/174S	Stewart G	A ^{169}Tm study of hole-doped $Tm_{2/3}Ca_{1/3}MnO_3$	Abstracts 15th ANZIP National Congress Australian Institute of Physics Congress M-065-CMP Sydney Australia July 2002

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01/053	Gerson A Harmer S	Surface leach control for improved copper recovery from chalcopyrite leaching	PhD Thesis University of South Australia 2002
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98/090	Hill D Dargaville T; George G; Whittaker A	An investigation of the thermal tensile properties of PFA following ν -radiolysis	Macromolecules 36 7132-7137 2003
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99/083	Hill D Dargaville T; <i>et al</i>	High energy radiation grafting of fluoropolymers	Prog Polym Sci 28 1355-1376 2003
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01/071	Hill D Dargaville T; <i>et al</i>	An investigation of the vapour phase grafting of styrene onto PFA	Macromolecules 36 8276-8281 2003
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00/043	Dragovich D Webb A; Erskine W	Flood-driven formation and destruction of a forested floodplain and in-channel benches on a bedrock-confined stream: Wheeny Creek, southeast Australia	The Structures, Function and Management Implications of Fluvial Sedimentary Systems IAHS Publ No 276 203-210 2002
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01/101P	McMinn A Irwin A; Hallegraeff G	Cyst and radionuclide evidence demonstrate historic <i>Gymnodinium catenatum</i> dinoflagellate populations in Manukau and Hokianga Harbours, New Zealand	Harmful Algae 36 1-14 2003
02/084	McMinn A Saunders K	The reconstruction of salinity changes in Orielton Lagoon	BSc (Hons) Thesis University of Tasmania 2002
02/082	McMinn A Riddle M; King C; Lane A; Snape I; Scouller R; <i>et al</i>	So you like a challenge? Water and sediment quality guidelines for Antarctica	Abstracts INTERACT 2002 147 Sydney Australia July 2002

Award Number	Chief Investigator Co-authors	Title of Publication	Reference
02/110	Roberts D Foster A	A diatom-based palaeosalinity history of a closed, meromictic saline lake in the Windmill Islands, east Antarctica	Plant Science research project for the University of Tasmania 2002
02/110	Roberts D Beld M	A palaeolimnological reconstruction from diatom assemblages in Holl Lake, east Antarctica	M Sc Thesis for Institute of Antarctic & Southern Ocean Studies 2002

University of Technology Sydney

PGRA	Peterson V	Diffraction investigations of cement clinker and tricalcium silicate using Rietveld analysis	PhD Thesis University of Technology Sydney 2003
PGRA	Peterson V Hunter B; Ray A	Importance of minor phase inclusion in the Rietveld analysis of cement clinkers	Proceedings 11th International Congress on the Chemistry of Cement 146-150 Durban South Africa May 2003
PGRA	Peterson V Hunter B; Aldridge L	Rietveld refinement of neutron synchrotron and combined powder diffraction data of cement clinker	Appl Phys Lett A 74 S1409-S1411 2002
97/133	Ray A Stevenson K	The retention of caesium and strontium in cemented zeolites	BSc (hons) Thesis University of Technology Sydney 1997
02/169	Skilbeck G Watson M; Goodwin I	The Holocene-LGM sedimentary record of Peru-Chile (Humbolt) current variability on the Peru continental margin, and implications for el nino activity over the past 20,000 yBP	6th Australian Marine Geoscience Conference, ANU ed A Heap 51 Canberra Australia July 2003
02/169	Skilbeck G	El nino correlations across the Pacific Ocean: short and long term variation	Cosmogenic Archives in the Southern Hemisphere workshop 8 Sydney Australia May 2003
00/143	Stevens M Evans P; Mino N; Noorman J; Prior M; Stelcer E	Characterisation of ion implanted PET electroless plated with Ni and Pt	The International Workshop on Particle Beams and Plasma Interaction on Materials 31 Chiang Mai, Thailand Jan-Feb 2002
01/136P	Thomas P White R	Museum conservation of pyrite	Honours Thesis University of Technology, Sydney 2002

The University of Western Australia

00/039	Dodson J Field J; Prosser I	A late Pleistocene vegetation history from a mid latitude Australian semi-arid zone	Quaternary Sci Rev 21 1023-1039 2002
02/092	Musca C Sewell R; Dell J; Faraone L	Minority carrier lifetime in abrupt MBE grown HgCdTe heterostructures	International Symposium on Optical Science and Technology Seattle Washington USA July 2002
02/092	Musca C Sewell R; Dell J; Faraone L; <i>et al</i>	Noise and minority carrier lifetime in abrupt MBE grown HgCdTe heterostructures	J Electron Mat 32 (7) 639-645 2003
02/179	St Pierre T Conolly J	Development of biomedical applications of magnetic fluids and investigation of their physical properties	PhD Thesis The University of Western Australia 2003

University of Western Sydney

01/093P	Maheswaran S George L; Dennis G; Evans P; <i>et al</i>	Effects of metal ion implantation on thin films of poly (styrene-co-acrylonitrile) (SAN)	15th National Congress of the Australian Institute of Physics 156-158 July 2002 Sydney Australia
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University of Wollongong

PGRA	Brooke B	The distribution of carbonate eolianite	Earth Science Reviews 55 135-164 2001
PGRA	Brooke B Woodroffe C; Murray-Wallace C; Heijnis H	Quaternary aminostratigraphy of eolianite on Lord Howe Island, southwest Pacific Ocean	Quaternary Science Reviews 22 387-406 2003

Award Number	Chief Investigator Co-authors	Title of Publication	Reference
PGRA	Brooke B Murray-Wallace C; Woodroffe C; <i>et al</i>	Quaternary calcarenite stratigraphy on Lord Howe Island, south-western Pacific Ocean and the record of coastal carbonate deposition	Quaternary Science Reviews 22 859-880 2003
02/020	Carr P Williams M; Carr P; Hotchkis M; Fink D	Re, Os and Pt isotope ratio measurements using AMS	5th International Symposium on Applied Isotope Geochemistry Heron Island Australia 67 May 2003
01/193S	Dharmappa H Lackenby J	The retention of caesium in cemented waste forms	BE Thesis University of Wollongong 2001
PGRA	Golab A Palamara D	Carbon and oxygen isotopic analyses of dawsonite from Late Permian coal measures Upper Hunter region Australia	AIG-5 - 5th International Symposium on Applied Isotope Geochemistry 179-181 Heron Island year 2003
PGRA	Golab A Palamara D; Carr P	Carbon and oxygen isotopic analyses of dawsonite from Late Permian coal measures Upper Hunter Valley Australia	Proceedings 35th Sydney Basin Symposium on Advances in the Study of the Sydney Basin University of Wollongong, Australia 330 2003
PGRA	Golab A Carr P	Groundwater composition in the presence of igneous intrusions, Late Permian coal measures, Upper Hunter region, Australia	Proceedings 35th Sydney Basin Symposium on Advances in the Study of the Sydney Basin 328 University of Wollongong Australia 2003
PGRA	Golab A	The impact of igneous intrusions on coal, cleat carbonate, and groundwater composition	PhD Thesis University of Wollongong 2003
02/091	Murray-Wallace C Clarke S; <i>et al</i>	Breathing life into the extinction of Aepyornis with eggshell amino acids and stable isotopes	XVI INQUA Congress Program with Abstracts 100 Reno USA 2003
00/115 01/108	Nanson G Cohen T	Late Holocene floodplain processes and post-European channel dynamics in a partly confined valley of New South Wales, Australia	PhD Thesis University of Wollongong 2003
00/115 01/108 97/121	Nanson G Cohen T; Doyle J; Price D	Alluvial evidence of late-Quaternary climate and flow-regime changes on the coastal rivers of New South Wales, Australia	Palaeohydrology: Understanding Global Change Ed Wiley, Chichester, Gregory and Benito 233-258 2003
PGRA	Nghiem L Schäfer A; Elimelech M	Mechanisms of steroid hormones and hormone mimicking compounds removal in nanofiltration	Environmental Engineering Research even CDROM Melbourne December 2003
PGRA	Nghiem L Manis A; Soldenhoff K; Schäfer A	Retention of EDCs estrone and estradiol in nanofiltration and reverse osmosis processes	AWA-IWA Conference Chemicals of Concern in Water CDROM Sydney June 2003
00/179S	Roberts R Cupper M	Late Quaternary environments of playas in southwestern New South Wales	Ph D Thesis The University of Melbourne 2003
00/132P	Rozenfeld A Orion I; Dilmanian F; Zhong Z; Henn A; Sagil I; Pena L	Simulations for x-ray synchrotron beams using the EGS4 code system in medical applications	in Advanced Monte Carlo for Radiation Physics, Particle Transport Simulation and Applications ed Kling, Barao, Nakagawa, Tavora and Vaz 93 - 98 2001
02/114	Rozenfeld A	Neutron dosimetry with new pin planar diodes	IEEE Transactions on Nuclear Science 50 N6 2003
02/114	Rozenfeld A	Semiconductor high-level dosimeters used in SLAC photon and neutron field	SLAC-Pub-8517 online 2003
02/121	Silver T Milliken D	Uranium doping of silver sheathed bismuth(2)-strontium(2)-calcium(2)-copper(3)-oxide superconducting tapes for increased critical current density through enhanced flux pinning	PhD Thesis The University of Wollongong 2003
PGRA	Sloss C Jones B; Murray-Wallace C	The chronostratigraphy of a Holocene barrier estuary on a tectonically stable coastline	Abstracts AINSE Quaternary dating workshop 70-72 Lucas Heights 2003 0-9577217 8 1
PGRA	Sloss C Murray-Wallace C; Jones B	Aspartic acid racemisation and the dating of Holocene to recent estuarine sedimentary successions	Abstracts AINSE Quaternary Dating Workshop 73-76 Lucas Heights 2003 0-9577217 8 1
PGRA	Sloss C Murray-Wallace C; Jones B	Aspartic acid racemisation and the dating of mid Holocene to recent sedimentation in Lake Illawarra, New South Wales, Australia. Coastal Environmental Change During Sea-Level Highstands	International Geological Correlation Program No. 437 , 223-225 Ontario Italy 2003

Award Number	Chief Investigator Co-authors	Title of Publication	Reference
PGRA	Sloss C Murray-Wallace C; Jones B	Aspartic acid racemisation and the dating of mid Holocene to recent sedimentation in Lake Illawarra, New South Wales, Australia	Quaternary Australasian 21(1) 28-30 2003
PGRA	Sloss C Jones B	The sedimentary evolution of Lake Illawarra during the last Glacial Cycle	Abstracts International Geological Correlation Program No 464, Continental Shelves During the Last Glacial Cycle 57-59 2003
02/140	Wang X Soltanian S	Studies of magnetic perovskite oxides and magnesium diboride compounds	PhD Thesis The University of Wollongong 2003
PGRA	Wheeler D Chivas A; Heijnis H; Price D	A palaeoclimatic record from perched lake sediments, Fraser Island, Queensland	Australian Quaternary Association Biennial Conference 43-44 Brisbane Australia 1998
PGRA	Wheeler D Chivas A; Hope G	Isotope stratigraphy of Bega swamp, southern NSW	Australian Quaternary Association Biennial Conference 46-47 Melbourne Australia 2000
01/207	Woodroffe C	Reef-island sedimentation on Indo-Pacific atolls and platform reefs	Proceedings 9th International Coral Reef Congress 2 , 1187-1192 Bali 2002
01/208	Woodroffe C Simms A; Baumber A	Modelling of sediment input into coastal lakes	Proceedings Coast to Coast Conference 515-518 Tweed Heads 2002
01/208	Woodroffe C Simms A; Jones B	Application of RUSLE for erosion management in a coastal catchment, southern NSW	In MODSIM 2003: International Congress on Modelling and Simulation, "Integrative Modelling of Biophysical, Social and Economic Systems for Resource Management Solutions" Volume 2 678-683 Townsville Queensland July 2003
01/207	Woodroffe C Morrison R	Reef-island accretion and soil development on Makin, Kiribati, Central Pacific	Catena 44 245-261 2001
01/207 01/208	Woodroffe C Baumber A	Holocene infill and evolution of Lake Wollumboola, a saline coastal lake on the New South Wales south coast	Honours Thesis 2001
02/152P	Zavitsanou K Katsifis A; Mattner F; Huang X-F	Investigation of M1/M4 muscarinic receptors in the anterior cingulate cortex in schizophrenia, bipolar disorder, and major depression disorder	Neuropsychopharmacology 29(3) 619-625 0893-133X/03

Victoria University

02/019P	Caridi D Beard J	A study of leaching tests for cement stabilised waste	PhD Thesis Victoria University 2003
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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 AINSE awards.

where:

"demand" is determined by the number of eligible projects applying for AINSE Awards.

[The number of eligible projects is determined by the number of applications for AINSE Awards 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 Award applications).

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

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

Year	1995	1996	1997	1998	1999	2000	2001	2002	2003
No. of applications	228	248	247	172	175	233	245	249	232
No. of awards	201	207	201	147	159	201	203	204	184
KPI(1)	88%	83%	81%	80%	91%	86%	82%	82%	80%
KPI(1) (excl. RIEF)	69%	64%	66%	86%	91%	86%	82%	82%	80%

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 Awards 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: Guidelines for the preparation of applications for AINSE Awards, 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 Awards as a percentage of the number of member universities (including RIEF funded grants)

Year	1995	1996	1997	1998	1999	2000	2001	2002	2003
No. of universities	31	34	36	35	36	36	37	37	37
Applications/uni	7.4	7.3	6.9	6.9	4.9	6.4	6.7	6.7	6.2
Awards/uni	6.5	6.1	5.6	5.0	4.4	5.5	5.5	5.4	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 the 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 Awards 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 PGRAs. 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).

Year	1995	1996	1997	1998	1999	2000	2001	2002	2003
No. of PGRA applications	14	13	13	23	23	39	22	43	29
No. of PGRAs awarded	4 + 2'	6 + 3*	6 + 2*	6 + 2*	8 + 1*	17	12	11	15
KPI(2)	43%	69%	62%	35%	39%	44%	54%	26%	52%

(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	1995	1996	1997	1998	1999	2000	2001	2002	2003
No. of universities	31	34	36	35	36	36	37	37	37
Applications/uni	0.45	0.38	0.36	0.66	0.64	0.61	0.59	1.2	0.78
PGRAs/uni	0.19	0.26	0.22	0.23	0.25	0.33	0.32	0.30	0.41

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

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 Awards.

Key Performance Indicator KPI(3)

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

Where "collaborative awards" refers to AINSE Awards involving ANSTO and university staff as joint investigators.

Year	1995	1996	1997	1998	1999	2000	2001	2002	2003
Collaborative awards	115	124	135	137	122	136	139	147	138
Total no. of awards	201	207	201	174	159	201	203	204	184
KPI(3)	57%	60%	67%	79%	77%	68%	68%	72%	75%

(Note: This indicator can be "forced" by giving preference to AINSE Awards 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 Awards and PGRAs.

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 means grants from external sources (such as LIEF 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).

Year	1996	1997	1998	1999	2000	2001	2002	2003
External grants	\$795,000	\$610,000	\$600,000	\$496,864	\$1,276,770	\$250,292	\$250,361	\$240,675
Subscriptions	\$1,470,600	\$1,638,300	\$1,719,300	\$1,795,700	\$1,876,077	\$1,919,754	\$1,958,539	\$2,139,288
KPI(4)	54 %	37%	35%	28%	68%	13%	13%	11%

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 Awards) + (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.

The latest figures for this index are reproduced below.

Year	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
AINSE KPI	2.67	2.75	3.86	3.35	3.53	3.05	3.23	3.39	3.61	2.99
KPI (without RIEF)	2.08	2.17	2.29	1.83	1.99	2.10	2.23	2.78	3.04	2.79
5 year average	2.96	2.91	3.15	3.16	3.24	3.32	3.41	3.31	3.36	3.25

(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

CODE	UNIVERSITY	CODE	UNIVERSITY
ACU	Australian Catholic University	MUR	Murdoch University
ADE	The University of Adelaide	NCT	The University of Newcastle
AKL	The University of Auckland	NSW	The University of New South Wales
ANS	ANSTO	NTU	Charles Darwin University
ANU	The Australian National University	QLD	The University of Queensland
BAL	University of Ballarat	QUT	Queensland University of Technology
CBR	University of Canberra	RMI	RMIT University
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	The University of Sydney
ECU	Edith Cowan University	TAS	University of Tasmania
FLI	Flinders University	UNE	The 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	The University of Western Australia
MAC	Macquarie University	UWS	University of Western Sydney
MEL	The University of Melbourne	VIC	Victoria University of Technology
MON	Monash University	WOL	University of Wollongong
GNS	Institute of Geological & Nuclear Science		

Specialist Committees

A	Archaeology and Geosciences
B	Biomedical Science and Biotechnology
E	Environmental Science
M	Materials – Properties and Engineering
N	Materials – Structures and Dynamics