

Interactions Across the University



The School assumes an active role in many areas across campus. For example, School staff contribute to the Centre for the Science and Engineering of Materials, the Quaternary Dating Research Centre and the Visual Sciences Research Centre. Details of the associated collaborations with other Schools, including RSBS, RSC, RSES and JCSMR, are found in Research Accomplishments (section 1) and Collaborative Ventures (section 3).

In this section we emphasise specifically the relationship with The Faculties, with whom the School has traditionally enjoyed a high level of interaction. This is particularly so for the Departments of Physics and Chemistry in the Faculty of Science, and the Faculty of Engineering and Information Technology. These interactions are reinforced by a number of joint staff appointments.

This year, School staff delivered 24 undergraduate courses in The Faculties and assumed responsibility for supervision and co-supervision of a number of honours and graduate students. These activities, together with details of research collaborations with Faculty staff (see also section 3 of the report) are reported below. The final part of this section lists contributions that School staff make to the routine functioning and management of the University.

Interaction with The Faculties

Department of Applied Mathematics

Dr V.J.S. Craig gave 5 lectures in CHEM 3052 3rd year Physical Chemistry, *Colloid and Surface Chemistry*. He also gave an Honours lecture course comprising 7 lectures, entitled *The Last Nanometres* and supervised the 12 week laboratory course.

Dr T.J. Senden taught a lecture and laboratory course in 3rd year Physical Chemistry 3052, Department of Chemistry and taught part of an Honours lecture course on *Surface Chemistry* in the Department of Chemistry. He also gave a lecture and laboratory session in connection with the Faculty of Engineering (ENGN4517), and gave assistance with several 4th year projects.

Dr D.W.R. Williams gave a 3rd year *Statistical Physics and Soft Matter* course, in the Department of Physics. This was a course of 20 lectures during September and October. Professor S. Hyde presented one lecture of the course.

Atomic and Molecular Physics Laboratories

Collaboration on "Atom Optics" continues between the Atom Manipulation project in the School and the Physics Department in The Faculties, involving Dr M.D. Hoogerland, Professor S.J. Buckman and Dr K.G.H. Baldwin [LPC]; Professor H. Bachor, Dr D. McClelland and Dr C. Savage [Physics Department, The Faculties].

This year the Department hosted one Physics Honours student for their experimental project work. Mr Robinson worked on experiments using the metastable helium trap in the Atom Manipulation project.

Dr A. Kheifets and Professor S.J. Buckman gave an Honours level lecture course in *Atomic Collision Processes* in April/May.

Dr M.D. Hoogerland contributed to a 3rd year lecture course in *Laser Physics*.

Dr M. Vos gave a course in *Solid State Physics* for 3rd year Physics students and 4th year Engineering students in August/September.

Electronic Materials Engineering

Dr R.G. Elliman and Professor C. Jagadish participated in teaching *Microelectronic Processing* Elective Course in the Department of Engineering, The Faculties.

Dr R.G. Elliman presented a general lecture in ion-beam analysis in CSEM lecture series

Professor C. Jagadish and Dr H.H. Tan supervised one Engineering Honours student, and he and Dr J. Wong-Leung co-supervised a PhD student in the Department of Engineering, The Faculties.

Dr H. Timmers (joint position with Nuclear Physics) lectured on *Nuclear Reactions*, to 3rd year Physics students, Department of Physics and Theoretical Physics, and gave tutorials and laboratory demonstrations to 1st year Physics and Engineering students, Department of Physics and Theoretical Physics.

Professor J.S. Williams supervised one Engineering Honours student.

Laser Physics Centre

Dr K.G.H. Baldwin gave an Honours year course in *Atom Optics* in the Physics Department, and gave a short course in *Lasers in Semiconductor Technology* to 3rd year Engineering students. Co-supervised a physics Honours student working on experiments in the Atom Manipulation project, and collaborated with AMPL and the Physics Department, The Faculties on several projects.



Collaborations began with Dr C. Savage of the Department of Physics, Faculty of Science and former student Ms K. Catchpole on the “Fundamentals of a Driven Two-Level Atom”. Staff involved are Dr N.B. Manson, Dr C. Wei and Dr J.P.D. Martin.

Collaboration with Dr M. Humphrey, Chemistry Department, Faculty of Science on the “Nonlinear Optical Properties of Organometallics” continues. Staff involved are Dr M. Samoc and Professor B. Luther-Davies.

Nuclear Physics

Dr A.M. Baxter of the Department of Physics and Theoretical Physics carries out research on “Nuclear Spectroscopy” in the Nuclear Physics Department.

Dr A.P. Byrne holds a joint appointment with the Department of Physics and Theoretical Physics.

Dr T. Esat from the Department of Geology carries out research on the “Calibration of the Radiocarbon Time Scale 30-40 ka BP” in the Nuclear Physics Department.

Dr L.K. Fifield continues collaborations with:

Dr P. De Deckker and Dr B. Opdyke of the Geology Department on “Dating of Marine Cores with Carbon-14”;

Professor J. Chappell, RSES on “Measurement of Erosion Rates at a Range of Scales in the Australian Landscape using *in situ* Produced ^{10}Be ”;

Professor K. Lambeck and Y. Yokoyama, RSES and Drs P. De Deckker and B. Opdyke, Department of Geology on “Precise Reconstruction of Past Sea-Levels via Radiocarbon Chronologies of Shallow Marine Cores from Northern Australia”;

Professor K. Lambeck and Y. Yokoyama, RSES and Dr T. Esat, Department of Geology on “Evidence for Large Fluctuations in Atmospheric ^{14}C between 30 and 50 ka BP from Uplifted Coral Terraces from the Huon Peninsula, PNG”;

Professor R. Wasson, CRES on “Landscape Evolution in the Southern Highlands Region of NSW, using ^{10}Be Deposited from the Atmosphere”;

T. Barrows, RSES (and with Dr J. Stone, now University of Washington) on “A Glaciation Chronology of the Snowy Mountains and Tasmania Determined from *in-situ* Produced ^{10}Be and ^{36}Cl ”.

Dr A.E. Stuchbery lectured 3rd year physics students, Department of Physics on *Elementary Particle Physics*.

Dr H. Timmers, (joint position with EME) gave a lecture course on *Nuclear Reactions* to 3rd year students in the Department of Physics and Theoretical Physics, The Faculties, and conducted tutorials and laboratory demonstrations for 1st year Physics and Engineering students, Department of Physics and Theoretical Physics.

He also supervised the Honours project of Mr Stephen Jones, “Compositional Ion Beam Analysis of YBCO Superconducting Films”.

Optical Sciences Centre

Professor Yu.S. Kivshar in collaboration with Dr C. Savage, Department of Physics, The Faculty of Science, organised the *One-Day International Workshop on Bose-Einstein Condensates and Atom Lasers*, held on 24 November in the RSPHYSSE.

Dr A. Ankiewicz and Professor J.D. Love taught the *Optical Communications* course for Physics and Engineering students in the Department of Physics.

Dr D. Edmundson taught a 2nd year lecture course (12 lectures) on *Thermodynamics*, and a section of the 3rd year Computational Physics lecture course on *Symbolic Computation*, and gave teaching assistance to 1st year students and a laboratory technician in the 1st year optics laboratory.

Plasma Research Laboratory

Dr G.G. Borg supervised Mr S. Chan, Mr C. Chung, Mr K. Kwai, Mr B. Kwan and Mr T. Ng, Faculty of Engineering Information Technology (FEIT) during their 4th year Engineering projects.

Professor R.W. Boswell participated in the FEIT *Micro-Electronics* course and is supervising three Engineering projects.

Dr. B.D. Blackwell supervised Mr D. Price of FEIT during his 4th year Engineering project.

Dr J. Howard presented an eighteen-lecture course on *Plasma Physics* to 3rd year students, Department of Physics, The Faculties.

Dr J. Howard supervised Mr A. Last during his 4th year Engineering project.

Dr M.G. Shats supervised Mr A. Gough during his 4th year Engineering project.

Theoretical Physics

Dr C.J. Burden gave a series of 10 lectures entitled *Special Relativity* to 3rd year students at Physics and Theoretical Physics, The Faculties from March to April, and again from April to June (a segment of PHYS3001).

Professor R.L. Dewar gave a series of 10 lectures on *Classical Mechanics* to 3rd year students at Physics and Theoretical Physics, The Faculties from March to April (a segment of PHYS3001). (Dr R. Ball acted as tutor for these lectures)

Dr H.J. Gardner lectured in *COMP1100 Introductory Programming and Algorithms*, *ENGN4518 Computational Engineering* and *COMP3067 Computational Science and Engineering*

Dr M. Gulacsi delivered a lecture course on *Statistical Physics* to Honours students at the Department of Physics and Theoretical Physics, The Faculties.

Dr A. Kheifets delivered a lecture course on *Atomic Collision Processes* to Honours students in Physics, The Faculties in March-May.

Dr S. Kuyucak is working on the study of “*Ion Channels in Biological Membranes*” with Dr S.H. Chung from the Department of Chemistry.

Mr M. Walker gave a course of 10 lectures in *Relativistic Quantum Mechanics* *PHYS 3002* in the second semester as part of the 3rd year Undergraduate course, Department of Physics and Theoretical Physics, The Faculties.

University and School Service

(Full Membership of School Committees is given on page 125)



Applied Mathematics

Professor S.T. Hyde

Member, Academic Staffing Strategy Advisory Group
Member, Research Directions and Policy Advisory Group

Dr T.J. Senden

Member, Vice Chancellor's Advisory Committee for the Centre for the Science and Engineering of Materials
Member, Scanned Probe Microscopy Facility

Atomic and Molecular Physics Laboratories

Professor S.J. Buckman

Member, Board of the Institute of Advanced Studies (BIAS) (until September)
Member, BIAS Committee on General Policy (until September)
Member, Board of Studies, Graduate Program in Physical Sciences
Chair, Committee to Review Technical Services
Member, Academic Staffing Strategy Advisory Group
Member, General Staff and Facilities Advisory Group
Member, RSPHysSE School Advisory Board

Dr B.R. Lewis

Member, Faculty, Research School of Astronomy and Astrophysics
Member, Promotions Committee, Research School of Astronomy and Astrophysics
Member, Library Committee
Member, Science Library Advisory Committee
Member, Board of the Institute of Advanced Studies
Chairman, Review of RSPHysSE Stores and Purchasing

Dr S.T. Gibson

Member, IT Local Contacts Committee

Mr K.J. Lonsdale

Member, ANU Council
Member, ANU Finance Committee
Member, Steering Committee, Faculties Review
Member, Staff Amenities Fund Committee ANU
Member, Selection Committee, Council Medal for General Staff Excellence
Member, Committee to Advise Council on the Appointment of the Tenth Vice-Chancellor
Member, University Staff Consultative Committee
Panel Member, Committee of Review
Member, University Mediation Panel
Member, Committee to Review Technical Support, Department of Geology

Professor E. Weigold

Member, Board of the Institute of Advanced Studies
Member, Major National Research Facilities H-1 Board
Member, Innovations Project Steering Group
Member, Advisory Board, Research School of Astronomy and Astrophysics
Member, University Fellowships Committee
Member, Board, ANU Centre for Theoretical Physics

Electronic Materials Engineering

Dr R.G. Elliman

Member, Physical Sciences Library Committee

Member, General Staff and Facilities Advisory Group
Member, ANU Electron Microscopy Unit Advisory Group

Professor C. Jagadish

Member, Board of Studies, Graduate Program in Physical Sciences
Member, Board of Studies, Graduate Program in Engineering
Coordinator, RSPHysSE Physics Honours Program

Professor J.S. Williams

Chair, Committee for Review of Physics, The Faculties
Member, Selection Panel, RSES
Member, Budget Strategy Advisory Group
Chair, Academic Staffing Strategy Advisory Group
Chair, External Earnings Advisory Group
Chair, General Staff and Facilities Advisory Group
Member, Research Directions and Policy Advisory Group

Mr T. Halstead

First Aid Coordinator

Laser Physics Centre

Dr K. Baldwin

Member, Summer School Committee 2000

Professor B. Luther-Davies

Member, Equipment & Facilities Advisory Group
Member, External Earnings Strategy Advisory Group
Member, Research Directions & Policy Advisory Group
Member, Promotions Committee

Dr N.B. Manson

Graduate Convenor, Physical Sciences Program
Member, ANU Radiation Safety Committee
Member, University Laser Safety Officer

Dr J. Martin

Associate Editor, 1999 School Annual Report

Mr I. McRae

Member, Committee to Review Technical Resources
Member, Technical Resources Advisory Committee (TRAC)
Member, Local Area Classification Advisory Group
Member, Area Occupational Health & Safety Committee

Ms A. Smith

Member, Staff Selection Committee
Member, Local Area Classification Advisory Group

Nuclear Physics

Dr A.P. Byrne

Member, Dean of Science IT Advisory Group
Member, Board of Studies, Graduate Program in Physics
Convenor, Graduate Program (September – October)

Professor G.D. Dracoulis

Ex-officio Member, Faculty Board
Member, Academic Staffing Advisory Group
Member, Research Directions and Policy Advisory Group
Member, (IAS Representative), Promotions Committee of the Board of the Faculties
Member, Institute Planning Committee

Dr L.K. Fifield

Member, External Earnings Advisory Group
Member, Committee, Review of Technical Services

Chair, Occupational Health and Safety Committee (from October 1999)

Dr D.J. Hinde

Editor, 1999 School Annual Report

Mr A.G. Muirhead

Convenor, Local Area Consultative Committee

Mr R.B. Turkentine

Member, Tender Evaluation Committee for the supply of Liquid Nitrogen, Compressed Gases and the procurement of Bulk Storage Liquid Nitrogen Vessels for the ANU

Dr D.C. Weisser

Chair, Technical Resources Advisory Committee

Optical Sciences Centre

Professor Yu.S. Kivshar

Chair, Colloquium Committee

Plasma Research Laboratory

Dr B.D. Blackwell

Member, ANU Information Technology Sponsors Committee

Professor R.W. Boswell

Chair, Faculty

Mr G.C.J. Davies

Member, Radiation Committee

Professor J.H. Harris

Member, Equity Diversity and Consultative Group
Member, Board of the Institute of Advanced Studies
Referee, IAS Performance and Planning Fund
IAS Representative, Review of the Faculties

Theoretical Physics

Professor R.J. Baxter

Member, Board, ANU Centre for Theoretical Physics

Professor V.V. Bazhanov

Deputy Director, ANU Centre for Theoretical Physics

Dr M.P. Das

Member, Working Party, Jagadishwar Mahanty Prize
Co-convenor, ANU CTP Summer School on Bose–Einstein Condensation (January 2000)

Professor R.L. Dewar

Deputy Chair, ANU High Performance Computing Advisory Committee
Member, Board of the Institute of Advanced Studies
Director, ANU Centre for Theoretical Physics

Dr B.A. Robson

Member, Board of the Faculties (BIAS Representative)
RSPHysSE Adviser on Integrity in Research
Member, Graduate Degrees Committee
Convenor, Working Party, Jagadishwar Mahanty Prize
Member, Selection Committee, Jagadishwar Mahanty Prize
Member, Board of Studies, Physical Sciences Program