

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 collaborations with other Schools, including RSBS, RSC, RSES and JCSMR, are found in Research Accomplishments (section 1) and Collaborative Ventures (section 3).

In 2001, the ANU welcomed Professor Ian Chubb as Vice Chancellor. Shortly thereafter, the VC initiated the establishment of the National Institutes, one aim of which was to enhance both the domestic and international profile of the University by revealing the breadth and depth of our academic activity. The School assumed a leadership role in the National Institute for Physical Sciences with the appointment of Professor J.S. Williams (EME) as Convenor. The aims of the Institute are two-fold: (i) to coordinate, strengthen and promote the outstanding physical sciences research, teaching and outreach programs of the ANU that span staff, facilities and capabilities across the entire campus and (ii) to enhance those programs, major facilities and activities with a national focus, including taking a leadership role in advancing the cause of the physical sciences within the community. In addition to the National Institute for Physical Sciences, staff from the School are also affiliated with other Institutes including that for Engineering and Information Sciences.

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 23 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) are reported in this section. 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

There is a high level of interaction between the School and The Faculties, particularly with the Faculty of Science (Department of Physics and Department of Chemistry) and also with The Faculty of Engineering and Information Technology.

A number of collaborative research projects are active. RSPHysSE staff teach and assume responsibility for supervision and co-supervision of many honours and graduate students enrolled in The Faculties. Additional interaction is facilitated by staff who hold joint appointments.

Applied Mathematics

Final revisions to image processing developed for Dr Phil Evans (Department of Forestry, The Faculties) were made by Dr A. Christy. A report on this project was presented by Dr Evans at the 32nd Annual Meeting, International Research Group on Wood Preservation, Nara, Japan, May

Dr V.S.J. Craig supervised D. Evans, Honours Student, Chemistry. He also lectured and operated the lab course *Applied Physical Chemistry* C3102 (12 lectures and 8 labs) for a third year undergraduate unit in the Department of Chemistry, The Faculties. Dr Craig also examined honours theses for the Department of Chemistry.

Dr V.S.J. Craig and Dr T. Senden developed a new undergraduate laboratory demonstration for physical chemists. This has been published in the *Journal of Chemical Education* and adopted in the Department of Chemistry.

Dr M.A. Knackstedt co-supervised M. Turner, honours student, Environmental Sciences.

Dr V. Robins tutored for the Maths Department course *Nonlinear Modelling and Chaotic Behaviour* in semester 2.

Dr T. Senden supervised B. Haupt (Research School of Chemistry) who submitted her PhD thesis "Single Polymer Chains" in October 2001. He also supervised M. Ramos (Department of Forestry) who submitted his MSc thesis "Improving the Gluing of Eucalypt Timber by Plasma Modification of Wood Surfaces" in April 2001.

Dr N.J. Welham coordinated the course *Characterisation of Materials* for FEIT (lecturers included Professor R.G. Elliman, Dr M.C. Ridgway and Dr H.H. Tan). He was also Guest Lecturer on *Aspects of Materials Science*, SREM; and participated in the Rings of History project with Forestry.

Atomic and Molecular Physics Laboratories

Collaboration on *Atom Optics* continues between the Atom Manipulation Project in the School and the Department of Physics in the Faculties, involving Dr K.G.H. Baldwin (LPC) and Professor S.J. Buckman, with Professor H.-A. Bachor, Dr J. Close and Dr C. Savage (Department of Physics, The Faculties).

Dr S.T. Gibson, co-supervised C. Puetter, a third year physics student, on the *Particle Imaging Detector* project.

Dr A.S. Kheifets gave a lecture course on *Atomic Collision Processes* which was delivered to honours students in the Department of Physics in March – May.

Director's Unit

Professor J.D. Love and Dr A. Ankiewicz presented a new 18-lecture course ENGN4543/PHYS3020 *Fibre and Waveguide Devices for Optical Systems and Networks* during second semester to 27 engineering and physics students.

Professor J.D. Love presented the 18-lecture course ENGN4542/PHYS3018 *Optical Fibre and Waveguide Transmission* during second semester to 37 engineering and physics students.

Electronic Materials Engineering

Dr M. Buda, Dr S. Deenapanray and Professor C. Jagadish supervised S. Doshi, fourth year engineering student from the Department of Engineering, Faculty of Engineering and Information Technology (FEIT).

Dr Y. Chen co-supervised a PhD student in FEIT.

Professor R.G. Elliman supervised an honours student from the Department of Physics and a fourth year student from FEIT.

Dr M.C. Ridgway presented a Guest Lecture in *Semiconductor Technology*, fourth year course in FEIT.

Dr M.C. Ridgway and Dr G.M. Azevedo co-supervised fourth year engineering students J. Betlehem, A. Cheung and M. Duggan.

Laser Physics Centre

Collaboration with Dr M. Humphrey of the Department of Chemistry continues on Nonlinear Optical Properties of organometallics. The Department of Chemistry continues to generously make its facilities available to support work on the synthesis of second order chromophores. Dr T. Wydrzynski from the Research School of Biology has also provided excellent support and cooperation in these studies.

Collaboration on *Atom Optics* continues between the Atom Manipulation Project in the School and the Department of Physics in the Faculties involving Dr K.G.H. Baldwin and Professor S.J. Buckman (AMPL), with Professor H-A Bachor, Dr J. Close and Dr C. Savage (Department of Physics).

Dr K.G.H. Baldwin presented a short course in *Lasers in Semiconductor Technology* to third year engineering students, and presented six lectures on *Atom Optics* to fourth year physics honours students.

Nuclear Physics

Dr R. Bark supervised third year student T. Vora, from the Department of Physics, during Semester 2, for her third year Special Topics Course *Configurations of Rotational Bands in ¹⁶⁷Tm*.

Dr A. Baxter of the Department of Physics, The Faculties, carried out research on nuclear spectroscopy in the Nuclear Physics Department and was a Visiting Fellow in the Department from 28 July 2001 to 26 January 2002 as part of the Distinguished Scholars' program in the Faculty of Science. Dr Baxter supervised A. Moylan, a second year student from the Department of Physics, during Semester 2, for his third year Special Topics Course *Optical Fibre Light Tube*.

Dr A.P. Byrne holds a joint appointment with the Department of Physics and Theoretical Physics, The Faculties, and is active on both sides of the campus.

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 K. Fifield continues collaborations with Dr P. De Deckker and Dr B. Opdyke, Department of Geology, on *Establishing Chronologies for Marine Cores via Radiocarbon Dating of Foraminifera*.

Dr G. Lane supervised third year student A. Alexander from the Department of Physics, during Semester 2, for her third year Special Topics course *E3 transitions and Octupole Correlations in Astatine Nuclei*.

Dr A.E. Stuchbery gave a third year lecture course on *Elementary Particle Physics*, supervised an honours student D. Mitchell whose project was entitled *Subnanosecond Lifetime Measurements with Barium Fluoride Detectors: Off Line Detector Characterization and In-beam Measurements* and supervised A. Dolinska who undertook an advanced reading project in Particle Physics as part of the Distinguished Scholar Program.

Dr H. Timmers (NP/EME) gave an honours course in the Department of Physics on *Nucleosynthesis* (jointly with Dr A.P. Byrne, 3rd year Nuclear Physics). He also supervised Benedikt Hecking, a student from the University of Bonn, Germany, as part of an exchange program between the Department of Physics, The Faculties and the University of Bonn. Benedikt visited the Nuclear Physics from April until November and worked on a project entitled *Heavy Ion Elastic Recoil Detection Analysis of Polycrystalline GaN Films*.

Optical Sciences Centre

Professor N. Akhmediev presented a third year undergraduate lecture course *Nonlinear Dynamics* in October.

Plasma Research Laboratory

Dr G.G. Borg presented a six week lecture course on *Radiofrequency Techniques for Wireless Communications* to students in FEIT.

Professor R.W. Boswell participated in the FEIT's *Virtual Reality Program and e-Science* course, and is supervising two engineering projects.

Professor J.H. Harris, Dr B. Blackwell and Dr K. Walshe developed and presented a new 18 lecture and laboratory course in *Power Electronics and Application* for fourth year engineering students in FEIT.

Dr J. Howard presented an 18-lecture course on *Plasma Physics* to third year students, Department of Physics.

Theoretical Physics

Dr S.H. Chung gave a third-year course on *Membrane Biophysics* offered by the Department of Physics.

Dr M.P. Das gave Special Lecture Courses *Statistical Physics* (12 lectures) and *Topics in Magnetism* (12 lectures) as well as distinguished scholar mentoring of third year student P. Brydon.

Professor R.L. Dewar taught *Classical Mechanics* (12 lectures) in the Department of Physics and Theoretical Physics, The Faculties.

Dr M. Gulacsi taught the *Statistical Physics* honours course at the Department of Physics and Theoretical Physics.

Dr A.S. Kheifets gave a lecture course on *Atomic Collision Processes* to honours students in the Department of Physics in March – May 2001.



University and School Service

Membership of regular School Committees is given in section 6. Unless stated otherwise, committees listed below are those within the School.

Applied Mathematics

Prof. Stephen Hyde

Interim board member, National Institute for Biological Sciences

Dr T.J. Senden

Member, Advisory Committee, ANU Centre for the Science and Engineering of Materials

Member, Advisory Committee, Electron Microscopy Unit

Dr A. Stewart

Member, Graduate Degrees Committee

Atomic and Molecular Physics Laboratories

Dr B.R. Lewis

Member, Faculty, Research School of Astronomy and Astrophysics

Member, Promotions Committee, Research School of Astronomy and Astrophysics

Member, University Scholarly Information Services Committee

Member, University Information Strategy Committee (from August)

Member, University Committee on Information (until July)

Member, Board of the Institute of Advanced Studies

Member, Committee on General Policy, Board of the Institute of Advanced Studies

Dr S.T. Gibson

Local IT Contact Representative

Professor E. Weigold

Member, University Academic Board

Member, Board of the Institute of Advanced Studies

Member, Major National Research Facilities H-1 Board

Member, Advisory Board, Research School of Astronomy and Astrophysics

Member, Board, ANU Centre for Theoretical Physics

Member, Advisory Committee, Centre for the Science and Engineering of Materials

Member, Advisory Committee, Innovation Management and Policy Program

Director's Unit

Professor J.D. Love

Member, University Sub-Committee on Major Equipment Expenditure

Member, University Postgraduate Research Scholarships Committee

Electronic Materials Engineering

Professor R.G. Elliman

Member, Board of the Institute of Advanced Studies

Faculty Representative on Faculty Board (until July)

Professor N. Fletcher

Chair, Review of the ANU Centre for Sustainable Energy Systems (September –November)

Professor C. Jagadish

Coordinator, Physics Honours Program (until April)

Member, Promotions Committee, Faculty of Engineering and Information Technology (FEIT)

Member, Review Committee, ANU Center for Sustainable Energy Systems, Department of Engineering, FEIT

Member, Board of Studies, Graduate Program in Physical Sciences

Member, Management Board, National Institute of Information Science and Engineering

Dr M.C. Ridgway

Member, Steering Committee, ANU Centre for the Science and Engineering of Materials

Dr H.H. Tan

Member, Board of Studies, Graduate Program in Engineering

Professor J.S. Williams

Convenor, National Institute for Physical Sciences

Laser Physics Centre**Professor N.B. Manson**

Convenor, Graduate Program in Physical Sciences

University Laser Safety Officer

Member, Board of Studies, Graduate Program in Engineering

Gender Equity Officer

Nuclear Physics**Dr A.P. Byrne**

Member, Board of Studies, Graduate Program in Physics

Convenor, Graduate Program in Physical Sciences (July)

Member, University Committee on Teaching and Learning (BIAS representative) (until June)

Member, “Adapting Boyer Working Group”

Member, Course Review Implementation Committee (until June)

Professor G.D. Dracoulis

Member, Promotions Committee of the Board of the Faculties (IAS Representative)

Member, Institute Planning Committee (IAS Representative)

Mr R.B. Turkentine

Member, Tender Evaluation Committee, Supply of Liquid Nitrogen and Compressed Gases

Plasma Research Laboratory**Dr B.D. Blackwell**

Member, University Information Technology Sponsors Committee

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

Dr John Howard

coordinator Physics Honours Programn (from April)

Theoretical Physics**Dr R. Ball**

Convenor, 15th Physics Summer School

Member, School Liaison Committee for Selection of a new Director

Professor R.J. Baxter

Member, ANU Centre for Complex Systems

Professor V.V. Bazhanov

Deputy Director, ANU Centre for Complex Systems

Professor R.L. Dewar

Member, Board of the Institute of Advanced Studies (until August)

Member, University Education Committee (from September)

Member, School Liaison Committee for Selection of a new Director

Dr H.J. Gardner

Convenor, Summer School on Plasma Physics, 29 January – 2 February 2001

Member, High Performance Computing Advisory Committee

Dr B.A. Robson

Advisor on Integrity in Research

Convenor, Working Party, Jagadishwar Mahanty Prize