3 National and International Links

Professor Jim Williams
- Associate Director (Resources)

This section reports on School activities that have a National or International focus. Such activities include service to outside organizations and also research collaborations, externally funded research and commercialization initiatives with research institutions, government or industry.

During 2000, the School was the recipient of more than 70 external R&D or industry grants amounting to more than $6 million in external funding support. Such funding has been received from domestic public institutions (DISR, DETYA, ARC, ANSTO, AINSE, CSIRO, etc.) in addition to industrial partners and funding through international collaborations. The details are presented in this section.

The School has continued to strengthen its already strong domestic and international collaborative links, which are major ingredients in the success of all of the major School research programs. We had over 230 collaborative projects in 2000 that have either resulted in a publication in the past year, or have attracted external funding support. There were also 29 national and 39 international Collaborative Agreements/MoUs. In addition, the School has hosted over 100 visitors who have either presented departmental seminars or who have participated in joint research projects. Results of these and other programs are, in part, disseminated through organizing conferences, colloquia and seminars. Another important collaborative function for the School is the support of major national facilities that would not otherwise be viable at regional universities. These experimental centers include the H-1 National Plasma Fusion Research Facility in the Plasma Physics Laboratory, which has received funding under the National Major Research Facilities scheme. The Heavy Ion Accelerator Facility in the Department of Nuclear Physics is another large-scale facility that is unique nationally. Both these facilities are a focus for students and researchers from other institutions (both nationally and internationally) to participate in large scale physics programs, while also enabling access for Australian scientists to equivalent major international facilities. Such collaborations, School visitors, conferences and colloquia are listed in this section. The School's research Centres are also an important focus for research collaboration. We selectively report the activities of the Australian Photonics Cooperative Research Centre, The ANU Centre for Theoretical Physics and The Centre for the Mind.

Interactions with industry not only bring additional money for applied research into the School but allow commercialization of the School's intellectual property. The range of industrial interactions includes: joint projects, service contracts, facilities access agreements, support for personnel to work in the School, partners in government grants and centre funding. In addition, there is applied research that the School is endeavouring to commercialise through different mechanisms including the creation of spin-off companies. Such activities are outlined under commercialization in this section.

A significant School priority is to raise public awareness of the importance of science. It is an important duty for members of the School to play an active role on committees and boards of universities, business and government organizations. It is noteworthy that academic staff of the School serve on the editorial boards of over 30 domestic and international journals and on the advisory boards of over 40 international conference series. Services to outside organizations are also presented in detail in this section.

Collaborative Ventures, Agreements & Memoranda of Understanding

Applied Mathematics

Dr A.G. Christy
Project: Polytypism, Short-Range Order and the Origin of Long-Range Order in Natural Khmaralite and Natural and Synthetic Beryllian Sapphirine
Partners: Professor E.S. Grew, University of Maine, USA; Dr A. Hölscher and Professor W. Schreyer, University of Bochum, Germany; Dr Y. Tabira, Research School of Chemistry, ANU

Dr V.S.J. Craig
Project: Surfactant Adsorption Kinetics
Partner: Dr S. Biggs, University of Newcastle

Project: Formation Mechanism of Single-walled Carbon Nanotubes in a Gas Phase
Partners: Drs W. Maser, E. Mu-oz, A.M. Benito, M.T. Martinez and G.F. de la Fuente, CSIC, Spain

Project: Deposition of Diamond-like Films by Powerful UV Femtosecond and Nanosecond Laser Ablation
Partners: Professor A. Perrone and Dr A. Zocco, University of Lecce, Italy; Professor C. Fotakis, Heraklion, Crete, Greece

Project: Excitation of Solids by Femtosecond Lasers: Non Equilibrium Phenomena, Phase Transitions and Ablation of Metals and Dielectrics
Partners: Dr A.V. Rode and Professor B. Luther-Davies, (Laser Physics Centre); Professors V.T. Tikhonchuk and P.N. Lebedev, Physical Institute, Moscow, Russia

Professor S.T. Hyde
Project: Polycontinuous Mesophases in Copolymer Melts
Partners: Professor T. Hashimoto and Professor H. Hasegawa, Kyoto University, Japan

Project: Microemulsions and Cubic Phases in Hydrogenated and Perfluorinated Systems
Partner: Professor M. Monduzzi, Cagliari University, Italy

Project: Mesoporous Inorganic Materials
Partner: Professor O. Terasaki, Kyushu University, Japan

Project: Differential Geometry of Attractors
Partner: Dr Y. Nagai, Kokusikan University, Japan

Project: Ultrastructured Inorganic Colloids
Partner: Professor J-M. Garcia Ruiz, University of Granada, Spain

Professor S. Marcelja
Project: Electrical Double Layers in Aqueous Solvent
Partner: Professor D. Andelman, Tel Aviv University, Israel

Professor B.W. Ninham
Project: Co-ion Dependence of DNA Nuclease Activity suggests Hydrophobic Cavitation as a Potential Source of Activation Energy
Partners: Professor B. Norden, Dr E. Tuite and Ms H-K Kim, Chalmers University, Sweden

Project: Observation of Conformational Changes of DNA Under Different Ionic Strength and Types of Ion by using Atomic Force Microscopy
Partners: Dr V. Craig and Ms H-K Kim, Chalmers University, Sweden

Dr T.J. Senden
Project: Nanomechanical Work on Small Molecular Assemblies
Partner: Professor J.-M. di Meglio, Institut Charles Sadron, France

Project: Novel Particulate Radiotherapeutics
Partner: Dr B. Burch, Australian Nuclear Science and Technology Organisation

Dr N.J. Welham
Project: Mechanochemical Processing of Coal
Partner: Dr P. Chapman, Curtin University of Technology

Project: Disposal Options for Ferrous and Arsenical Solutions from Mineral Processing Operations
Partners: Dr K. Malatt, Gold Mines of Sardinia; Dr S.Vukcevic, Anaconda Nickel

Project: Electrochemistry of Pyrite and its Application to Gold Recovery
Partner: Dr G.H. Kelsall, UBC, Canada and Imperial College, London, UK

Project: Mechanical Enhancement of the Formation of Lithium Ferrites
Partners: Dr V. Berbenni and Dr A. Marini, University of Pavia, Italy

Project: Effect of Mechanical Activation on Self-propagating High-temperature Reactions
Partner: Dr U. Anselmi-Tamburini, University of Pavia, Italy

Dr D.R.M. Williams
Project: Folding Dynamics of DNA Condensates
Partners: Mr B. Schnurr and Dr F.C. MacKintosh, University of Michigan, USA

Dr Y.Y. Yaminsky
Project: Dynamic Hydrophobic Transitions
Partners: Dr K. Thuresson and Dr T. Nylander, Lund University, Sweden

Project: Ensembles of Nanoparticles
Partners: Dr S. Ohnishi and Dr K. Abe, National Institute of Materials and Chemical Research, Tsukuba, Japan

Atomic and Molecular Physics Laboratories

Professor S.J. Buckman
Project: Low Energy Electron Molecule Scattering
Partners: Dr M.J. Brunger and Professor P.J.O. Teubner, Flinders University

Project: Electron Scattering from Molecular Radicals
Partners: Dr M.J. Brunger and Professor W. Lawrance, Flinders University

Project: Electron Scattering from CO_2
Partners: Professor M.A. Morrison, University of Oklahoma, USA; Dr S.F. Mazevet, Los Alamos National Laboratory, USA

Project: Electron Scattering from Metal Vapours
Partners: Professor P.D. Burrow, University of Nebraska, USA; Professor K. Bartschat, Drake University, USA

Project: Electron Molecule Scattering
Partners: Professor H. Tanaka, Sophia University, Japan; Professor H. Cho, Chungnam National University, Korea

Professor L.T. Chadderton
Project: Phase Changes in Transition Metal Dichalcogenides due to GeV Heavy Ion, and MeV Fullerene Ion Bombardments – Transmission Electron Microscopy and Surface Force Microscopy
Partner: Dr A. Dunlop, SESI, École Polytechnique, Paliseaux, France

Project: Radiation Effects on Polymers; Semiconductors
Partner: Dr D. Fink, Hahn-Meitner Institute, Berlin, Germany

Project: Theory and Practice of Organic Radical Formation and Motion in GeV Ion Irradiated Polymers
Partner: Professor S.A. Cruz, Autonomous Metropolitan University of Mexico, Mexico

Project: (e,2e) Primary Current Electron Spectroscopy and Other Surface Technical Investigations of the Graphite/Fullerene Radiation Induced Phase Change
Partner: Professor P.B. Möller, Niels Bohr Institute, Copenhagen, Denmark

Professor R.W. Crompton and Dr K. Kumar (Theoretical Physics)
Project: Quantum Statistics and Boltzmann's Equation
Partners: Dr R.E. Robson, James Cook University; Professor M.A. Morrison, University of Oklahoma, USA

Dr M.D. Hoogerland
Project: Ultracold Atomic Collisions
Partner: Dr I. Whittingham, James Cook University

Dr A.S. Kheifets
Project: Convergent Close-coupling Theory of Double Ionization by Photon and Electron Impact
Partner: Dr I. Bray, Flinders University

Project: Electron Impact Double Ionization of the Helium Atom
Partners: Professor A. Lahmam-Bennani, University of Paris – Orsay, France; Dr A. Dorn, University of Freiburg, Germany

Project: Multiple Atomic Photoionization
Partner: Professor Y. Azuma, Photon Factory, High Energy Accelerator Research Organization, Japan

Dr A.S. Kheifets and Dr M. Vos
Project: Coincident Compton Scattering from Solids
Partner: Professor F. Bell, University of Munich, Germany

Project: Comparison of Modern Many-body Theories with the Measured Energy-resolved Momentum Densities of Aluminium
Partners: Dr B. Holm, Chambers University, Sweden; Dr F. Aryasetiawan, Joint Research Center for Atom Technology, Angstrom Technology Partnership, Japan

Dr B.R. Lewis and Dr S.T. Gibson
Project: Analysis of EEL Spectra
Partners: Dr M.J. Brunger, Flinders University; Dr M. Allan, University of Fribourg, Switzerland

Project: Rydberg-valence Interactions in O_2
Partner: Professor H. Lefebvre-Brion, Université de Paris-Sud, Orsay, France

Project: Analysis of REMPI Spectra
Partners: Professor M.L. Ginter, University of Maryland, USA; Dr J.S. Morrill, Naval Research Laboratory, Washington DC, USA; Dr R.A. Copeland, SRI International, Menlo Park CA, USA

Project: Anomalous Intensities in REMPI Spectra
Partners: Dr R.A. Copeland, Dr R. Robertson and Ms A. Tucay, SRI International, Menlo Park CA, USA

Project: Coupled-channel Calculations for Atmospheric Photochemical Models
Partners: Dr L.W. Torop and Dr F.T. Hawes, University of Adelaide

Dr B.R. Lewis and Dr K.G.H. Baldwin (LPC)
Project: Development of Ultra-high Resolution VUV Laser Sources
Partner: Professor B.J. Orr, Macquarie University

Professor E. Weigold
Project: Electron Momentum Spectroscopy of Atoms and Molecules
Partners: Dr M.J. Brunger and Professor I.E. McCarthy, Flinders University

Project: Electron Momentum Spectroscopy of Large Molecules
Partners: Professor I.E. McCarthy, Dr M.J. Brunger and Dr W. Adcock, Flinders University; Dr M.T. Michalewicz, CSIRO Division of Information Technology; Dr D. Winkler, CSIRO Division of Chemicals and Physics

Professor E. Weigold, Dr A. Kheifets and Dr M. Vos
Project: Electron Momentum Spectroscopy of Solids
Partners: Professor I.E. McCarthy and Dr M. Ford, Flinders University

Professor E. Weigold and Dr J. Lower
Project: (e,2e) Processes with Polarized Electrons and Targets
Partners: Dr J. Berakdar, Max-Planck-Institut für Microstruktur Physik, Halle, Germany; Dr S. Mazevet, Los Alamos Laboratory, USA

Project: National Facility for Spin Polarisation Studies of Atoms and Molecules
Partner: Professor J.F. Williams, University of Western Australia

Electronic Materials Engineering

Dr M. Buda
Project: Growth and Characterisation of Long Wavelength in GaAsN Layers
Partners: Professor J. Wolter and Dr M. Leys, Eindhoven University of Technology, The Netherlands

Dr M. Buda, Ms L. Fu, Ms J. Hay, Dr H.H. Tan and Professor C. Jagadish
Project: Design, Fabrication and Testing of High Power Lasers
Partners: Professor G. Acket and Dr T. Van De Roer, Eindhoven University of Technology, The Netherlands

Ms C. Carmody, Dr H.H. Tan and Professor C. Jagadish
Project: Self-assembled Monolayers for Passivation of Semiconductor Surfaces
Partners: Dr V. Braach-Maksvytis and Dr B. Ragner, CSIRO-TIP

Dr Y. Chen
Project: TEM Investigation of Nanotube Materials
Partner: Dr J. Fitz Gerald, Research School of Earth Sciences, ANU

Project: Formation Mechanism of Nanotubes
Partner: Professor L. Chadderton (AMPL)

Project: Synthesis of BN Nanotubes using Ball Milling
Partner: Dr L. Chaffron, Saclay Research Center, France

Project: Synthesis and Application of Carbon Nanotubes
Partner: Professor H.M. Cheng, Chinese Academy of Science, China

Project: Mossbauer Analysis of Nanotube Materials
Partner: Professor S. Campbell, University of New South Wales

Project: Microscopy and Microanalysis of Nanotubes
Partner: Dr J. Zou, University of Sydney

Mr M.I. Cohen, Dr H. Boudinov, Dr H.H. Tan and Professor C. Jagadish
Project: Novel Processing of Vertical Cavity Surface Emitting Lasers
Partners: Dr A. Allerman and Dr K. Choquette, Sandia National Laboratories, USA

Mr P.N.K. Deenapanray, Ms L. Fu, Dr M. Petravic and Professor C. Jagadish
Project: XPS Studies of Anodic Oxides of Gallium Arsenide
Partner: Professor R.N. Lamb, University of New South Wales

Dr R.G. Elliman
Project: Morphological Instability in Ion Irradiated Germanium
Partner: Professor B. Stritzker, University of Augsburg, Germany

Project: Electrical and Optical Properties of Dielectric Layers containing Metallic or Semiconducting Nanocrystals
Partner: Professor S-H. Choi, Kyung Hee University, Korea

Project: Light Emission from the Er: Si Nanocrystal System
Partner: Dr G. Ross, INRS –Energie et Materiaux, Quebec, Canada

Dr R.G. Elliman, Dr H. Timmers and Ms T.D.M. Weijers
Project: Energy Loss and Straggling of Heavy Ions
Partners: Professor H. Whitlow, Lund University, Sweden and Dr D.J. O'Connor, University of Newcastle

Project: Heavy Ion Elastic Recoil Analysis of Silicon Oxynitride Layers
Partners: Professor H. Whitlow and Mr J. Uribasterra, University of Lund, Sweden

Project: Pulse Height Deficits in Surface Barrier Detectors
Partner: Professor J.A. Davies, McMaster University, Canada

Project: Ion Beam Analysis of GaN Thin Films
Partner: Dr K.S.A. Butcher, Maquarie University

Project: Ion Beam Analysis of Plasma Treated Steel
Partner: Dr M.P. Fewell, University of New England

Ms L. Fu, Dr H.H. Tan and Professor C. Jagadish
Project: Fabrication and Characterization of Quantum Well Infrared Photodetectors
Partners: Professor S.C. Shen, Professor W. Lu and Dr N. Li, Shanghai Institute of Technical Physics, Chinese Academy of Sciences, China

Ms J. Hay, Dr H.H. Tan and Professor C. Jagadish
Project: Reactive Ion Etching of Gallium Nitride
Partner: Dr F. Karouta, Eindhoven University of Technology, The Netherlands

Professor C. Jagadish, Dr H.H. Tan and Ms L. Fu
Project: Optical Spectroscopy Studies on Semiconductor Quantum Wires and Dots
Partners: Professor S.C. Shen, Professor Wei Lu, Dr Xingquan Liu, Dr Li Na, Dr Z. Chen, Mr Li Ning, Dr Yong Chang and Ms H.F. Dou, Shanghai Institute of Technical Physics, Chinese Academy of Sciences, China

Professor C. Jagadish, Dr H.H. Tan and Ms C. Lobo
Project: Electrical and Optical Characterization of Self-assembled Quantum Dots
Partners: Dr A. Babinski, Dr A. Wysmolek, Mr T. Tomaszewicz and Professor J. Baranowski, Warsaw University, Poland

Mr S.O. Kucheyev, Professor C. Jagadish and Professor J.S. Williams
Project: Processing of GaN Based Optoelectronic Devices for Blue Light Emission
Partner: Dr A.G. Li, Ledex Corporation, Taiwan

Mr S.O. Kucheyev, Professor J.S. Williams and Professor C. Jagadish
Project: Cathodoluminescence and Environmental SEM Studies of Ion Implanted GaN
Partners: M. Toth and Dr M. Phillips, University of Technology, Sydney

Project: Electron Microscopy of GaN
Partner: Dr J. Zou, University of Sydney

Project: Ion Implanted GaN
Partner: Professor S.J. Pearton, University of Florida, USA

Ms P. Lever, Ms C. Lobo, Dr H.H. Tan and Professor C. Jagadish
Project: Cathodoluminescence Imaging of Quantum Wires and Dots
Partners: Dr M.R. Phillips and M.A. Stevens Kalceff, University of Technology Sydney

Dr M. Petravic
Project: Characterisation of Standards for Surface Composition and Sputter Depth Profiling
Partner: Dr D.W. Moon, Korean Research Institute of Standards and Science, Korea

Project: Surface Analysis Using a Free Electron Laser
Partners: A/Professor B.V. King, University of Newcastle; Professor R. Clark, University of New South Wales; Dr M.J. Pelin, Argonne National University, USA

Dr M. Petravic and Mr P.N.K. Deenapanray
Project: Photon Stimulated Desorption of Hydrogen from Semiconductor Surfaces
Partners: Dr G. Dujardin, Dr G. Comtet and Dr L. Hellner, University Paris-Sud, Orsay, France; Professor A. Hoffman, Technion, Israel; Dr B. Usher, LaTrobe University

Project: Roughening of Si Surface under Oxygen and Nitrogen Ion Bombardment
Partner: Dr D.W. Moon, Korean Research Institute of Standards and Science, Korea

Project: Selective Photon Stimulated Desorption of Hydrogen from GaAs Surfaces
Partners: Dr B. Usher, LaTrobe University; Dr J.M. Chen, Synchrotron Radiation Research Center, Hsinchu, Taiwan

Dr M.C. Ridgway, Mr C.J. Glover and Dr G. Azevedo
Project: EXAFS Measurements of Implantation-induced Disorder in Compound Semiconductors
Partners: Dr K.M. Yu, Lawrence Berkeley National Laboratory, USA; Dr G. Foran, Photon Factory, Japan

Dr M.C. Ridgway, Mr C.J. Glover and Dr A.P. Byrne
Project: Perturbed Angular Correlation Measurements of Implantation-induced Disorder in Semiconductors
Partner: Dr R. Vianden, Universität Bonn, Germany

Dr M.C. Ridgway, Professor J.S. Williams and Mr X. Zhu
Project: In-situ Transmission Electron Microscopy of Implantation-induced Nano-cavity Evolution in Si
Partners: Dr H. Bernas, Dr F. Fortuna and Dr M.-O. Ruault, Centre National Research Scientifique, Orsay, France

Dr M.C. Ridgway and Mr C.J. Glover
Project: EXAFS Characterisation of Implantation-induced Disorder in Ge and Ge_xSi_{1-x} Alloys
Partners: Dr A. Nylandsted-Larsen and J. Hansen, Aarhus University, Denmark

Dr H.H. Tan, Ms L. Fu, Ms P. Lever, Mr Q. Gao, Mr P.N.K. Deenapanray, Ms C. Carmody and Professor C. Jagadish
Project: Optical Spectroscopy of Semiconductor Quantum Structures and Devices
Partners: Dr L.V. Dao, Mr S. Ilyas and Professor M. Gal, University of New South Wales

Dr H.H. Tan, Professor C. Jagadish, Dr M.J. Lederer, M. V. Kolev and Professor B. Luther-Davies
Project: Passive Mode-locking of Solid State Lasers using Semiconductor Saturable Absorbers
Partners: M. Haiml, Dr U. Seigner and Professor U. Keller, ETH-Zurich, Switzerland

Dr H.H. Tan and Professor C. Jagadish
Project: Ultrafast Optical Spectroscopy Studies of Non-stoichiometric GaAs
Partners: Professor A. Krotkus, Semiconductor Physics Institute, Vilnius, Lithuania; Dr S. Marcinkevicius, Royal Institute of Technology, Stockholm, Sweden

Dr N.J. Welham
Project: Cataloguing the Dadson Collection
Partner: Dr P.D. Evans, Forestry, ANU

Project: Thermal Analysis of Australian Eucalypts
Partner: Dr P.D. Evans, Forestry, ANU

Project: Novel Metal – Ceramic Composites
Partner: Dr P.E. Willis, Research School of Earth Sciences, ANU

Project: Mechanochemical Processing of Coal
Partner: Dr P. Chapman, Curtin University of Technology

Project: Disposal Options for Ferrous and Arsenical Solutions from Mineral Processing Operations
Partners: Dr K. Malatt, Gold Mines of Sardinia; Dr S. Vukcevic, Anaconda Nickel

Project: Electrochemistry of Pyrite and its Application to Gold Recovery
Partner: Dr G.H. Kelsall, UBC, Canada and Imperial College, London, UK

Project: Mechanical Enhancement of the Formation of Lithium Ferrites
Partners: Dr V. Berbenni and Dr A. Marini, University of Pavia, Italy

Project: Effect of Mechanical Activation on Self-propagating High-temperature Reactions
Partner: Dr U. Anselmi-Tamburini, University of Pavia, Italy

Professor J.S. Williams and Mr M.C. Conway
Project: Ion Implantation of MgO and Sapphire
Partner: Dr V. Gurarie, University of Melbourne

Professor J.S. Williams and Ms J.E. Bradby
Project: Microindentation of Semiconductors
Partners: Professor M.V. Swain and Dr P. Munroe, University of Sydney

Professor J.S. Williams, Dr J. Wong-Leung, Dr M. Petravic and Mr M.J. Conway
Project: Metal Gettering to Cavities
Partner: Dr A. Kinomura, ONRI, Japan

Project: Open Volume Defects in Silicon
Partners: Professor B. Stritzker and Dr J. Lindner, University of Augsburg, Germany

Professor J.S. Williams and Dr G. de Medeiros Azevedo
Project: Rp/2 Defects in Silicon
Partner: Dr M. Behar, Instituto de Fisica, Porto Alegre, Brazil

Dr J. Wong-Leung, Dr H.H. Tan, Ms S. Fatima and Professor C. Jagadish
Project: Electron Microscopy Study of Defects in Ion Implanted Semiconductors
Partners: Professor D.J.H. Cockayne, University of Oxford, UK; Dr J. Zou, University of Sydney; Dr J. Fitz Gerald, Research School of Earth Sciences, ANU

Dr J. Wong-Leung, Mr P.N.K. Deenapanray, Mr S.O. Kucheyev and Professor C. Jagadish
Project: Defect Characterization in Ion Implanted Semiconductors
Partners: Professor B.G. Svensson and Dr A. Kuznetsov, Royal Institute of Technology, Kista-Stockholm, Sweden and University of Oslo, Norway

Laser Physics Centre

Dr K.G.H. Baldwin
Project: Measurement of He 1s – 2s Transition
Partners: Dr T. Lucatorto, NIST, Maryland, USA; Professor T.J. McIlrath, University of Maryland, USA; Professor E. Eyler, University of Connecticut, USA

Project: High Resolution XUV Laser Spectroscopy
Partners: Dr W. Ubachs and Professor W. Hogervorst, Vrije Universiteit, The Netherlands

Dr K.G.H. Baldwin and Dr M.D. Hoogerland (AMPL)
Project: Ultracold Atomic Collisions
Partner: Dr I. Whittingham, James Cook University

Dr K.G.H. Baldwin and Dr B.R. Lewis (AMPL)
Project: Development of Ultra-high Resolution VUV Laser Sources
Partner: Professor B.J. Orr, Macquarie University

Dr W. Krolikowski
Project: Vector Solitons
Partners: Professor T. Tschudi and Dr C. Denz, Darmstadt University of Technology, Germany

Project: Incoherent Solitons
Partner: Dr O. Bang, Technical University Denmark, Copenhagen, Denmark

Project: Photorefractive Solitons
Partners: Professor F. Agullo-Lopez, Universidad Autonoma de Madrid, Spain; Dr A. Bledowski, Polish Academy of Sciences, Warsaw, Poland

Project: Non-local Nonlinear Media
Partner: Dr J. Wyller, Agricultural University of Norway

Dr M. Lederer
Project: Ultrafast Nonlinear Optical Absorption in Ion-implanted GaAs
Partners: M. Haiml, U. Siegner and U. Keller, Swiss Federal Institute of Technology, ETH Zürich, Switzerland

Project: Ultrabroadband Output Coupling Mirrors for 5 Femtosecond Pulse Generation in a Kerr-lens Mode-locked Titanium Sapphire Laser
Partners: U. Morgner and F.X. Kärtner, Universität Karlsruhe, Germany

Dr N.B. Manson
Project: Off-centre Ions
Partner: Dr H. Reisen, ADFA, University of New South Wales

Dr N.B. Manson and Dr M.J. Sellars
Project: Chromophores in Amorphous Materials
Partners: Dr E. Krausz and Dr R. Purchase, Research School of Chemistry, ANU

Dr N.B. Manson, Dr J.P.D. Martin, Dr M.J. Sellars and Ms E.A. Wilson
Project: Origin of Raman Heterodyne Signals
Partners: R. Neuhaus, Universität Dortmund, Germany; Professor D.C. Doetschman, Bingham University, NY, USA

Dr A. Rode, Professor B. Luther-Davies, Professor E. Gamaly and Dr M. Samoc
Project: Light Induced Structural Phase Transitions in Gallium Films Produced by Ultrafast Laser Ablation and their Optoelectronic Applications
Partner: Professor N.I. Zheludev, University of Southampton, UK

Dr A. Rode and Professor E. Gamaly
Project: Growth Mechanism of Carbon Nanotubes Produced in Laser Plumes
Partner: Dr W. Maser, Instituto de Carboquimica, Spain

Dr A. Samoc, Dr M. Samoc and Professor B. Luther-Davies
Project: Nonlinear Optical Properties of Substituted Poly(phenylenevinylenes)
Partners: Professor H-H. Hoerhold and Dr R. Stockmann, University of Jena, Germany

Project: Third-order Nonlinear Optical Properties of Conjugated Polyenes
Partner: Dr Ch. Andraud, Ecole Normale Superieure de Lyon, France

Dr M. Samoc and Professor B. Luther-Davies
Project: Organometallics for Nonlinear Optics
Partner: Dr M.G. Humphrey, Department of Chemistry, ANU

Nuclear Physics

Dr R.A. Bark and Professor G.D. Dracoulis
Project: Intrinsic and Rotational Bands in ^{180}Ta
Partners: G. Sletten, University of Copenhagen, Denmark and Euroball Collaboration, Strasbourg, France

Project: Very High Spin States in ^{174}Os Populated with Cold Symmetric Reactions
Partners: H. Hübel, University of Bonn, Germany; R. Julin, University of Jyväskylä, Finland

Dr A.P. Byrne
Project: Development of an Ion Implanter for Radioisotopes
Partner: A/Professor D.H. Chaplin, ADFA, University of New South Wales

Project: Production of Isotopes for Cancer Therapy
Partners: Professor B. Allen and Dr G. Goozee, St. George Cancer Care Centre, NSW

Dr A.P. Byrne and Professor G.D. Dracoulis
Project: Spectroscopy of Neutron Rich Nuclei near and above ^{208}Pb Studied using Deep Inelastic Reactions
Partners: Dr G.J. Lane, Lawrence Berkeley Laboratory, California, USA; Professor R. Broda, INP, Krakow, Poland; Dr R.V.F. Janssens, Argonne National Laboratory, Illinois, USA

Dr A.P. Byrne, Dr A.M. Baxter (Faculties)**, Professor G.D. Dracoulis and Dr G.J. Lane**
Project: Spectroscopy of Neutron Deficient Lead and Thallium Nuclei
Partner: Professor R. Julin, University of Jyväskylä, Finland

Dr M. Dasgupta and Dr D.J. Hinde
Project: Fusion and Breakup of Light Ions Near the Fusion Barrier
Partner: Professor P.R.S. Gomes, University of Fluminense, Niterói, Brazil

Professor G.D. Dracoulis
Project: High-K Isomers
Partners: Professor P.M. Walker, University of Surrey, UK; Dr D.M. Cullen, University of Liverpool, UK

Project: High-K Isomers in Hafnium
Partners: Dr F.G. Kondev and Dr R. Janssens, Argonne National Laboratory, USA

Project: Spectroscopy of Very Heavy Nuclei
Partners: Professor J.F. Sharpey-Schafer, National Accelerator Centre, South Africa; Professor P.A. Butler, University of Liverpool, UK

Project: Systematics of Isomer Structure in the N = 74 Region
Partner: Dr A.M. Bruce, University of Brighton, UK

Professor G.D. Dracoulis and Dr A.P. Byrne
Project: Spectroscopy of Heavy Nuclei
Partner: Professor A.R. Poletti, University of Auckland, NZ

Project: Laser Spectroscopy of Deformed Isomers
Partners: Dr J. Billowes, University of Manchester, UK; Professor J.A.R. Griffith, University of Birmingham, UK; Dr P. Dendooven, University of Jyväskylä, Finland

Professor G.D. Dracoulis, Dr R.A. Bark and Dr A.P. Byrne
Project: Deep-inelastic Excitation of High-K States
Partner: Dr. S.M. Mullins, National Accelerator Centre, Faure, South Africa

Dr L.K. Fifield
Project: Dating of Marine Cores with Carbon-14
Partners: Dr P. De Deckker and Dr B. Opdyke, Geology Department, ANU

Project: Measurement of Erosion Rates at a Range of Scales in the Australian Landscape using *in situ* Produced ^{10}Be
Partner: Professor J. Chappell, Research School of Earth Sciences, ANU

Project: Precise Reconstruction of Past Sea-levels via Radiocarbon Chronologies of Shallow Marine Cores from Northern Australia
Partners: Professor K. Lambeck and Y. Yokoyama, Research School of Earth Sciences, ANU; Dr P. De Deckker and Dr B. Opdyke, Department of Geology, ANU

Project: Evidence for Large Fluctuations in Atmospheric ^{14}C between 30 and 50 ka B.P. from Uplifted Coral Terraces from the Huon Peninsula, PNG
Partners: Professor K. Lambeck and Y. Yokoyama, Research School of Earth Sciences, ANU; Dr T. Esat, Department of Geology, ANU

Project: Landscape Evolution in the Southern Highlands Region of NSW, using ^{10}Be Deposited from the Atmosphere
Partner: Professor R. Wasson, Centre for Resource and Environmental Studies, ANU

Project: A Glaciation Chronology of the Snowy Mountains and Tasmania Determined from *in-situ* Produced ^{10}Be and ^{36}Cl
Partners: T. Barrows, Research School of Earth Sciences, ANU (with Dr J. Stone, now University of Washington, USA)

Dr L.K. Fifield and Dr P.A. Hausladen
Project: Tracing Releases of Plutonium from the Mayak Production Plant, Southern Urals, Russia
Partner: Dr D. Oughton, Agricultural University of Norway

Project: Uptake by Humans of Plutonium Following Inhalation
Partners: Professor N.D. Priest, Middlesex University, UK, Dr N. Stradling and Dr G. Etherington, National Radiation Protection Board, UK

Project: Long-term Retention and Excretion of Plutonium by the Human Female
Partners: Dr D. Newton and Dr R.J. Talbot, AEA Technology, Harwell, UK

Project: Measurements of ^{59}Ni, ^{36}Cl, ^{26}Al and ^{41}Ca in Fragments of the Canyon Diablo Meteorite
Partners: Professor G. Herzog, Rutgers University, USA; Dr C. Schnabel, ETH, Zurich, Switzerland

Project: Measurements of ^{59}Ni, ^{36}Cl, ^{10}Be, ^{26}Al and ^{41}Ca in a Fragment of the Campo del Cielo Meteorite from Argentina
Partners: Dr J. Fernandes-Niello and R. Liberman, Tandar Laboratory, Buenos Aires, Argentina

Project: Retreat Rate of the Drakensberg Escarpment, SE Africa, Using ^{36}Cl Produced *In Situ*
Partner: Professor M. Summerfield, University of Edinburgh, Scotland

Project: Dating of Ice in Temperate-region Glaciers with ^{32}Si
Partners: Dr U. Morgenstern and Dr A. Zondervan, Geological and Nuclear Sciences, Lower Hutt, New Zealand

Project: Groundwater Flow and Recharge Processes on the Western Margin of the Great Artesian Basin
Partner: Dr A. Love, South Australian Department of Primary Industry and Resources

Project: The History of Mercury Deposition in the Amazon during the Holocene
Partner: Professor P.R. Gomes, Universidade Federal Fluminense, Niterói, Brazil

Dr D.J. Hinde
Project: Neutron Multiplicities in Heavy-ion Collisions
Partners: Professor Y. El-Masri and J. Cabrera, Universite Libre de Louvain, Belgium; Professor R.J. Charity, Washington University, USA

Dr D.J. Hinde, Dr M. Dasgupta and Dr C.R. Morton
Project: Modelling Fission using the Langevin Approach
Partner: Professor Y. Abe, Kyoto University, Japan

Dr D.J. Hinde, Dr M. Dasgupta and Dr C.R. Morton
Project: Fusion with a High-spin ^{178}Hf Isomeric Target
Partners: Dr C. Briançon, Orsay, France; Professor N. Rowley, IRES, Strasbourg, France

Dr A.E. Stuchbery
Project: Measurement of Nuclear g-factors and Investigation of Transient Magnetic Fields
Partner: Professor H.H. Bolotin, University of Melbourne

Project: Nuclear Moments and Structure Changes in Exotic Nuclei
Partner: Dr P.F. Mantica, Michigan State University, USA

Project: Nuclear Structure through Measurements of g-factors in even Xe Isotopes by Projectile Excitation
Partners: Professor N. Benczer-Koller, Rutgers University, USA; Professor K.-H. Speidel, University of Bonn, Germany; Dr A. Pakou, Ioannina, Greece; Dr A. Macchiavelli, Lawrence Berkeley Laboratory, USA

Project: In-beam Studies of Local Magnetism using Recoil Implantation
Partners: Dr A.A. Tulapurkar and Dr S.N. Mishra, Tata Institute, India

Project: Evaluation of the Quadrupole Moment of ^{59}Fe and Applications to Solid-state Physics
Partners: A/Professor D.H. Chaplin and Dr W.D. Hutchinson, ADFA, University of New South Wales

Project: Single Particle Degrees of Freedom in Transitional Nd Nuclei from Projectile-excitation g-factor Measurements
Partners: Professor N. Benczer-Koller, Rutgers University, USA; Professor K.-H. Speidel, University of Bonn, Germany; Dr A. Macchiavelli, Lawrence Berkeley Laboratory, USA; Dr W. Rogers, Westmont College, USA

Dr H. Timmers
Project: Compositional Depth-profiling of Nitrided Stainless Steel with Elastic Recoil Detection Analysis
Partner: A/Professor M. Fewell, University of New England, Armidale

Project: Stopping and Energy Straggling of Heavy Ions in Technologically Relevant Materials
Partners: Professor H. Whitlow, Lund Institute of Technology, Lund University, Sweden; A/Professor J. O'Connor, University of Newcastle

Project: Elastic Recoil Detection Analysis of GaN Films
Partner: Dr Scott, Macquarie University, Sydney

Optical Sciences Centre

Professor N. Akhmediev
Project: Simultaneous Existence of a Multiplicity of Stable and Unstable Solitons in Dissipative Systems
Partners: Professor K.S. Chiang, City University of Hong Kong; Dr J.M. Soto-Crespo, Instituto de Optica, Madrid, Spain

Project: Two-parameter Two-component Solitons in Nonlinear Directional Coupler with Intermodal Dispersion
Partners: Dr V. Rastogi and Professor K.S. Chiang, City University of Hong Kong

Project: Pulsating Solitons, Chaotic Solitons, Period Doubling, and Pulse Coexistence in Mode-locked Lasers: CGLE Approach
Partners: Dr J.M. Soto-Crespo, Instituto de Optica, Madrid, Spain; Dr G. Town, University of Sydney

Project: Soliton Interactions in Perturbed Nonlinear Schrödinger Equations
Partners: Dr J.A. Besley, Racal Research Ltd, Berkshire, UK; Dr P.D. Miller, Monash University

Project: Linear Guidance Properties of Solitonic Y-junction Waveguides
Partners: Dr J.A. Besley, Racal Research Ltd, Berkshire, UK; Dr P.D. Miller, Monash University

Project: Pulse-pulse Interaction in Dispersion-managed Fibre Systems with Nonlinear Amplifiers
Partners: Dr F. Zen, Institute of Technology, Bandung, Indonesia; Professor Pak Chu, University of New South Wales

Professor N. Akhmediev and Dr A. Ankiewicz
Project: Pulsating, Creeping and Erupting Solitons in Dissipative Systems
Partner: Dr J.M. Soto-Crespo, Instituto de Optica, Madrid, Spain

Professor Y. Kivshar
Project: Cascaded Nonlinearities and Parameteric Optical Solitons
Partners: Professor P.L. Christiansen and Dr O. Bang, Technical University of Denmark, Lyngby, Denmark

Project: Parametric Optical Conversion in Photonic Crystals
Partner: Professor S. Saltiel, Sofia University, Bulgaria

Project: A Book for Academic Press: Optical Solitons: From Waveguides to Photonic Crystals
Partner: Professor G. Agrawal, University of Rochester, USA

Project: Spatial Optical Solitons in Photorefractive Media
Partners: Professor M. Segev and Dr Z. Chen, Princeton University, USA; Professor D. Christodoulides, Lehigh University, USA

Project: Intrinsic Localised Modes in Nonlinear Discrete Models
Partner: Professor S. Takeno, Osaka Institute of Technology, Japan

Project: Aharonov-Bohm Effect for Optical Vortices
Partners: Professor A. Nepomnyashchy and Professor L. Pismen, Technion, Israel

Project: Nonlinear Dynamics of the Bose-Einstein Condensates
Partners: Dr S. Turitsyn, Aston University, UK; Dr L. Berge and J.J. Rasmussen, RISO National Laboratory, Denmark

Project: Linear Stability Analysis of Nonlinear Localised Waves
Partner: Dr D. Pelinovsky, University of Toronto, Canada

Project: Nonlinear Localised Modes in Photonic Crystals
Partner: Professor C. Soukoulis, Iowa University and Ames Laboratories, USA

Professor Y. Kivshar and Dr E.A. Ostrovskaya
Project: Spatial Optical Solitons and Vortices in Higher Dimensions
Partners: Professor D. Anderson and Professor M. Lisak, Chalmers Technical University, Sweden

Project: Stability of Spatial Solitons
Partner: Professor V. Garcia-Ripoll, University of Castilia-La Mancha, Spain

Professor J.D. Love & Dr. A Ankiewicz
Project: Planar Lightwave Circuits Program
Partners: University of New South Wales; RMIT University; University of Sydney; Royal Institute of Technology, Stockholm; Redfern Integrated Optics, Sydney; Ericsson Australia Pty Ltd, Melbourne

Professor J.D. Love
Project: Add/Drop Optical Wavelength Filters
Partners: Dr G. Meltz, OFT Associates, USA; Department of Communications, Canada

Project: Optical Fibre Couplers
Partner: ADC Telecommunications Australia Pty Limited, Canberra

Project: Hybrid Silica-Polymer Devices
Partner: Lightwave Microsystems Corporation, USA

Project: Optical Coupler Bandpass Filter
Partners: Dr A. Stevenson, Victoria University; Dr P.K. Lam, Dept of Physics, ANU

Project: Fibre/Waveguide Etching & Characterisation
Partner: Dr S. Huntington, University of Melbourne

Project: Tapered, Depressed-Cladding Fibres
Partner: Prof R. Stolen, Virginia Tech University, USA

Project: Tapered Fibre WKB and Local-Mode Theory
Partner: Dr D. Salazar, University of Oxford, UK

Project: Undergraduate Book on Optical Communications
Partner: Dr F. Payne, University of Cambridge, UK

Project: Thin, Flat-Panel Video Screen
Partner: Dr S. Huntington, Melbourne University; Mr D. Thorncraft, Redfern Photonics Pty Ltd; Mr I. Maxwell, Redfern Polymer Optics Pty Ltd

Plasma Research Laboratory

Dr B.D. Blackwell and Dr J. Howard
Project: Soft X-ray Measurements on H-1NF
Partner: A/Professor A.D. Cheetham, University of Canberra

Dr G.G. Borg, Dr I.V. Kamenski and Dr D.G. Miljak
Project: RF Plasma Wave Studies in H-1NF
Partner: Dr T. Seki, National Institute for Fusion Science, Japan

Dr G.G. Borg and Professor J.H. Harris
Project: Plasma Antenna Concept Demonstrator
Partner: Dr N.M. Martin, Defence, Science and Technology Organisation

Dr G.G. Borg and Mr P. Linardakis
Project: Plasma Switches for Mobile Phones
Partner: Dr R. Scheer, Motorola, Harvard, Illinois, USA

Professor R.W. Boswell and SP3 Group
Project: Stereo Digital Video
Partner: Compucat

Project: HARE
Partners: Professor D. MacKenzie, Dr B. James and Dr I. Falconer, University of Sydney

Project: Etching of Si/Ge Films
Partner: Professor G. Turban, University of Nantes, France

Project: Plasma Deposition of Palladium
Partner: Dr P. Brault, University of Orleans, France

Dr J. Howard
Project: Fibre Optic Probes for Plasma Diagnostics
Partners: Mr V. Everett and Professor G. Woolsey, University of New England

Project: Measurement of Electric Field in H-1NF Using Laser Induced Fluorescence Techniques
Partners: Mr P. Feng and A/Professor B.W. James, University of Sydney

Dr M.G. Shats
Project: Electron Cyclotron Heating of Plasma in Stellarators
Partner: Dr K. Nagasaki, Kyoto University, Japan

Project: High Confinement Studies in Stellarators
Partner: Professor K. Toi, National Institute for Fusion Science, Nagoya, Japan

Project: Development of a Quasi-optical Transmission Line for a High-power Microwave Gyrotron
Partner: Professor M. Sato, National Institute for Fusion Science, Nagoya, Japan

Project: Application of Novel Signal Analysis Techniques to the Plasma Turbulence
Partner: Dr X.H. Shi, Central Queensland University

Theoretical Physics

Dr Rowena Ball
Project: Bistability and hysteresis in self-assembling micelle systems: A micellar switch
Partner: A. D. J. Haymet, University of Houston, Texas, USA

Professor F.C. Barker
Project: The ^{7}Be(p, γ)^{8}B S-factor
Partner: Professor A.M. Mukhamedzhanov, Texas A&M University, USA

Project: Proton Reactions on ^{9}Be
Partner: Professor Y. Kondo, Kyoto Women's University, Japan

Project: Beta Delayed Deuteron Emission from ^{6}He
Partner: Dr L. Buchmann, TRIUMF, Canada

Dr M.P. Das
Project: Electron Correlation and Metal-insulator Transition
Partner: Professor D. Neilson, University of New South Wales

Project: Fluctuations in Mesoscopic Systems
Partner: Dr F. Green, CSIRO and University of New South Wales

Project: Magnetic Properties of High Tc Superconductors
Partner: Professor S.X. Dou, University of Wollongong

Project: Two Dimensional Interacting Coulomb Systems
Partner: Professor K.I. Golden, University of Vermont, USA

Professor R.L. Dewar
Project: Text on Fluid Dynamics and Magnetohydrodynamics
Partner: Professor R.J. Hosking, University of Brunei

Project: The Spectrum of Ballooning Modes in Strongly Three-dimensional Plasmas
Partner: Dr W.A. Cooper, CRPP, Ecole Polytechnique Fédérale de Lausanne, Switzerland

Project: Ballooning Modes in Three-dimensional Plasmas with Magnetic Islands
Partner: Dr S.R. Hudson, Princeton University, USA

Dr H.J. Gardner
Project: Three-dimensional Resistive Magnetohydrodynamic Stability
Partner: Professor R. Storer, Flinders University

Dr A.S. Kheifets
Project: Convergent Close-coupling Theory of Double Ionization by Photon and Electron Impact
Partner: Dr I. Bray, Flinders University

Project: Electron Momentum Density Studies in Metals and Metal Oxides
Partner: Dr M. Ford, Flinders University

Project: Electron Impact Double Ionization of the Helium Atom
Partners: Professor A. Lahmam-Bennani, University of Paris – Orsay; Dr A. Dorn, University of Freiburg, Germany

Project: Coincident Compton Scattering from Solids
Partner: Professor F. Bell, University of Munich, Germany

Project: Multiple Atomic Photoionization
Partner: Professor Y. Azuma, High Energy Accelerator Research Organization, Japan

Dr S.Yu. Kun
Project: Quantum-classical Correspondence in Microscopic and Mesoscopic Complex Collisions
Partners: Professor W. Greiner, University of Frankfurt, Germany; Dr A.V. Vagov, University of Sheffield, UK

Dr S. Kuyucak
Project: Magnetic Dipole Properties in Collective Nuclei
Partner: Professor B.R. Barrett, University of Arizona, USA

Dr B.A. Robson
Project: Antiproton Scattering
Partner: Professor Zhang Yu-shun, Institute of High Energy Physics, Beijing, P.R. China

Project: High Energy Deuteron-Deuteron Elastic Scattering
Partner: Professor Zhang Yu-shun, Institute of High Energy Physics, Beijing, P.R. China

Dr L.J. Tassie
Project: A Scenario for the Formation of the Universe by the Fragmentation of Macroscopic Superstrings.
Partner: Professor P. Brosche, Bonn University, Germany

Dr W.S. Woolcock
Project: Electromagnetic Corrections to Hadronic Processes
Partners: Dr A. Gashi, Dr E. Matsinos and Professor G. Rasche, University of Zürich, Switzerland; Professor G.C. Oades, University of Aarhus, Denmark

The School holds 39 international collaborative/cooperative agreements and/or memoranda of understanding with the following institutions and organisations:

- Samsung Electronics Co. Ltd, Korea
- Shanghai Institute of Technical Physics (SITP), Chinese Academy of Sciences
- The Physics Department, University of Pretoria
- Institute of Advanced Energy, Kyoto, Japan
- Tsinghua University, Beijing, China
- The European Union-Australia Science & Technology Agreement, DIST
- Deutscher Akademischer Austauschdienst (DAAD) Exchange Service
- ANU-Engineering & Physical Sciences Research Council Agreement (ANU-EPSRC), UK (The ANU-EPSRC agreement in effect covers a range of UK universities)
- Beijing University, China
- National Institute for Fusion Science, Nagoya, Japan
- Lockheed Martin Energy Research Corporation, Oak Ridge National Laboratory, USA
- L'Ecole Polytechnique, Paris, France
- Royal Institute of Technology, Stockholm, Sweden
- Ericsson Components AB, Stockholm, Sweden
- British Telecom Laboratories, UK
- Cambridge University, UK
- Telecom Korea, Seoul
- OFT Associates, USA
- Department of Communications, Ottawa, Canada
- ATLAS Accelerator Facility, Argonne National Laboratory, USA
- Physics Division, Lawrence Berkeley Laboratory, USA
- HHRIF, Oak Ridge National Laboratory, USA
- Physics Department, University of Jyväskylä, Finland
- National Accelerator Facility and FRD, South Africa
- GANIL IN2P3, France
- Hahn-Meitner Institute, Berlin, Germany
- RCNP, Osaka, Japan
- Institute of Nuclear Physics, Leuven, Belgium
- Ericsson Fibre Optic Research Centre, Stockholm, Sweden
- British Telecom Research Laboratories, UK
- Bell Laboratories, USA
- Lucent Technologies (an offshoot of Bell Labs), USA
- Princeton Plasma Physics Laboratory, Princeton University, USA
- Stanford Linear Accelerator Center, Stanford Sychrotron Radiation Laboratory, USA
- Institute of Mathematics Modelling, Technical University of Denmark
- COBRA Inter-Universiy Research Institute on Communication Technology, Eindhoven UTech, The Netherlands
- National Laboratory for Infrared Physics, Shanghai Institute of Technical Physics, Chinese Academy of Sciences
- Lightwave Microsystems Corporation, USA
- Oxford University, UK

National Collaborative Agreements from 1994

The School holds 29 national collaborative agreements under the IAS/Other Australian University Collaboration Scheme and has various independent agreements with Australian industries:

- Royal Melbourne Institute of Technology
- Macquarie University
- La Trobe University
- University of Newcastle
- The University of Canberra
- The University of Wollongong, NSW
- University of Queensland
- The University of South Australia
- Griffith University
- Curtin University of Technology, Western Australia
- University of New England
- University College, Canberra, University of New South Wales
- Monash University, Victoria
- James Cook University, Queensland
- University of Melbourne
- University of New South Wales
- University of Sydney
- Central Queensland University
- Flinders University of South Australia
- University of Western Australia
- Faculty of Business and Technology, University of Western Sydney
- AGEN Pty Ltd
- Ericsson Australia Pty Ltd, Melbourne
- ADC Australia, Canberra (AOFR Pty Ltd)
- Siemens Ltd, Sydney
- Photonic Technologies Pty Ltd, Sydney
- Hypatia Analytic Thought Pty Ltd, Melbourne
- The Powerhouse, Museum of Applied Arts & Sciences, Sydney
- JDS/Uniphase, Sydney

The Australian Photonics Cooperative Research Centre (Canberra Division)

The Australian Photonics Cooperative Research Centre (CRC) is in its ninth year of operation. It is an unincorporated collaborative venture that was established in 1992 under the Commonwealth Government's Cooperative Research Centre scheme. Funding was renewed in April 1999 with a further 27.4M$ being provided by the Commonwealth for operations over seven years. The following organisations are current partners in the CRC: The Australian National University, the Universities of Melbourne, Sydney, and New South Wales, RMIT University, TAFE NSW, ABB Transmission and Distribution Ltd, ADC Australia Ltd, Australian Electrical and Electronic Manufacturers Association, Allen and Buckeridge Pty Ltd, Australian Photonics Pty Ltd, Bishop Innovation Pty Ltd, CEOS Pty Ltd, Coherent Scientific Pty Ltd, The Department of Defence – Defence Science Technology Organisation, Ericsson Australia Pty Ltd, Filtronic Components Pty Ltd, Future Fibre Technologies Pty Ltd, JDS Uniphase Pty Ltd, Macquarie Photonics Pty Ltd, Nextrom Oy, Nortel Networks (Photonics) Pty Ltd, Redfern Fibres Inc, Redfern Photonics Pty Ltd, Telstra Corporation Ltd, TransGrid, Virtual Photonics Inc., Vision Abell Pty Ltd.

The objectives of the CRC include:

- to be a centre of excellence in photonics with internationally recognised, commercially relevant research programs,
- to improve the international competitiveness of Australian industry through transfer of photonic technology, and
- to provide industry with knowledge and skills in photonics through educational programs with emphasis on high quality postgraduate training.

Demand for photonic technology for advanced telecommunications systems continues rapid growth worldwide and this is providing the CRC with unprecedented opportunities to commercialise its research. The downside of the vigorous international growth in the photonics market is the increasing difficulty CRC research providers face in retaining key staff as they are head-hunted by industry.

To support its commercialisation programs, the CRC established Redfern Photonics to incubate new companies using CRC intellectual property and many researchers have left the Universities to join companies under the Redfern Photonics banner. Redfern Photonics to date has established six start-up ventures: Redfern Fibres; Redfern Integrated Optics; Redfern Optical Components; Redfern Broadband Networks; Redfern Interlink and Redfern Polymer Optics, and is also involved in a joint venture with the Fasten Group in China to manufacture optical fibre cables. This year has seen many important milestones and rapid growth in the Redfern Photonics group. A key investment in Redfern Fibres from overseas backers, E-TEK Dynamics Group Inc., HRLD Venture Partners LP, and Intel Capital was announced in March to expand Redfern Fibres into global markets. More recently Redfern Broadband Networks raised 28M$US from a consortium of overseas and local investors to speed the development of its *Gigawave* photonic wavelength management system for metropolitan and regional area networks.

Whilst these companies are being grown by the CRC itself, the broader industry sector in Australia is also riding this wave of expansion. In March the CRC was awarded 1.5M$ from the Science Lectureships Initiative (SLI) program of the Federal Government to assist in providing graduates with skills in photonics to support industry growth. Data presented in the CRC's submission to the SLI program was that 18,000 new jobs in photonics would be created over the next decade. Recent analyses have confirmed a shortfall in the ability of Australian Universities and vocational training organisations (TAFE/CIT) to meet the training needs to supply these employees. In this context the ANU Council approved in October a plan to establish new degrees in Photonics at the ANU starting in 2002. The new degrees comprise a 3-year B. Photonics science degree and a 4-year B. Photonic Systems engineering degree. In addition, the CRC established the Photonics Institute, probably to be located in Canberra, as a structure to manage new education initiatives in Photonics, particularly those funded by the SLI grant.

The future of the CRC after 2006, when government funding ends, has been the subject of active debate. The CRC has established the Photonics Foundation as a non-profit organisation to manage assets accumulated as a result of the CRC commercialisation activities and use these as a source of future funding. Mechanisms for building the asset base of the Foundation are being actively pursued.

Research

The CRC's research is organised into four programs: planar integrated circuits; novel photonic components; telecommunications technologies, and photonic information processing. The Canberra activities mostly fall in the PICs area although the work on solitons and other nonlinear phenomena fall in the NPC program, whilst the ABB/Transgrid funded program on novel plastic optical fibres for voltage sensing is in NSSP. ANU researchers from the Laser Physics Centre, the Department of Electronic Materials Engineering, the Optical Sciences Centre and the Plasma Research Laboratory now contribute to the CRC.

The Canberra Division received $427,190 Commonwealth, $42,720 ANU, and $189,330 of contract funding through the CRC in 1999/2000. The budget for 2000/2001 is set at $1,103,360 Commonwealth, $100,000 ANU, and $292,000 of industry funding.

CRC Canberra Division research outcomes in 2000 have included the following:

- we have developed novel low loss ORMOSIL materials suitable for use in planar lightwave circuits;
- we have further developed the capabilities of the HARE reactor for making planar silica and germano-silicate glass films;
- we have demonstrated that we can create low loss chalcogenide glass waveguides using our patented pulsed laser deposition technology;
- several new concepts for photonic signal processing using four dimensional holography have been demonstrated;
- new procedures for synthesis of novel side chain electro-optic chromophores suitable for use in a PMMA host have been developed;
- we have studied the properties of vector spatial solitons, both theoretically and experimentally, predicting a novel type of robust self-trapped composite optical beams, dipole-mode vector solitons;
- the theory of bit-parallel optical pulse transmission has been completed;
- substantial progress has been made in the theory of cascaded optical nonlinearities where the concept of the so-called multistep cascading was suggested and developed for several new cases;
- we have installed a new fs OPG facility capable of providing tunable radiation from the visible to near IR for studies in nonlinear optics.

RSPhysSE APCRC Staff

Group Head (ANU); Director of Research; Director of Australian Photonics Pty Ltd
Professor Barry Luther-Davies

Researchers
Professor Nail Akhmediev (Key Researcher)
Dr Adrian Ankiewicz
Dr Robbie Charters (until July)
Dr Darran Edmundson (until March)
Dr Rob Elliman
Dr Anke Freydank
Dr Reiner Friedrich (from April)
Mr Keith Gaff (from August)
Dr Eugene Gamaly (from November)
Professor C Jagadish
Ms Ruth Jarvis (from April)
Professor Yuri Kivshar (Key Researcher)
Dr Wieslaw Krolikowski
Professor John Love (Program Manager, Key Researcher)
Dr Neil Manson
Dr Elena Ostrovskaya
Dr Andrei Rode
Dr Anna Samoc
Dr Marek Samoc (Key Researcher)
Dr Matt Sellars
Professor Alan Snyder (Key Researcher)
Dr Hoe Tan
Professor Jim Williams
Dr Congji Zha (from June)

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Maryla Krolikowska
Craig Macleod
Therese Martin

Office Manager
Helen McMartin

Postgraduate Students
Tristram Alexander
Sam Ashby
Keith Gaff
Ruth Jarvis
Andrey Sukhorukov
Snjezana Tomljenovic-Hanic

ANU Centre for Theoretical Physics

The National Centre for Theoretical Physics was started by the Department of Theoretical Physics in 1994. In March 1999, the ANU Council authorised a change of name to *The Australian National University Centre for Theoretical Physics*. The CTP is a partner in a nascent National Institute for Theoretical Physics (currently centred in Adelaide) and also in the Asia Pacific Center for Theoretical Physics (Seoul). The activities of the Centre are overseen by a widely representative cross-campus advisory Board.

The aims of the CTP are:

- to foster graduate education and research in physics within Australia and the Asia-Pacific region through annual summer schools;
- to promote innovative, interdisciplinary research through seminars and topical international research workshops typically lasting two or more weeks.

The first activity of the CTP this year was the **13th Physics Summer School** on *Bose–Einstein Condensation: Atomic Physics to Quantum Liquids* (Convenors Dr Craig Savage and Dr Mukunda Das) at the ANU, 17-28 January 2000.

The program covered basic and advanced topics in the area of Bose-Einstein Condensation and Atom Optics. Lecturers of the School included Anthony Leggett (Urbana), William Phillips (NIST), Allan Griffin (Toronto), Jaan Oitmaa (UNSW), Keith Burnett (Oxford), Robert Ballagh (Dunedin), Andrew Wilson (Dunedin), Mohit Randeria (Mumbai) and Peter Drummond (Brisbane).

The School was attended by 69 participants, including 21 from overseas (5 from New Zealand). The Proceedings of the School is being published by World Scientific.

The CTP, jointly with the School of Mathematical Sciences, ran a workshop, **The Baxter Revolution in Mathematical Physics,** 3–19 February, to celebrate the 60th birthday of Professor Rodney Baxter. The organisers were Professor Vladimir Bazhanov, Dr Murray Batchelor and Dr Paul Pearce (University of Melbourne).

The workshop encompassed all topics and areas where Rodney Baxter's work has been influential, including the most recent developments in exactly solved lattice models, integrable quantum field theory, quantum groups, knot theory, q-series, combinatorics and their applications in statistical physics. The workshop was attended by 75 participants, including 31 from overseas, 36 from Australia and by 8 Australian and overseas students. The proceedings of the meeting will be published as a special issue of the Journal of Statistical Physics in February 2001.

Both the summer school and workshop were partially funded as External Activities of the Asia Pacific Center for Theoretical Physics.

Through the involvement of Dr Mukunda Das as a co-convenor, the CTP was a partner in the **10th Gordon Godfrey Workshop** on Condensed Matter Physics, held in the University of New South Wales during 9-10 June 2000. This year the emphasis was placed on *New Opportunities in Condensed Matter Physics: The Living State.* The life sciences are in the middle of a revolution which involves the study of life. There is an exciting opportunity for developing physical theories for life processes and an analogue of *condensed matter physics* for complex bio-systems. The Workshop provided a once-in-the-year opportunity for all researchers and postgraduate students in condensed matter physics and related fields to come together to exchange ideas and to identify new directions of research. The Proceedings of the Workshop will be published in the Australian Journal of Physics.

With funding provided by a donation to the ANU Centre for Theoretical Physics, David Williams organised a workshop on **Soft Matter Physics: Theoretical and Biological Aspects** from 16 to 29 October. There were nine mornings of talks, with a regular attendance of 40 people at each talk. The workshop was very successful, with a large contingent from overseas, from elsewhere in Australia and from the ANU. The inter-disciplinary nature of the workshop was reflected in the broad interest shown by Schools across campus, with a particularly strong showing from researchers in the Research School of Chemistry. Overseas invited speakers included: P. Pincus, T. Aste, S. Dietrich, J. Garcia-Ruiz, Y. Suzuki, S. Ramiswamy and J. Hoh.

http://wwwrsphysse.anu.edu.au/theophys/CTP

Director:
Professor Robert L. Dewar

Deputy Director:
Professor Vladimir V. Bazhanov

Centre for the Mind

CENTRE
FOR THE
MIND

The Centre for the Mind is a joint venture of two of Australia's premier universities, The Australian National University and the University of Sydney. The Centre invests in daring research on fundamental topics of wide general interest. It stage manages spectacular initiatives which challenge and inspire and it acts as a nexus for the great minds of the world.

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Professor Allan Snyder FRS

Research Professor
Professor John Mitchell

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Dr Tim Thompson

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Ms Megan Cusack

Web Designer
Mr Matthew Immonen

Research Directions

The Centre's research is primarily concerned with exceptional creativity and performance in all domains of human endeavour. A common theme in its research is the phenomenon of non-conscious execution of skills and problem solving. The Centre brings scientists from diverse disciplines to research these subjects.

What Makes a Champion? is the ongoing research theme for 2000 and beyond. Nelson Mandela heralded the launch of this initiative along with a stunning cast of nominated 'champions' from many fields of human endeavour. The event was hosted as part of the Sydney 2000 Olympic Games.

The initiative is integrated with previous breakthrough research on creativity and non-conscious processing. A collection of 12 senior researchers from a mosaic of fields including linguistics, medicine and psychology were assembled to unravel what makes a champion in the broadest sense. The initiative is a large research collaboration involving AMP, Ernst & Young, Australian Olympic Committee, Prime Minister John Howard as Patron, and both the Australian National University and the University of Sydney.

"*Let me sleep on it*" We are largely unaware of the ways in which our brains processes information. Unconscious problem solving is crucial to the creative process. Our research will explore and characterise the phenomenon quantitatively through experimentation in several domains. The Centre has offered two post-doctoral positions for non-conscious research which will commence in 2001.

A number of recent reports in the literature show that during sleep, the brains of mammals re-rehearse activities undertaken whilst awake. There is mounting evidence to link some aspects of the complex phenomena of dreaming with this process and non-conscious learning. Dr Tim Thompson and Professor John Mitchell have been running a series of experiments during the year attempting to resolve certain anomalies in subjective perception of human dream frequency. It is hoped that this data can be correlated with the centre's primary research aims in the area of nonconscious processing.

Commercialisation

News Ltd is the foundation sponsor of the Centre. A collaborative agreement and research partnership has also been forged between the Centre for the Mind AMP, Ernst & Young and the Australian Olympic Committee working on the *What Makes a Champion?* initiative. In addition, a post-doctoral position in collaboration with the Research School of Biological Sciences and the Research School of Physical Sciences has been offered.

Outreach

The Centre for the Mind stage-manages spectacular initiatives which challenge and inspire. We do this, not only to make ideas accessible, but because we value and benefit from the interaction with a diverse section of society.

What makes a Champion?

The Centre for the Mind orchestrated Nelson Mandela's visit to Australia to launch the *What Makes a Champion?* initiative and to receive the Centre for the Mind's Millennium Medal.

What Makes a Champion? was the pilot for adding a permanent intellectual component to the Olympic Games. Celebrities, leading authorities, eminent researchers and champions from all walks of life unravelled the ingredients of what it is that makes a champion.

Geniuses, Prodigies & Savants Extraordinary People - What Makes Them Tick

Following the overwhelming success of the 1999 event *Geniuses, Prodigies & Savants*, the Centre published the formal proceedings, to document the groundbreaking research and collaborative exploration of the field.

Annual "Creative Mind" – Schools Essay Competition 2000

What Makes a Champion – is it nature or nurture? was the challenging essay question posed for all high school students in Australia's Olympic year. The competition encourages participants to think creatively and reaches beyond the boundaries of conventional disciplines.

Setting Role Models for the Champions of the Future

A mosaic of events have been formulated which will catapult the intellectual creativity of youth to the frontier of knowledge. The project includes a unique magazine/web site, think tank, plus a development program to nurture creativity and innovation. This initiative has been refined throughout 2000 and incorporated with the *What Makes a Champion?* collaborations. Further planning will see many of the components launched throughout 2001.

Public Profile

In the past year, the Centre for the Mind and its initiatives have attracted unparalleled media attention. The *What Makes a Champion?* event in September achieved exclusive CNN world-wide coverage, as well as Reuters, Bloomberg and NBC coverage as far afield as India and South Africa. Nationally, the event went to air on ABC TV as a half-hour program and made ten cover page stories. The event was also mentioned in over 180 radio news broadcasts and in over 45 radio interviews, (with over 3 hours of radio airtime in interviews) and in over 60 national print media publications.

Professor Allan Snyder has continued his occasional column in the newspaper "*The Australian"*. His opinion articles "*Their Winning Ways"*, "*Great Minds Think Big*" and "*Borrowed and Beautiful*" and the book review "*Mind your Emotions*" were published. These can be downloaded from the Centre's website.

Mind Space, the Centre for the Mind's bi-annual newsletter, is distributed widely to the academic and scientific community, government and corporate associates, and the Friends of the Centre.

In 2000, the Centre for the Mind's website was re-developed and launched. The new site was tested with the staging of Australia's first exclusive on-line media campaign and was successful in gaining the approval of the international media community and the general public. The site currently receives an average of 105,000 hits per month and over 3,500 hits per day! Ongoing development will continue to advance the audience for the work of the Centre.

Publications

Book Chapters

Professor J. Mitchell (2000) "How do they do it?" *Geniuses, Prodigies & Savants. Extraordinary People and What Makes Them Tick.* University of Sydney Printing Services, Sydney.

Professor A. Snyder FRS (2000) "Forward" *Geniuses, Prodigies & Savants. Extraordinary People and What Makes Them Tick.* University of Sydney Printing Services, Sydney.

Conference Proceedings

Geniuses, Prodigies & Savants – Extraordinary People, What Makes Them Tick? Formal Proceedings from the December 1999 event.

Invited Conference Presentations & Lectures

Professor A. Snyder

"*Creative Mind Prizes 2000*" Keynote for Award presentation, Australian Technology Park Sydney, May.

"Blinded by your expertise", Australian Pacific Health Conference, National Convention Centre, Canberra, 26 June.

"*What Makes a Champion?"* Keynote Address, University of Sydney, 3 September.

"*Blinded by your Expertise"* College of Health Sciences, Blue Mountains, 1 November.

"*Great Leaders of the Future"* Keynote Address, National Youth Day 2000, Melbourne Convention Centre, 10 November.

Mandawuy Yunupingu, Professor Allan Snyder, The Hon. John Howard and Nelson Mandela, What Makes a Champion? Sydney, 3 September.

Commercialisation

During 2000 the School advanced its efforts in commercialization of its applied research and joint ventures with industry. Foremost in these endeavours was the launch in April by Hon. Senator Nick Minchin, Minister for Industry, Science and Resources, of a University spin off company, Acton Lasers, to exploit the enormous commercial opportunities for innovative optoelectronic devices developed in EME, as outlined in this section. The Blue Lab, a joint R&D venture between the School and a Taiwanese Company, LEDEX, was also launched by the Chief Minister, Kate Carnell in July. It is envisaged that the Blue Lab projects will begin in the 3rd quarter of 2001. At the end of 2000, a further spin-off company, Redfern Polymer Optics, was established to further develop R&D arising out of the School activities in the Australian Photonics CRC. A new MOCVD reactor, funded from a major REIF grant and a large number of organizations including the ANU's major equipment committee, was installed in June 2000. This constitutes a $3.5M national facility and will be a unique facility in Australia for the growth of advanced photonic and electronic structures and devices for both fundamental studies and developing pre-commercial prototypes. It will be officially opened by Senator Alston early in 2001. Several other commercial ventures were pursued in 2000 as detailed below.

A Pico-second Nd-doped Yttrium ortho-Vanadate Laser

The laser is passively mode-locked by a semiconductor saturable absorber mirror (SESAM) which was designed at the Laser Physics Centre and manufactured at EME using metal organic vapor deposition. The laser will be packaged by Eletro Optic Systems Pty. Ltd. and is intended for use in satellite laser ranging systems. This project is supported by a SPIRT grant from the ARC and the company has recently been awarded a START grant to aid the development of the technology. (Dr M. Lederer)

High Voltage Optical Fibre Sensing

This project, with ABB/Transgrid through the Australian Photonics Cooperative Research Centre as partner, involves the development of a special polymer optical fibre capable

Chief Minister, Kate Carnell launches the Blue Lab

of sensing voltage. The fibre uses an electro-optic chromophore within its core so that the phase of a light beam propagating through the fibre is affected by an applied voltage. (Professor B. Luther-Davies, Dr M. Samoc, Dr A. Samoc, Dr A. Freydank, Ms M. Krolikowska and Ms T. Martin)

The WEDGE.

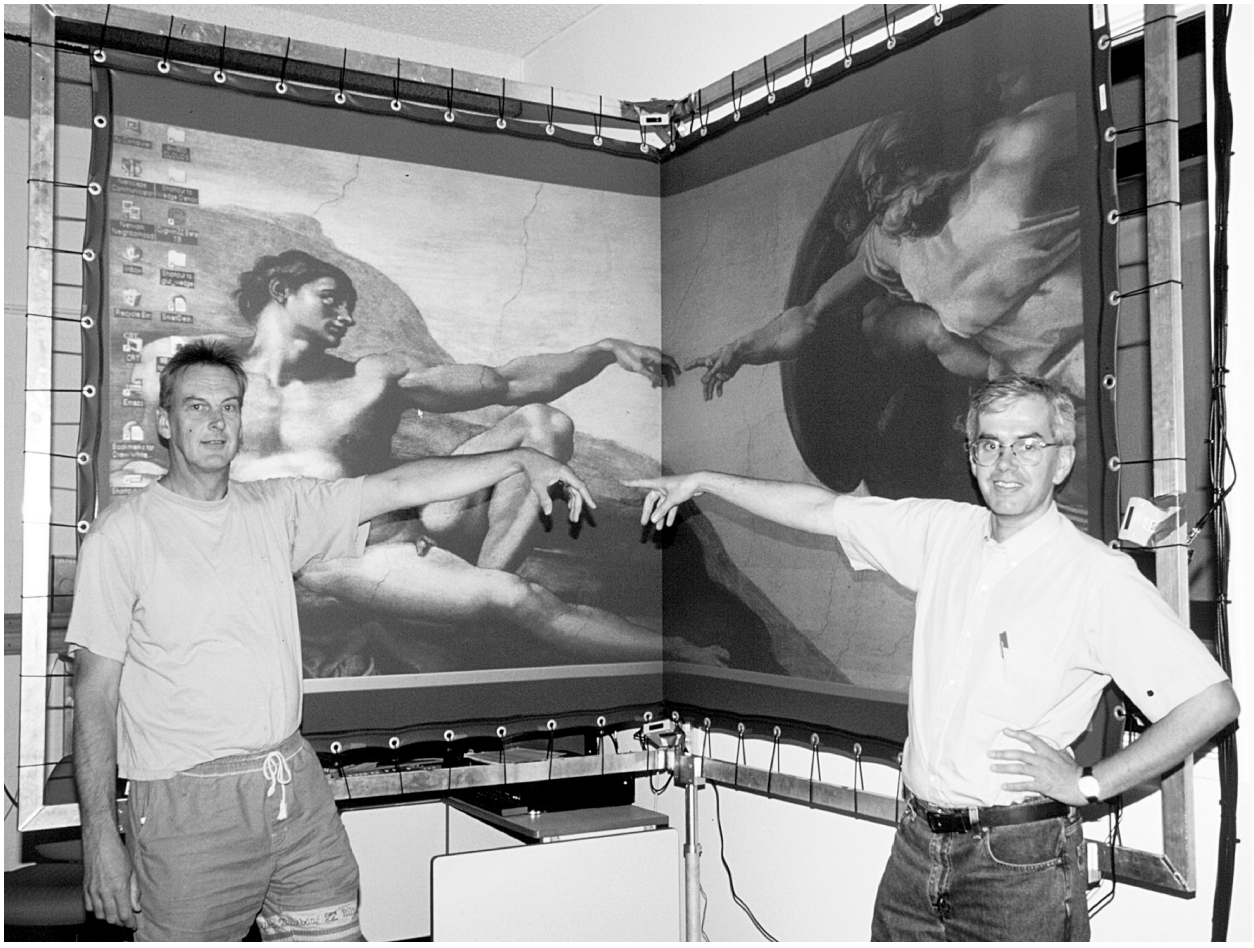
Two installations of the WEDGE Virtual Reality Theatre were purchased during the year. One is installed at the CSIRO Discovery Centre and the other at the Australian Defence Force Academy. A further installation is being built at the Department of Computer Science, ANU. (Dr Henry Gardner, Professor R. Boswell).

Acton Semiconductors.

At the end of 2000, a new company was launched, Acton Semiconductors (AS), to commercialise part of the IP developed by the School and held by Acton Lasers. The company will operate independently of the ANU and will manufacture a range of pump laser products that will be taken to prototype stage in the School. There are already 4 customers for these products who would consume more than $15M worth of product per year if the new company can supply such volumes. AS is in the final stages of securing a US$22.5M investment for funding this venture over 2 years, as well as securing a major US company as strategic partner. When funding is secured, the company will submit a multimillion dollar START grant application to mainly fund prototyping and R&D work in the School. Both the ANU and the School will hold equity in this company. Acton Lasers will remain as a wholly owned ANU company to manage the future IP from the semiconductor group in EME. (Professors C Jagadish and J S Williams and a team of researchers in EME).

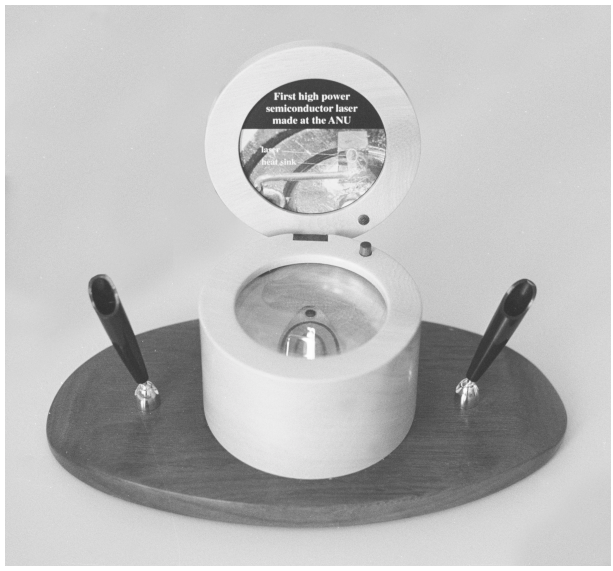
Novel antenna systems for wireless data communications and radar.

The Plasma Research Laboratory, the University of Canberra, and the Defence Science and Technology Organisation are collaborating in a project to use state-of-the-art communications test equipment to aid in the development of innovative technology for wireless communications and radar. The initial focus of research using this equipment will be the development of a novel concept, the plasma antenna, which uses ionised gas, instead of metal conductors, to transmit radio signals. This invention, developed in the School, offers potential advantages for applications in military communications, digital data communications for remote areas, coastal surveillance radar, mobile telephones, and even radio astronomy, and has already attracted research support from Australia and the US. A recent article in New Scientist (see put ref here) describes the physical principles and possible military applications. Since that time, a number of possible commercial applications have been developed, some of which are being explored with industry partners. (Jeffrey Harris, Gerard Borg, ANU, Andrew Cheetham, John Rayner University of Canberra, Noel Martin, Defence Science and Technology Organisation).



Professor R. Boswell (left) and Dr Henry Gardner with an early version of the WEDGE

The Hon. Senator Nick Minchin, Minister for Industry, Science and Resources, officially launches Acton Lasers (top). The Deputy Vice Chancellor, Professor John Richards, presents Senator Minchin with one of the world beating high power semiconductor lasers (above)



The specially mounted laser presented to The Hon. Senator Nick Minchin. The case was made by Tony Cullen of the School's Electronics Unit

A prototype plasma antenna undergoing field trials

Outside Grants and Contracts

In 2000, the School's annual recurrent grant of $14m was supplemented by additional income from the University's Major Equipment Committee's funds ($774k), the Performance and Planning Fund ($230k), from full fee paying students ($70k) and by a significant number of outside grants from a variety of sources. These grants, which are shown below, reflect the School's income opportunities and some of its collaborative activities.

Applied Mathematics

Australian Partnership for Advanced Computing

Dr M. Knackstedt, Dr A.P. Sheppard and Professor S.T. Hyde $250,000

DETYA (Australian Research Council)

Dr V.S. Craig
Australian Postdoctoral Research Fellowship
February 1999 to February 2002 $177,009

Dr T.J. Senden
Australian Postdoctoral Research Fellowship
March 1997 to March 2000 $181,302

University of New South Wales

Dr M. Knackstedt
January 1998 onwards $20,000

Atomic and Molecular Physics Laboratories

Commonwealth Scientific & Industrial Research Organisation

Professor L. Chadderton
Swift Ions Project
August 1998 to August 2003 $150,000

DETYA (Australian Research Council)

Dr R.J. Gulley
Australian Postdoctoral Research Fellowship
March 1998 to February 2001 $164,000

Dr D.R. Lun
Australian Postdoctoral Research Fellowship
January 1997 to January 2000 $178,263

Professor H .Cho
International Research Fellow
June 1999 to May 2000 $97,278

Dr M. Vos
Queen Elizabeth II Research Fellowship
November 1996 to June 2001 $308,216

DISR

Professor S.J. Buckman
Technology Diffusion Program
Electron Induced Processes
March to April 2000 $2,610

Professor R.W. Crompton
Technology Diffusion Program
Atomic Molecular Databases Producers & Users Program
March 2000 $4,734

International Interactive Forum

Dr B. Lewis
13th International Conference on Vacuum Ultraviolet Radiation Physics
January 1998 to August 2001 $4,955

Electronic Materials Engineering

ANSTO

Dr M. Petravic
Access to Major Research Facilities Program
Visit Synchrotron Radiation Research Centre, Taiwan
Selective Photo-desorption of hydrogen from Hydrogenated GaAs Surfaces
July 2000 $6,400

Dr M.C Ridgway
EXAFS Measurements of Amorphised Semiconductors
July 2000 $6,400

ACTON LASERS - ANU Commercialisation (Venture Capital) Fund

General Contingency Fund
Develop Stage 1 of Acton Lasers
Professor C. Jagadish
March 2000 $500,000

DETYA (Australian Research Council)

Dr H. Tan
Australian Postdoctoral Research Fellowship
December 1996 to January 2000 $161,568

Dr Y.J. Wong-Leung
Australian Postdoctoral Reserch Fellowship
January 1998 to December 2000 $164,000

Dr H. Timmers (Jointly with Nuclear Physics)
Australian Postdoctoral Research Fellowship
June 1999 to June 2002 $174,576

DETYA (ARC-International Researcher Exchange Program)

Dr Y.J. Park and Professor C. Jagadish
Fabrication of Photonic Devices using Semiconductor Nanostructures
January 2000 to December 2000 $79,478

DETYA (ARC Large Research Grants)

University of Canberra

(ANU participant)
Professor C. Jagadish
Fabrication and Testing of Low Noise Semiconductor Lasers
1998 to 2000 $228,000
(Held at the University of Canberra)

University of Newcastle

(ANU participant)
Dr M. Petravic
Surface Analysis using a Free Electron Laser
1999 to 2002 $120,000
(Held at the University of Newcastle)

University of New South Wales

(ANU participant)
Professor C. Jagadish
Quantum Well Intermixing in In P Based Optoelectronic Materials & Devices
1999 to 2001 $223,000
(Held at the University of New South Wales)

University of Wollongong

(ANU participant)
Professor C. Jagadish
For Infrared Laser Generation from Optically & Electrically Pumped Semiconductor Quantum Well Systems
1998 to 2000 $150,000
(Held at the University of Wollongong)

DETYA Strategic Partnerships with Industry Grants (SPIRT)

Professor J.S. Williams
Indentation Studies of Semiconductor Thin Films
January 1999 to January 2002 $62,268

Australian Scientific Instruments contribution to the **SPIRT Program**
Professor J.S. Williams
January 1999 to January 2002 $15,000

DISR

Professor J.S. Williams
Targeting Research Alliances – Business Model
1999 to 2000 $65,000

Professor J.S. Williams
Technology Diffusion Program
Harnessing Materials Research & Development Resources
May to November 2000 $113,000

DSTO

Vision Abell Contract
Professor C. Jagadish
Development of Indigenous Photodetectors for RF Photonic Links $90,000
1999 to 2000

IEEE Electron Devices Society

Professor C. Jagadish 11th
International Semiconducting & Insulating Materials Conference US$100,000
July 2000

Lithography Clean Room Project

Various Donors
March 2000 to February 2005 $150,000

Stanley Melbourne Bruce Science & Industry Fund

Professor J.S. Williams
For Protection of IP in respect of an Optoelectronics Materials Opportunity
February 2000 to February 2002 $60,000

Laser Physics Centre

ABB Transmission & Distribution Pty Ltd & Transgrid

Professor B. Luther-Davies et al.
High Voltage Optical Fibre Sensing
April 1999 to March 2001 $251,080

Australian Academy of Science

Dr A. Rode
Confining Gallium – A New Material for Photonics
(collaboration with the Royal Society of London)
July 1999 to June 2000 $7,850

Ericsson Australia Pty Ltd

Professor B. Luther-Davies et al.
New Methodologies and Software
July 1999 to June 2000 $64,250

DETYA (Australian Research Council)

Dr M.J. Sellars
Australian Postdoctoral Research Fellowship
February 1998 to January 2001 $164,000

Dr A.V. Rode
Queen Elizabeth II Research Fellowship
June 1996 to December 2000 $385,000

DETYA (ARC Large Research Grants)

Macquarie University

(ANU participants)
Drs. K. Baldwin & B. Lewis (AMPL)
Pulsed Nonlinear-optical Spectroscopic Research Infrastructure Equipment & Facilities Program
January 2000 to 2002 $153,000

Professor B. Luther-Davies
A High-power Tunable Femtosecond Light Source for Testing Advanced Nonlinear Optical Materials
January 2000 to December 2000 $270,000

DETYA (ARC-International Researcher Exchange Program)

Professor Byeong-Soo Bae, KAIST, Korea
Photosensitive ORMOSIL Materials for Planar Waveguide Applications
July 1999 to June 2000 $61,060

DETYA Strategic Partnerships with Industry Grants (SPIRT)

Dr R. Charters (resigned during 2000)
Design, Fabrication & Evaluation of Planar Lightwave Circuits in Organically Modified Silicate Glasses for Telecommunications and other Applications
June 1999 to June 2002 $220,132
(AOFR contribution) $54,000

DETYA (RIEF)

University of Sydney/ University of Melbourne

Professor B Luther-Davies
Short Pulse Laser for Ranging Applications Incorporating Semiconductor Saturable Absorber
June 1999 to June 2002 $151,223
(EOS contribution) $45,000

DISR

Professor B. Luther-Davies et al
Grant for Australian Photonics Cooperative Research Centre (Canberra node)
April 1992 – June 2000 $3,122,386

Dr K. Baldwin Scientific Visit to Europe
High Resolution XUV Laser Spectroscopy
July 2000 to June 2001 $7,850

Nuclear Physics

ANSTO

Access to Major Research Facilities Program
Dr R. Bark
Visit France & Finland, *Intrinsic & Rotational Bands in ^{180}Ta and Very High Spin States in ^{174}0s Populated in a Cold Near-symmetric Reaction*
July to August 2000 $9,200

Access to Major Research Facilities Program
Professor G.D. Dracoulis
Visit 88" Cyclotron, Lawrence Berkeley Laboratory, USA
Characterising Shape Co-existence in ^{188}Pb and ^{187}T1
October to November 2000 $12,000

DETYA (Australian Research Council)

Dr M. Dasgupta
Queen Elizabeth II Research Fellowship
April 1998 to March 2003 $360,000

Dr C.R. Morton
Post Doctoral Research Fellowship
June 2000 to June 2003 $179,769

Dr H. Timmers (jointly with EME)
See EME

Optical Sciences Centre

DETYA (Australian Research Council)

Professor J.D. Love and Dr M. Elias (ADC Telecommunications Australia Pty Limited)
APRA (Industry) Scholarship: Planar Optical Devices for Wavelength Division Multiplexing
K Gaff
February 1997 to February 2000 $71,598

Professor J.D. Love and Dr M. Elias (ADC Telecommunications Australia Pty Limited)
APRA (Industry) Scholarship: Modelling of Polymer-based Planar Optical Devices
S. Tomljenovic-Hanic
June 1999 to May 2002 $71,598

Dr A.V. Buryak
Australian Postdoctoral Research Fellowship
January 1997 - January 2000 $165,000

DETYA (ARC Large Research Grants)

ADFA

(ANU participants)
Dr A.V. Buryak and Professor Y.V. Kivshar
Parametric Wave Mixing in Nonlinear Optics
January 1998 to January 2001 $159,000

Centre for the Mind

News LTD

Professor A W Snyder
Contribution to Research
July 1998 to June 2001 $150,000

Plasma Research Laboratory

Australian Academy of Science

Dr M.G. Shats
Comparative Studies in the Stellarator Transport
July 2000 $5,225

DETYA (ARC Large Research Grants)

University of Sydney
(ANU Participants)
Dr J. Howard & Professor S.J. Buckman
LIF Measurement of Plasma E Field
January 2000 to December 2002 $250,000

DETYA Strategic Partnerships with Industry Grants (SPIRT)

Dr G.G. Borg
The application of Plasma Antennas to Communications and Radar
June 2000 to May 2003 $62,466

DISR

Professor J. Harris et al
National Plasma Fusion Research Facility
December 1995 to December 2001 $8,700,000

DSTO

Professor J. Harris, Dr G.G.Borg and Dr N.M. Martin
Research Agreement
Production of a Demonstration Plasma Antenna
2000 $37,000

Museum of Applied Arts & Sciences

Professor R.W. Boswell, Dr H.J. Gardner and Dr R. Gingold
Software License Agreement - Powerhouse
June 1999 to June 2000 $25,000

Motorola Inc (USA)

Professor J. Harris
Application of Plasma Switches to Mobile Personal Communications Systems
June 2000 to June 2001 US$27,413

University of Sydney

Dr G.G. Borg and Dr D.J. Miljak
Technical Officer Support
January to December 2000 $25,000

Theoretical Physics

United States Air Force Office of Scientific Research

Dr I.B. Talanina
Ultrafast Optical Logic with Semiconductor Nonlinear Directional Couplers
1998 to April 2000 USD$78,940

Dr I.B. Talanina
AOARD Potential Applications of the Resonant Soliton Switches in
WDM Networks USD$24,880
July to December 2000

DETYA (Australia Research Council)

Dr R. Ball
Australian Postdoctoral Fellowship
June 2000 to June 2003 $177,009

Dr M. Gulacsi
Queen Elizabeth II Research Fellowship
June 1995 to May 2000 $364,300

Industrial Research Alliances Program

Dr M. Gulacsi
Impurity Effects in Mesoscopic Systems
July 1999 to March 2000 $20,000

Institution of Engineers

Professor R.L. Dewar
International Conference on Plasma Physics (ICPP 2002)
June 1998 to November 2002 $5,000

Japan Society for the Promotion of Science

Dr A. Kheifets – Visiting Fellowship 2000 $10,000
Dr S. Kuyucak – Visiting Fellowship 2000 $10,000

Australian Academy of Science

Dr Rowena Ball
Travelling Fellowship to the U.K. $7850

General Endowments

Funds for Conferences, Summer Schools & Workshops
February 1996 to December 2000 $20,000

Donation from personal estate
June 1997 indefinite $103,000

Named Scholarships and Prizes
Jagadishwar Mahanty Prize $13,100
Funds to be matched

Service to Outside Organisations

Applied Mathematics

Dr A.G. Christy

Associate Editor, *Mineralogical magazine* (UK)

Dr V. Craig

Engaged as an expert witness in a patent opposition matter, by patent attorneys Baldwin, Shelston, Waters

ACT Committee Member, Royal Australian Chemical Institute

Professor B.W. Ninham

Member, UNESCO World Commission on Ethics of Scientific Knowledge and Technology (COMEST)

Organiser, New International Scandinavian Research Institute in Basic Science to form in Malmo, Sweden

Joint supervision of students and postdocs, in Sweden, France and Italy

Dr A.M. Stewart

Vice President (Academic) and Treasurer, ANU Branch, National Tertiary Education Union

Dr N.J. Welham (see also EME)

Returning Officer, Institute of Electrical and Electronics Engineers, ACT Section

Returning Officer, Institute of Electrical and Electronics Engineers Australian Chapter of Electron Devices Society and Lasers and Electro-optics Society

Atomic and Molecular Physics Laboratories

Professor S.J. Buckman

Member, General Committee, International Conferences on the Physics of Electronic and Atomic Collisions (ICPEAC)

Member, Organising Committee, 11th Gaseous Electronics Meeting, Armidale

Member, International Scientific Committee, International Symposium on Electron-Molecule Collisions and Swarms, Lincoln, Nebraska

Member, Executive Committee, Gaseous Electronics Conferences (USA)

Member, International Scientific Committee, Symposium on the Physics of Ionized Gases, Yugoslavia

Professor L.T. Chadderton

Founding Editor, *International Journal of Radiation Effects and Defects in Solids*

Member, Editorial Advisory Board, *Nuclear Tracks and Radiation Measurement*

Member, Editorial Advisory Board, *International Materials Science Forum*

Member, Steering Committee, Bilateral Science & Technology Agreement, Mexico and the Federal Government of Australia

Member, United Nations Committee on Photovoltaic Applications in Less-Developed Countries, UN Centre for Science & Technology for Development

Member, International Committee, Biennial Conference Series on Radiation Effects in Insulators

Member, International Committee, Biennial Conference Series on Particle Tracks in Solids

Professor R.W. Crompton

Convenor, ACT Chapter, Australian Fulbright Association

Member, Editorial Advisory Board, *Physics of Atoms and Molecules*

Member, International Advisory Board, International Conferences on Atomic and Molecular Data and their Applications

Chair of Board, National Youth Science Forum

Dr M.T. Elford

Member, Editorial Board, *Australian Journal of Physics*

Dr S.T. Gibson

CGI WebMaster, Australian Optical Society

Dr B.R. Lewis

Member, International Advisory Board, International Conferences on Vacuum Ultraviolet Radiation Physics

Associate Editor, *Journal of Quantitative Spectroscopy and Radiative Transfer*

Dr J.C.A. Lower

Treasurer, ACT Branch, Australian Institute of Physics

Ms L. Uhlmann

Participant, Adopt-a-Physicist Program, ACT Branch, Australian Institute of Physics

Professor E. Weigold

Member, International Scientific Committee, International Conferences on X-Ray and Inner Shell Processes

Member, International Scientific Advisory Committee, International Symposium on (e,2e) Double Photoionization and Related Topics, Rolla, Missouri, USA, July 2001

Member, Board, Australian Photonics CRC

Chairman, National Committee for Physics, Australian Academy of Science (until May)

Member, International Scientific Committee, Many-Particle Spectroscopy of Atoms, Molecules and Surfaces, Halle, Germany, July 2000

Member, International Organizing Committee, Sagamore (International Conference on Charge, Spin and Momentum Densities)

Member, Nominating Committee, American Physical Society Few-Body Topical Group

Member, Australian Academy of Science Committee, Major National Research Facilities

Electronic Materials Engineering

Ms A. Dowd

Participant, Adopt-a-Physicist Program, ACT Branch, Australian Institute of Physics

Dr R.G. Elliman

Member, Advisory and Program Committees, 12th International Conference on Ion Beam Modification of Materials, Porto Alegre, Brazil, 3-8 September

Member, Advisory Committee, 16th Australian MicrOzcopy Conference, MicrOzcopy 2000, Canberra, 6-11 February, 2000

Member, International Committee, Ion Beam Modification of Materials Conference Series

Member, International Committee, Ion Beam Analysis Conference Series

Co-Chair, Symposium R, Microstructural Processes in Irradiated Materials, Materials Research Society Fall Meeting, Boston, USA

Chair, International Conference, Ion Beam Analysis, 15-20 July 2001

Chair, AINSE National Conference, Nuclear Techniques of Analysis, 2001

Member, Editorial Board, *Nuclear Instruments and Methods B*

Member, ACT Branch Committee, Australian Institute of Physics

Member, Governing Council, Electronic Materials Division, International Union of Vacuum Science Techniques and Applications

Member, AINSE Accelerator Science Specialist Committee

Member, AINSE Environmental Science Specialist Committee

Member, DISR Feasibility Study: Harnessing Materials R&D Resources for the Benefit of Australian Manufacturing Industry

Technical Advisor, APEC Materials Research, DISR

Founder and Co-Chair, Australasian Ion Beam Association (AIBA)

Program Reviewer, ANSTO Accelerator Applications Affinity Area

Co-ordinator, Adopt-a-Physicist Program, ACT Branch, Australian Institute of Physics

Professor N.H. Fletcher

Editor, *Acoustics Australia*

Editor, Newsletter of the Australian Academy of Science

Member, Editorial Board, *Journal of Sound and Vibration*

Member, Editorial Board, *Applied Acoustics*

Member, Editorial Board, American Institute of Physics/ Springer-Verlag Monograph Series, *Modern Acoustics and Signal Processing*

Member, National Library's Australian Library Collections Task Force

Professor C. Jagadish

Past Chair, IEEE ACT Section

Chair, IEEE Australian Chapter of Electron Devices Society (EDS) and Lasers & Electro-Optics Societies (LEOS)

Chair, IEEE Optoelectronic Devices Technical Committee, Electron Devices Society, USA

Member, International Advisory Committee, 11th International Conference on Semiconducting and Insulating Materials, Canberra, Australia July 3-7, 2000

General Chair, 11th International Semiconducting and Insulating Materials Conference, Canberra, Australia, July 3-7, 2000

Member, IEEE Compound Semiconductor Devices and Circuits Technical Committee of The Electron Devices Society

Member, IEEE Electron Devices Society Meetings Committee, USA

Member, Nanotechnology Technical Committee of IEEE Electron Devices Society

Member, International Advisory Committee, COBRA, Inter University Research Institute for Communications Technology, Eindhoven University of Technology, The Netherlands

Member, IEEE Compound Semiconductor Integrated Circuits Technical Committee, Electron Devices Society

Member, Administrative Committee, IEEE Electron Devices Society, USA, 1999-2001

Member, Program Committee, 11th International Semiconducting and Insulating Materials Conference, Canberra, Australia, July 3-7, 2000

Member, Scientific Advisory Committee, 2000 Conference on Optoelectronic and Microelectronic Materials and Devices, December 6-8, 2000, Melbourne

Co-Chair, Technical Program Committee, International Conference on Fibre Optics and Photonics (PHOTONICS2000), Calcutta, December, 2000

Member, International Scientific Committee, Symposium on Materials for Opto-electronics and High Frequency Electronics, International Conference on Materials for Advanced Technologies (ICMAT-2001), 1 – 6 July 2001, Singapore

Member, International Advisory Committee, TENCON 2000, Intelligent Systems and Technologies for the New Millennium, Kuala Lumpur, Malaysia, 24th - 27th September 2000

Chair, International Advisory Committee, 12th International Semiconducting and Insulating Materials Conference, June 2002, Bratsilova, Slovakia

Member, Advisory Committee for the Centre for Materials Technology, University of Technology, Sydney

Professional Adviser, LEDEX Corporation, Taiwan

Dr M. Petravic

Member, Program Committee, 15th Australian Microscopy Conference, Canberra, February 2000

Member, Program Committee and Organising Committee, 16th International Conference on Ion Beam Analysis, Cairns, Australia (2001)

Dr M.C. Ridgway

Member, Specialist Committee of the Australian Synchrotron Research Program

Member, Organising and Program Committees for the 15th International Conference on Ion Beam Analysis

Presenter, Public Lecture for the Centre for the Science and Engineering of Materials entitled "Atomic-Scale Materials Characterisation with Synchroton Radiation"

Lecturer, 2nd Year Physics Class, Australian Defence Force Academy entitled "Semiconductor Materials Growth, Processing and Characterisation"

Referee, Grant Proposals, Australian Research Council

Dr. H.H. Tan

Vice-chair, IEEE ACT section

Member, Organising Committee, 11th International Semiconducting and Insulating Materials Conference, Canberra, 3-7 July 2000

Dr H. Timmers

Member, Organising Committee, 15th International Conference on Ion Beam Analysis, Cairns, Australia (2001)

Ms T.D.M. Weijers

Member, Local Organising Committee, 15th International Conference on Ion Beam Analysis, Cairns, Australia (2001)

Dr N.J. Welham

Member, Editorial Board, *Proceedings of the Australasian Institute of Mining and Metallurgy*

Committee Member, Canberra Branch Australasian Institute of Mining and Metallurgy

Organising Committee Member, Southern Africa-Australia Mineral Sector Synergies Symposium

Newsletter Editor, Canberra Branch, Australasian Institute of Mining and Metallurgy

Co-organiser, Southern Africa-Australia Mineral Sector Synergies Symposium

Organising Committee Member, SIMC-XI 2000 Conference

Consultant, Gold Mines of Sardinia Pty Ltd

Consultant, Sons of Gwalia

Consultant, Royal Australian Mint

Consultant, Metal Mining Agency of Japan

Lecturer, 40h course in "Mineral Chemistry" and 30h course in "Field Analytical Techniques", Geoscience students, Canberra Institute of Technology

Professor J.S. Williams

President, Australian Materials Research Society

Member, International Advisory Committee, International Conference Series on Ion Beam Analysis

Member, International Advisory Committee, International Conference on Ion Implantation Technology

Member, Adhering Body Commission, International Union of Materials Research Society

Member, Editorial Board, *Radiation Effects and Defects in Solids*

Member, Public Affairs Committee, Materials Research Society, Pittsburg, USA

Member, Advisory Board, *Applied Physics Reviews*

External Member of Advisory Board, Strategic Program in Functional Materials, ANSTO

Professional Advisor, LEDEX Corp, Taiwan

Referee, Grant Proposals, ARC, NSERC, NSF and DISR

Laser Physics Centre

Dr K.G.H. Baldwin

Member, Technical Program Committee, IQEC 2000

Member, Technical Program Committee, Atom Optics and Interferometry 2000

Member, National Committee for Spectroscopy, Australian Academy of Science

Member, ACT Branch Committee, Australian Institute of Physics

Member, Science Policy Committee, Australian Institute of Physics

Member, Australasian Council on Quantum Electronics

Chair, Australian Conference on Optics, Lasers and Spectroscopy Liaison Committee

Chair, Science Policy Committee, Federation of Australian Scientific and Technological Societies

Member, International Council on Quantum Electronics

Co-ordinator, Adopt-a-Physicist Program, ACT Branch, Australian Institute of Physics

Dr M. Lederer

Member, ACT Section Committee, IEEE

Professor B. Luther-Davies

Director, Research, Australian Photonics Cooperative Research Centre

Member, Executive and Board, Australian Photonics Py Ltd

Chair, Australian Conference on Optical Fibre Technology

Referee, Grant Proposals, Australian Research Council

Dr N.B. Manson

Member, International Advisory Committee, International Conference on Dynamical Processes in Excited States of Solids

Referee, Grant Proposals, Australian Research Council

Referee, Grant Application, Research Corporation (USA)

Dr A. Samoc

Referee, Grant Proposals, Australian Research Council

Dr M. Samoc

Member, Editorial Board, *Photonics Science News*

Referee, Grant Proposals, Australian Research Council

Nuclear Physics

Dr A.P. Byrne

Member, Committee and Minutes Secretary, ACT Branch of the Australian Institute of Physics

Participant, Adopt-a-Physicist Program, ACT Branch, Australian Institute of Physics

Reviewer, Australian Research Council

Dr M. Dasgupta

Committee Member, ACT Branch, Australian Institute of Physics

Participant, Adopt-a-Physicist Program, ACT Branch, Australian Institute of Physics

Dr L.K. Fifield

International Member, AMS Strategy Group, UK Natural Environment Research Council

Member, ACT Radiation Council

Professor G.D. Dracoulis

Member, Committee, Nuclear and Particle Physics Group, Australian Institute of Physics

Member, International Advisory Committee "Nuclear Structure 2000" NSCL, Michigan, USA (August 2000)

Member, International Advisory Committee "Luderitz 2000" - Fundamental and Applied Aspects in Modern Physics, Luderitzbuch, Namibia (November 2000)

Member, 18th AINSE Nuclear and Particle Physics Program Committee, (in association with the AIP Congress), Adelaide (December 2000)

Member, International Advisory Committee, Crete Conference on Nuclear Structure, July (2001, 2002)

Member, North America Committee, Australian Academy of Science, International Program of Scientific visits

Member, Program Advisory Committee of the 88-inch Cyclotron (including Gammasphere), Lawrence Berkeley National Laboratory

Member, International Scientific Advisory Committee, International Nuclear Physics Conference INPC 2001, Berkeley, USA (July 2001)

ANU Representative, Engineering and Physical Sciences Research Council (UK), ANU-EPSRC Agreement: Beam Time Allocation

Referee, Engineering and Physical Sciences Research Council (UK), Senior Research Fellowship Scheme

Expert Referee, Engineering and Physical Sciences Research Council (UK), Research Grants; Nuclear Physics Program

Expert Reviewer, University of Sydney, ARC Small Grants

Evaluator, Foundation for Research Development (South Africa) - Evaluation of Research Outputs of Principal Grant Holders

Dr D.J. Hinde

Member, International Advisory Committee, Seventh International Conference on Nucleus-Nucleus Collisions, Strasbourg (July 2000)

Dr A.E. Stuchbery

Member, Committee and Social Secretary, ACT Branch of the Australian Institute of Physics

Member, Committee, Nuclear and Particle Physics Group (NUPP), Australian Institute of Physics

Member, Program Committee and Conference Chair, 18th AINSE Nuclear and Particle Physics Conference, Adelaide (December, 2000)

Supervisor, student projects within the CSIRO Student Research Scheme

Professor S.R. Taylor

Associate Editor, *Meteoritics and Planetary Science*

International Secretary, Geochemical Society

Member, Board of Advisers, The Planetary Society

Member, Nominations Committee, The Meteoritical Society

Optical Sciences Centre

Professor N. Akhmediev

Referee, Grant Proposals, Australian Research Council

Professor Y. Kivshar

Associate Editor, *Physical Review E*

Elected Fellow, Optical Society of America (OSA)

Convenor and Chair, International Workshop, Nonlinear Guided Waves, associated with ACOFT, 25th Australian Conference on Optical Fiber Technology (26-28 June 2000)

Program Chair, OSA Topical Meeting on Nonlinear Guided Waves and Applications

Member, Technical Program Committee, SPIE Symposium, Optical Pulse and Beam Propagation, San Jose, USA 2001

Professor J.D. Love

Member, Organising Committee, ACOFT, 25th Australian Conference on Optical Fiber Technology (26-28 June 2000)

Referee, Grant Proposals, Australian Research Council

Deputy Chair, Australian Conference on Optical Fibre Technology 2000

General Co-chair, Integrated Optics and Optical Communications Conference, Optolelectronics Communications Conference, and Australian Conference on Optical Fibre Technology, Sydney 2001

Director, Siemens Science Experience, ANU

Member, Council of the Australian Optical Society

Program Manager - Planar Integrated Circuits, Australian Photonics Cooperative Research Centre

Postgraduate Supervisor, La Trobe University and RMIT University

Professor A. Snyder

Member, Editorial Board, *Optics Communications*

Plasma Research Laboratory

Dr G.G. Borg

Editor, *Czech Journal of Physics*

Professor R.W. Boswell

Member International Organizing Committee of ISPC 15, 2000

Vice-President Member Committee for the Gaseous Electronics Meeting

Vice-President, Vacuum Society of Australia

Mr S. Collis

Participant, Adopt-a-Physicist Program, ACT Branch, Australian Institute of Physics

Mr F. Glass

Participant, Adopt-a-Physicist Program, ACT Branch, Australian Institute of Physics

Professor J.H. Harris

Member, Stellarator Physics Advisory Committee, Princeton Plasma Physics Laboratory, Princeton, USA

Member, Plasma Specialist Committee, AINSE

Member, Executive Committee for the International Energy Agency Implementing Agreement for Research on Stellarators

Chairman, 13th International Stellarator Workshop, Canberra, Australia, 2001

Dr J. Howard

Member, Plasma Specialist Committee, AINSE

Lecturer, 4th Year Electrical Engineering, Electronic Engineering Case Studies, University of Canberra

Dr M.G. Shats

Member, Program Committee, International Workshop, Role of Electric Fields in Plasma Confinement and Exhaust, Prague

Theoretical Physics

Professor R.J. Baxter

Member, Editorial Board, *Journal of Geometric and Functional Analysis*

Member, Editorial Board, *Journal of Statistical Physics*

Member, Advisory Board, *Physica A*

Member, Editorial Committee, *Philosophical Transactions of the Royal Society, Series A*

Member, Editorial Board, *Annals of Combinatorics*

Member, Editorial Board, *Theoretical Physics and Related Mathematics (International Press)*

Member, Board, Australian National University Centre for Theoretical Physics

Senior Fellow, Asia-Pacific Center for Theoretical Physics, Seoul, Korea

Mr B. Corry

Participant, Adopt-a-Physicist Program, ACT Branch, Australian Institute of Physics

Dr M.P. Das

Member, Editorial Board, *Condensed Matter and Materials Communications*

Guest Editor, *Australian Journal of Physics*, Volume 53

Co-Convenor, Annual Gordon-Godfrey Research Workshop on Condensed Matter Physics

Co-Convenor, The 13th Physics Summer School on Bose-Einstein Condensation

Professor R.L. Dewar

Member, Editorial Board, *Australian Journal of Physics*

Member, International Advisory Committee of ICPP 2000

Chair, Local Organising Committee for ICPP 2002

Member, C16: Commission on Plasma Physics, International Union Pure and Applied Physics (IUPAP)

Member, National Committee for Physics, Australian Academy of Science

Member, ACT Branch Committee of the Australian Institute of Physics

Associate Editor, The Physicist for the ACT

Dr K. Kumar

Member, Editorial Board, *The Journal of Transport Theory and Statistical Mechanics*, Marcel Dekker, New York

Dr S. Kuyucak

Convenor, Physics Summer School on Biophysics, 15-26 January, 2001, ANU

Dr B.A. Robson

Member, Organising Committee, 18th AINSE Nuclear and Particle Physics Conference, Adelaide

Dr M. Walker

Participant, Adopt-a-Physicist Program, ACT Branch, Australian Institute of Physics

Outreach Activities

Founder's Day was held on 5 October with invited guests from the ANU, government organisations, industry and the media, as well as former employees. It is a day of celebration of our Founder, Sir Mark Oliphant, who sadly passed away earlier this year. The following members of staff were Founder's Day speakers:

Dr Vince Craig and Chiara Neto, Applied Mathematics
Slippage: Implications for Fluid Flow in Confined Spaces

Dr Matt Sellars, Laser Physics Centre
Faster Than Light, But Einstein is Resting Peacefully

Dr Mark Ridgway, Electronic Materials Engineering
Order in Disordered Materials

Dr Andrew Stuchbery, Nuclear Physics
Gyrations of the Excitations, a Flash of Gamma Rays, and a Look Inside the Nucleus

Dr Shiu Tin, School Computer Unit
The School's Network - Where is it Going?

Dr Brenton Lewis, Atomic and Molecular Physics Laboratories
Vacuum-Ultraviolet and Ultraviolet Radiation, Health and the Environment

Professor Rodney Baxter, Theoretical Physics
The Hard Hexagon Model in Statistical Mechanics

Dr John Howard, Plasma Research Laboratory
MOSSI-FIR: Shedding Light on Plasma Behaviour

Founders Day 2000, Andrew Stuchbery demonstrates properties of the nucleus using Meccano (top left), Chiara Neto talking about fluid flow (top right) and the familiar post talks barbecue scene (below)

Dr Brenton Lewis (left) and Dr John Howard giving talks on Founders Day

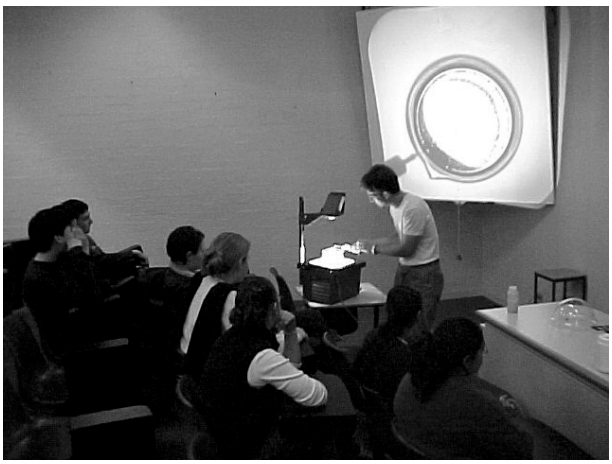
The 2000 Siemens Sciences and Engineering Experience was conducted for students entering Year 10 in 2001. The program is coordinated by Professor John Love, OSC, – see Science Schools, Section 3 for further details. Dr John Martin, LPC, Dr Tim Thompson, PR and a variety of student helpers are acknowledged.

National Youth Science Forum. The Forum provides a unique experience for Year 11 students (some 280 in total) to visit the School and meet with leading scientists and tour the laboratories and major national research facilities. Professor Crompton, AMPL, has been Chairman of the Board since 1996 and Dr Malcolm McIntosh, CSIRO, is President. The School's involvement this year was coordinated by Laura Walmsley, EME. This year's Forum ran in two sessions from 4-14th and 17-28th January, and tours were conducted by Dr Tim Thompson, PR Unit. Further details can be obtained from the web address: http://www.anu.edu.au/nysf/

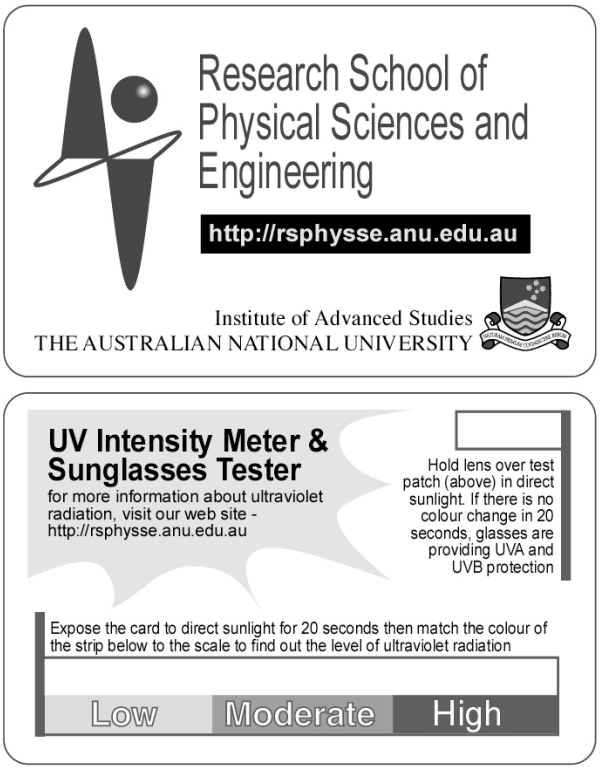
The Australian Institute of Physics "Adopt-a-Physicist" Program. Now in its third year of operation, the ACT AIP "Adopt a Physicist" program visited 10 ACT Secondary Colleges. Dr Ken Baldwin (LPC) who implemented the program was assisted by Dr Aidan Byrne (NP), Dr Nanda Dasgupta (NP) and Dr Rob Elliman (EME) as well as Dr John Close, Dr Paul Danehy and Dr Paul Francis (Physics Faculties). RSPhysSE students participating in the program included Scott Collis (PRL), Ben Corry (TP), Annette Dowd (EME), Fenton Glass (PRL), Linda Uhlmann (AMPL) and Michael Walker (TP).

"Science Meets Parliament" Day, Federation of Australian Scientific and Technological Societies (FASTS). Following the success of the inaugural "Science Meets Parliament Day" which was initiated by Dr Ken Baldwin (LPC) last year, 187 scientists including members of the School converged on Parliament House to meet with 166 politicians on November 1st to discuss the key issues relating to investment in Australia's scientific research base. This successful event also coincided with the visit by Dr Neal Lane, Science Advisor to the President of the United States of America, who also visited the Research School.

*Professor Sue Serjeantson (ANU, FASTS President), Senator the Hon. Nick Minchin (Minister for Industry, Science and Resources) and Dr Ken Baldwin (LPC, FASTS Policy Chair) at the launch of the FASTS policy document (*Australian Science: An Investment for the 21st Century*) at the inaugural "Science Meets Parliament" Day.*



RSPhysSE student Michael Walker bringing physics to the classroom for Year12 students at Lake Ginninderra College under the ACT AIP "Adopt a Physicist" programme.



The promotional UV tester cards were in high demand at this year's Science Festival

Professor Barry Luther-Davies (LPC) presented a lecture *Photonics - the Future is Bright* to around sixty years 9/10 students from Telopea Park High School in November as well as around twenty year 12 students from Canberra College (the visit was arranged by Dr Anna Samoc). A similar presentation was made to 45 students and their teachers from a leading private school from Singapore who were visiting the ANU for an educational experience in Photonics arranged by Professor Hans Bachor. The students were hosted by Professor Barry Luther-Davies and Professor Jim Williams during visits to photonics laboratories in RSPhysSE.

Dr Keith Fifield gave a talk to the ACT Branch of the Australian Institute of Physics entitled: "Using an Accelerator for Ultrasensitive Tracing of Discharge from Nuclear Processing Plants". He also gave a talk to a group of students from the Australian Defence Force Academy (ADFA) as well as taking them on a tour of the accelerator on 18 August. In October he gave a seminar on " Ultrasensitive Tracing of Discharges from Nuclear Processing Plants" at the School of Physics, ADFA.

Interaction with local schools has continued this year with Dr Aidan Byrne (NP) presenting several tours of the School's Heavy-Ion Facility to groups from Lake Tuggeranong and Narrabundah Colleges, Canberra Grammar School and Griffith High School (NSW). He also presented two talks to Wanniassa Primary School on "Gases and Pressure" and "Light and Sound" designed to interest younger students in physics.Dr Nanda Dasgupta conducted tours of the Heavy-Ion Facility for students of Dickson College.

The Plasma Research Laboratory hosted a visit by a group of twelve engineers from the Australian Nuclear Science and Technical Organisation in January. During this visit the engineers were taken on a tour of the H-1NF Facility and took the opportunity to have discussions with academic and technical staff.

Professor Rod Boswell and Dr Christine Charles employ the most difficult means imaginable to showcase the WEDGE and other ANU technology to schools along the Murrumbidgee, following Sturt's epic journey of 1829. The lower photo prompted several letters from conspiracy theorists, claiming the whole trip was in fact faked, as they claim were the NASA moon landings - the journey supposedly being carefully stage managed in a small swimming pool in O'Connor

A number of students attending the Australian Industrial Development Corporation Forum for January 6-21 undertook hands-on experiments in both the Toroidal and Space Group of PRL.

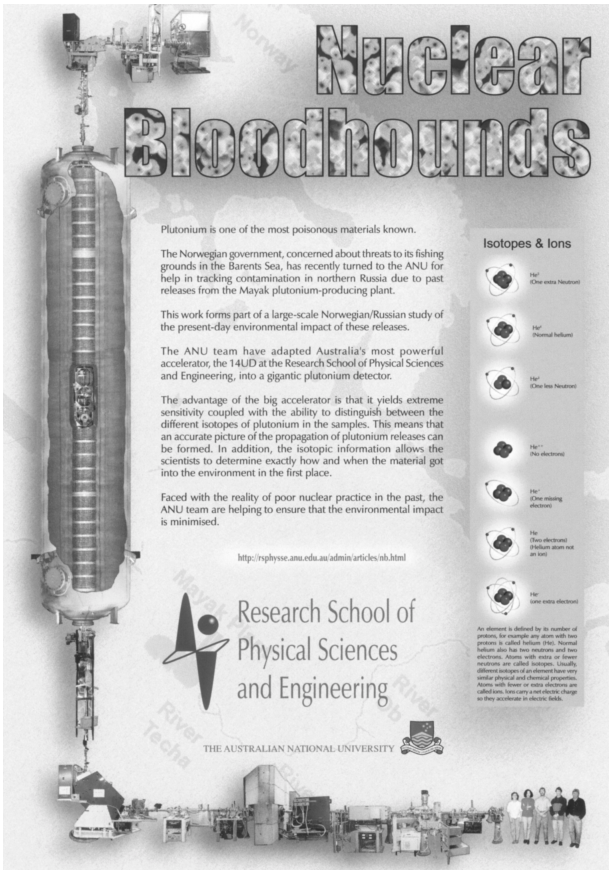
Dr Boyd Blackwell made a presentation on the H-1 National Facility to the Annual Conference of the Institute of Engineers Australia on Energy Supply and later conducted a technical inspection for about 40 conference attendees.

Dr Gerard Borg presented a seminar at the Defence Scientific and Technology Organisation (DSTO), South Australia, to describe the research outcomes on the steering of microwave beams using a plasma lens. The plasma lens was the subject of the third DSTO contract on plasma antennas.

WEDGE: The CSIRO Discovery Centre opened its new exhibition using a WEDGE or virtual reality theatre. Professor Rod Boswell and Peter Alexander assisted in the successful outcome of this project.

"The WEDGE Virtual Reality Theatre" (Henry Gardner, TP; Rod Boswell, Peter Alexander and Rhys Hawkins, PRL) was taken to Wagga Wagga to be demonstrated to both Mt Erin High school students and the general public for the weekend of 11-12 November. The exhibition was also taken to other local high schools in the area on 13th November and approximately 1000 people enjoyed this experience over the three-day period. The software shown focused on scientific experiments and led to many questions from the young observers.

Australian Science Festival. The School was once again a contributor to the ANU stand at the Australian Science Festival, this year providing a display relating to ultra violet penetration of the atmosphere. Special UV testing cards, which also carried the School's web page, were given out in large numbers. As a result, the School's specially created UV information page attracted 248 visitors.



Promotional poster for Dr Keith Fifield's work on tracing nuclear discharges

Professor Barry Luther-Davies, sporting a freshly plastered broken arm, addresses year 9/10 students on potential careers in photonics - and the dangers of rounding up wild horses

Workshops and Conferences

Applied Mathematics

Workshop in Force Microscopy at Microscopy 2000 Conference, Canberra, February 6, was run by Dr T. Senden. An Introduction to Scanned Force Microscopy for Material and Biological Sciences. A full day workshop on basic imaging methodologies including: imaging biological molecules, polymers and composites, general techniques, surface forces/nano mechanical work. Speakers included Tim Senden, Lin Huang of Digital Instruments – Veeco (Santa Barbara) and John Thomas of Group Scientific (and University of SA). 18 people attended the workshop.

Electronic Materials Engineering

11th International Semiconducting and Insulating Materials Conference, 3-7 July, Huxley Lecture Theatre, ANU. Professor Jagadish, Conference Chair, was supported by other departmental committee members. The conference was attended by delegates from many international and national universities. There were 40 oral presentations and 22 poster presentations.

Optical Sciences Centre

International Workshop of Nonlinear Guided Waves and Applications, 29-30 June – associated with ACOFT'2000. Professor Yuri Kivshar was the Convenor and Chair of the Workshop. Invited international speakers were Professors A. Hasegawa (Japan), P.St.J. Russell (UK), N. Broderick (UK), S. Saltiel (Bulgaria) and N. Rosanov (Russia). The workshop attracted 48 participants and 24 talks were given.

Laser Physics Centre/Optical Sciences Centre

25th Australian Conference on Optical Fibre Technology (ACOFT), 28-30 June, was held in the Huxley Theatre and the Innovations Building, and attracted 150 delegates. The conference was organised by Professor B. Luther-Davies (Chair), Professor J.D. Love (Deputy Chair), Dr R. Charters (Technical Program Chair), Mr D. Thorncraft (Trade Exhibition) and Mrs H. McMartin.

Theoretical Physics

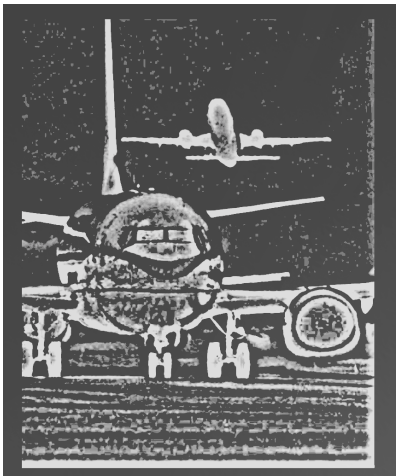
The 13th Physics Summer School on Bose–Einstein Condensation: Atomic Physics to Quantum Liquids (Convenors Dr Craig Savage and Dr Mukunda Das) at ANU, 17-28 January. The program covered basic and advanced topics in the area of Bose-Einstein Condensation and Atom Optics.

International Workshop – The Baxter Revolution in Mathematical Physics, in honour of Professor R.J. Baxter's 60th birthday, was held from 13 to 19 February at the ANU. The workshop highlighted Professor Baxter's pioneering contributions in *Exactly Solved Models in Statistical Mechanics* which have inspired crucial developments in key areas of mathematical physics.

Workshop on Soft Condensed Matter: Physical and Biological Aspects, October 16 – 29, ANU. This workshop had a broad scope so as to be accessible and of interest to all soft matter researchers both in Australia and internationally. Topics covered were Polymers, including Biopolymers, Foams, Liquid Crystals, Wetting, Biomineralisation and Gel-Mineral systems and Computational Physics.

For more information please refer to section ANUCTP.

Visitors



Applied Mathematics

Mr C. Arns, University of New South Wales
Dr T. Aste, INFM, Genova, Italy
Dr S. Biggs, University of Newcastle
Professor H. Brown, University of Wollongong
Dr S. Cox, Trinity College, Dublin, Ireland
Professor S. Dietrich, University of Stuttgart, Germany
Dr W. Ducker, Virginia, USA
Professor H. Hansma, University of Santa Barbara, USA
Professor R.G. Horn, Ian Wark Institute, South Australia
Mr J. Kirkness, Westmead Hospital, NSW
Professor D. Langevin, Université de Paris-Sud, France
Ms J-Y. Lee, University of New South Wales
Dr H. Maeda, Kyushu University, Japan
Dr K. Mecke, Bergische Universität, Germany
Dr M. Miyahara, Kyoto University, Japan
Dr L. Paterson, CSIRO Melbourne
Professor P. Pincus, University of California at Santa Barbara, USA
Professor W.V. Pinczewski, University of New South Wales
Dr S. Ramiswamy, ITT Bangalore, India
Professor R. Zana, Institute Charles Sadron in Strasbourg, France

Atomic and Molecular Physics Laboratories

Dr J. Berakdar, Max-Planck-Institute for Microstructure Physics, Germany
Dr M.J. Brunger, Flinders University
Professor M.L. Ginter, University of Maryland, USA
Dr P. Hammond, University of Western Australia
Dr K. Helmerson, National Institute of Standards & Technology, USA
Dr B. Holm, Uppsala University, Sweden
Professor W. Jhe, Seoul National University, Korea
Dr P. Leo, National Institute of Standards & Technology, USA
Professor B.J. Orr, Macquarie University
Dr W.D. Phillips, National Institute of Standards & Technology, USA
Dr L.W. Torop, Adelaide University

Electronic Materials Engineering

Dr V. Arora, Nanyang Technological University, Singapore
Dr K. Choquette, University of Illinois at Urbana-Champaign, USA
Professor R. Clark, University of New South Wales
Dr A. Ipri, David Sarnoff Research Centre, USA
Dr D. Kane, Macquarie University
Dr R. Singh, Nuclear Science Centre, India
Dr H. Whitlow (jointly with NP), University of Lund, Sweden

Laser Physics Centre

Dr A. Zakery, University of Shiraz, Iran
Professor B.-S. Bae, KAIST, Korea

Nuclear Physics

Dr A. Bruce, University of Brighton, UK
Dr F. Bruhn, University of Kiel, Germany
Dr D. Cullen, University of Manchester, UK
Dr P. Day, University of Manchester, UK
Professor B. Fulton, University of York, UK

Dr D. Hawecroft, Staffordshire University, UK
Dr D. Mahboub, University of Surrey, UK
Dr P. Mantica, Michigan State University, USA
Dr V. Ninov, Lawrence Berkeley National Laboratory, USA
Dr D. Oughton, Agricultural University of Norway
Dr Z. Podolyak, University of Surrey, UK
Professor N. Priest, Middlesex University, UK
Dr V. Pucknell, Daresbury Laboratory, UK
Dr N. Soic, University of Birmingham, UK
Dr P.M. Walker, University of Surrey, UK
Dr R. Ward, Staffordshire University, UK
Dr D. Watson, University of York, UK
Dr C. Wheldon, University of Liverpool, UK
Dr H. Whitlow (jointly with EME), University of Lund, Sweden
Dr B. Wolf, Ulverstone, Tasmania

Plasma Research Laboratory

Professor I. Hutchinson, Massachusetts, USA

Theoretical Physics

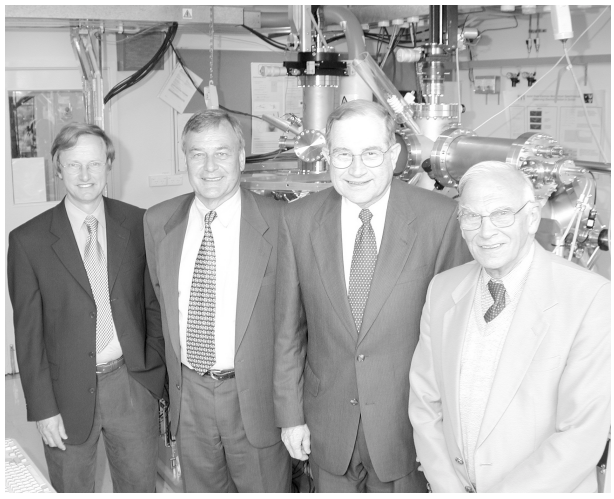
Professor C. Ahn, Ewha Woman's University, Korea
Professor B.R. Barrett, University of Arizona, USA
Dr R. Ballagh, University of Otago, New Zealand
Professor K. Burnett, University of Oxford, UK
Dr T.C. Choy, University of Melbourne
Professor S. Dietrich, Berg University Wuppertal, Germany
Professor P. Drummond, University of Queensland
Professor J. Fang, China Institute of Atomic Energy
Professor M. Ge, Nankai University, China
Professor D.J.W. Geldart, Dalhousie University, Canada
Professor K.I. Golden, University of Vermont, USA
Professor M. Gould, University of Queensland
Professor A. Griffin, University of Toronto, Canada
Professor C. Hamer, University of New South Wales
Dr M. Hinma, Aizu University, Japan
Professor J. Hoh, John Hopkins University, USA
Professor R.J. Hosking, Universiti Brunei Darussalam, Brunei
Prof. F. Iachello, Yale University, USA
Dr R.M. Kashaev, St Petersburg Branch of the Steklov Mathematical Institute, Russia
Professor A. Leggett, University of Illinois, USA
Professor J.M. Maillard, LPTHE, France
Professor T. Miwa, Kyoto University, Japan
Dr R. Morrow, Morrow Corona Solutions International
Dr M. Nadeem, Chalmers University of Technology, Gothenburg, Sweden
Dr J. Nadrchal, Institute of Physics, Prague, Czech Republic
Professor J. Oitmaa, University of New South Wales
Professor P. Pearce, University of Melbourne
Professor J.H.H. Perk, Oklahoma State University, USA
Dr W. Phillips, National Institute of Standards and Technology, Gaithersburg, USA
Professor P. Pincus, University of California, USA
Professor Y. Pugai, Kyoto University, Japan
Professor R. Quispel, La Trobe University
Professor S. Ramaswamy, Indian Institute of Science, India
Professor M. Randeria, Tata Institute of Fundamental Research, India
Professor A.R.P. Rau, Louisiana State University, Baton Rouge, USA
Professor C.H. Rim, Chonbuk National University, Korea
Professor R. Robson, James Cook University
Dr M. Simmons, University of New South Wales
Dr J. Singh, Northern Territory University
Professor F. Smirnov, LPTHE, France
Professor Yu. Stroganov, Kyoto University, Japan
Professor H. Tverberg, Bergen University, Norway
Dr S.V. Vladimirov, University of Sydney
Professor M. Wadati, University of Tokyo, Japan
Professor P.B. Wiegmann, University of Chicago, USA
Dr A. Wilson, University of Otago, New Zealand
Professor F. Wu, Northeastern University, USA
Professor Zhang Yu-shun, Institute of High Energy Physics, Beijing, P.R. China

Government & Industry Delegations

- 5/4/2000 The Honourable Senator Nick Minchin, Mr Gary Humphries and distinguished guests for the launch of Acton Lasers
- 21/4/2000 Defence & Industry Study Course (40)

International Visitors & Delegations

- 16/2/00 Chinese Delegation from the National People's Congress (5)
- 27/3/00 Professor Roger Downer, President and Dr Miriam Hederman, Chancellor, University of Limerick (2)
- 12/4/00 Delegation from Tsinghua University, China (7)
- 8/5/00 Delegation from the Institute of Scientific and Technical Information of China (2)
- 28/6/00 IBM Research (3)
- 19/9/00 Michael Milken, Chairman of the Milken Institute
- 10/10/00 Delegation from Tsinghua University, China – Professor He, Professor Zhuang, Mr Zhou and Ms Ge
- 30/10/00 Dr Neil Lane, Assistant to the President for Science and Technology and Director of the White House Office of Science and Technology Policy, USA



Dr Neil Lane visiting the School accompanied by Professor Jim Williams, Professor Erich Weigold and Professor Bob Crompton

Student Tours

- 11-13/9/00 Siemens Science and Engineering Experience (81)
- 4-14/1/00 and 17-28/1/00 National Youth Science Forum (280)

Colloquium Speakers

Convenor Professor: Yuri Kivshar

Professor W. Phillips, National Institute of Standards and Technology, USA
Atom Optics with Bose Condensates

Professor Denis Weaire, Physics Department, Trinity College, Ireland
The Physics of Foams

Professor Jack Tuszynski, University of Alberta, Canada
What Physics Can do for Biology

Professor Claude Fabre, Ecole Normale Superieur, France
Quantum Limits to Resolution in Optical Images

Professor Mandyam Srinivasan, Centre for Visual Sciences, Research School of Biological Sciences
From Living Insects to Autonomous Robots

Professor Bernie Shizgal, Deparment of Chemistry and Department of Physics, University of British Columbia
Thermal and Nonthermal Escape of Planetary Atmospheres

Professor Barry Luther-Davies, Director, Australian Photonics Cooperative Research Centre
Photonics – The Future is getting Brighter

Professor Hans Bachor, Physics Department, Faculty of Science
From Squeezing to Teleportation: Experiments on Optical Quantum Information

Dr Alan Bishop, Theoretical Division, Los Alamos National Laboratory, USA
Lattice Effects in Nonlinear Systems: The Long and Short of It

Professor Jak Kelly, Physics Department, University of Sydney
Cold Fusion and Transmutation

Professor Sajeev John, Department of Physics, Toronto University, Canada
Photonic Band Gap Materials: A New Frontier in Quantum and Nonlinear Optics

National and International Links

Postdoctoral Fellowship Completions and Destinations

Atomic and Molecular Physics Laboratories

Dr Alan Lun, Price Waterhouse, Canberra

Laser Physics Centre

Dr Chanjiang Wei, IT Industry

Nuclear Physics

Dr Clyde Morton resigned from his position as a Postdoctoral Fellow to take up an Australian Research Council Postdoctoral Fellowship in the Department of Nuclear Physics.

Theoretical Physics

Dr Rowena Ball resigned from her position as a Postdoctoral Fellow to take up an Australian Research Council Postdoctoral Fellowship in the Department of Theoretical Physics.