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Major Awards and Publications



Books, journal articles and reports, along with conference and workshop presentations, are the primary means by which research accomplishments are communicated. Their measure, together with patents and the award of special honours, medals and distinctions, are clear indicators of the achievements of the School during the year. Some highlights of the latter are mentioned at greater length in the Director's report, however, a complete list of major awards is presented below.

Over 330 papers were published in refereed journals this year, as detailed below. Also listed in this section are **invited** and/or **keynote** presentations to the total of 68 papers, that were presented at domestic and international workshops and conferences. Details of other conference and workshop presentations may be found on the School web site by department: <http://rsphysse@anu.edu.au>

The papers published by staff of the School are listed in this section according to the authors' affiliation. Many papers have authors from more than one department. These have been assigned according to the affiliation of the first RSPHYSSE author. In a few cases, this author has a joint appointment with two departments. In these cases, the paper appears in both lists, with the words "also listed under Theoretical Physics", for example, following the reference.

Honours and Awards



Dr Ole Bang, Optical Sciences Centre, received the Talent Grant from the Danish Technical Scientific Research Council for the amount of 3 million Danish Kroner to be used over 3 years to set up a nonlinear optics group in Denmark at the IMM.

Professor Rod Boswell, Plasma Research Laboratory, was made a Fellow of the Australian Academy of Technological Sciences and Engineering.

Professor Stephen Buckman, Atomic and Molecular Physics Laboratories, was awarded a Short Term Fellowship by the Japan Society for the Promotion of Science.

Professor Robert Crompton, Atomic and Molecular Physics Laboratories, was made a Member of the Order of Australia in the New Year's Honours List.

Dr Mukunda Das, Department of Theoretical Physics, was elected Fellow of the Institute of Physics, UK.

Professor George Dracoulis, Department of Nuclear Physics, was inducted into the Australian Academy of Science in May, where he also contributed to a special New Fellows session, with a paper entitled "Living Longer".

Mr Keith Gaff, Optical Sciences Centre, won the Dean's Prize for the best theoretical paper at the Postgraduate Students Seminar Series. He was awarded the prize on Founder's Day.

Professor Stephen Hyde, Department of Applied Mathematics, was appointed Visiting Professor, Université Cergy-Pontoise (France) August – September.

Professor Chennupati Jagadish, Electronic Materials Engineering, was elected as AdCOM Member, IEEE Electron Devices Society. He was also appointed Visiting Professor, COBRA, Eindhoven University of Technology, Netherlands. August-September.

Mr Owen Kershaw, Mechanical Workshop, was awarded the Council Medal for General Staff Excellence Team Award. It was presented at the Conferring of Degrees ceremony on 1st October (jointly with Mr Miroslav Peric).

Dr Anatoli Kheifets, Atomic and Molecular Physics Laboratories and Department of Theoretical Physics, was awarded a Visiting Fellowship, Science and Technology Agency of Japan.

Professor Yuri Kivshar, Optical Sciences Centre, was appointed the Associate Editor of *Physical Review E* for the initial period 1999–2002. He became the first Australian (and second non-American) Editor of the *Physical Review* in the history of the American Physical Society.

Mr Marcus Kohonen, Department of Applied Mathematics, was the winner of the inaugural Director's Award for best student paper published over the last year.

Dr Sergey Kun, Department of Theoretical Physics, was awarded the following Fellowships:

Max-Planck-Institute for Nuclear Physics, Heidelberg, Germany, MPI Fellowship, Spontaneous Coherence in Complex Microscopic and Mesoscopic Systems, April–July.

Alexander von Humboldt Foundation, Germany, AvH Fellowship, Nonequilibrium phase transitions in complex microscopic and mesoscopic systems, May–June.

Professor Stepjan Marcelja, Department of Applied Mathematics, was appointed a Sackler Scholar at the Mortimer and Raymond Sackler Institute of Advanced Studies, Tel Aviv University, Israel, from October.

Dr Clyde Morton, Department of Nuclear Physics, was awarded an ARC Fellowship in December.

Professor Barry Ninham, Department of Applied Mathematics, was appointed to the UNESCO World Commission on Ethics of Scientific Knowledge and Technology, and took up the Tage Erlander Chair of the National Research Council, Sweden for one year.

Professor Trevor Ophel, Department of Nuclear Physics, was awarded an Honorary Fellowship of the Australian Institute of Nuclear Science and Engineering (AINSE) in December.

Dr Elena Ostrovskaya, Optical Sciences Centre, received the T.M. Cherry Prize for the best student presentation at the Annual Conference of the ANZIAM Society, Applied Mathematics Conference. She was also awarded the inaugural Jagadishwar Mahanty Prize for the best PhD thesis in 1998/99, which was presented on Founder's Day.

Mr Miroslav Peric, Mechanical Workshop, was awarded the Council Medal for General Staff Excellence Team Award, which was presented at the Conferring of Degrees ceremony on 1st October (jointly with Mr Owen Kershaw).

Mr Horst Punzmann, PhD student in the Plasma Research Laboratory, won the Best Student Poster prize at PLASMA 99, the 22nd AINSE Plasma Science and Technology Conference held in Canberra from 8-9 February.

Ms Anita Smith, Laser Physics Centre, was chosen to represent the ANU at the 8th International Women in Leadership Conference

hosted by the Edith Cowan University. The conference was held in Perth in November, and her attendance was funded by a grant from the ANU's Equity and Diversity Unit.

Mr Wayne Solomon, PhD student in the Plasma Research Laboratory, won the Director's prize in the Postgraduate Students Seminar Series. The award was presented by the Director on Founder's Day. He also won the prize for the best student talk at the 22nd AINSE Plasma Science and Technology Conference held in Canberra from 8-9 February.

Ms Kalista Stewart, Winner of the inaugural Wanda Henry Prize, awarded to the top physics student who attended the Optical Communications course, PHYS3018/ENGN4513, presented by Professor John Love, Dr Adrian Ankiewicz and Mr Keith Gaff in the Faculties.

Dr Heiko Timmers, who holds a joint position with the Nuclear Physics/Electronic Materials and Engineering/Department of Physics and Theoretical Physics, The Faculties, was awarded an ARC Fellowship in January.

Ms Tessica Weijers, Department of Electronic Materials Engineering/Nuclear Physics, won a 1998 University Medal for Honours in Physics. The medal was presented to Tessica at the Conferring of Degrees Ceremony on 22 April.

Mr Felix White, a joint Honours student in Applied Mathematics/BAMBI, won a 1998 University Medal for Honours in Biochemistry and Molecular Biology. The medal was presented to Felix at the Conferring of Degrees Ceremony, on 22 April.



Kallista Stewart, winner of the inaugural Wanda Henry Prize, with Bob Henry and Margaret Henry

**Legend**

Former member of School

* Not a member of this University

† Publication appearing in more than one department due to first author having a joint appointment

Applied Mathematics**Books and Book Chapters**

Hyde, S.T.

*Sponges*In **Foams and Emulsions - NATO ASI Series E354**, Ed. J.F. Sadoc and N. Rivier, Kluwer Academic Publishers, Dordrecht (1999) 437-470

Hyde, S.T. and Ramsden, S.

*Crystals. Two-dimensional Non-Euclidean Geometry and Topology*In **Chemical Topology: Applications and Techniques - Mathematical Chemistry Series 6**, Eds. D. Bonchev and D.H. Rouvray, Gordon and Breach Science Publishers NY (1999) 35-174

Lindman, B.* and B.W. Ninham

Conceptual Locks and the Importance of Cubic Phases In The Colloid Science of Lipids, New Paradigms for Self Assembly in Science and Technology - Progress in Colloid and Polymer Science 108, Kåre Larsson Festschrift (1998) 1-3**Publications in Refereed Journals**

Arns, C.H.*, Knackstedt, M.A., Roberts, A.P.* and Pinczewski, W.V.*

Morphology, Co-continuity and Conductive Properties of Anisotropic Polymer Blends
Macromolecules 32 (1999) 5964-5966

Atkins, D.T.* and Ninham, B.W.

*Surface and Structural Forces Measured between Silica Surfaces in 1, 2-Ethanediol***Colloids and Surfaces A 129** (1998) 23-30

Bright, J.N. and Williams, D.R.M.

*Collapse of Semiflexible Brushes in Poor Solvents: Tilting and Bending***Europhysics Letters 48** (1999) 540-543

Bright, J.N. and Williams, D.R.M.

*Grafted Semiflexible Polymers in Poor Solvents: Toroidal and Tower Surface Micelles***Europhysics Letters 45** (1999) 321-324

Bright, J.N. and Williams, D.R.M.

*Membrane- and Surface-grafted Polymers and Proteins in Shear Flows***Langmuir 15** (1999) 3836-3841

Bunkin, N.F.*, Lobeyev, A.V.*, Lyakhov, G.A.* and Ninham, B.W.

*Mechanism of Low-threshold Hypersonic Cavitation Stimulated by Broadband Laser Pump***Physical Review E 60** (1999) 1681-1690

Corkery, R.W. and Martin, J.P.D.

*Laser Spectroscopy and Hole Burning of Europium Laurate and Europium-doped Lanthanum Laurate***Journal of Luminescence 82** (1999) 1-8

Craig, V.S.J., Ninham, B.W. and Pashley, R.M.*

*Direct Measurement of the Hydrophobic Attraction: The Effects of Dissolved Gas, Approach Rate and Neutron Irradiation***Langmuir 15** (1999) 1562-1569

Cruz Jimenez, S.*, Soullard, J.* and Gamaly, E.G.

*Proton Stopping in Dense Molecular Hydrogen: A Molecular Confinement Model***PhysPhysical Review A 60** (1999) 2207-2213

Ennis, J.*, Sevick, E.M. and Williams, D.R.M.

*Compression of a Polymer Chain by a Small Obstacle: The Effect of Fluctuations on the Escape Transition***Physical Review E 60** (1999) 6003-6008

Eskilsson, K.*, Ninham, B.W., Tiberg, F.* and Yaminsky, V.V.

*Interaction between Hydrophilic Surfaces in Triblock Copolymer Solution***Langmuir 14** (1998) 7287-7291

Eskilsson, K.*, Ninham, B.W., Tiberg, F.* and Yaminsky, V.V.

*Effects of Adsorption of Low-molecular-Weight Triblock Copolymers on Interactions between Hydrophobic Surfaces in Water***Langmuir 15** (1999) 3242-3249

Fogden, A.* and Ninham, B.W.

*Electrostatics of Curved Fluid Membranes: The Interplay of Direct Interactions and Fluctuations in Charged Lamellar Phase***Advances in Colloid and Interface Science 83** (1999) 85-110

Fogden, A.* and Hyde, S.T.

*Continuous Transformations of Cubic Minimal Surfaces***The European Physical Journal B 7** (1999) 91-104

Freysingae, E.*, Antelmi, D.*, Kékicheff, P.*, Richetti, P.* and Bellocq, A.-M.*

*Softening of the Interactions between Surfactant Bilayers in a Lamellar Phase due to the Presence of a Polymer***European Physical Journal B 9** (1999) 123-136

Gallardo, B.S.*, Gupta, V.K.*, Eagerton, F.D.*, Jong L.I.*, Craig, V.S.J., Shah, R.R.* and Abbott, N.L.*

*Electrochemical Principles for Active Control of Liquids on Submillimeter Scales***Science 283** (1999) 57-60

Hyde, S.T.

*Boxing Partula***Forma 13** (1998) 145-178

Kaczmarek, W.A., Campbell, S.J.* and Schmidt, M.

*Structural Investigation of Milled α -Fe and Barium Ferrite Nano-mixtures***Materials Science Forum 312-314** (1999) 197-202

Kohonen, M.M., Maeda, N. and Christenson, H.K.

*Kinetics of Capillary Condensation in a Nanoscale Pore***Physical Review Letters 82** (1999) 4667-4670

Larsson, M.*, Larsson, K.*, Andersson, S.*, Kaqkahr, J.*

Nylander, T.*, Ninham B.W. and Wollmer, P.*

*The Alveolar Surface Structure: Transformation from a Liposome-like Dispersion into a Tetragonal CLP Bilayer Phase***Journal of Dispersion Science and Technology 20** (1999) 1-12

Lisiecki, I.*, André, P.*, Filankembo, A.*, Petit, C.*, Tanori, J.*

Gulik-Krzywicki, T.*, Ninham, B.W. and Pileni, M.P.*

*Mesostructured Fluids. I. $\text{Cu}(\text{ATO})_2\text{-H}_2\text{O}$ -Isooctane in Oil Rich Regions***Journal of Physical Chemistry B 103** (1999) 9168-9175

Lisiecki, I.*, André, P.*, Filankembo, A.*, Petit, C.*, Tanori, J.*

Gulik-Krzywicki, T.*, Ninham, B.W. and Pileni, M.P.*

*Mesostructured Fluids. II. Microstructure and Supra-aggregation***Journal of Physical Chemistry B 103** (1999) 9175-9189

McBride, A., Kohonen, M. and Attard, P.#

*The Screening Length of Charge-asymmetric Electrolytes - A Hypernetted Chain Calculation***Journal of Chemical Physics 109** (1998) 2423-2428

Maeda, N. and Christenson, H.K.

*Direct Observation of Surface Effects on the Freezing and Melting of an n-alkane***Colloids and Surfaces A 159** (1999) 135-148

Marcelja, S.

*Towards a Realistic Theory of the Interaction of Membrane Inclusions (Editorial)***Biophysical Journal 76** (1999) 593-594

Marrink, S.J.* and Knackstedt, M.A.

*Percolation Thresholds on Elongated Lattices***Journal of Physics A 32** (1999) L461-466

Ninham, B.W.

*On Progress in Forces since the DLVO Theory***Advances in Colloid and Interface Science 83** (1999) 1-17

Nishikawa, Y.*, Jimnai, H.*, Koga, T.*, Hashimoto, T.* and Hyde, S.T.

*Measurements of Interfacial Curvatures of Bicontinuous Structure from Three-dimensional Digital Images. I. A Parallel Surface Method***Langmuir 14** (1998) 1242-1249

Ohnishi, S., Hato, M.* and Tamada, K.* and Christenson, H.K.
Presence of Particles on Melt-cut Mica Sheets
Langmuir **15** (1999) 3312-3316

O'Keeffe, M.* and Hyde, S.T.
Vertex Symbols for Zeolite Nets
Microporous Mesoporous Materials **25** (1998) 231-233

Pashley, R.M. #, Karaman, M.E. #, Craig, V.S.J. and Kohonen, M.M.
Use of the Light-lever Technique for the Measurement of Colloidal Forces
Colloids and Surfaces A **144** (1998) 1-8

Pereira, G.G. and Williams, D.R.W.
Diblock Copolymer Thin Film Melts on Striped Heterogeneous Surfaces: Parallel, Perpendicular and Mixed Lamellar Morphologies
Macromolecules **32** (1999) 758-764

Pereira, G.G. and Williams, D.R.W.
Thin Films of Perpendicularly Oriented Diblock Copolymers: Lamellar Distortions Driven by Surface-diblock Interfacial Tensions
Macromolecules **32** (1999) 1661-1664

Pereira, G.G., Williams, D.R.W. and Napper, D.H. #
Coil to Globule Collapse Transitions of Polymers: The Effect of Adsorbed Surfactants
Langmuir **15** (1999) 906-909

Pereira, G.G. and Williams, D.R.W.
Lamellar Distortions of Thin, Commensurately Aligned Diblock Copolymer Films on Patterned Surfaces
Langmuir **15** (1999) 2125-2129

Pereira, G.G. and Williams, D.R.W.
Undulatory Instabilities of Smectic Thin Films on a Heterogeneous Patterned Surface under Positive and Negative Strains: The Case of Diblock Copolymers
Journal of Chemical Physics **110** (1999) 9223-9229

Pereira, G.G.
Numerical Pore-Scale Modelling of Three-phase Fluid Flow: Comparison between Simulation and Experiment
Physical Review E **59** (1999) 4229-4242

Pereira, G.G. and Williams, D.R.W.
Thin Diblock Films on Patterned Surfaces: Computer Simulations and the Frenkel-Kontorova Model
Physical Review E **60** (1999) 3431-3435

Pereira, G.G. and Williams, D.R.W.
Diblock Copolymers in Electric Fields: The Transition from Parallel to Perpendicular Alignment using a Capacitor Analogy
Macromolecules **32** (1999) 8734-8742

Pereira, G.G. and Williams, D.R.M.
Surface Crinkling of Strained Diblock Copolymer Smectic Thin Films on Striped Substrates
Europhysics Letters **44** (1999) 302-306

Pileni, M.P.*, Ninham, B.W., Gulik-Kryzwicki, T.*, Tanori, J.*, Lisiecki, I.* and Filankembo, A.*
Direct Relationship between Shape and Size of Template and Synthesis of Copper Metal Particles
Advanced Materials **11** (1999) 1358-1362

Qiao, Y. and Christenson, H.K.
Triple-point Wetting and Liquid Condensation in a Slit-pore
Physical Review Letters **83** (1999) 1371-1374

Radlinski, A.P.*, Radlinska, E.Z., Agamalian, M.*, Wignall, G.D.*, Lindner, P.* and Randl, O.G.*
The Fractal Geometry of Rocks
Physical Review Letters **82** (1999) 3078-3081

Schmidt, M.† and Kaczmarek, W.A.
Synthesis of SrFeO_{2.5} from Mechanically Activated Reactants
Journal of Alloys and Compounds **283** (1999) 117-121
(also listed under Electronic Materials Engineering)

Sevick, E.M. and Williams, D.R.M.
A Polymer End-tethered to a Potential Stripe: A Simple Example of an Escape Transition
Macromolecules **32** (1999) 6841-6846

Sevick, E.M. and Williams, D.R.M.
Polymers Grafted onto Strongly Adsorbing Surfaces in Poor Solvents: Stretching, Fission, Phase Separation and Globular Micelles in 2D
Physical Review Letters **82** (1999) 2701-2704

Sheppard, A.P., Knackstedt, M.A., Pinczewski, W.V. # and Sahimi, M. #
Invasion Percolation: New Algorithms and Universality Classes
Journal of Physics A **32** (1999) L521-529

Stewart, A.M.
General Proof of Gauge Independence of the Sum of Diamagnetic and Paramagnetic Moments
Journal of Physics A: Mathematical and General **32** (1999) 6091-6096

Welham, N.J.
Formation of TiB₂ from Rutile by Room Temperature Ball Milling
Minerals Engineering **12** (1999) 1213-1224

Welham, N.J. † and Llewellyn, D.J.
Formation of Nanometric Hard Materials by Cold Milling
Journal of the European Ceramic Society **19** (1999) 2833-2841
(also listed under Electronic Materials Engineering)

Wennerström, H.*, Daicic, J.D. # and Ninham, B.W.
Temperature Dependence of Atom-atom Interactions
Physical Review A **60** (1999) 2581-2584

Yaminsky, V.V.
The Hydrophobic Force: The Constant Volume Capillary Approximation
Colloids and Surfaces. A: Physicochemical and Engineering Aspects **159** (1999) 181-195

Yaminsky, V.V. and Ninham, B.W.
Surface Forces Vs. Surface Compositions. Colloid Science from the Gibbs Adsorption Perspective
Advances in Colloid and Interface Science **83** (1999) 227-311

Yaminsky, V.V., Thuresson, K. # and Ninham, B.W.
Marangoni "Precursor" in Dynamic Dewetting Transition: Adsorption Pressure Effects
Langmuir **15** (1999) 2683-2688

Yin, Q., Kelsall, G.H., Vaughan, D.J. and Welham, N.J.
Rotating Ring (Pt) disc (FeS₂) Electrode Behavior in Hydrochloric Solutions
Journal of Colloid and Interface Science **210** (1999) 375-383

Refereed Conference Proceedings

Biggs, S.*, Reitsma, M.* and Craig, V.S.J.
Adhesion and Deformation of Polymers Measured Using Atomic Force Microscopy
27th Australasian Chemical Engineering Conference (CHEMECA 99), Newcastle, NSW, Australia, September 26-29 (1999) (Paper 50)

Craig, V.S.J., Atkin, R.* and Biggs, S.*
A Reflectometry Study of the Adsorption Kinetics of Cetyltrimethylammonium Bromide to the Silica-water Interface
27th Australasian Chemical Engineering Conference (CHEMECA 99), Newcastle, NSW, Australia, September 26-29 (1999) (Paper 51)

Craig, V.S.J. and Notley, S.*
Direct Measurement of The Hydrodynamic Drag Force on a Sphere Approaching Rigid Plane Interface using an Atomic Force Microscope
27th Australasian Chemical Engineering Conference (CHEMECA 99), Newcastle, NSW, Australia, September 26-29 (1999) (Paper 55)

Craig, V.S.J., Notley, S.* and Biggs, S.*
Surface Rheology Measurements Using an Atomic Force Microscope
27th Australasian Chemical Engineering Conference (CHEMECA 99), Newcastle, NSW, Australia, September 26-29 (1999) (Paper 56)

Cox, S.F.* and Knackstedt, M.A.
Ore Genesis in Fracture Controlled Hydrothermal Systems: Percolation Theory Approaches
PACRIM (Bali, Indonesia), October 11-14 (1999) 639-642

Patent

Gamaly, E., *Method for Deposition of Thin Films*
International Patent Application No. PCT/AU98/00739, priority date 11 September, 1997

Atomic and Molecular Physics Laboratories

Books and Book Chapters

Weigold, E. and McCarthy, I.*
Electron Momentum Spectroscopy
Kluwer Academic/Plenum Publishers, New York, USA (1999) p 269

Publications in Refereed Journals

Brunger, M.J.#, McCarthy, I.E.* and Weigold, E.
High-resolution Electron-momentum Spectroscopy of Argon: Validation of Technique and Approximations
Physical Review A **59** (1999) 1245-1252

Buckman, S.J., Alle, D.T., Brennan, M.J.#, Burrow, P.D.*, Gibson, J.C., Gullely, R.J., Jacka, M.#, Newman, D.S.#, Rau, A.R.P.#, Sullivan, J.P. and Trantham, K.W.#
Role of Negative Ion Resonances in Electron Scattering from Atoms and Molecules
Australian Journal of Physics **52** (1999) 473-491

Canney, S.A.*, Sashin, V.A.*, Ford, M.J.* and Kheifets, A.S.†
Electronic Band Structure of Magnesium and Magnesium Oxide: Experiment and Theory
Journal of Physics: Condensed Matter **11** (1999) 7507-7522
(also listed under Theoretical Physics)

Chadderton, L.T. and Chen, Y.
Nanotube Growth by Surface Diffusion
Physics Letters A **263** (1999) 401-405

Dall, R.G., Hoogerland, M.D., Baldwin, K.G.H. and Buckman, S.J.
Guiding of Metastable Helium Atoms through Hollow Optical Fibres
Journal of Optics B: Quantum Semiclass Opt. **1** (1999) 396-401

Elford, M.T., Roeggen, I.* and Skullerud, H.R.*
Interaction Potential and Transport Coefficients for Li+ Ions in Helium
Journal of Physics B: Atomic, Molecular and Optical Physics **32** (1999) 1873-1883

Gibson, J.C., Green, M.A.*, Trantham, K.W.#, Buckman, S.J., Teubner, P.J.O.* and Brunger, M.J.*
Elastic Electron Scattering from CO₂
Journal of Physics B: Atomic, Molecular and Optical Physics **32** (1999) 213-233

Gullely, R.J. and Buckman, S.J.
Absolute Elastic Electron Scattering from Benzene
Journal of Physics B: Atomic, Molecular and Optical Physics **32** (1999) L405-L409

Kaur, S.*, Srivastava, R.*, McEachran, R.P. and Stauffer, A.D.*
Electron Impact Excitation of the np⁵ (n+1)p States of Ar (n=3), Kr (n=4) and Xe (n=5) Atoms
Journal of Physics B: Atomic, Molecular and Optical Physics **31** (1998) 4833-4852

Kaur, S.*, Srivastava, R.*, McEachran, R.P. and Stauffer, A.D.*
Excitation of the np⁵ (n+1)p (J=1, 2 and 3) States of the Inert Gases by Spin-Polarized Electrons; Integrated State Multipoles and Stokes Parameters
Journal of Physics B: Atomic, Molecular and Optical Physics **32** (1999) 4331-4359

Kheifets, A.S.† and Bray, I.*
Photoionization with Excitation and Double Photoionization of Two-electron Atomic Targets
Journal de Physique (Paris) **9** (1999) 79-83
(also listed under Theoretical Physics)

Kheifets, A.S.†, Bray, I.* and Bartschat, K.*
Convergent Calculations for Simultaneous Electron-impact Ionization-Excitation of Helium
Journal of Physics B: Atomic, Molecular and Optical Physics **32** (1999) L433-L438
(also listed under Theoretical Physics)

Kheifets, A.S.†, Bray, I.*, Duguet, A.*, Lahmam-Bennani, A.* and Taouil, I.*
A Comparative Experimental and Theoretical Investigation of the Electron Impact Double Ionization of He and keV Regime
Journal of Physics B: Atomic, Molecular and Optical Physics **32** (1999) 5047-5065
(also listed under Theoretical Physics)

Kheifets, A.S.†, Bray, I.*, Soejima, K.#, Danjo, A.#, Okuno, K.# and Yagishita, A.#
Experimental and Theoretical Study of Linear and Circular Dichroism in Helium Double Photoionization
Journal of Physics B: Atomic, Molecular and Optical Physics **32** (1999) L501-L509
(also listed under Theoretical Physics)

Kheifets, A.S.†, Lun, D.R. and Savrasov, S.Yu.*
Full-potential Linear-Muffin-Tin-Orbital Calculation of Electron Momentum Densities
Journal of Physics: Condensed Matter **11** (1999) 6779-6792
(also listed under Theoretical Physics)

Lacoursiere, J.*, Meyer, S.A.*, Faris, G.W.*, Slanger, T.G.*, Lewis, B.R. and Gibson, S.T.
The O(D) Yield from O₂ Photodissociation near H Lyman- α (121.6 nm)
Journal of Chemical Physics **110** (1999) 1949-1958

Lewis, B.R., Gibson, S.T., Copeland, R.A.* and Bressler, C.G.*
Missing Bands in the Multiphoton Excitation of Coupled Molecular States
Physical Review Letters **82** (1999) 4212-4215

Lewis, B.R., Gibson, S.T. and Yoshino, K.*
Comment on: "Ab Initio Dynamic Dipole Polarizabilities for O₂, its Photoabsorption Spectrum in the Schumann-Runge Region, and Long-Range Interaction Coefficients for its Dimer"
Journal of Chemical Physics **111**, (1999) 11236-11237

Lewis, B.R., Gibson, S.T., Morrill, J.S.* and Ginter, M.L.*
Perturbations in the 3s_g⁻¹3p_g Rydberg States of O₂: Bound-Bound Interactions with the Second¹P_g and d¹D_g and Valence States
Journal of Chemical Physics **111** (1999) 186-197

Lewis, B.R., Gibson, S.T., Slanger, T.G.* and Huestis, D.L.*
The B¹S_g⁻AE b¹S_g⁺ Transition of Molecular Oxygen
Journal of Chemical Physics **110** (1999) 11129-11132

Lunt, S.L.*, Field, D.*, Hoffmann, S.V.*, Gulley, R.J. and Ziesel, J.-P.*
Very Low Energy Electron Scattering in C₆H₆F, C₆H₅Cl and C₆H₆J
Journal of Physics B: Atomic, Molecular and Optical Physics **32** (1999) 2707-2717

McCarthy, I.E.* and Vos, M.
Understanding Multinucleus Orbitals by Electron Momentum Spectroscopy
Australian Journal of Physics, **52** (1999) 363-376

Metz, C.*, Tschentscher, Th.*, Suortti, P.*, Kheifets, A.S. †, Lun, D.R., Sattler, T.*, Schneider, J.R.* and Bell, F.*
Three-dimensional Electron Momentum Density of Aluminum by $(\gamma, e\gamma)$ Spectroscopy
Physical Review B **59** (1999) 10512-10520
(also listed under Theoretical Physics)

Metz, C.*, Tschentscher, Th.*, Suortti, P.*, Kheifets, A.S. †, Lun, D.R., Sattler, T.*, Schneider, J.R.* and Bell, F.*
Three-dimensional Electron Momentum Densities of Graphite and Fullerene: A Comparison
Journal of Physics: Condensed Matter **11** (1999) 3933-3942
(also listed under Theoretical Physics)

Mitroy, J.
A Hartree-Fock Program for Atomic Structure Calculations
Australian Journal of Physics **52** (1999) 973-997

Mitroy, J., Bromley, M.W.J. and Ryzhikh, G.
Positron Binding to a Model Alkali Atom
Journal of Physics B: Atomic, Molecular and Optical Physics **32** (1999) 2203-2214

Mitroy, J. and Ryzhikh, G.
Configuration-interaction Calculation of the Cue⁺ Ground State
Journal of Physics B: Atomic, Molecular and Optical Physics **32** (1999) 2831-2839

Mitroy, J. and Ryzhikh, G.
Positron Binding to Atomic Zinc
Journal of Physics B: Atomic, Molecular and Optical Physics **32** (1999) 1375-1383

Mitroy, J. and Ryzhikh, G.
Positronium Binding to Potassium and other Alkali Atoms
Journal of Physics B: Atomic, Molecular and Optical Physics **32** (1999) 3839-3848

Mitroy, J. and Ryzhikh, G.
Measuring the Positron Affinities of Atoms
Journal of Physics B: Atomic, Molecular and Optical Physics **32** (1999) L411-L417

Mitroy, J. and Ryzhikh, G.
Comment on "Semiempirical Approach to Positron Annihilation in Molecules"
Physical Review Letters **83** (1999) 3570.

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Theoretical Physics

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World Scientific Publishing, Singapore, (1999) p 381

Kuyucak, S. (Editor)
Frontiers in Nuclear Physics
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Kokko, K.* and Das, M.P.
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Zimin, S.†, Cross, R. C.* and Dewar, R.L.
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Centre for the Mind

Snyder, A.W. and Mitchell, D.J.
Is Integer Arithmetic Fundamental to Mental Processing?: The Mind's Secret Arithmetic
Proceedings of the Royal Society of London: Biological Sciences 266 (1999) 537-647

Invited Conference Presentations and Lectures

For all other School conference presentations, lectures and posters please refer to the School web page <http://rsphysse.anu.edu.au>

Applied Mathematics

Contemporary Research in Physical Metallurgy, Monash University, February

Hyde, S.T., *Alloy structures and non-euclidean sphere packings*

Scanned Probe Microscopy II Conference, Sydney University, February

Senden, T.J. – *Polymer Adsorption and Adhesion at the Molecular Scale*

Special Swedish Universities National Meeting, Thorskogs Slot, Sweden, March

Marcelja, S. – *Problems in Aqueous Solutions and Interfaces*

Ninham, B.W. – *The Boundaries between Physical and Biological Sciences*

Inaugural meeting of UNESCO World Commission on Ethics of Scientific Knowledge and Technology, Oslo Norway, 28-30 April

Ninham, B.W. – *Ethics of Water*

46th Society of Nuclear Medicine, Los Angeles, May

Senden, T.J. – *The Nature of Technegas*

International Conference on Small Angle Scattering (SAS99), Brookhaven, N.Y., USA, 17-20 May

Radlinski, A.P., Radlinska, E.Z., Agamalian, M., Wignall, G.D., Lindner, P., and Randl, O.G. – *The Fractal Geometry of Rocks*

Biophysics in the New Millennium, Coolfont, West Virginia, 28-31 May

Marcelja, S. – *Problems in Aqueous Solutions and Interfaces*

Ninham, B.W. – *Specific Ion Effects and Role of Dissolved Gas in Biology*

Regional Summer School on Scaling and Disordered Systems, Zanjan, Iran, 3-16 July

Knackstedt, M.A. – *Fluid Penetration into Porous Networks: The Role of Pore Morphology*

26th International Conference on Solution Chemistry, Fukuoka, Japan, 26-31 July

Christenson, H.K. – *Origin of the Long-Range Attraction between Certain Hydrophobic Surfaces*

Gordon Conference on Chemistry and Physics of Liquids, Plymouth, New Hampshire, 1-6 August

Christenson, H.K. – *Wetting and Phase Transitions at Mica Surfaces*

Joint AINSE-ANU Symposium on Small Angle Scattering and Reflectometry, AINSE, Lucas Heights, Sydney, 30 September-1 October

Radlinski, A.P.#, Radlinska, E.Z. – *The Microstructure of Sedimentary Rocks*

9th Gordon Godfrey Workshop on Condensed Matter Physics: Condensed Matter in Zero, One and Two Dimensions, University of New South Wales, 8 November

Stewart, A.M. – *General Gauge Independence of Diamagnetism plus Paramagnetism*

11th AINSE Conference on Nuclear Techniques of Analysis and 6th Vacuum Society of Australia Congress, Lucas Heights, Sydney, 24-26 November

Radlinski, A.P.#, Radlinska, E.Z. – *Applications of Small Angle Neutron Scattering to Petroleum Geology*

UNESCO COMEST Sub-Commission on Water, Aswan, Egypt, 27-29 November

Ninham, B.W. – *Scientific Uncertainty and Scientists as Factors in Ethics of Water*

Atomic and Molecular Physics Laboratories

Plasma '99 – The 22nd AINSE Plasma Science and Technology Conference, Canberra, 8-9 February

Hoogerland, M.D., Gulley, R.J., Colla, M., Lu, W., Milic, D., Baldwin, K.G. and Buckman S.J. – *Atomic Collisions Research with Excited Atomic Species*

The 16th Conference of Photopolymer Science and Technology with The International Symposium on Materials and Processes for Giga-bit Lithography '99, Chiba, Japan, 22-25 June

Lu, W., Hoogerland, M.D., Buckman, S.J. and Baldwin, K.G.H. – *Atom Lithography using a Laser Controlled Metastable Helium Beam*

International Symposium on Electron-Molecule Collisions and Swarms 1999, Tokyo, Japan, 18-20 July

Gulley, R.J. and Buckman, S.J. – *Low Energy Electron-Molecule Collisions: A Comparison of Recent Experiment and Theory*

The International Symposium on (e,2e) Double Photoionization and Related Topics, Beijing, China, 29 July-1 August

Bray, I.*, Fursa, D.*, and Kheifets, A.S. – *Close-Coupling Approach to Ionization Processes*

Elliott, A.M., Lower, J.C.A. and Weigold, E. – *Dichroism and Polarization Effect in (e,2e) Collisions on Sodium*

Japan-UK Seminar on the Theory of Atomic Collisions, Tokyo, Japan, 31 July-1 August

Kheifets, A.S. and Bray, I.* – *Double Ionization of Two-Electron Atomic targets by the Photon and Fast Electron Impact*

International Symposium on Atomic Physics, Hanoi, Vietnam, 2-6 August

Elliott, A.M., Lower, J.C.A. and Weigold, E. – *(e,2e) Collisions with Polarized Electrons and Excited, Oriented and Spin-Polarized Targets*

Electronic Materials Engineering

5th IUMRS International Conference on Advanced Materials, Beijing, China, 13-18 June

Jagadish, C., Tan, H.H., Fu, L., Deenapanray, P.N.K., Cohen, M.I., Johnston, M.B., Dao, L.V. and Gal, M. – *Interdiffusion in GaAs/AlGaAs Quantum Wells*

14th International Conference on Ion Beam Analysis, Dresden, 26-30 July

Timmers, H., Ophel, T.R., and Elliman, R.G. – *Simplifying Position-Sensitive Gas-Ionization Detectors for Heavy Ion Elastic Recoil Detection*

International Conference of Nanotechnology in Carbon and Related Materials, Brighton, UK, 8-10 September

Chen, Y., Chadderton, L.T., Williams, J.S. and FitzGerald, J. – *Solid-State Growth of Nanotubes from Ball-Milled Carbon and Boron Nitride Powders*



Fall Materials Research Society Meeting, Boston, 29 November–3 December

Deenapanray, P.N.K., Tan, H.H. and Jagadish, C. – *Influence of SiO₂ Capping Layer Quality on Impurity-Free Interdiffusion in GaAs/AlGaAs Quantum Wells*

International Workshop on Physics of Semiconductor Devices, New Delhi, India, 14–18 December

Jagadish, C., Tan, H.H., Fu, L., Cohen, M.I., Deenapanray, P.N.K. and Gal, M. – *Quantum Well Intermixing for Photonic Device Integration*

Third International Conference on Unsolved Problems of Noise, Adelaide

Edwards, P.J., Cheung, W.N. and McDonald, R. – *Bipolar Junction Noise Revisited*

Laser Physics Centre

Australian Institute of Nuclear Science and Engineering Meeting, Canberra, 7–8 February

Hoogerland, M.D., Gully, R.J., Colla, M., Lu, W., Milic, D., Baldwin, K.G.H. and Buckman, S.J. – *Atomic Collisions Research with Excited Atomic Species*

XIIIth International Winterschool on Electronic Properties of Novel Materials (IWEPNM'99), Kirchberg, Austria, 27 February–6 March

Rode, A.V., Gamaly, E.G., Elliman, R.G., Kheifets, A.S. and Luther-Davies, B. – *Cluster-Assembled Carbon Nano-Foam Synthesised by High-Pulse-Rate Laser Ablation*

5th International Conference of Frontiers of Polymers and Advanced Materials, Poznan, Poland, 21–25 June

Samoc, M., Samoc, A. and Luther-Davies, B. – *Third-Order Nonlinear Optical Effects Due to One and Two-Photon Absorption in Conjugated Polymers*

Electrical and Related Properties of Organic Solids – ERPOS-8, Szklarska, Poreba, Poland, 26–30 June

Samoc, M., Samoc, A. and Luther-Davies, B. – *Two-Photon and One-Photon Resonant Third-Order Nonlinear Optical Properties of π -Conjugated Polymers*

5th International Conference on Laser Ablation (COLA'99), Goettingen, Germany, 19–23 July

Rode, A.V., Gamaly, E.G. and Luther-Davies, B. – *Ultrafast Laser Ablation with High-Pulse-Rate Lasers*

International Conference on Lasers and Electrooptics, LEOS'99, San Francisco, USA, 8–11 November

Luther-Davies, B. and Krolikowski, W. – *Formation and Interaction of Spatially Incoherent Solitons in a Slow Nonlinear Medium*

II Nonlinear Science Festival, Risoe National Laboratory, Roskilde, Denmark, 1–4 December

Krolikowski, W. – *Incoherent Spatial Optical Solitons in a Slow Nonlinear Medium*

Nuclear Physics

The Nucleus, New Physics for the New Millennium, Faure, South Africa, 18–22 January

Dracoulis, G.D. – *Summarising the Nucleus*

Workshop on Nuclear Structure Physics near the Coulomb Barrier: Into the 21st Century, Yale University, USA, 10–12 June

Stuchbery, A.E. – *Nuclear Moments and Related Physics*

Gordon Conference on Nuclear Chemistry, New London, New Hampshire, USA, 13–18 June

Dracoulis, G.D. – *Spherical and Deformed States in Light Lead Nuclei*

Second International Conference on Fission and Neutron-rich Nuclei, St. Andrews, Scotland, 28 June–2 July

Hinde, D.J. – *Interplay of Fusion and Fission Dynamics*

International Conference on Achievements and Perspectives in Nuclear Structure, Crete, Greece, 11–17 July

Dracoulis, G.D. – *High-K States as a Probe of Nuclear Structure*

Gordon Research Conference on Materials Processes Far From Equilibrium, Plymouth, New Hampshire, USA, 11–16 July

Stuchbery, A.E. – *Thermal Spike Lifetime from Pre-Equilibrium Effects in Hyperfine Fields Following Ion Implantation*

14th International Conference on Ion Beam Analysis, Dresden, Germany, 26–30 July

Timmers, H., Ophel, T.R. and Elliman, R.G. – *Simplifying Position-Sensitive Gas-Ionization Detectors for Heavy Ion Elastic Recoil Detection*

8th International Conference of Accelerator Mass Spectrometry, Vienna, Austria, 6–10 September

Fifield, L.K. – *Advances in Accelerator Mass Spectrometry (Keynote Address)*

ANA-99, the Australian Nuclear Association Conference on Nuclear Science and Engineering in Australia, Canberra, 27–28 October

Dracoulis, G.D. – *International and Local Trends in Nuclear Physics*

11th AINSE Conference on Nuclear Techniques of Analysis, Lucas Heights, NSW, 24–26 November

Ophel, T.R. – *NTA since 1955: A Nostalgic Review (plenary address)*

Optical Sciences Centre

International Union of Theoretical and Applied Mechanics Symposium 99/4: Mechanical and Electromagnetic Waves in Structured Media, Sydney, 18–22 January

Kivshar, Yu.S. – *Nonlinear Modes in Discrete Lattices*

International Workshop on Kinetic Equations and their Applications, Technion, Haifa, 1–7 June

Kivshar, Yu.S. – *Multi-Color and Quasi-Periodic Nonlinear Waves*

Dynamics Day Asia-Pacific: First International Conference in Nonlinear Science, Hong-Kong, 13–16 July

Kivshar, Yu.S. – *Spatial Optical Solitons: An Overview*

Workshop on Novel Solitons and Nonlinear Periodic Structures - 99, Abbaye de la Bussiere, 30–31 August

Akhmediev, N.N. – *Consequence of Non Paraxiality*

The Australian Institute of Physics, Melbourne, 9 September

Kivshar, Yu.S. – *Solitary Waves in Solids and Optics*

ROSC Symposium: Massive WDM and TDM Soliton Transmission Systems, Kyoto, Japan, 9–12 November

Kivshar, Yu.S. – *Multi-Soliton Pulse Transmission and Pulse Shepherding in Bit-Parallel Optical Fibre Links*

Plasma Research Laboratory

12-th International Stellarator Workshop, Madison, Wisconsin, 27 September–1 October

Harris, J.H. – *Status and Plans for the H-1 Helic Experiment*

Shats, M.G. – *Fluctuations and Turbulent Transport Studies in the H-1 Helic*

Third Conference on Nuclear Science and Engineering in Australia, Canberra, 27–28 October

Harris, J.H. – *Fusion Energy for the 21st Century*

41st Meeting of the American Physical Society, Division of Plasma Physics, Seattle, USA, 15–19 November

Borg, G.G. – *Plasma as Antennas: Theory, Experiment and Application*

Theoretical Physics

International Workshop on Superconductivity, Magneto-Resistive Materials and Strongly Correlated Quantum Systems, Hanoi, Vietnam, 4–10 January

Das, M.P. – *Why Worry About the Anomalies and What Can You Do About It?*

Random Matrices and their Application, Mathematical Sciences Research Institute, Berkeley, 19, 21–23 January

Baxter, R.J. – *Solvable Model in Statistical Mechanics: Ising to Chiral Potts and The Chiral Potts Model*

Workshop on Symmetry Principles in Many Body Phenomena, Hawaii, USA, 17–22 February

Kuyucak, S. – *Dynamical Symmetries and Shape-Phase Transitions in the Vibron Model*

Workshop on Algebraic Methods in Many-Body Physics, Seattle, USA, 15–19 March

Kuyucak, S. – *Octupole States in the Interacting Boson Model*

University of Sydney, School of Physics Colloquium, 19 April

Dewar, R.L. – *Ballooning Modes*

Statistical Physics on the Eve of the Twenty-First Century, Florida Atlantic University, Delray Beach, Florida, 7 May

Baxter, R.J. – *Ramifications of the Yang-Baxter Relation*

Symposium in Honor of C.N. Yang, State University of New York at Stony Brook, Institute for Theoretical Physics, 21 May

Baxter, R.J. – *Solvable Model in Statistical Mechanics: Ising to Chiral Potts*

23rd International Workshop on Condensed Matter Theories, Ithaca, Greece, 17–23 June

Das, M.P. – *Kinetic Approach to Mesoscopic Noise*

7th International CLUSTER '99 Conference, Island of Rab, Croatia, 14–19 June

Kun, S. Yu – *Spontaneous Nuclear Clustering and Atomic Electron Effects in Deeply Inelastic Heavy-Ion Collisions*

Kun, S. Yu and Robson, B.A. – *Hot Hyperdeformed Coherently Rotating Clusters in $^{24}\text{Mg} + ^{24}\text{Mg}$ and $^{28}\text{Si} + ^{28}\text{Si}$ Elastic and Inelastic Scattering*

The Fractional Quantum Hall Effect on the Eve of the New Millennium, University of Adelaide, 16–20 August

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* External to the University
Former member of the University
Presenter of contributed paper is underlined