

## NATIONAL AND INTERNATIONAL LINKS

### *Collaborative Research Projects with Universities, CSIRO and Other Institutions*

#### Biological Chemistry

##### *Protein Structure and Function*

Carbohydrate binding by C-type lectins by DR N E DIXON with Drs J E Gready, M Hulett and Mr Y-M Hyun, John Curtin School of Medical Research, ANU

Cleavage of DNA by chromium(V) complexes by DR N E DIXON and MS P E LILLEY with Professor P A Lay and Dr A Levina, School of Chemistry, University of Sydney

Expression, isolation and structures of the *Bacillus subtilis* DnaC helicase and Dnal proteins by DRS N E DIXON, P M SCHAEFFER, X-C SU and MS K V LOSCHA with Professor R G Wake, and Drs D B Langley and J M Guss, School of Molecular and Microbial Biosciences, University of Sydney

Evolution of new protein functions by DRS N E DIXON and P M SCHAEFFER with Dr G Coia, Evogenix Pty Ltd, Melbourne

*In vitro* protein synthesis by DRS N E DIXON, M J HEADLAM, K OZAWA and PROFESSOR G OTTING with Professor R Dean, University of Canberra; Dr K Rogers, Heart Research Institute, Sydney; Dr A V Kralicek, HortResearch, Auckland, NZ; and Dr M Pavlov and Professor M Ehrenberg, University of Uppsala, Sweden

Mass spectrometry of protein-protein and protein-DNA complexes by DRS N E DIXON, P M SCHAEFFER, MS K V LOSCHA and MS A Y PARK with Dr J L Beck, Mr S J Watt and Professor M M Sheil, Department of Chemistry, University of Wollongong

Mechanisms of termination of DNA replication by DRS N E DIXON, P M SCHAEFFER, A J OAKLEY and MR M MULCAIR with Dr D C Neylon, Department of Chemistry, University of Southampton, UK; Dr A V

Kralicek, HortResearch, Auckland, NZ; and Professor T M Hill, School of Medicine and Health Sciences, University of North Dakota, USA

Near-perfect rubber by DR N E DIXON with Dr C M Elvin, CSIRO Division of Livestock Industries, Brisbane

Properties and structures of proteins circularised by intein-mediated reactions by DRS N E DIXON, P PROSELKOV, N K WILLIAMS, P D CARR, MS A Y PARK, MR B BANCIA, PROFESSOR G OTTING and PROFESSOR D L OLLIS with Dr J M Matthews, School of Molecular and Microbial Biosciences, University of Sydney; Dr J L Beck, Mr S J Watt and Professor M M Sheil, Department of Chemistry, University of Wollongong; Dr E Liepinsh, Department of Medical Biochemistry and Biophysics, Karolinska Institute, Stockholm, Sweden; Mr D Spencer and Dr H-X Zhou, Institute of Molecular Biophysics, Florida State University, USA; and Drs A Rak and K Alexandrov, Department of Physical Biochemistry, Max-Planck-Institute for Molecular Physiology, Dortmund, Germany

QOR quinone reductase structure and mechanism by DRS N E DIXON, P PROSELKOV and R D WEBSTER with Dr J-I Mano, Faculty of Agriculture, Yamaguchi University, Japan

Spectroscopic studies of the proofreading exonuclease subunit of DNA polymerase III by DR N E DIXON and MS A Y PARK with Dr G Schenk, Department of Chemistry; and Professor G R Hanson, Centre for Magnetic Resonance, University of Queensland

Structural genomics of integron proteins by DRS N E DIXON, P M SCHAEFFER, MR P WU and PROFESSOR G OTTING with Drs B Mabbutt, H Stokes and Mr A Robinson, Department of Chemistry, Macquarie University; and Dr Zs Dosztányi, Institute of Enzymology, Budapest, Hungary



Structure and mechanism of action of proline aminopeptidase by DRS N E DIXON, P M SCHAEFFER and MS P E LILLEY with Professor H C Freeman and Dr J M Guss, School of Molecular and Microbial Biosciences, University of Sydney

Structure of DnaG primase by DRS N E DIXON, A J OAKLEY, P PROSELKOV, P M SCHAEFFER, MR B BANCIA, MS K V LOSCHA and PROFESSOR G OTTING with Dr M C J Wilce, University of Western Australia; and Dr E Liepinsh, Department of Medical Biochemistry and Biophysics, Karolinska Institute, Stockholm, Sweden

Structures and functions of the *Escherichia coli* replicase by DRS N E DIXON, A J OAKLEY, K OZAWA, P PROSELKOV, MR S JERGIC, MS A Y PARK and PROFESSOR G OTTING with Drs K Kongsuwan and G Wijffels, CSIRO Division of Livestock Industries, Brisbane; and Drs R Rothnagel and B Hankamer, Institute for Molecular Biosciences, University of Queensland

Structures of complexes of the proofreading exonuclease subunit of DNA polymerase III by DRS N E DIXON, M A KENIRY, G PINTACUDA, PROFESSOR G OTTING and MS A Y PARK with Dr E Liepinsh, Department of Medical Biochemistry and Biophysics, Karolinska Institute, Stockholm, Sweden

Structures of the *Escherichia coli* DnaB helicase protein and the DnaB•DnaC complex by DRS N E DIXON, P M SCHAEFFER and MS K V LOSCHA with Professor J M Carazo, Drs L E Donate, M Barcéna and Ms Y Robledo, Centro Nacional de Biotecnología, Universidad Autónoma, Madrid, Spain

### *Nuclear Magnetic Resonance*

Defining the structure of a proteins involved in the onset of breast cancer by DR M A KENIRY with Professor C C Benz and Dr G Scott, Buck Institute for Age Research, Novato, California, USA Supported by a travel grant from the International Union Against Cancer

The association of calothrixin with DNA by DR M A KENIRY and MS E A OWEN with Drs C Chai, M Waring and G Smith, Department of Chemistry, ANU

### *Structural Biology*

Glutathione transferases from the malaria vector *Anopheles dirus* Their pesticide binding and detoxifying properties by DR A J OAKLEY with Dr Albert Ketterman, Mahidol University, Thailand

Haloalkane dehalogenases-structure and function of bioremediation enzymes of the  $\alpha/\beta$  hydrolase family by DR A J OAKLEY with Dr Jiri Damborsky, Masaryk University, Brno, Czech Republic

Structure of cofactor-free oxygenases by DR A J OAKLEY with Professor S Fetzner, University of Oldenburg, Germany

Structure of tomato *endo*- $\beta$ -mannanase by DR A J OAKLEY with Dr R Bourgault and Professor J D Bewley, University of Guelph, Canada

### *Protein Crystallography and Engineering*

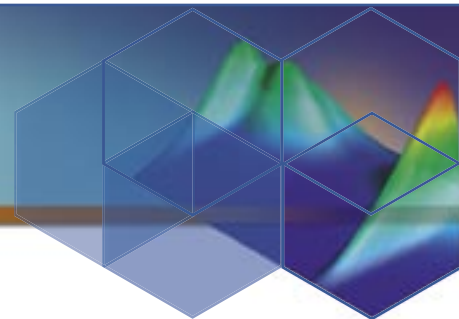
Structural studies of the  $\beta$  IL5 receptor by PROFESSOR D L OLLIS, MR J M MURPHY and DR P D CARR with Professor I G Young, John Curtin School of Medical Research, ANU

Structural studies of the PII and GlnK proteins by PROFESSOR D L OLLIS and DR P D CARR with Drs S G Vasudevan and Y Xu, James Cook University, Queensland

Structure function studies with esterases by PROFESSOR D L OLLIS with Dr J Oakeshott, CSIRO, Department of Entomology, Canberra, ACT

### *Biomolecular NMR*

Analysis of the oligomerisation interface of the PYRIN domain by PROFESSOR G OTTING and MR P WU with Dr J Sagara, M Moriya and S Taniguchi, Osaka University, Japan; and Dr E Liepinsh, Karolinska Institute, Stockholm, Sweden



Cross-correlated DSA/CSA relaxation by PROFESSOR G OTTING and DR G PINTACUDA with Dr A Kaikkonen, Karolinska Institute, Stockholm, Sweden

Determination of the three-dimensional structure of pig Cox-17 by PROFESSOR G OTTING, with Drs E Liepinsh and R Sillard, Karolinska Institute, Stockholm, Sweden

Determination of the three-dimensional structure of WIF-1 by PROFESSOR G OTTING, with Dr E Liepinsh, Karolinska Institute, Stockholm, Sweden; and Professor L Patthy, Hungarian Academy of Sciences, Budapest, Hungary

Fast structure-based assignment of  $^{15}\text{N}$ -HSQC spectra of selectively  $^{15}\text{N}$ -labeled paramagnetic proteins by PROFESSOR G OTTING, DRS G PINTACUDA, M A KENIRY, N E DIXON and MS A Y PARK with Dr T Huber, University of Queensland

Protein-labelling with paramagnetic ions by PROFESSOR G OTTING and DR G PINTACUDA with Dr A Moshref, Karolinska Institute, Stockholm; and Drs A Leonchicks and A Sharipo, University of Latvia

Study of protein hydration by high-resolution NMR and MRD by PROFESSOR G OTTING with Dr E Liepinsh, Karolinska Institute, Stockholm, Sweden; Dr K Modig and Dr B Halle, University of Lund, Sweden

Thermodynamic and kinetic analysis of a cyclized protein by PROFESSOR G OTTING, DRS N E DIXON, N K WILLIAMS and P PROSELKOV with Drs J M Matthews and P Attard, University of Sydney; Mr S J Watt and Dr J L Beck, University of Wollongong; and Dr E Liepinsh, Karolinska Institute, Stockholm, Sweden

3D structure determination of human coactosin-like protein by PROFESSOR G OTTING with Drs E Liepinsh, M Rakonjac, B Samuelsson and O Rådmark, Karolinska Institute, Stockholm, Sweden; and Dr O Provost and V Boissoneault, Centre de Recherche du CHUL, Ste-Foy, QC, Canada

3D structure determination of the helicase-binding domain of *E coli* primase by PROFESSOR G OTTING, DRS N E DIXON, P M SCHAEFFER, A J OAKLEY, G

PINTACUDA and MS K V LOSCHA with Dr M C J Wilce, University of Western Australia; and Dr E Liepinsh, Karolinska Institute, Stockholm, Sweden

## Inorganic Chemistry

### *Coordination Chemistry and Spectro-electro Chemistry*

Computational modelling of electrochemical responses by DR P J MAHON with Assoc. Professor D K Cope, North Dakota State University, USA; and Professor K B Oldham, Trent University, Ontario, Canada

Corrosion analysis and conservation treatments by DRS G A HEATH and P J MAHON with Professor D C Creagh, University of Canberra; and Dr V Otiengo-Alego, AFP Forensic Laboratories, Weston, ACT

Paintings and textiles; spectroscopic means of analysis by DRS G A HEATH, P J MAHON and MS M E KUBIK with Dr R Maxwell, Art History, ANU; Dr M Sterns, Chemistry, ANU; Ms D Ward, Australian National Gallery; Professor D C Creagh, University of Canberra; Dr V Otiengo-Alego, AFP Forensic Laboratories, Weston, ACT; and Dr D J Fyffe, Varian Analytical Instruments, Melbourne

Redox-modulation of metal cluster compounds by DRS G A HEATH, A J EDWARDS, P J MAHON and MR S B LEE with Dr S P Best and Mr M Bondin, University of Melbourne; and Dr G Foran, Australian National Beamline Facility, KEK, Tsukuba, Japan

Spectro-electrochemical and theoretical investigation of binuclear and tetranuclear arrays by DR G A HEATH with Dr J E McGrady and Dr S Z Knottenbelt, University of York, UK

### *Inorganic Stereochemistry and Asymmetric Synthesis*

Tertiary arsine adducts of iodoarsines: A structural and theoretical investigation by PROFESSORS A D REA, S B WILD, DRS A C WILLIS and X-T ZHOU with Drs S Petrie and R Stranger, Department of Chemistry, The Faculties



## *Solid State Inorganic Chemistry*

A composite modulated structure approach to hollandites by PROFESSOR R L WITHERS with Ms M Carter, Australian Nuclear Science and Technology Organisation, Menai, NSW

A low temperature electron diffraction study of structural disorder and its relationship to the Kondo effect in UAsSe by PROFESSOR R L WITHERS with Professor J Schoenes, Technical University Braunschweig, Germany

Atomic ordering in doped, rare earth cobaltates by PROFESSOR R L WITHERS with Dr M James, Australian Nuclear Science and Technology Organisation, Menai, NSW

Composition induced structural phase transitions in the  $(\text{Ba}_{1-x}\text{La}_x)_2\text{In}_2\text{O}_{5+x}$  ( $0 \leq x \leq 0.6$ ) system by PROFESSOR R L WITHERS and DR Y LIU with Drs A Pring and C Tenailleau, South Australian Museum; and Professor M Carpenter, University of Cambridge, UK

Constrained refinement techniques for problem crystal structure refinements by PROFESSOR A D RAE with Dr K J Haller and Ms W Somphon, Suranaree University of Technology, Nakhon Ratchisima, Thailand

Oxygen/fluorine ordering in  $\text{Nb}_3\text{O}_5\text{F}_5$  by PROFESSOR R L WITHERS and MR F BRINK with Mr S Cordier, University of Rennes, France

Refinement of crystal structures showing twinning and disorder by PROFESSOR A D RAE with Dr S W Ng, University of Malaya, Kuala Lumpur, Malaysia

## *Organic Chemistry*

### *Synthesis and Mechanism*

Biotransformations by PROFESSOR M G BANWELL and MR D W LUPTON with Dr G M Whited, Genencor International Inc, Palo Alto, California, USA

Chemoenzymatic routes to novel dendritic architectures suitable for pharmaceutical applications by PROFESSOR M G BANWELL and MS L FEARNSIDE with Drs G Krippner and T McCarthy, Starpharma Ltd, Melbourne

Studies in biologically active alkaloid analogue synthesis by PROFESSOR M G BANWELL and MR M O SYDNES with Dr C Burns, Cytopia Pty Ltd, Melbourne; and Professor C Parish, John Curtin School of Medical Research, ANU

The development of chemoenzymatic methods for the selective elaboration of polyfunctionalised therapeutic agents to oligomers with improved efficacy by PROFESSOR M G BANWELL and MR M P FRIEND with Dr J Lambert, Biota Chemistry Laboratories, Melbourne

The development of new, non-steroidal anti-asthma drugs with novel modes of action by PROFESSOR M G BANWELL with Dr A Stewart, Cryptopharma Pty Ltd, Melbourne

The development of novel carbohydrate-like drugs by PROFESSOR M G BANWELL, DRS M BONNET, A KREIPL and J RENNER with Drs R H Don and V Ferro, Progen Industries Ltd, Brisbane

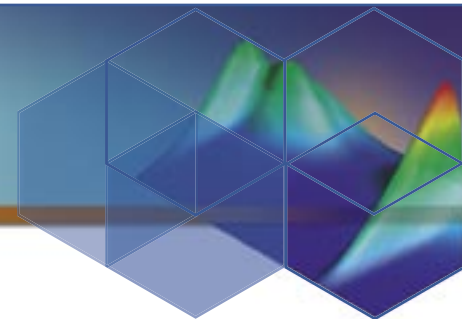
The total synthesis of biologically active marine alkaloids from the Great Barrier Reef by PROFESSOR M G BANWELL, DRS M BACKES and S GROSS with Assoc. Professor M J Garson, Department of Chemistry, University of Queensland; and Dr C Burns, Cytopia Pty Ltd, Melbourne

The total synthesis of biologically active natural products by PROFESSOR M G BANWELL and MR S CHAND with Dr G P Savage, CSIRO Molecular Science, Melbourne; Professor C Parish, John Curtin School of Medical Research, ANU; and Professor G Dannhardt, Institute of Pharmacy, University of Mainz, Germany

### *Biochemical Reactions and Molecular Recognition*

Activators and inhibitors of ryanodine receptor calcium ion channels by PROFESSOR C J EASTON and DR J K ROBINSON with Professor A Dulhunty and Dr M Casarotto, John Curtin School of Medical Research, ANU; and Dr M Miller, Biotron, Canberra

Cycloaddition reactions of nitrile oxides by PROFESSOR C J EASTON with Drs G P Savage and G W Simpson, CSIRO Molecular Science, Melbourne



Free radical reactions by PROFESSOR C J EASTON, MR B J W BARRATT, MR A J HERLT, MS I LI, MR A J MORTIMER, DR J S SIMPSON, MS Y-C TSAI, MR Z WATTS and DR A WRIGHT with Mr M Taylor, ANUTECH Pty Ltd; Business ACT; Professor L Radom, University of Sydney; Dr R O'Hair, University of Melbourne; and Professor C Schofield, Oxford University, UK

Lipid chemistry by PROFESSOR C J EASTON with Professors A Ferrante and A Poulos, Adelaide Medical Centre for Women and Children, SA

Lipid modified coordinating ligands by PROFESSOR C J EASTON and DR M R NAIRN with Dr J Altin, Division of Biochemistry and Molecular Biology, ANU; and Lipotek Pty Ltd, Canberra

Macrocyclic chemistry by PROFESSOR C J EASTON with Professor R Keene, James Cook University; and Professor L Lindoy, University of Sydney

Supramolecular chemistry of cyclodextrins by PROFESSOR C J EASTON, MS L BARR, MS S BOWEN, MS M M CIESLINSKI, MR R DAWSON, MR A J HERLT and DR J S SIMPSON with Professor S F Lincoln, Ms J S Locke, Mr B L May and Ms J Patrick, University of Adelaide

Synthetic enzymes for synthetic chemistries by PROFESSOR C J EASTON with Dr J Oakeshott and Dr R Russell, CSIRO Entomology; and Dr G W Simpson, CSIRO Molecular Science

Towards improved melamine-urea-formaldehyde resins by PROFESSOR C J EASTON and MS A PHILBROOK with Dr N Dunlop, Orica Adhesives and Resins, Melbourne, through the UniChe program

### *Organic Synthesis*

Biosynthetic, structural and metabolic studies on gibberellins by PROFESSOR L N MANDER and MR B TWITCHIN with Professor R P Pharis, Department of Biology, University of Calgary, Canada; Drs M Koshioka and M Nakayama, Department of Genetics and Physiology, National Institute of Floricultural Science, Tsukuba, Japan

Structural and biosynthetic studies on antheridiogens from fern gametophytes by PROFESSOR L N MANDER

with Dr J Banks, Department of Botany and Plant Pathology, University of Purdue, USA; Dr J Nester, Department of Biological Sciences, Sam Houston State University, Texas, USA

Studies on gibberellin receptors by PROFESSOR L N MANDER and MR J R CROW with Dr P M Chandler, CSIRO Division of Plant Industry, Canberra, ACT

Studies on growth inhibition and flowering by PROFESSOR L N MANDER and MR B TWITCHIN with Drs L T Evans and R W King, CSIRO Division of Plant Industry, Canberra; and Professor R P Pharis, University of Calgary, Canada

### *Organic Synthesis, Methodology and Host-guest Chemistry*

Cavitand boronic acids by DR M S SHERBURN and MS E S BARRETT with Dr P Duggan, Molecular Engineering Program, CSIRO Molecular Science, Melbourne

Cavitand coordination cages by DRS M S SHERBURN and D J SINCLAIR with Professor P J Stang and Dr H Jude, Department of Chemistry, University of Utah, UT, USA

Himbacine muscarinic receptor antagonists by DRS M S SHERBURN, MR L S-M WONG and MR T N CAYZER with Hon Assoc. Professor F J Mitchelson, Department of Pharmacology, University of Melbourne

New horizons in Diels-Alder chemistry by DRS M S SHERBURN, R TRIPOLI and A D PAYNE with Emeritus Scientia Professor M N Paddon-Row and Dr D Moran, School of Chemical Sciences, University of New South Wales

### *Physical and Theoretical Chemistry*

#### *Theoretical Chemical Physics*

Chemical reaction dynamics by PROFESSOR M A COLLINS, with Assoc. Professor D H Zhang, National University of Singapore; Dr M Brouard, Oxford University, UK; and Dr J F Castillo, Universidad Complutense de Madrid, Spain





Construction of the energy surfaces for multiple electronic states by PROFESSOR M A COLLINS, with Professor Mark Gordon and Ms Heather Netzloff, Iowa State University, USA

Nonadiabatic dynamics and coupled potential energy surfaces by PROFESSOR M A COLLINS, with Professor D Yarkony, Johns Hopkins University, USA; and Associate Professor D H Zhang, National University of Singapore

Quantum scattering of hydrogen and methane on a nickel surface by PROFESSOR M A COLLINS, with Dr C Crespos and Professor G-J Kroes, University of Leiden, Netherlands

### *Computational Quantum Chemistry Polymer Chemistry*

Combined experimental/theoretical studies of RAFT polymerization by DR M L COOTE with Professor T P Davis, Dr Achim Feldermann, Dr M H Stenzel, Dr C Barner-Kowollik and Mr H Chaffey-Millar, Centre for Advanced Macromolecular Design, University of New South Wales

Degradation Resistant PVC by DR M L COOTE with Professor A J Schouten, Ms J Purmova, Ms K F D Pauwels, Ms W van Zoelen, and Dr J E Vorenkamp, Department of Polymer Science, University of Groningen, The Netherlands

Copolymerization Kinetics by DR M L COOTE with Professor T P Davis, and Dr C Barner-Kowollik, Centre for Advanced Macromolecular Design, University of New South Wales; Dr P Vana, Georg-August-Universität Göttingen, Germany; and Professor K Matyjaszewski, Carnegie Mellon University, Pittsburgh PA, USA

Reactions catalyzed by vitamin B<sub>12</sub> by PROFESSOR L RADOM, MR G SANDALA and DR M L COOTE with Dr D Smith, Rudjer Boskovic Institute, Zagreb, Croatia

Bond dissociation energies by DR M L COOTE and PROFESSOR L RADOM with Professor A Pross, Ben Gurion University, Israel

### *Liquid State Chemical Physics*

Chaos and nonequilibrium statistical mechanics by PROFESSOR D J EVANS with Professor L Rondoni, Politecnico Di Torino, Italy

Derivation of potential models for phase equilibria by DR J P DELHOMMELLE with Dr P Millie, Laboratoire Francis Perrin, France

Fluctuation theorem by PROFESSOR D J EVANS, DRS E MITTAG, E M SEVICK and G M WANG with Dr D J Searles, Griffith University, Brisbane

### *Laser and Optical Spectroscopy*

Multi-dimensional spectroscopy of PSII protein sub-assemblies by PROFESSOR E KRAUSZ with Dr R Pace, Department of Chemistry, ANU; Dr M Seibert, NREL, Golden Colorado, USA

EPR and optical spectroscopy of thermophilic PSII from *Synechococcus vulcanus* by PROFESSOR E KRAUSZ with Dr R Pace Department of Chemistry, ANU; Professor J-R Shen, Riken Institute, Hyogo, Japan; and Dr S Peterson Årksöld, University of Lund Sweden

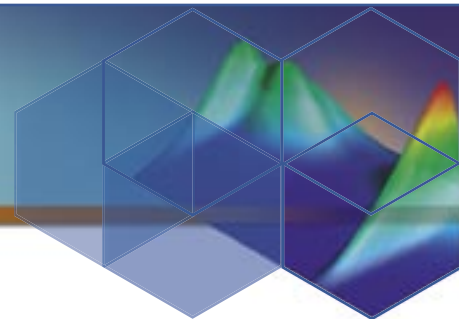
Magneto-optical spectroscopy of cytochrome *b<sub>6</sub>f* by PROFESSOR E KRAUSZ with Professor S Peterson Årksöld, Professor J F Allen, Dr J Ström, University of Lund, Sweden

Spectroscopy of mutants of the *Rhodospseudomonas viridis* bacterial reaction centre by PROFESSOR E KRAUSZ with Professor J Norris, Mr R Baxter, and Dr N Ponomarenko, University of Chicago, USA

Light induced changes in single crystals of *Rhodospseudomonas viridis* by PROFESSOR E KRAUSZ with Professor J Norris, Mr R Baxter, University of Chicago, USA

Spectroscopy of CP47 Mutants of the *syn 6803cyanobacteria*; investigating the trap state by PROFESSOR E KRAUSZ with Professor J Eaton-Rye, Otago University, NZ

Narrow band hole-burning in active Photosystem II by PROFESSOR E KRAUSZ and MR J HUGHES with Professor H Riesen, University College UNSW, ADFA, ACT



Spectroscopy of New Chromium(III) Hole-burning materials by PROFESSOR E KRAUSZ and MR J HUGHES with Professor H Riesen, University College UNSW, ADFA, ACT

Development of the new generation MCD Metallo-Enzyme Spectrometer by PROFESSOR E KRAUSZ with Dr M Riley, University of Queensland; and Alex Stanco, CEO LASTEK Adelaide

Physical and optical properties of self-assembled Si nanocrystals by PROFESSOR E KRAUSZ with Professor R Elliman, RSPHysSE ANU; and Professor S H Choi, Kyung Hee University, Korea

### *Computational Quantum Chemistry*

Solvation of glycol radicals by PROFESSOR L RADOM, with Mr G P F Wood, University of Sydney; and Professor M S Gordon, Iowa State University, USA

Thermochemistry of metal oxides and hydroxides by PROFESSOR L RADOM with Dr N L Haworth, University of Sydney; Professor A K Wilson, University of North Texas, USA; and Professor J M L Martin, Weizmann Institute, Israel

Oxidative damage to proteins by PROFESSORS L RADOM, C J EASTON and DR M L COOTE with Mr G P F Wood and Dr D Moran, University of Sydney; Dr R Jacob, RMIT University; Dr M Davies, Heart Research Institute, Sydney; Associate Professor R A J O'Hair, University of Melbourne; and Professor A Rauk, University of Calgary, Canada

Reactions catalysed by vitamin B<sub>12</sub> by PROFESSOR L RADOM and DR M L COOTE with Professor B T Golding, University of Newcastle upon Tyne, UK; Dr D M Smith, Rudjer Boskovic Institute, Zagreb, Croatia; and Dr S D Wetmore, Mount Allison University, Canada

Development of improved theoretical procedures by PROFESSOR L RADOM with Mr G P F Wood, University of Sydney; and Professor G A Petersson, Wesleyan University, USA

Interaction of calcium dications with molecules of biological interest by PROFESSOR L RADOM with Ms I Corral, Professor M Yanez and Professor O Mo, Autonoma University of Madrid, Spain

Carbapenem biosynthesis by PROFESSORS L RADOM, C J EASTON, and MR G M SANDALA with Dr M Topf, University of California, San Francisco, USA; Dr D M Smith, Rudjer Boskovic Institute, Zagreb, Croatia; and Professor C J Schofield, University of Oxford, UK

### *Disordered Materials*

Neutron diffuse scattering and Monte Carlo study of the relaxor ferroelectric  $\text{PbZn}_{1/3}\text{Nb}_{2/3}\text{O}_3$  (PZN) by PROFESSOR T R WELBERRY and DR D J GOOSSENS with Dr M J Gutmann, ISIS Facility, Rutherford Appleton Laboratory, Oxfordshire, UK; Dr H Woo and Dr G Xu, Physics Department, Brookhaven National Laboratory, New York, USA; and Dr C Stock, Department of Physics, University of Toronto, Ontario, Canada

Diffuse scattering from benzil,  $\text{C}_{14}\text{H}_{10}\text{O}_2$  by PROFESSOR T R WELBERRY and DR D J GOOSSENS with Professor W I F David and Dr M J Gutmann, ISIS, Rutherford Appleton Laboratory, Oxfordshire, UK

Diffuse scattering in zeolites by PROFESSOR T R WELBERRY with Dr B Campbell, Department of Physics and Astronomy, Brigham Young University, Utah, USA

High-pressure X-ray scattering of oxides with a nanoscaled local structure by PROFESSOR T R WELBERRY with Dr J Kreisel, Laboratoire Matériaux et Génie Physique, ENS de Physique de Grenoble, France; Professor A M Glazer, Clarendon Laboratory, Oxford, UK; and Dr P A Thomas, Department of Physics, University of Warwick, UK

Phonon softening in benzil by DR D J GOOSSENS with Dr M E Hagen, SNS, Oak Ridge, USA

Structure and magnetism in disordered perovskite oxides, focussing on cobaltates by DR D J GOOSSENS and PROFESSOR R L WITHERS with Dr M James, ANSTO, Sydney; and Dr K F Wilson, Physics Department, ANU

Magnetic Structure in  $\text{RNiAl}_4$  (R = rare earth) by DR D J GOOSSENS with Dr W Hutchison, University College, UNSW (ADFA) ACT



Diffuse neutron scattering and structural phase transition in *p*-terphenyl, by DR D J GOOSSENS and PROFESSOR T R WELBERRY with Dr M J Gutmann, ISIS, UK

Magnetic ordering in dicyanamide coordination polymers by DR D J GOOSSENS with Dr S Batten, Monash University

### *Solid State Molecular Science*

The interface between complex fluids and solids by DR P A REYNOLDS, PROFESSOR J W WHITE, DRS M J HENDERSON, J ZANK and MR K BARANYAI with Dr S A Holt, Rutherford Appleton Laboratory, Oxford, UK; and Dr D Tunaley, Orica Ltd, Australia

Making film stars-nanocomposite films for solar energy capture by DR M J HENDERSON, and PROFESSOR J W WHITE with Dr A Gibaud and Dr J-F Bardeau, Laboratoire de Physique de l'Etat Condensé, Le Mans, France; and Dr A R Rennie, Uppsala University, The Studsvik Neutron Research Laboratory, Sweden – Innovation Access Programme (CG050120)

Conformation of proteins at interfaces by PROFESSOR J W WHITE and DR M J HENDERSON with Dr S A Holt, Rutherford Appleton Laboratory, Oxford, UK

Kinetics of template action in silicalite synthesis by PROFESSOR J W WHITE with Dr L Iton, Argonne National Laboratory, Chicago, USA

Millisecond X-ray reflectometer for ChemMatCARS by PROFESSOR J W WHITE and DR M J HENDERSON with Dr R Garrett, ANSTO, Sydney; and Dr J Viccaro, University of Chicago, USA

Nanostructure of milk membrane and proteins by PROFESSOR J W WHITE with Dr S A Holt, Rutherford Appleton Laboratory, UK; and Dr B Cox, Dairy Research Corporation, Melbourne

Structure of high internal phase emulsions by PROFESSOR J W WHITE, DRS P A REYNOLDS, M J HENDERSON, J ZANK and MR K BARANYAI with Drs R Goodridge, C Such, Orica Ltd, Australia; and Mr A Fontaine, FIUPSO, France

Structure of polymer surfactant films by PROFESSOR J W WHITE with Dr J Penfold, Rutherford Appleton Laboratory, Oxford, UK

X-ray small angle scattering from whole blood and haemoglobin by PROFESSOR J W WHITE with Dr C Garvey, Department of Biochemistry, University of Sydney

Titania and zirconia composite thin films by PROFESSOR J W WHITE and DR M J HENDERSON with Professor A R Rennie, NFL, Studsvik, Uppsala Universitet, Sweden; and Mr N Rosier, FIUPSO, France

Structure of inorganic catalyst films by PROFESSOR J W WHITE with Dr J Bartlett, ANSTO, Sydney

Structure of polymer clay-composites by PROFESSOR J W WHITE with Dr E Gilbert, ANSTO, Sydney

Structure of polymer composites by PROFESSOR J W WHITE with Dr D Martin, Department of Chemical Engineering, University of Queensland

Proposal for an X-ray liquid surface reflectometer by PROFESSOR J W WHITE with Dr M Schlossman, University of Illinois, Chicago and CARS Synchrotron Consortium, Argonne National University, USA

The following collaborators visited the group during 2004 to conduct X-ray reflectometry experiments:

Dr W Fullagar University of Queensland; Dr V James Hon Visiting Fellow, RSC; Dr C Garvey University of Sydney; Dr K Latham RMIT University, Melbourne; Drs V Luca and M James, ANSTO, Sydney; Dr D Martin, University of Queensland; Dr A Whittaker, University of Queensland; Dr G Warr, University of Sydney; Dr J Ruggles, University of Queensland; Professor R Amal, University of NSW, and Dr Y Chen, RSPHysSE, ANU; Dr L Graham, CSIRO, Mr B Finnegan, University of Queensland; Ms L Rodgers, UNSW and Dr R Knott, ANSTO

### *Electrochemistry*

Corrosion of copper in potable water systems by DR R D WEBSTER with Dr A G Christy, Department of Geology, ANU; Dr A Lowe and Mr M Stoll, Department of Engineering, ANU; and Dr V OtienoAlego, AFP Forensic Laboratories, Weston, ACT

Electrochemistry and EPR spectroscopy of transition metal complexes containing bridging thiolate ligands by DR R D WEBSTER with Dr L Y Goh, National University of Singapore