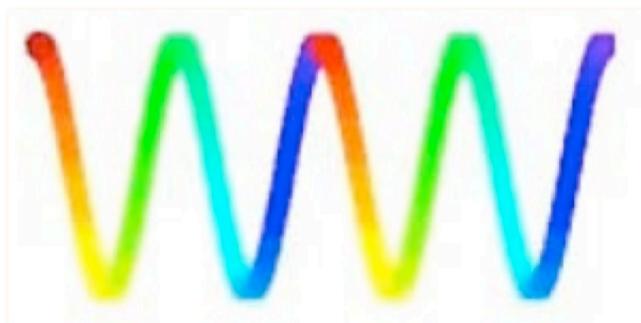
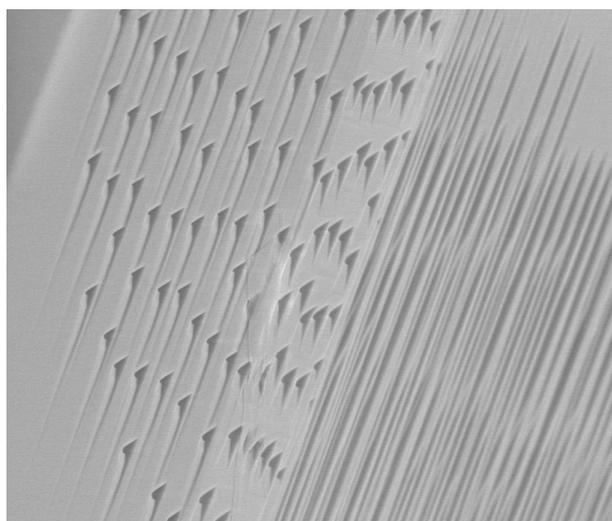


Proceedings of the 34th Annual
Condensed Matter and Materials
Meeting



2010

Waiheke Island Resort, Waiheke,
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2 - 5 February 2010



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The 34th Annual Condensed Matter and Materials Meeting

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Editor: Tilo Söhnel

The 34th Annual Condensed Matter and Materials Meeting was held at Waiheke Island, Auckland, New Zealand, from 2-5 February, 2010. There were 87 attendees, including international visitors [USA, UK, Israel, Spain, Germany, Japan]. A total of 11 invited and 28 contributed oral papers were presented during the two and one half days of scientific sessions. There were also two sessions with a total of 50 poster presentations. All presenters were invited to submit a manuscript (six pages for invited papers and four for contributed papers) for publication in the conference proceedings. Each manuscript was refereed by at least two anonymous reviewers who worked to a set of guidelines made available by the editor. Each accepted publication therefore satisfies the requirements for classification as a refereed conference publication (E1). The organizers would like to thank the 28 reviewers for their time and effort in reviewing manuscripts, which resulted in 22 papers being accepted for publication. The accepted manuscripts are available at the on-line publication section of the Australian Institute of Physics national web site (<http://www.aip.org.au/>).

Manuscript-review team: M. Alario-Franco, D. Andrae, T. J. Bastow, D. Bennett, G. A. Bowmaker, S. J. Campbell, J. S. Collington, M. Das, T. R. Finlayson, N. Gaston, C. J. Hamer, A. Hill, J. Hodgkiss, W. D. Hutchison, H. Idriss, A. Kaiser, C. D. Ling, K.-D. Liss, A. Nelson, E. Pahl, M. N. Read, B. J. Ruck, S. A. Schmid, P. A. Schwerdtfeger, K. Sears, G. A. Stewart, R. D. Tilley, H. Timmers.

Organising committee: Tilo Söhnel (chair), Graham Bowmaker, Jadranka Travas-Sejdic, Kathrin Wichmann (all The University of Auckland)

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Date: 14/July/2010

Conference Program

Wednesday, 3 February 2010

- 1 High Pressure Simulations – Squeezing the Hell out of Atoms, Peter Schwerdtfeger, *Massey University, NZ* **INVITED**
- 2 Specific heat of a Ferroelectric PZT Ceramic at the Morphotropic Phase Boundary, Sidney Lang, *Ben-Gurion University, Israel*
- 3 Electronic structure and magnetism in rare-earth nitrides, Ben Ruck, *MacDiarmid Institute for Advanced Materials and Nanotechnology and Victoria University of Wellington, New Zealand*
- 4 Thermodynamics and the prospects for room-temperature superconductivity, Jeff Tallon, *IRL and MacDiarmid Institute for Advanced Materials and Nanotechnology, Wellington, New Zealand*
- 5 Surface treatment: new methods, new applications, John S. Colligon, *Manchester Metropolitan University, UK* **INVITED**
- 6 NMR detection of dilute defect phases in solids, Tim J. Bastow, *CSIRO, South Clayton, Australia*
- 7 Wavefunction-based correlation calculations for the potential energy surface of zinc and cadmium: understanding the hcp anisotropy, Nicola Gaston, *IRL and MacDiarmid Institute for Advanced Materials and Nanotechnology, Wellington, New Zealand*
- 8 Solid state calculations of ice from an incremental coupled cluster approach, Andreas Hermann, *Massey University Auckland, New Zealand*
- 9 The World of Wombat: a review of high speed neutron diffraction at the OPAL research reactor, Andrew J. Studer, *The Bragg Institute, ANSTO, Sydney, Australia* **INVITED**
- 10 Kohn Anomaly in Conventional Superconductors: A Surprise, Mukunda P. Das, *The Australian National University, Australia* **INVITED**
- 11 Spin-mediated strong coupling superconductivity in lightly doped cuprates, Wei Chen, *University of New South Wales, Sydney, Australia*
- 12 Copper Selenide: Soft Photon Modes and Superionic Phase Transition, Sergey Danilkin, *Bragg Institute, ANSTO, Sydney, Australia*
- 13 ZnO solid state dye sensitized solar cells, Natalie O. V. Plank, *Victoria University of Wellington, New Zealand*
- 14 The Crystal Structure of the Close-Packed Polymorphs of Ytterbium: A Quantum Chemical Study, Dirk Andrae, *Freie Universität Berlin, Germany*
- 15 Approaching metallic hydrogen through chemical stealth; the high hydrides, Neil Ashcroft, *Cornell University, Ithaca, NY, USA* **INVITED**

Thursday, 3 February 2010

- 16 X-ray Photon Correlation Spectroscopy Applied to the Study of a Martensitic Transformation, Trevor R. Finlayson, *University of Melbourne, Australia* **INVITED**
- 17 Systematic trends in the structural phase transitions of the 4 *d* transition-metal oxides SrMO₃ (*M* = Zr, Nb, Mo, Tc, Ru and Rh), Brendan Kennedy, *The University of Sydney, Sydney, Australia*
- 18 Anomalous Spin Dynamics and Orbital Excitations in Mott-Insulating Titanates, Clemens Ulrich, *University of New South Wales, Sydney, Australia*
- 19 Single Polymer Golbules of Multiblock Copolymers: How to make a very Complicated Tennis Ball, David R. M. Williams, *Australian National University, Canberra, Australia*
- 20 Models and simulations of the growth of carbon nanotubes, Shaun C. Hendy, *MacDiarmid Institute for Advanced Materials and Nanotechnology, Victoria University of Wellington, New Zealand* **INVITED**
- 21 The coalescence of gold nanoparticles: an *in situ* synchrotron study, Bridget Ingham, *Industrial Research Limited, Wellington, New Zealand*
- 22 Zero field NMR and NQR measurements of natural copper minerals, Daniel Bennett, CSIRO, Lucas Heights, Australia
- 23 Junction effects and optical properties of RhPd/CeO₂, Morgan Scott, *University of Auckland, New Zealand*
- 24 Cluster-based Electronic Devices, Simon Brown, *University of Canterbury, New Zealand* **INVITED**
- 25 Electrons in Carbon Flatland: Understanding Conduction in Graphene, Alan B. Kaiser, *MacDiarmid Institute for Advanced Materials and Nanotechnology, Victoria University of Wellington, New Zealand* **INVITED**
- 26 Time Reversal of a Pseudospin: General Properties and Applications to Graphene, Ulrich Zülicke, *Massey University, Palmerston North, New Zealand*
- 27 Water and Ion Transport in a Novel Sulfonated Pentablock Copolymer, Geoffrey Geise, *University of Texas, USA*
- 28 Characterisation and tracing of prosthesis debris – Can pathways of polymer particles be suppressed? Heiko Timmers, *University of New South Wales at ADFC, Canberra, Australia*
- 29 Synthesis at High Pressure and High Temperature of M-1212 metalo-cuprates, Miguel Alario-Franco, *Universidad Complutense, Spain*
- 30 The structures, phase transition and dynamics behind mixed ionic and electronic conduction in hydrated Ba₄Nb₂O₉, Chris D. Ling, *The University of Sydney, Sydney, Australia*
- 31 Modern Diffraction Methods for the Investigation of Thermo Mechanical Processes in Materials Physics, Klaus-Dieter Liss, *ANSTO, Sydney, Australia*

Friday, 5 February 2010

- 32 Quantum Phase Transitions in Coupled Quantum Optical Cavities, Andrew D. Green-tree, *University of Melbourne, Australia* **INVITED**
- 33 A new approach to the Creation of Magnetically Modulated Structures, Thomas Saerbeck, *ANSTO/University of Western Australia, Sydney/Perth, Australia*
- 34 Modulated Structures in the Fresnoite Family, Siegbert Schmid, *The University of Sydney, Sydney, Australia*
- 35 Organic Solar Cells with Carbon Nanotube Sheet Electrodes, Kallista Sears, *CSIRO, Clayton, Australia*
- 36 Studying Electrical Double Layers in Ionic Liquids using Neutron and X-ray Reflectometry, Andrew Nelson, *The Bragg Institute, ANSTO, Sydney, Australia* **INVITED**
- 37 Hydrodynamic mobility of an optical trapped colloidal particle near fluid-fluid interfaces, Genmiao Wang, *Australian National University, Canberra, Australia*
- 38 Pulsed ESR Measurement of Coherence Times in Si:P at Very Low Temperature, Wayne Hutchinson, *The University of New South Wales, Sydney, Australia*
- 39 Synthesis and Applications of Nanoparticles, Richard D. Tilley, *MacDiarmid Institute for Advanced Materials and Nanotechnology and Victoria University of Wellington, New Zealand*

Poster Presentations

Poster #	Authors	Title
40	<u>B. Assadollahzadeh</u> and P. Schwerdtfeger	From Clusters to the Solid State: A Systematic Search for Global Minimum Structures for Cs, Sn and Au Clusters
41	<u>D. Bennett</u> , D. Miljak, B. Schwitter and J. Khachan	Zero field NMR and NQR measurements of natural copper minerals
42	<u>V.K. Bhatia</u> , C.S. Kealley, G.J. Thoroughgood, A. Dowd and M.B. Cortie	AuCuAl Shape Memory Alloys for Use in Nano-Actuators
43	<u>S. Biering</u> and P. Schwerdtfeger	The influence of relativistic effects on the structure of the group 12 chalcogenides: A density functional study
44	<u>R. Clements</u> , B. Kennedy, C. Ling, A.P.J. Stampfl	A Neutron and Synchrotron Investigation of The Electronic Structure of Lanthanide Zirconates
45	<u>Y.X. Gao</u> , G.M. Wang and E.M. Sevick	Under what experimental conditions are Fluctuation Theorems necessary?
46	<u>M.B. Gray</u> , W. Giardini, P. Manson, R.B. Warrington and M. Wouters	The Avogadro Project and it's role in the redefinition of the kilogram
47	<u>C. Hamer</u> , O. Rojas and J. Oitmaa	Spin-wave Approach to the Spin-1 Heisenberg Antiferromagnet with Uniaxial Anisotropy in a Field
48	P. Falcaro, C. Doherty, K. Nairn, A. Thornton, S. Pas, C. Elvin and <u>A. Hill</u>	Adaptive materials
49	<u>J.M. Hodgkiss</u> , G. Tu, S. Albert-Seifried, W.T.S. Huck and R.H. Friend	Coupling ionic and electronic charge transport in organic semiconductors: A new paradigm for enhanced functionality in molecular electronics
50	<u>M. Holt</u> , D. Stanek, O.P. Sushkov and G.S. Uhrig	Pnictides as frustrated three dimensional quantum antiferromagnets close to a quantum phase transition
51	<u>W.D. Hutchison</u> , P.G. Spizzirri and M.S. Brandt	Electrically Detected Magnetic Resonance Applied to the Study of Near Surface Electron Donors in Silicon
52	<u>A.R. Hyndman</u> , G.V.M. Williams and J. Stephen	Magnetization and Magnetotransport Study of SrFeO _x
53	<u>S. Janssens</u> , D. Clarke, G.V.M. Williams and A. Edgar	Spectroscopic properties of sensitized LaF ₃ :Eu ³⁺ nanoparticles
54	<u>J. Leveueur</u> , S. Kupke, J. Kennedy, G.V.M. Williams, A. Markwitz and J. Metson	Fabrication of Fe nanoclusters using ion implantation and electron beam annealing

55	<u>A.E. Malik</u> , K. Belay, D. Llewellyn, W.D. Hutchison, K. Nishimura and R.G. Elliman	Ferromagnetic Nanoparticles Formed in Silica by Ion Implantation
56	<u>A. Markwitz</u> , F. Fang and P.B. Johnson	Electron beam annealing of (100) Si following dual ion implantation of Pb/N
57	<u>D.J. Miller</u>	Advantages of measuring average spin using condensed matter methods
58	<u>S.W. Morgan</u> , G.V.M. Williams, A.R. Hyndman and J. Stephen	Temperature Resolved Cathodoluminescence Spectroscopy and Magnetic Properties of Cobalt Doped Titanium Dioxide Thin Films
59	<u>E. Pahl</u> , F. Calvo and P. Schwerdtfeger	Towards accurate melting temperatures from ab initio Monte Carlo simulations: from nano clusters to the bulk
60	<u>N.O.V. Plank</u> , F. Natali, B.M. Ludbrook, J. Richter, B.J. Ruck, H.J. Trodahl and J.V. Kennedy	Epitaxial growth and electrical properties of thick SmSi ₂ layers on (001) silicon.
61	<u>R.M. Puscasu</u> , B.D. Todd, P.J. Davis and J.S. Hansen	Nanoscale Modeling of Polymer Glasses – Dynamics of Viscous Kernel
62	<u>S.G. Raymond</u> , G.V.M. Williams, C. Varoy, C. Dotzler and D. Clarke	New Materials for Optically stimulated Luminescence Dosimetry
63	<u>M.N. Read</u>	Momentum-dependent inelastic mean-free-path and high-energy electronic structure of Aluminium
64	<u>J.H. Richter</u> , B.J. Ruck, B.M. Ludbrook, I.L. Farrel, F. Natali, N.O.V. Plank and H.J. Trodahl	Properties of EuN thin films
65	<u>U. Rohrmann</u> , S. Schäfer and R. Schäfer	Magnetic Response of Molecular Cage Clusters: Mn@Sn ₁₂ and Mn@Sn ₁₃
66	<u>S. Saengkae</u> , M. Binder, B.F. Usher and J. Petrolito	Efficient Surface Stress Cancelling Algorithms
67	<u>T. Saerbeck</u> , N. Loh, M. Ali, B.J. Hickey, D. Lott, B.P. Toperverg, A. Mulders, A.P. J. Stampfl, F. Klose and R.L. Stamps	Temperature Dependent Biquadratic Exchange Coupling in Co/Cu _(0.94) Mn _(0.06) Multilayers
68	<u>H.A. Salama</u> , G.A. Stewart, K. Nishimura, W.D. Hutchison, D. Scott, H.O'Neill, C.J. Voyer and D.H. Ryan	Hysteresis effects in o-YbMnO ₃ ?
69	W. R. Brant and <u>S. Schmid</u>	Defect Perovskites in the Sr _{1-x} M _{1-2x} Nb _{2x} O ₃ (M = Ti, Zr) Family
70	X.-F. Song and <u>L. Yin</u>	Surface Fracture in Diamond Adjusting of a Leucite-Reinforced Glass Ceramic Using a Clinical Dental Handpiece

71	<u>T. Schnyder</u> , G. Williams and J. Tallon	Evidence of Ionic Effect ("Chemical Pressure") in $\text{Bi}_2\text{Sr}_{1.6}\text{Ln}_{0.4}\text{CuO}_{6+\delta}$ (Ln = Ba, La, Eu, Gd, Y) studied by Susceptibility and Raman Measurements
72	<u>E.M. Sevick</u> and D.R.M. Williams	A piston-rotaxane as a molecular shock absorber
73	<u>T. Söhnel</u> , W. Reichelt and K. Teske	Solid State Coulometric Investigations in the System Ir/Sn/O - Determination of the thermodynamical data of $\text{Ir}_{10}\text{Sn}_{45}\text{O}_{44}$, $\text{IrSn}_4\text{O}_{4-x}$, $\text{Ir}_3\text{Sn}_8\text{O}_4$, Ir_5Sn_7 and IrSn_2
74	<u>S. Spoljaric</u> , T. Köpplmayr, A. Genovese, T.K. Goh, A. Blencowe, G.G. Qiao and R.A. Shanks	Nano-composites with physical crosslinks introduced by core crosslinked star polymers into a like-polymer
75	<u>S. Spoljaric</u> , A. Genovese, T. Köpplmayr and R.A. Shanks	Long term structural integrity of high density polyethylene blends investigated by static force thermomechanometry
76	<u>J. Stephen</u> , G.V.M. Williams and B. Ruck	Magnetic and electronic study of the colossal magnetoresistance compound, $\text{Sr}_2\text{FeMoO}_6$
77	<u>K.J. Stevens</u> , B. Ingham, M. Ryan, J.A. Kimpton, K.S. Wallwork, V. Luzin and K. Cheong.	Carbide Composition and Stress Measurement in Ethylene Pyrolysis Tubes
78	B. Saensunon, <u>G. Stewart</u> , P.C.M. Gubbens, M. Russina and E. Kemner	The Crystal Field Schemes for Er^{3+} in $\text{Er-Cr}_2\text{Si}_2$ and ErMn_2Si_2
79	<u>M.J. Styles</u> , D.P. Riley and I.C. Madsen	Parametric Rietveld refinement applied to in-situ diffraction studies
80	<u>E.F. Talantsev</u> , N.M. Strickland, J.A. Xia, N.J. Long, M.W. Rupich, X. Li and S. Sathyamurthy	In-field performance and microstructure of metal-organic deposited YBCO films doped with BaZrO_3
81	P. Kessler, Th. Geruschke, <u>H. Timmers</u> , A.P. Byrne and R. Vianden	$^{100}\text{Pd}/\text{Rh}$ gamma-ray perturbed angular correlations in GaN and ZnO – Are these semiconductors suitable for spintronics?
82	Y. Liu, L.G. Gladkis and <u>H. Timmers</u>	Micro-scratching of UHMW polyethylene surfaces
83	<u>R. Tonner</u> , V.A. Soloshonok and P. Schwerdtfeger	Optical purification via sublimation – DFT results on lactic acid derivatives
84	C. Roux, D. Williamsa and <u>J. Travas-Sejdic</u>	Comb-like copolymers based on polythiophene
85	A. Edgar, J. Zimmermann, H. von Seggern and <u>C.R. Varoy</u>	X-ray phosphor properties of Eu^{2+} - doped lanthanum-stabilised cubic barium chloride

86	<u>J.L. Wang</u> , S.J. Campbell, J.M. Cadogan, A.J. Studer, R. Zeng and S.X. Dou	Magnetic Phase Transitions in Layered NdMn ₂ Ge _{2-x} Si _x
87	<u>M. Watanabe</u>	The Angled Crack Problems in Compression and Tension
88	<u>M. Went</u> , J. Roberts, R. Weed, S. Buckman and J. Sullivan	A Variable Energy Positron Beamline for PALS experiments
89	<u>N.M. Winch</u> and A. Edgar	CsBr:Eu ²⁺ X-Ray Storage Phosphor Imaging Plates
90	<u>J.A. Xia</u> , N.M. Strickland, E.F. Talantsev, N.J. Long, M.W. Rupich, S. Sathyamurthy, X. Li and J. Kennedy	Investigation of columnar defects in MOD YBCO films by TEM

Proceedings Content

- 1 The Crystal Structure of the Close-Packed Polymorphs of Ytterbium: A Quantum Chemical Study
D. Andrae and B. Paulus
- 2 Zero Field NMR and NQR measurements of natural copper minerals
D. Bennett, D. Miljak, B. Schwitter and J. Khachan
- 3 Surface Treatment: New Methods, New Applications
J.S. Colligon
- 4 Kohn Anomaly in Conventional Superconductors: A Surprise
M.P. Das and R. Chaudhury
- 5 X-ray Photon Correlation Spectroscopy Applied to the Study of a Martensitic Transformation
L. Müller, M. Waldorf, C. Gutt, A. Madsen, G. Grübel, T.R. Finlayson and U. Klemradt
- 6 Spin-wave Analysis of the Spin-1 Heisenberg Antiferromagnet with Uniaxial Anisotropy in a Field
C.J. Hamer, O. Rojas and J. Oitmaa
- 7 Magnetic Nanoparticles Synthesised by Ion-Implantation
A.E. Malik, K. Belay, D. Llewellyn, W.D. Hutchison, K. Nishmura and R. Elliman
- 8 Electrically Detected Magnetic Resonance Applied to the Study of Near Surface Electron Donors in Silicon
W.D. Hutchison, P.G. Spizzirri, F. Hoehne and M.S. Brandt
- 9 Pulsed ESR Measurement of Coherence Times in Si:P at Very Low Temperatures
W.D. Hutchison, L.K. Alexander, N. Suwuntanasarn and G.N. Milford
- 10 Unbound Surface and Bulk Electron Energy Bands for Al(111) Surface
M.N. Read
- 11 Defect Perovskites in the $\text{Sr}_{1-x}\text{M}_{1-2x}\text{Nb}_{2x}\text{O}_3$ ($M = \text{Ti}, \text{Zr}$) Family
W.R. Brant and S. Schmid
- 12 Modulated Structures in the Fresnoite Family
P.K. Allen and S. Schmid
- 13 Activation of Rh,Pd/CeO₂ nano-catalyst
M. Scott, G. Waterhouse, T. Söhnle

- 14 Nanocomposites with physical crosslinks introduced by core cross-linked star polymers into a like-polymer
S. Spoljaric, T. Köpplmayr, A. Genovese, T.K. Goh, A. Blencowe, G.G. Qiao and R.A. Shanks
- 15 Long term structural integrity of high density polyethylene blends investigated by measurement of creep
S. Spoljaric, A. Genovese, T. Köpplmayr and R.A. Shanks
- 16 Carbide Composition and Stress Measurement in Ethylene Pyrolysis Tubes
K.J. Stevens, B. Ingham, M. Ryan, V. Luzin and K. Cheong
- 17 The Crystal Field Schemes for Er^{3+} in ErCr_2Si^2 and ErMn_2Si_2
B. Saensunon, G.A. Stewart, P.C.M. Gubbens, M. Russina and E. Kemner
- 18 Parametric Rietveld Refinement Applied to *In Situ* Diffraction Studies
M.J. Styles, D.P. Riley, I.C. Madsen and E.H. Kisi
- 19 Investigation of columnar defects in MOD YBCO films by TEM
J.A. Xia, N.M. Strickland, E.F. Talantsev, N.J. Long and J. Kennedy
- 20 Critical Temperature, In-Field Performance and Microstructure of Metal-Organic Deposited $\text{YBa}_2\text{Cu}_3\text{O}_{7-\delta}$ Films Doped with BaZrO_3
E.F. Talantsev, N.M. Strickland, J.A. Xia, N.J. Long, M.W. Rupich, X. Li and S. Sathyamurthy
- 21 Characterisation and Tracing of Prosthesis Debris: Towards Suppressing the Pathways of Ultra-high Molecular Weight Polyethylene Wear Particles
H. Timmers, L.G. Gladkis, J. A. Warner
- 22 Micro-Scratching of UHMW Polyethylene Surfaces with 90° Cube Corner Silicon Tips
Y. Liu, L.G. Gladkis and H. Timmers