The Solar Energy Society
PV-Net UK
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PVSAT-4

4th Photovoltaic Science, Applications and Technology Conference C89

University of Bath
Wednesday 2 – Friday 4 April 2008

PROGRAMME

Sponsored and supported by

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IOP Institute of Physics
Materials and Characterisation Group

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PVSAT-4 Programme

Wednesday 2nd April 2008

12.00 Registration opens, Building 2E, The Parade

14.00 – 15.50	**OPENING SESSION** **Chair: Tim Bruton**
14:00	Welcome: Prof Geoff Hammond, Bath University Welcome: Tim Bruton, PVSAT-4Conference Chair President's Welcome: Dr Mary Archer, The Solar Energy Society (UK-ISES) Conference and Programme Announcements
14:30	Understanding Non-Conventional Photovoltaic Cells, Invited *Prof. Laurie Peter, Bath University*
15:10	Two and Three Terminal Photovoltaic Cells Using InP Lattice-Matched InGaAs and InGaAsP, *Richard Tuley, Robin J. Nicholas, James Orr, Mahieddine Emziane, Dave C. Rogers, Paul J. Cannard, Sukhjiban Dosanjhb, University of Oxford*
15:30	Excitons in Chalcopyrite Solar Cell Materials: $CuInSe_2$ and $CuInS_2$, *M.V.Yakushev, R.W.Martin, A.V.Mudryi, University of Strathclyde*

15:50 – 16.20 Coffee Break, Level 1 Café, Building 2W

16:20 – 18:15	**SESSION 2** **Chair: Stuart Irvine, Optic Technium, North East Wales Institute**
16:20	Overview of Organic PV Technology, Invited *Prof Sir Richard Friend, University of Cambridge*
16:50	APCVD deposited F doped SnO_2 TCO for optimum performance solar cells, *H.M.Yates, P.Evans, D.W. Sheel, U. Dagkaldiran, A. Gordijn, F. Finger, Z. Remes, M. Vanecek, University of Salford*
17.10	Studying the Groove Profiles Produced for Fine Line Screen Printed Front Contacts in Laser Grooved Buried Contact Solar Cells, *A. Cole, K. C. Heasman, S. Roberts, T. M. Bruton ,L.Pirozzi, L. Serenelli, M. Izzi, M. Tucci, E. Salza, NaREC*
17:30	PV R&D discussion facilitated by PV-NET – all welcome

19.00 Drinks Reception and Dinner, Claverton Rooms, Bath University

PVSAT-4 Programme

Thursday 3rd April 2008

9.00 – 10.20 **SESSION 3:**

Chair: Bryce Richards, Heriot-Watt University

9:00 Outlook for Crystalline Silicon and Emerging Thin Film PV Technologies,
N Mason, PV Consultant

9:30 Nanotechnology and Photovoltaics: Optical Biomimetics and Plasmonics,
Darren M. Bagnall, Stuart Boden, Tristan Temple and Peter Stavroulakis, Southampton University

9:50 Characterisation of strain-balanced quantum well concentrator cells enhanced by photon recycling,
J.G.J. Adams, K.W.J. Barnham, J.P. Connolly, C. Calder, G. Hill, J.S. Roberts, T.N.D. Tibbits, M. Geen, Imperial College London

10:10 Microscopic Model of Organic Photovoltaic Cells,
Robin Kimber and Alison B Walker, Bath University

10:30 – 11.00 Coffee Break, Level 1 Café

11.00 – 12.30 **SESSION 4:**

Chair: Hari Reehal, London South Bank University

11:00 The Development of Photovoltaics in China, Invited
Prof. Liye Xiao, Prof W Wang, Chinese Academy of Sciences, Beijing, China

11.30 Optimisation of pulsed Solar Simulators for multi-technology PV Device Testing,
T.R. Betts, M.J. Parker, R. Gottschalg, Loughborough University

11.50 How accurate can PV energy yield simulations be ?
S. Ransome, PV Consultant

12:10 Optimised Inverter Sizing in the UK,
I. Balouktsis, J. Zhu, R. Bründlinger, T.R. Betts, R. Gottschalg, Loughborough University

12:30 – 13.30 Lunch, Level 1 Café

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Thursday 3rd April 2008

13.30 - 15.30 **POSTER SESSION**

Level 1 Café

Chair: Steve Ransome, PV Consultant

All delegates are invited to view and discuss the posters with the authors (see annex for details of poster papers)

15:30 – 16.00 Coffee Break, Level 1 Café

16.00 – 17.30 **SESSION5:**

Chair: Ralph Gottschalg, Loughborough University

16:00 The Global Status of Photovoltaics, Invited
Bernard McNelis and Sarah Davidson, IT Power

16.30 Photovoltaic-powered Water Treatment Systems for Disaster Relief and Developing Country Applications,
Bryce S. Richards, A.I. Schäfer, Heriot-Watt University

16.50 Technical and regulatory developments needed to foster grid-connected photovoltaic within the UK electricity sector,
Chiara Candelise, ICEPT, Imperial College London

17:10 Welsh Initiatives for the support of PV and other Microgeneration Technologies,
A Stafford, S.J.C. Irvine, Bangor University

19.00 **City of Bath, Civic Reception,**
Councillor Ian Dewey, Chairperson, Bath and North East Somerset Council
The Pump Room, Bath

20.00 **CONFERENCE DINNER AND AWARDS PRESENTATION,**
The Pump Room, Bath
Guest Speaker: Larry Kazmerski, National Center for Photovoltaics, USA

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Friday 4th April 2008

9.00 – 10.50	SESSION 6:
	Chair: Nicola Pearsall, Northumbria University
9:00	Quantum Concentrator Photovoltaics, Invited *Prof. Keith Barnham, Imperial College London*
9:30	Improving Spectral Response of mc-Si Cells via Luminescent Down-Shifting of the Incident Spectrum, *Efthymios Klampaftis and Bryce S. Richards, Heriot-Watt University*
9:50	Laser Grooved Buried Contact Concentrator Solar Cells, *K. C. Heasman, A. Cole, S. Roberts, S. Devonport and T. M. Bruton, NaREC*
10:10	Recombination at short circuit limiting the performance of ordinary dye sensitised cells, *Piers R. F. Barnes, Brian C. O'Regan, Assaf Anderson, Tracy Dos Santos, Sara Koops, Ana Morandeira, Virgine Vissac, Kate Walley and James R. Durrant, Imperial College London*
10.30	Optimised efficiency enhancement of silicon solar cells by highly-scattering metal nanoparticles, *Tristan Temple and Darren Bagnall, Southampton University*

10:50 – 11.20 Coffee Break, Level 1 Café

11.20 – 12.30	CLOSING SESSION
	Chair: Tim Bruton, NaREC
11:20	The Carbon Trust: Support for PV Development, *Richard Guy, Carbon Trust*
11:30	The European PV Technology Platform: an update on progress, *Nicola Pearsall, Northumbria University*
11:50	Solar Energy Society Remarks, *Tony Book, Chairperson, Solar Energy Society*
12:10	Conference Closing Remarks, *Tim Bruton, Conference Chair*

12:30 – 13.30 **SOLAR ENERGY SOCIETY**
34th Annual General Meeting
All members welcome

PVSAT-4 Programme

POSTER PAPERS

Poster Ref. No	Paper ReferenceNo	PaperTitle	Authors
P-01	PVSAT4_015	Wet chemical passivation methods for application in silicon solar cells	Lefteris Danos, Adib Ibrahim and Tomas Markvart, School of Engineering Sciences, University of Southampton
P-02	PVSAT4_020	Process Development of Coloured LGBC Solar Cells for BIPV Applications	S. Devenport, S. Roberts, K.C. Heasman, M.D. Brown, A. Cole, T.M. Bruton, New and Renewable Energy Centre (NaREC)
P-03	PVSAT4_021	Enhancement of minority carrier life time through back surface field formation in crystal silicon solar cells	Zhibin Zhou, Kevin Bass, Department of Electronic and Electrical Engineering, Loughborough University
P-04	PVSAT4_024	Photoconductive measurements of Laser Grooved Buried Contacts (LGBC) Silicon Solar cells	G.Claudio, ,Z.Zhou, K.Bass, Department of Electronic and Electrical Engineering, Loughborough University
P-05	PVSAT4_067	Poly-Si Films prepared by Aluminium Induced Crystallisation on TiN	G Ekanayake and H S Reehal, London South Bank University
P-06	PVSAT4_001	Structural and Electrical characterisation of CdS/CdTe devices with double layered CdS substrates	B.R. Wakeling, D.W. Lane, K.D. Rogers, Department of Materials and Applied Science, Cranfield University
P-07	PVSAT4_005	Towards thin film amorphous silicon micro-morph cells on flexible substrates	Owain D. Clark, Mike Thwaites, Darren Bagnall, Southampton University, Plasma Quest Ltd
P-08	PVSAT4_012	Quantum yield measurements of high-efficiency dyes for luminescent solar concentrators	Lindsay R Wilson, Bryce S. Richards. Heriot-Watt University, Anita C. Jones, Patricia R. Richardson, University of Edinburgh, Alex Cole NaREC, Ian Fraser, Neil Kirtley, Lesley Minto, Lucite International Ltd.
P-09	PVSAT4_025	A Rapid Screening Study of the Influence of Interfaces on CdTe/CdS Solar Cells	Mohammed Alturkestani, Ken Durose, Department of Physics, Durham University
P-10	PVSAT4_028	An investigation into the effects of gold nano-structured templates on CdS and CdTe layers deposited by MOCVD	R. L. Rowlands-Jones, S. J. C. Irvine, D. M. Bagnall and T. Temple, School of Chemistry, Bangor University
P-11	PVSAT4_032	Phase transformations in sputtered Cu(In,Al) metallic precursor layers	Guillaume Zoppi, Ian Forbes, Robert W. Miles, Vincent Barrioz, Stuart J. C. Irvine, Northumbria Photovoltaics Applications Centre, Northumbria University
P-12	PVSAT4_039	Effects of i-Layer Thickness on the Performance of a-Si:H Solar Cells	C. Monokroussos, R. Gottschalg and A.N. Tiwari, Centre for Renewable Energy Systems Technology, Loughborough University
P-13	PVSAT4_040	Preliminary investigations of molybdenum doped indium oxide films as transparent contacts for photovoltaic cells	S. Calnan, H.M. Upadhyaya and A.N. Tiwari, Centre for Renewable Energy Systems Technology, Loughborough University
P-14	PVSAT4_041	Enhanced photon capture by utilizing a CdZnS ternary alloy for the window layer in MOCVD grown CdS/CdTe solar cells	E. W. Jones, V.Barrioz, S.J.C Irvine, Y.Proskuryakov and J.D Major, School of Chemistry, University of Wales Bangor

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P-15	PVSAT4_044	Investigation of how the Chemical and Physical Properties of Thermally Evaporated SnS Vary With Source and Substrate Temperatures	Ogah Ogah, Guillaume Zoppi, Ian Forbes, Robert W. Miles, Northumbria Photovoltaics Applications Centre, Northumbria University
P-16	PVSAT4_045	Sputtered amorphous silicon solar cells with low hydrogen dilution suitable for deposition on low cost flexible substrates.	R. Kaur, P.A.B. James, A. S. Bahaj, J. Dutson, M. Thwaites, ol of Civil Engineering & Environment, University of Southampton
P-17	PVSAT4_052	Chemical incorporation of copper into indium selenide thin films	C. J. Hibberd, K. E. Ernits, M. Kaelin, A. N. Tiwari, Centre for Renewable Energy Systems Technology, Loughborough University
P-18	PVSAT4_004	Investigation of Near-Infrared emitting Lanthanide complexes in Luminescent Solar Concentrators	Brenda C. Rowan, Bryce S. Richards, School of Engineering and Physical Sciences, Heriot-Watt University
P-19	PVSAT4_008	Nanoimprinting for Antireflective Moth-Eye Surfaces	Stuart A. Boden and Darren M. Bagnall, School of Electronics and Computer Science, University of Southampton
P-20	PVSAT4_009	The Role of Disorder in Biomimetic Antireflective Moth-eye Surfaces	Petros I. Stavroulakis, Stuart A. Boden and Darren M. Bagnall, School of Electronics and Computer Science, University of Southampton
P-21	PVSAT4_014	The Chemical Potential of Fluorescent Light r	T.J.J. Meyer, T. Markvart, School of Engineering Sciences, University of Southampton
P-22	PVSAT4_016	Photosynthesis And Photovoltaic: A Comparative Study Of Conversion Processes	M.A. Ibrahim, T. Markvart and Dmitry Bavykin, School of Engineering Sciences, University of Southampton
P-23	PVSAT4_017	The role of fluorescent collector edge on the fluorescent solar collector performance	N. Soleimani, P. Kittidachachan, L. Danos, T.J.J. Meyer, and T. Markvart, School of Engineering Sciences, University of Southampton
P-24	PVSAT4_036	The Luminescent Concentrator: Thin Films and Large Area Modelling	R. Bose, D.J. Farrell, A.J. Chatten, A. Büchtemann and K.W.J. Barnham, Imperial College London
P-25	PVSAT4_037	Performance of single plate luminescent solar concentrators containing different luminescent species	M. Kennedy, S. J. McCormack, J. Doran, B. Norton, Dublin Institute of Technology, Ireland
P-26	PVSAT4_048	Understanding device performance: charge carrier density and decay lifetime in bulk heterojunction polymer/fullerene solar cells	Andrea Maurano, Chistopher Shuttle, Richard Hamilton, Brian O'Regan, James Durrant, Iain McCulloch and Steve Tierne, Department of Chemistry, Imperial College, London
P-27	PVSAT4_049	Efficiency of Tandem Quantum Well Solar Cells	Ben Browne, Andreas Ioannides, James Connolly, Keith Barnham, John Roberts, Robert Airey, Geoffrey Hill, Guy Smekens and Jose Van Begin Blackett Laboratory, Physics Department, Imperial College London
P-28	PVSAT4_055	Coupling of light to planar waveguides by metal nanoparticles	F. Djidjeli, D. M. Bagnall and S. A. Boden, School of Engineering Sciences, University of Southampton
P-29	PVSAT4_058	Developments of nanocrystalline TiO2 dye sensitised solar cells at CREST	Hari M.Upadhyaya, Jake W. Bowers, Sonya Calnan and Ayodhya N.Tiwari, Centre for Renewable Energy Systems Technology, Loughborough University
P-30	PVSAT4_063	Dye uptake in Dye-sensitised Photovoltaic Cells	Eric N Maluta and Alison B Walker, Department of Physics, University of Bath
P-31	PVSAT4_056	Modelling I/V characteristics of CdTe-modules	Hans Georg Beyer, Ralph Gottschalg, Gabi Friesen, Inst. of Electrical Engineering, University of Applied Sciences Magdeburg-Stendal (FH)

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POSTER PAPERS

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P-32	PVSAT4_050	Exporting electricity from Solar Photovoltaic Systems in England – Practices and Concerns	Saji Philip and Sean Cavendish, Solar World, Hampshire
P-33	PVSAT4_060	Phase Change Materials for Thermal Control of Building Integrated Photovoltaics: Characterisation and Experimental Evaluation	Hasan, A., McCormack, S. J., Huang, M. J. and Norton, B, Focas Institute, School of Physics, Dublin Institute of Technology
P-34	PVSAT4_065	Energy Yield Of Different Photovoltaic Systems installed In Cyprus	George Makrides, Bastian Zinsser, Matthew Norton, George E. Georghiou, Markus Schubert and Jürgen H. Werner, University of Cyprus
P-35	PVSAT4_003	Thermal Performance of a Fully Roof Integrated Photovoltaic System	L. Mei , D.G. Infield, R. Gottschalg, D.L. Loveday, D. Davies and M. Berry, Loughborough University
P-36	PVSAT4_018	Accuracy Assessment of Models Estimating Total Irradiance on Inclined Planes in Loughborough	J Zhu, T Betts, R. Gottschalg, Loughborough University
P-37	PVSAT4_023	Accelerated Testing of Performance of Thin Film Modules	P. Vorasayan, T.R. Betts, R. Gottschalg, A.N. Tiwari, Loughborough University
P-38	PVSAT4_031	Initial Solar Cell Characterisation Test And Comparison With A LED-Based Solar Simulator With Variable Flash Speed And Spectrum	M.Bliss*, T.R. Betts, R. Gottschalg, Loughborough University
P-39	PVSAT4_033	Effect Of Operating Conditions On Degradation Of Amorphous Silicon Solar Modules	K.S. Astawa, T.R. Betts, R. Gottschalg, Loughborough University
P-40	PVSAT4_034	Evaluation Of Proposed Photovoltaic Energy Rating Standard: Validation Against Outdoor Measurements	J.Roy, T.R. Betts, R. Gottschalg, Loughborough University
P-41	PVSAT4_043	Angular Irradiance Distribution from Broadband Irradiance Data	S.R. Williams, K. Hutchings, F. Cappai, T.R.Betts, R. Gottschalg, D.G. Infield, Loughborough University
P-42	PVSAT4_051	Performance Study of Solar Photovoltaic Systems Installed at Different Orientations at the same Location.	Saji Philip and Sean Cavendish, Solar World, Hampshire
P-43	PVSAT4_046	BIPV education initiative at the Mackintosh School of Architecture : Regeneration of the Bourdon Building	Masa Noguchi, Mackintosh School of Architecture, Glasgow School of Art

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EXHIBITION

Level 1 Café

PVSAT-4 EXHIBITORS

Asylum Research UK Ltd, Oxford

Bentham Instruments, Reading

Bruker Optics, Coventry

Carbon Trust, London

PV Crystalox Solar, Abingdon

EMV, Milton Keynes

IT Power, Basingstoke

NaREC, Blyth

OpTek, Abingdon