



The Solar Energy Society
and
PV-Net UK



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8th Photovoltaic Science, Applications and Technology
Conference C94

PVSAT-8

Northumbria University
Newcastle upon Tyne, England

2-4 April 2012

PROGRAMME

Sponsored and supported by



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IOP Institute of Physics
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Characterisation Group





PVSAT-8 Programme



Monday 2nd April 2012

11:00	OPENING SESSION	<i>Chair: Tim Bruton,</i>	<i>TMB Consulting</i>
11:00	Welcome – Prof Ian Postlethwaite Deputy Vice Chancellor Tim Bruton, Conference Chair Alex Cole, Programme Chair Nicola Pearsall, Local Host		Northumbria University TMB Consulting Narec Solar Northumbria University
11:30	Invited – Nigel Mason	Outlook for c-Si PV Cell Technologies	PV Consulting Ltd
12:00	Invited - Nicola Pearsall	Using Environmental Impact Analysis to Inform PV Development	Northumbria University
12:30 to 13:30	<i>Lunch</i>		
13:30 to 14:30	POSTER SESSION A	<i>Chair: Ian Forbes</i>	<i>Northumbria University</i>
	SESSION 1	<i>Chair: Ralph Gottschalg</i>	<i>Loughborough University</i>
14:30	Invited - Finlay Colville	The PV Industry in 2012: Market Growth & Technology Trends	Solarbuzz
15:00	H.M. Yates, P. Evans, D.W. Sheel, S. Nicolay, L. Ding, C.Ball	The Development of High Performance SnO ₂ :F as TCOs for Thin Film Silicon Solar Cells	Salford University
15:15	L.M. Brown, K. Drew, A. Cole and K. Heasman	Review of Narec's achievements within the EU Seventh Framework Programme ASPIS project	Narec Solar
15:30	C. J. M. Emmott, B. Azzopardi, N. Espinosa, R. Garcia- Valverde, A. Urbina, J. Mutale, F.C. Krebs and J. Nelson	Economic Assessment of Solar Electricity from Organic Photovoltaic Systems	Imperial College
15:45	<i>Coffee/Tea</i>		



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SESSION 2	<i>Chair: Darren Bagnall</i>	<i>Southampton University</i>	
16:30	Eric Don and Ian Forbes	The majority carrier electrical properties of selected thin film polycrystalline solar cell window and absorber layers determined by the method of four coefficients	Semimetrics / Northumbria University
16:45	Steve Ransome	The optimum way to predict and validate PV performance	SRCL
17:00	Giray Kartopu, Andy J. Clayton, Will Brooks, Simon Hodgson, Vincent Barrioz, Dan A Lamb and Stuart J.C. Irvine	Impact of Zn content in high efficiency CdZnS/CdTe thin film solar cells	Glyndŵr University

19.00	Welcome Reception, Northumbria University		
19.30	Dinner, Northumbria University		

Tuesday 3rd April 2012

SESSION 3	<i>Chair: Alex Cole</i>	<i>Narec Solar</i>	
09:00	Panel Discussion: D Bagnall, N Pearsall, S Irvine, N Cowern, R Gottschalg	The future of photovoltaic research in the UK – opportunities, challenges and goals	
09:30	Chiara Candelise, Robert Gross, Mark Winkler	Photovoltaic cost reductions: from experience curves to underlying technical dynamics	Imperial College
09:45	A. J. Clayton, S. L. Rugen-Hankey, W. S. M. Brooks, G. Kartopu, V. Barrioz, D. A. Lamb, S. D. Hodgson and S. J. C. Irvine	Optimisation of the MOCVD process to produce high efficiency Cd _{1-x} Zn _x S/CdTe PV cells	Glyndŵr University
10:00	Peter J. Holliman, Matthew Davies, Arthur Connell, Moneer Mohsen, Kareem Al-Salihi, Dhiyaa Al-Husenawi and Eurig Jones	Increasing light harvesting in dye sensitized solar cells	Bangor University
10:15	Holly Edwards, Jannik Giesekam, James Gooding, Rolf Crook and Philippa Hardy	Solar City Indicator: A methodology and ranking of the potential for PV in UK cities	Leeds University

10:30	<i>Coffee/Tea</i>		
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	SESSION 4	<i>Chair: Nigel Mason</i>	<i>PV Consulting Ltd</i>
11:00	Efthymios Klampaftis, David Ross, Sieghard Seyrling, Ayodhya N Tiwari and Bryce S Richards*	Impact of luminescent down-shifting EVA layers onto CIGS solar cells	Heriot-Watt University
11:15	T Betts and R Gottschalg	Energy Yield Prediction of Photovoltaic Modules based on Advanced Indoor Characterisation	Loughborough University
11:30	S. Chandra, J. Doran, S.J. McCormack, M. Kennedy, A.J.Chatten	A Study of Transportation Losses in Quantum Dot Solar Concentrator	Dublin Institute of Technology, Ireland
11:45	A. Asadollahbaik, S.A. Boden, S.J. Cox and D.M. Bagnall	Moth-eye antireflective surfaces: specular reflection as a function of angle of incidence and azimuth	University of Southampton
12:00	S. Ali, N. Pearsall and G. Putrus	Impact assessment of high penetrations of grid-connected photovoltaic (PV) system on the low voltage distribution network	Northumbria University
12.15	R. E. Treharne, K. Hutchings, D. A. Lamb, S. J. C. Irvine, D. Lane, K. Durose	Combinatorial optimisation of Al doped ZnO films for thin-film PV	Liverpool University
12:30 to 13:30	<i>Lunch</i>		
13:30 to 14:30	POSTER SESSION B	<i>Chair: Dharme Dharmadasa</i>	<i>Sheffield Hallam University</i>
	SESSION 5	<i>Chair: Rolf Crook</i>	<i>Leeds University</i>
14:30	Invited - Tom Tibbits	Cost and efficiency – where do multijunction cells fit into the commoditised silicon market?	JDSU
15:00	H. Qasem T.R. Betts and R. Gottschalg	Long Term Modelling of the Effect of Dust on Photovoltaic Modules	Loughborough University
15:15	K. Drew, L.M. Brown, A. Cole D.J. Morrison and K. Heasman	A simple approach to experimentally investigate solar cell recombination with illumination intensity	Narec Solar
15:30	Steve Reynolds and Vlad Smirnov	Modelling compositional dependence of microcrystalline silicon solar cell parameters	University of Dundee
15:45	<i>Coffee/Tea</i>		



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SESSION 6		<i>Chair: Steve Ransome</i>	<i>SRCL</i>
16:30	Tim Bruton and Nigel Mason	The potential for PV in the UK	TMB Consulting
17.00	Tony Book	FiTs , Starts and Stops	Riomay
17.15	Adam Sharpe, Philip Eames, Ralph Gottschalg	Estimating the Direct Normal Irradiance Available to a Solar Cell as Part of a Realistic Concentrator Photovoltaic System	Loughborough University

19.15	Drinks Reception		
20.00	PVSAT-8 CONFERENCE DINNER AND AWARDS PRESENTATION The Assembly Rooms, Fenkle Street, Newcastle upon Tyne, NE1 5XU		

Wednesday 4th April 2012

SESSION 7		<i>Chair: Stuart Irvine</i>	<i>Glyndŵr University</i>
09:00	Invited - Henry Snaith	Progress in Dye Sensitised Solar Cells	Oxford University
09:30	C P Jones	Photovoltaic manufacturing – the challenges associated with waste gases.	Edwards Ltd
09:45	F.Al-Saab, B. Gholipour, C.C. Huang, D.W. Hewak, A Anastasopoulos and B Hayden	Crystallization Study of the $\text{Cu}_2\text{ZnSnS}_4$ Chalcogenide Material for Solar Applications	University of Southampton
10:00	The Solar Energy Society (UK-ISES) 37th Annual General Meeting		
10:30	<i>Coffee/Tea</i>		



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SESSION 8		<i>Chair: Nicola Pearsall</i>	<i>Northumbria University</i>
11:00	Invited - Nick Cowern	Technology Computer-Aided Design for enhancement of photovoltaic solar cells	Newcastle University
11:30	Foteini Plyta, Blagovest V. Mihaylov, Thomas R. Betts and Ralph Gottschalg	Optical Design of a LED Solar Simulator and Survey on its Performance Characterisation Capability	Loughborough University
11:45	D.M. Bagnall, M. Banakar, S.A. Boden, T.L. Temple, D.N.R. Payne, R.S.A. Sesuraj, A. Asadollahbaik and M.A. Rind	Review of anti-reflection and light-trapping schemes for thin film photovoltaics	University of Southampton
12:00	P.A. Nwofe, K.T. Ramakrishina Reddy, J.K. Tan, I. Forbes, M. Leach, D.Y. Jang and R.W Miles	Investigating the Potential of SnS for use in Photovoltaic Solar Cell Applications'	Northumbria University
12:15	Closing remarks	Tim Bruton	TMB Consulting

12:30	
to	<i>Lunch</i>
13:30	

13.30 – 16.00	TECHNICAL TOUR – NAREC SOLAR – Delegates must pre-register
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9th Photovoltaic Science, Applications and Technology Conference
PVSAT-9
SPECIFIC, University of Swansea, Wales, 10-12 April 2013



PVSAT-8 Poster Papers



Poster Session A: Monday 2nd April 13.30 – 14.30

Poster Ref. No	Paper Reference No	PaperTitle	Authors
D1-1	PVSAT-8_027	Study of Crystallographic Properties and Elemental Migration in two-stage prepared Cu(In,Al)Se ₂	Rémi Aninat, Guillaume Zoppi, Patrick Chapon, Robert Miles and Ian Forbes
D1-2	PVSAT-8_036	Optimisation of TCO/CdS Thin Film Stacks for use in CdTe Solar Cells	B Maniscalco, F Lisco, P Isherwood, A Abbas, P M Kaminski, G Claudio and J M Walls
D1-3	PVSAT-8_053	Thin Film Amorphous Silicon Solar Cells on Different Textured Transparent Conducting Oxides	M.A. Rind, D.N.R. Payne and D.M. Bagnall
D1-4	PVSAT-8_054	Silicon nanowires by self-organised reactive ion etching	M. Banakar, S. Aghdaei, S. A. Boden, I. Sari and D.M. Bagnall
D1-5	PVSAT-8_014	Optical losses in thin film DSC/CdTe tandem solar cells	Vincent Barrioz, Peter Holliman, Andrew J Clayton, Arthur Connell, Stuart J.C. Irvine, Matthew L. Davies, Simon Hodgson
D1-6	PVSAT-8_026	Increased Efficiency in CdS/CdTe Photovoltaics Utilising a Semiconductor Quantum Dot based Luminescent Down-Shifting Layer	S.D. Hodgson, V. Barrioz, W. S. M. Brooks, A. J. Clayton, G. Kartopu, D.A. Lamb, S.J.C. Irvine
D1-7	PVSAT-8_009	Abatement of process gases and by-products from industrial solar processes	F Gray
D1-8	PVSAT-8_023	Overcoming artefacts during spectral response measurement of III-V triple junction cells	Vincent Barrioz, James Hammond, Stuart J. C. Irvine, Austen Hearn
D1-9	PVSAT-8_028	Evaluation of Laser Scribed Thin Film Cadmium Telluride Devices for Module Development	S.L. Rugen-Hankey, V. Barrioz, A. Maertens, A. J. Clayton, G. Kartopu, S.J.C. Irvine, C. White, G. Rutterford, G. Foster-Turner
D1-10	PVSAT-8_029	The deposition of p-type layers on n-type silicon nanowires grown on glass substrates	J. Ball and H.S.Reehal
D1-11	PVSAT-8_001	Electrical Properties of Au-Cd _{1-x} Zn _x Se Solar Cells with x = 0.47 and x = 0.54	A A Al-Bassam and U A Elani
D1-12	PVSAT-8_030	Characterisation of Photovoltaic Materials by plasma profiling techniques: GD-OES and PP-TOFMS	A.Tempez, C. Olivero, P. Chapon, J. Cooper, D. Sheppard



PVSAT-8 Poster Papers



Poster Session B: Tuesday 3rd April 13.30 – 14.30

Poster Ref. No	Paper Reference No	PaperTitle	Authors
D2-1	PVSAT-8_043	Cu-Sb Based Library for Solar Cell Absorber Material Identification	Pietro Maiello, Guillaume Zoppi, Kyle Hutchings, Scilla Roncallo and Ian Forbes
D2-2	PVSAT-8_051	Plane restricted illumination profiles – ray tracing an extended light source through optical systems with variable misalignment parameters	I.R. Cole, R. Gottschalg
D2-3	PVSAT-8_008	Characterization of Luminescent Down-Shifting Materials and Applications for PV Devices	H. Ahmed, M. Kennedy, J. Doran, S. J. McCormack, M. Della Pirriera,, D. Gutiérrez-Tauste and L. Aubouy
D2-4	PVSAT-8_013	A silicone host for lumogen dyes	D A Hardy, A Kerrouche, S C Roaf, B S Richards
D2-5	PVSAT-8_033	A Low Cost Luminescent Solar Concentrator	Neil S. Beattie, Themis Themistokleous, Guillaume Zoppi, Ian Forbes and Robert Miles
D2-6	PVSAT-8_050	Uncertainty Analysis of Solar Photovoltaic Energy Yield Prediction	B. Goss, T.R Betts, R. Gottschalg
D2-7	PVSAT-8_057	PolyGlass, a collaborative project to develop novel primary optics for concentrated photovoltaic systems	C Vacogne
D2-8	PVSAT-8_020	Factors influencing the Short-circuit Current of a Tandem Photovoltaic device	Ira Devi Sara, T.R. Betts, R. Gottschalg
D2-9	PVSAT-8_022	Development of a virtual pyranometer for performance monitoring of PV systems	P A Burgess, M M Vahdati, E A Essah, S K Philip, D Davies
D2-10	PVSAT-8_058	Comparing the UK's installed solar capacity with expectation	Alastair Buckley, Giuseppe Colantuon, Aldous Everard, Lisa Hall
D2-11	PVSAT-8_060	PV module degradation mechanisms under different environmental stress factors	Dan Wu, Jiang Zhu, Thomas R. Betts, Ralph Gottschalg
D2-12	PVSAT-8_040	The status and prospects of Thin Film PV as emerging technology systems	Chiara Candelise, Mark Winskel, Evangelos Gazis, Robert Gross
D2-13	PVSAT-8_002	X-ray analysis and band gap measurement of polycrystalline of $\text{CuIn}_{1-x}\text{Ga}_x\text{Se}_2$ films	A A Al-Bassam and U A Elani
D2-14	PVSAT-8_061	Spectrally Tunable Plasmonic Light Trap for Thin Film Si Solar Cells	Rufina S.A. Sesuraj, Tristan L. Temple, Darren M. Bagnall



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