



The Solar Energy Society

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11th Photovoltaic Science, Applications and Technology Conference C97

PVSAT-11

University of Leeds
Conference Auditorium and The Edge Exhibition Centre
Leeds, UK

Wednesday 15th April – Friday 17th April 2015

PROGRAMME

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PVSAT-11 Programme

Wednesday 15th April 2015

Conference Auditorium

Opening Session Chair: Nigel Mason, PV Consulting Ltd

11:00 – 12:30

Time	Session No.	Talk	Speaker	Title	Affiliation
11:00	0.1	Welcome	William Gale Nigel Mason Alex Cole	University of Leeds Welcome Conference Chair Welcome Program Chair Welcome	Professor, Director, Energy Research Institute PV Consulting PolyPhotonix
11:30	0.2	Invited	Rolf Crook	Stochastic generation of minutely irradiance time series derived from hourly weather observation data	University of Leeds
12:00	0.3	Invited	John Wohlgemuth	Improving PV Reliability and Durability	NREL, USA

**Lunch, Sports Hall 2, The Edge
12:30 – 13:30**

**Poster Session A Chair: Alex Cole, PolyPhotonix Limited
Sports Hall 2, The Edge 13:30 – 14:30**

**Session 1 Chair: Nicola Pearsall, Northumbria University
14:30-16:00**

Time	Session No.	Talk	Speaker	Title	Affiliation
14:30	1.1	Invited	Pierre Verlinden	High-performance Crystalline Silicon PV Modules for Large Volume Production	Trina Solar
15:00	1.2	PVSAT_37	T. Wilson	Addressing Reflectivity Losses in Multi-Junction Solar Cells to Achieve 50% Power Conversion Efficiency	Imperial College
15:15	1.3	PVSAT_15	K. Hooper	Spiro free perovskite devices with a transparent conducting electrode	Swansea University
15:30	1.4	Sponsors and Exhibitors	Various	Presentations	Various

**Coffee/Tea Break, Sports Hall 2, The Edge
16:00 – 16:45**



PVSAT-11 Programme

Session 2 Chair: Dharme Dharmadasa, Sheffield Hallam University

16:45 – 18:00

Time	Session No.	Talk	Speaker	Title	Affiliation
16:45	2.1	PVSAT_25	B. Mihaylov	Uncertainty in Module Energy Rating	Loughborough University
17:00	2.2	PVSAT_44	L. Micheli	500× CPV receiver with integrated micro-finned heat sink	Exeter University
17:15	2.3	PVSAT_38	J. Zhu	Failures of PV Module Packaging under Stressed Condition during Accelerated Lifetime Test	Loughborough University
17:30	2.4	PVSAT_6	A. Clayton	A new approach to SnS thin film PV using MOCVD	Glyndwr University
17:45	2.5	PVSAT_12	R. Hatton	Ultra-thin metal films: An alternative to transparent conducting oxide and metal grid electrodes for emerging photovoltaic technologies?	Warwick University

**No conference activities scheduled
18:00 – 19:00**

**Welcome Reception and Dinner
Leeds University Union Refectory 19:00**



PVSAT-11 Programme

Thursday 16th April 2015

Conference Auditorium

Session 3 Chair: Trystan Watson, Swansea University

9:00-10:30

Time	Session No.	Talk	Speaker	Title	Affiliation
9:00	3.1	Invited	Tom Tibbits	New efficiency frontiers with wafer-bonded multi-junction solar cells	Fraunhofer ISE
9:30	3.2	PVSAT_21	G.Koutsourakis	Towards Current Mapping of Photovoltaic devices by Compressed Imaging	Loughborough University
9:45	3.3	PVSAT_8	G. Eperon	Efficient, Semi-Transparent Neutral-Coloured Solar Cells Based on Microstructured Formamidinium Lead Trihalide Perovskite	Oxford University
10:00	3.4	PVSAT_46	N.Pearsall	Economic Potential of the Domestic PV Market in India and the Current Status	Northumbria University
10:15	3.5	PVSAT_20	E.Koubli	Replenishing Deficient Datasets in PV System Monitoring	Loughborough University

**Coffee/Tea Break, Sports Hall 2, The Edge
10:30 – 11:00**

Session 4 Chair: Peter Holliman, Bangor University

11:00 – 12:15

Time	Session No.	Talk	Speaker	Title	Affiliation
11:00	4.1	Invited	Jon Major	Low cost, non-toxic chloride activation treatments for thin film CdTe solar cells	Liverpool University
11:30	4.2	PVSAT_30	D. Palmer	Assessment of Potential for Photovoltaic Roof Installations by Extraction of Roof Slope from Lidar Data and Aggregation to Census Geography	Loughborough University
11:45	4.3	PVSAT_17	J. Asirvatham	Delta doping and positioning effects of type II GaSb quantum dots on GaAs solar cell performance	Lancaster University
12:00	4.5	PVSAT_9	M. Gona	Pulsed DC and RF Magnetron Sputtered Aluminium-doped Zinc Oxides for Thin Film Solar Cell Applications	Loughborough University



PVSAT-11 Programme

**Lunch, Sports Hall 2, The Edge
12:15 – 13:30**

**Poster Session B Chair Michael Hutchins, The Solar Energy Society
Sports Hall 2, The Edge 13:30 – 14:30**

**Session 5 Chair: Ken Durose, University of Liverpool
14:30 – 16:00**

Time	Session No.	Talk	Speaker	Title	Affiliation
14:30	5.1	Invited	James Durrant	Challenges and opportunities in organic solar cells	Imperial College London
15:00	5.2	PVSAT_07	D. Dharmadasa	Next Generation Solar Cells Based on Graded Bandgap Devices Utilising Rod-Type Electroplated Nano-Materials	Sheffield Hallam University
15:15	5.3	PVSAT_26	A. Nawabjan	Development of Epitaxial Interdigitated Back Contact (IBC) Solar Cell as a Test Platform for Novel Antireflection and Light-trapping Schemes	Southampton University
15:30	5.4	PVSAT_41	A. Hassan	Development and Testing of a Novel Type of Photovoltaic Thermal System Employing Phase Change Materials	UAE University
15:45	5.5	PVSAT_16	S. Irvine	The potential for further reduction in the embodied carbon in PV solar energy systems	Glyndwr University

**Coffee/Tea Break, Sports Hall 2, The Edge
16:00 – 17:00**



PVSAT-11 Programme

Session 6 Chair: Rolf Crook, University of Leeds
17:00 – 18:00

Time	Session No.	Talk	Speaker	Title	Affiliation
17:00	6.1	PVSAT_19	G. Kartopu	Comparative study of conventional vs. one-step-interconnected (OSI) monolithic CdTe modules	Glyndwr University
17:15	6.2	PVSAT_48	X. Wu	Effects of lateral resistances in photovoltaic cells and full 2-D parameter extraction for the spatially-resolved models using electroluminescence images	Loughborough University
17:30	6.3	PVSAT_13	A. Connell	Surface engineering in dye-sensitized solar cells	Bangor University
17:45	6.4	PVSAT_45	T. Mallick	Four-axis test platform to emulate solar azimuth and elevation for accurate measurement of PV devices	Exeter University

No conference activities scheduled
18:00 – 19:00

Drinks Reception
Great Hall 19:00 – 20:00

PVSAT-11 Conference Dinner and Awards Presentation
Great Hall 20:00



PVSAT-11 Programme

Friday 17th April 2015

**Conference Auditorium
Session 7 Chair: Stuart Irvine, Glyndwr University
9:00-10:30**

Time	Session No.	Talk	Speaker	Title	Affiliation
9:00	7.1	Invited	Raymond Knappen	Equipment for roll-to-roll, special atomic layer deposition of CIGS buffer layers	VDL FLOW
9:30	7.2	PVSAT_47	P. Westacott	Assessing the electricity generation and grid feed-in of PV deployment within the UK	Imperial College London
9:45	7.3	PVSAT_35	J. Taylor	Monitoring thousands of distributed PV systems in the UK: Energy production and performance	University of Sheffield
10:00	7.4	PVSAT_33	S. Ransome	Comparing PV models for different technologies with outdoor IV data	SRCL
10:15	8.3	PVSAT_23	P. Leicester	Evaluating self-consumption for domestic solar PV: simulation using highly resolved generation and demand data for varying occupant archetypes	Loughborough University

**Coffee/Tea Break, Sports Hall 2, The Edge
10:30 – 11:00**



PVSAT-11 Programme

Session 8 Chair: Steve Ransome, Steve Ransome Consulting Limited 11:00 – 12:45

Time	Session No.	Talk	Speaker	Title	Affiliation
11:00	8.1	Invited	Matthias Kauer	Battery storage for residential PV systems	SHARP Laboratories of Europe
11:30	8.2	PVSAT_24	N. Mason	Solar PV Yield and Electricity Generation in the UK	PV Consulting Limited
11:45	8.4	PVSAT_10	J. Gooding	Solar Resource Estimation using an Integrated Radiance Model with LiDAR Defined Geometries and Shading	University of Leeds
12:00	8.5	PVSAT_02	H. Al Husna	Spectral Response Measurements of Photovoltaic Devices using a Pulsed Source Solar Simulator	Loughborough University
12:15	8.6	PVSAT_14	P. Holliman	DMF and water - approaches to avoid solvent limitations in perovskite solar cells	Bangor University
12.30			N Mason	Chair's Closing Remarks	

**Lunch, Sports Hall 2, The Edge
12:45**

CONFERENCE CLOSE



PVSAT-11 Poster Papers

Poster Session A: Wednesday 15th April 13.30 – 14.30 **Chair: Alex Cole, PolyPhotonix Limited**

Poster Ref. No	Paper Reference No	Paper Title	Authors
D1-1	PVSAT-11_031	On the Mechanism of Chloride Activation of CdTe Solar Cells	A. Pressman, H. Bayhan, M. Bayhan, J.D.Major and K. Durose
D1-2	PVSAT-11_028	Electrodeposition of Fluorine Doped Cadmium Telluride for Application in Photovoltaic Device Fabrication	A. A. Ojo and I. M. Dharmadasa
D1-3	PVSAT-11_022	Environmental and Mechanical Testing of CdTe on Ultra-thin Cerium-doped Cover Glass for Large Area Extraterrestrial Solar Arrays	D. A. Lamb, S. J. C. Irvine, A. J. Clayton, V. Barrioz, G. Kartopu, M. A. Baker, C. I. Underwood, R. Grilli, R.Kimber, J. Hall
D1-4	PVSAT-11_042	A study of the phase boundaries of the CuS-Bi system for application to thin film photovoltaic cells	Robert McCracken, Mike Edwards, David Lane
D1-5	PVSAT-11_050	Detection and identification of vacancy-related point defects in photovoltaic materials	Mohamed R.M. Elsharkawy, Gurmeet S. Kanda, Esam E. Abel-Hady, Werner Egger and David J. Keeble
D1-6	PVSAT-11_051	Earth Abundant Thin Film CZTSSe Produced From Ball Milled Precursor Materia	G. Ming and I. Forbes
D1-7	PVSAT-11_036	Quantifying PV fleet output variability in the UK: consequences for Distribution Network Operators	Jamie Taylor, Jonathan Leloux
D1-8	PVSAT-11_003	Module Scale Electroluminescence on PV devices: Measurements and Image Quality	K. Bedrich, M. Bliss, T.R. Betts, R. Gottschalg
D1-9	PVSAT-11_054	CVD-grown Tin Sulphide for Thin Film Solar Cell Devices	Ghadah AlZaidy, Chung-Che Haung and Daniel W. Hewak



PVSAT-11 Poster Papers

Poster Session B: Thursday 16th April 13.30 – 14.30

Chair: Michael Hutchins, The Solar Energy Society

Poster Ref. No	Paper Reference No	Paper Title	Authors
D2-1	PVSAT-11_049	The Conjugate Reflective-Refractive Homogeniser in a 500x Cassegrain Concentrator: Design and limits	Katie Shanks, Hasan Baig, Tapas K Mallick
D2-2	PVSAT-11_001	Electrodeposition of CdTe thin films using chloride precursor for the application in solar cells	N. A. Abdul-Manaf, H.I. Salim, M. L. Madugu and I.M. Dharmadasa
D2-3	PVSAT-11_029	Growth of n- and p-type ZnTe Semiconductors by Intrinsic Doping	O.I. Olusola, M.L. Madugu and I.M. Dharmadasa
D2-4	PVSAT-11_012	Ultra-thin metal films: An alternative to transparent conducting oxide and metal grid electrodes for emerging photovoltaic technologies?	Ross Hatton, Oliver Hutter, Martin Tyler
D2-5	PVSAT-11_018	Plasmonic effects of random orientation silver nanowire meshes deposited onto crystalline silicon solar cells	Ross Jarrett, Hiroyuki Kanda, Norihisa Harano, Takuma Noguchi, Rolf Crook, Seigo Ito
D2-6	PVSAT-11_034	Cathodic electrodeposition of CdS thin films from thiourea precursor for solar cell applications	H.I. Salim and I.M. Dharmadasa
D2-7	PVSAT-11_032	Exploring the development of Solar Businesses - in the ways that are economically, socially and environmentally viable while helping to meet the energy needs of society and reducing the CO2 emission	Vivien Shao Yuan Fu
D2-8	PVSAT-11_052	Unsteady Optical and Thermal Behaviour of Crossed Compound Parabolic Concentrator with Solar Cell	Wenguang Li, Manosh C Paul, Nazmi Sellami, Tapas K Mallick, Andrew R. Knox
D2-9	PVSAT-11_053	Optimisation of the fabrication methodology in 2-Step interdiffusion based Perovskite Solar Cells	V Stoichkov and J Kettle



PVSAT-11 Programme Overview

Conference Timeline

	9	10	11	12	13	14	15	16	17	18	19	20	21
Wednesday				Opening Session	Lunch	Poster Session A	Session 1	Coffee	Session 2			Welcome Reception and Dinner	
Thursday	Session 3	Coffee	Session 4	Lunch	Poster Session B	Session 5	Coffee	Session 6			Drinks Reception	Conference Dinner	
Friday	Session 7	Coffee	Session 8	Lunch and Close									
	9	10	11	12	13	14	15	16	17	18	19	20	21



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....Next Year....

PVSAT-12

University of Liverpool
April 2016

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