

31st International Photovoltaic Science and Engineering Conference (PVSEC-31)
MONDAY 13 December 2021 - WEDNESDAY 15 December 2021

As at 22 November 2021

Monday, 13 December 2021

AEDT				
	<i>Welcome</i>			
11:00	Photovoltaics: Where have we come from and where are we heading? Martin Green Malcolm Turnbull			
12:00	263: High efficiency perovskite/silicon tandems for electricity and hydrogen Kylie Catchpole			
12:30	236: The Future of Inorganic Thin Film PV Gang Xiong			
13:00-13:15	ACEx Sponsored Industry Session Key materials for the production of solution-processed perovskite solar cells at scale Anthony Chesman			
13:00	Lunch Break			
14:00	246: Efforts to expand the applications of III-V ultra-high efficiency solar cells from space to the ground Tatsuya Takamoto			
14:30	248: Integrated Molecular and Process Engineering for Highly Efficient Organic Photovoltaics with Suppressed Recombination Loss Alex Jen			
15:00	A1 Silicon: Passivated contacts (1) 14:00 16:00	A2 Inorganic thin-film 15:00 16:00	A2 CIGS Solar cells 15:00 16:00	A5 Perovskite materials & solar cells 15:00 16:00
15:00	238: Cell design to minimise disruption of technology and investments on the way beyond PERC Pietro Altermatt	241: Wide bandgap sulphide chalcopyrite Chang Yan	242: Present status of molecular ink-based solution processing routes for Cu(In,Ga)(S,Se) ₂ solar cell absorbers Sunil Suresh	256: Efficient, stable and scalable all-perovskite tandem solar cells Hairen Tan
15:20	184: How to understand and improve the gettering effectiveness of polysilicon/oxide passivating contact structures Anyao Liu	26: Vacuum-deposited Cu ₂ BaGe _{1-x} SnxSe ₄ films and solar cells Yongshin Kim	164: Optimization of Absorber/Back-contact Interface in Flexible and Bifacial Cu(In,Ga)Se ₂ Thin-film Solar Cells Abdurashid Mavlonov	39: Tuning perovskite composition for high-performance, stable semi-transparent perovskite solar cells Jacek Jasieniak
15:35	103: Detailed electrical and optical loss-analyses of a 24.8% n-type silicon large-area screen-printed solar cell with phosphorus doped passivating contact. Er-Chien Wang	165: Facile synthesis of CuO-NiO-MAX nanocomposite for enhanced photocatalytic hydrogen evolution Karthik Kannan	217: Influences of Al ₂ O ₃ passivation layers on the property of CIGS solar cells Yukiko Kamikawa	48: Perovskite/Graphene Solar Cells without a Hole-Transport Layer Ryousuke Ishikawa
15:50	94: Spin-on doping for poly-Si passivating contacts Josua Stuckelberger	74: Mechanism of atomic hydrogen passivation for optical properties improvement of As-doped BaSi ₂ films Sho Aonuki	Afternoon Break	49: Homologous bromides treatment for improving the open-circuit voltage of perovskite solar cells Yong Li
16:05	Afternoon Break	Afternoon Break		Afternoon Break
16:30	A1 Silicon: Defect engineering for passivating contact and heterojunction solar cells 16:30 18:00	A2 CIGS solar cells: 16:30 18:15	A3 III-V, Space & Concentrator PV 16:30 18:10	A5 Perovskite cells & modules 16:30 17:50
16:30	29: New insights into the Gettering and Passivation observed in doped Poly-Silicon/Oxide Passivating contacts in Silicon-Photovoltaics via Atom Probe Tomography Apurv Yadav	255: Passivation and Light management, the needed boost in ultrathin Cu(In,Ga)Se ₂ technology Salome Pedro	253: III-V Compound Semiconductor Nanowire Solar Cells Ziyuan Li	70: Contactless and spatially-resolved determination of current-voltage curves in perovskite solar cells Anh Bui
16:45				110: Correlative imaging of optical properties for perovskite materials in single-junction and tandem solar cells Khoa Dang Nhat Nguyen
16:50	67: Fluorine and hydrogen passivation of p- and n- type polysilicon passivating contacts Hang Cheong Sio	46: Printed Metallization Increases Power Output of CIGS Modules Katharina Gensowski	171: Thermal study of voids under packaged concentrator solar cells Anastasia Soeriyadi	111: Benefits of Photo-thermal Deflection Spectroscopy (PDS) for Characterisation of Photovoltaic Materials Henner Kampwerth
17:00				152: Accurate quantification of photon recycling in highly luminescent perovskite thin films reveals the internal luminescence quantum efficiency and establishes a new benchmark at 78% Paul Fassi
17:05	71: Firing response of phosphorus doped polysilicon passivating contacts for high efficiency silicon solar cells Di Kang	109: Analysis of grain boundary and CdS/Cu(In,Ga)Se ₂ interface by using EBIC measurements Ryotaro Fukuda	20: Effectively transparent contacts for elimination of shading losses in concentrator solar cells Stefan Tabernig	156: Bichromatic light source for advanced subcell-dependent analysis in tandem solar cells Marko Topic
17:15				
17:20	168: Gallium and Boron Doped Silicon Heterojunction Solar Cells Bruno Vicari Stefani	116: Investigation of the CdS/RISe/CIGSe Interface Structure by Hard X-ray Photoelectron Spectroscopy Jakob Bombsch	27: High Efficiency InP solar cells: Revisiting Hydrogen plasma treatment Bikesh Gupta	
17:30				
17:35	31: Effect of hydrogenation process on passivation performance of silicon nanocrystal/silicon oxide compound layer Masashi Matsumi	120: Development of alkali fluoride-treatment strategies for Cu(In,Ga)(S,Se) ₂ thin-films grown under atmospheric pressure Pablo Reyes-Figueroa	105: Outdoor evaluation of plastic-integrated concentrating photovoltaic module with 1-eV- bottom subcell triple-junction solar cell Taichi Uno	
17:45				
17:50	210: High-intensity illuminated annealing for silicon heterojunction solar cells Matthew Wright		245: Nanophotonics for ultra-thin III-V photovoltaics Louise Hirst	
18:05	93: Bulk Defects and Hydrogenation Kinetics in Fired Passivating Contacts (FPC) Franz-Josef Haug			
18:10				

Kesterite Workshop 15:00 22:00

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Tuesday, 14 December 2021					
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10:15	Early Bird Quiz				
10:45	Break				
11:00	234: X-factors that might determine how perovskite solar cells are deployed Michael McGehee				
11:30	237: Taking Charge of Upconversion: Mechanistic Insights into Perovskite-Sensitized Triplet-Triplet Annihilation Lea Neihaus				
12:00	100% Renewable Energy Session				
13:00	Lunch Break				
14:00	A1 Silicon Tandems: 14:00 16:05	A2 Inorganic thin-film 14:00 16:00	A6 New Materials & Discovery: 14:00 16:05	A7 Module Characterisation: 14:00 16:05	A8 PV modules & systems: 14:00 15:20 & A10 PV development, industry, market & policy 15:20 16:10
14:00	18: 27% efficient monolithic perovskite/c-Si tandem featuring commercial TOPCon bottom cell Yiliang Wu	244: Parsing voltage losses in polycrystalline CdSeTe solar cells Arthur Onno	257: Autonomous and Fully Automated High-throughput Materials Discovery Platform Adam Surmiak	278: Precise and Reliable Performance Characterization of Novel Photovoltaic Devices Masahiro Yoshita	259: Building Integrated PV: Application Status and Pathways in Australia Rebecca Yang
14:15	138: Improving the performance of the silicon bottom cell in epitaxial III-V/Si tandem solar cells Stephen Bremner	126: Screening the Recombination Active Defect in High-Efficiency Thin-film Solar Cell Using Multi-Platform Electron Microscopy based Characterization Jialiang Huang	47: Bayesian optimization of hydrogen plasma treatment for reducing defects in silicon quantum dot multilayers Fuga Kumagai	35: Recent Advances in Outdoor PL Imaging at UNSW Oliver Kunz	30: Optimization Method of Installation Distance of Bifacial PV Modules Considering Cost, Shadow and Cluster Yuki Sado
14:30	224: The Pathway for Solution-less Photovoltaics Optimisation: combining PERC and Perovskites for an industrially relevant tandem cell Gregory Wilson	173: Defect-resolved effective majority carrier mobility in highly anisotropic antimony chalcogenide thin-film solar cells Jianjun Li	34: Sputtering Zn-1-xGe-xO thin films towards n+-AZO/p-BaSi2 heterojunction solar cells Yudai Yamashita	129: PV string fault detection by using density of module operation points for Large-scale PV power plant Kaori Tanina	130: Reducing greenhouse gas emissions by recycling end-of-life photovoltaic panels Rong Deng
14:45	216: Techno-economic analysis of 2-junction and 3-junction Silicon Perovskite tandem cells Nathan Chang	135: Development of modulated surface texturing for high-efficiency, thin-film, flexible, silicon-based tandem solar cells Gianluca Limodio	144: Quasi-1D (Sb,Bi)2Se3 thin films for band-gap tuning in photovoltaic applications Ivan Caño Prades	190: A Study on Continuous Monitoring and Fault Detection of Photovoltaic Modules Yuta Okamura	153: Impact of Bifacial PV Module Shading and Mismatch on Yearly Energy Yield Simulations Javier Guerrero
14:50	155: Building blocks for scalable large-area Pk/Si tandem solar cells Hariharsudan Sivaramakrishnan Radhakrishnan	213: Effect of H2S concentration for Cu2SnS3 thin films Yoji Akaki	209: Defect Energy Levels of Doped ZnO: A Hybrid DFT Study Md. Anower Hossain	175: Investigation of Thermal Induced Stress in Silicon PV Modules Interconnected with Multi Busbar Interconnection by Finite Element Modelling Zhimeng Wang	231: Anti-reflection coating on solar glass Ning Song
15:05	89: Investigation of the contaminants from molecular beam epitaxy growth chamber for III-V/Si tandem solar cells Chuiqi Yi, Zhuangyi Zhou	80: Amorphous Mg-doped ZnO Films to Enhance Electronic Properties and Efficiency of CZTS Solar Cells: A First-principles Modelling and Experimental Study Md. Anower Hossain	146: Spray Technology for Flash and Controlled Infiltration of Active Materials in Solar Cells Tuija Bhavani Korukonda	131: Estimation of Individual Solar Cell Electrical Performance Parameters using Statistical Analysis of Electroluminescence Images for Silicon Photovoltaic Modules Amit Singh Rajput, Li Wan, Mauro Pravettoni	56: An Australian DER Bill of Rights Niraj Lal
15:10	133: Energy Yield Modelling of Perovskite/Si Tandem Photovoltaics Ulrich Paetzold	139: Impact of substrate temperature on bandgap in ZnSnP2 thin films by MBE Taro Kuwano	169: Comparative study on effect of shell materials like TiO2, NiO and ZnS coated on CdS core for superior photocatalytic H2 efficiency under visible light irradiation V. Navakoteswara Rao	55: A Novel Indoor Approach for the Measure of the Incident Angle Modifier at the Module Level Muhd Nabil Abdul Aziz, Mauro Pravettoni	14: Solar Building Envelope Potentials in Urban Environment Hongying Zhao
15:40	Afternoon Break	Afternoon Break	Afternoon Break	Afternoon Break	187: Distributed PV and power system security during disturbance events in the Australian NEM Naomi Stringer
15:50	Afternoon Break	Afternoon Break	Afternoon Break	Afternoon Break	Afternoon Break
15:55	Afternoon Break	Afternoon Break	Afternoon Break	Afternoon Break	Afternoon Break
16:00	Afternoon Break	Afternoon Break	Afternoon Break	Afternoon Break	Afternoon Break
16:05	Afternoon Break	Afternoon Break	Afternoon Break	Afternoon Break	Afternoon Break
16:10	Afternoon Break	Afternoon Break	Afternoon Break	Afternoon Break	Afternoon Break
16:30	A1 Silicon Sustainability, reliability and characterisation: 16:30 17:45	A2 Kesterite solar cells 16:30 18:15	A4 Organic & hybrid solar cells : 16:30 18:15	A5 Perovskite materials development: 16:30 18:15	A8 Vehicle Integrated Photovoltaics: 16:30 18:15
16:30	21: Expected global silver consumption for PV based on future energy roadmaps Moonyong Kim	243: DMSO solution route to 13% efficient kesterite solar cell Hao Xin	247: Development of Novel π -Conjugated Polymers for High-Efficiency Organic Solar Cells Itaru Osaka	163: Efficiency enhancement of tin and alloyed tin/lead perovskite solar cells by surface passivation with ethylenediamine Shuzi Hayase	4: Japanese Activities for the PV-Powered Vehicles Masafumi Yamaguchi
16:45	13: Sequential LeTID test to separate the two types of degradations in Si PERC solar cells Yuji Ino	84: Illumination-dependent Temperature Coefficient of Voc in CZTS Photovoltaic Cells Simon Meng Fei Zhang	12: Inverted Organic Solar Cell using Zinc-Oxide with Low Temperature Process Junyoung Kim	191: Microfluidic Processing and Ligand-Engineering of NO Nanoparticle Thin-Films for Low-Temperature Perovskite Solar Cells Monika Michalska	252: PV-Powered Electric Vehicles Katelyn Purnell
17:00	113: Quantitative analysis of sub-band-gap luminescence in silicon using a constant injection level Rabin Basnet	141: Potential beneficial effects of I-III-II decomposition during the reactive annealing in CZTSe solar cells Alex Jimenez	66: High-Quality Passivating Oxide Layer for Silicon-Organic Hybrid Solar Cell Applications Aditya Saha	200: Complementary bulk and surface passivations for highly efficient perovskite solar cells by gas quenching Shi Tang	17: The resilience of PV-powered Vehicles (VIPV) Kenji Araki
17:05	179: Fluorine passivation of ring defects in Czochralski-grown silicon Rabin Basnet	186: Performance improvement in Cd-free CZTS solar cells enabled by wide bandgap window layers via ALD Xin Cui	176: Zn-Porphyrins are low cost and more efficient sensitizer in dye sensitized solar cells (DSSC) Kotteswaran Shanmugam	218: Thermally regulated strain-induced reverse halide segregation Nursultana Mussakhanyuly	73: Thermal modeling of vehicle-integrated photovoltaic modules Yoshitaka Hayakawa
17:10	33: Efficiency Prediction of Solar Cells using Photoluminescence Images and Deep Learning Yoann Buratti	38: Light soaking effect in solution processed Cu2ZnSn(S,Se)4 thin film solar cells Michael Jones	121: The Role of Excimer in Singlet Fission Parisa Hosseinabadi	219: Flexible Inorganic CsPbI3 quantum dot solar cell Long Hu	68: Review of reliability assessment for automobile components and terrestrial PV modules towards standardization of vehicle-integrated PV Daisuke Sato
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17:25	179: Fluorine passivation of ring defects in Czochralski-grown silicon Rabin Basnet	186: Performance improvement in Cd-free CZTS solar cells enabled by wide bandgap window layers via ALD Xin Cui	176: Zn-Porphyrins are low cost and more efficient sensitizer in dye sensitized solar cells (DSSC) Kotteswaran Shanmugam	218: Thermally regulated strain-induced reverse halide segregation Nursultana Mussakhanyuly	73: Thermal modeling of vehicle-integrated photovoltaic modules Yoshitaka Hayakawa
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18:00	Quick Break	254: Status of emerging kesterite photovoltaic technology Edgardo Saucedo	86: Effects of halogen composition controlled by ligand concentration on near IR luminescence of inorganic lead halide perovskite nanocrystals for quantum cutting application Tomoya Yamada	134: Triple-Cation Narrow Bandgap Perovskite Thin-films for High-Efficiency All-Perovskite Tandem Solar Cells Somayeh Moghadamzadeh	107: Seasonal Variation of the Car-Mounted Photovoltaic Module Performance under Driving Conditions Yasuyuki Ota
18:15	Quick Break	Quick Break	Quick Break	Quick Break	Quick Break
19:00	Poster Presentations				
21:00	Poster Presentations				

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Wednesday, 15 December 2021					
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11:00	279: Current trends and future prospects of PV performance analysis Yuzuru Ueda				
11:30	280: Dispatchable Solar Power - a Hybrid Approach John Lasich				
12:00	251: Facilitating a power system with 100% of energy from distributed resources Jenny Riesz				
12:30	271: Trends of global PV market and industry Izumi Kaizuka				
13:00	Lunch Break				
14:00	Hamakawa & PVSEC Awards				
14:00					
14:45	A1 Silicon : Alternative processes for passivating contacts: 14:00 16:05	A2 CdTe Solar cells: 14:45 16:05	A5 Perovskite PV Performance: 14:45 16:05	A6 Novel PV devices: 14:45 16:05	A7 Module performance: 14:45 16:05
14:45	160: Self Assembled Monolayers for Passivated Contacts William Nemeth	265: MgZnO Emitter Layer for CdTe Solar Cells James Sites	75: The transparent conductive oxide layer impacts recombination and resistance losses within a perovskite solar cell Daniel Walter	222: Hot carrier solar cells: Phonon bottlenecks to slow carrier cooling in bulk materials, perovskites and MQWs Gavin Conibeer	258: Module Reliability In Tropical Asia: Three Case Studies Mauro Pravettoni
15:00			77: Effect of Edge States for Optical and Electrical Properties in Two-Dimensional Bromide Halide Perovskite Eunyoung Choi	145: Demonstration of power generation from a thermoradiative diode Muhammad Hasnan Sazzad	28: Impact of Glass Textures on the Energy Yield in Field-Installed Solar Modules Marco Ernst
15:05	91: Copper oxide as a hole-selective material for silicon solar cells Gabriel Bartholazzi	266: The Path to Bifacial CdTe PV Randy Ellingson	100: Investigating reverse bias stability and recovery of perovskite solar cells Viqar Ahmad	114: Heat flows and non-equilibrium in non-ideal Hot Carrier Solar Cells Abhinav Sharma	37: Modelling extreme module degradation risks and fat tails: the impact of compounding and mismatch. Fiacre Rougieux
15:15	44: Alumina-Titania Alloy Affords Low Contact Resistivity and Excellent Surface Passivation with J0 below 2 fA/cm2 Mohamed Ismael	272: Low-temperature ex-situ Group V doping for polycrystalline CdTe Solar cells Feng Yan	159: Reliable Power Rating of Perovskite PV Modules Nikos Kopidakis	192: Mini Photovoltaic Cells Enabling Less Invasive Medical Implants with Longer Operating Life Daniel Londono	154: Towards the Development of Digital Twins for Industrial Screen-Printed Metallization Sebastian Tepner
15:20	211: Remarkably high carrier injection from MoOx passivating contacts with an amorphous silicon interlayer on silicon Borong Sang	268: High efficient CdTe solar cells with ZnMg1-xO/CdS/CdSe complex window layers Lili Wu	112: Developments within and Collaboration Opportunities with ACAP on Advanced Material and Device Characterisation Henner Kampwerth	232: A Spectrum of Ideal Flowline Concentrators Alex Lehmann	228: A cost-effective PV module passive cooling using vortex generator Zibo Zhou
15:25	95: Development of Inkjet-Printed Doping for Poly-Si Based Silicon Solar Cells Jiali Wang		143: All-evaporated perovskites: challenges and opportunities for tandem photovoltaic devices Thomas Feeney	Afternoon Break	Afternoon Break
15:30			Afternoon Break		
15:35			Afternoon Break		
15:45					Afternoon Break
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16:00					Afternoon Break
16:05					Afternoon Break
16:15					Afternoon Break
16:30	A1 Silicon : Passivating contacts (2): 16:30 17:50	A2 New Material & Tandems: 16:30 17:50	IEA PVPS Task 17 16:30 17:50	A9 PV system integration: 16:30 17:50	A10 Large Scale PV: 16:30 17:50
16:30	239: The potential application of SiOx/doped poly Silicon for the mass production of silicon solar cell Weiwei Deng	240: Antimony Selenosulfide Solar Cells Tao Chen	260: PV and Transport – Expected Benefits of PV-Powered Vehicles Keiichi Komoto	TBC	178: Terawatt PV and the Aluminium Challenge Alison Lennon
16:50	41: Laser Doped & Polysilicon Contact Bifacial Solar Cells over 24% Efficiency and 95% Bifacial Factor Kean Chern Fong	269: More Se Vacancies in Sb2Se3 under Se-rich Conditions: an Abnormal Behavior induced by Defect-Correlation in Compensated Compound Semiconductors Shiyu Chen	273: VIPV demonstration for light commercial vehicles: Test drives and energy flow analysis Robby Peibst	43: Renewable energy supply system intended to improve resilience after disasters Youichi Hirata	181: Material challenges for terawatt scale silicon PV production and technology choices for improved sustainability at the cell and module level Brett Hallam
17:05	52: Large-area monoPoly cells on 110 μm c-Si wafers with efficiency approaching 24% Naomi Nandakumar	270: Monolithic Perovskite/CIGSe tandem solar cells in two terminal configuration Tobias Bertram	261: Multidisciplinary study for PV-Powered Electric Vehicle Charging Stations: first approach and preliminary results Manuela Sechilariu	128: A Prediction system of solar power generation output using SHAP values. Eun Gyeong Kim	119: European Member State Targets for Photovoltaics: Is it enough for the European Green Deal Arnulf Jäger-Waldau
17:10	92: Passivating polysilicon recombination junctions for crystalline silicon solar cells Franz-Josef Haug	267: Road to 27% Perovskite-on-CI(G)S tandem solar cells Iteaz Hossain	262: Photovoltaic optimized charging of Electric Vehicles Urs Muntwyler	193: The Investigation of Impacts and Power Values from PV Grid Connection Sorraphat Bubpharam	264: Analysis of Indium Availability: Not a Critical Issue for Large Scale Development of CIGS Technology Daniel Lincot
17:20				Quick Break	Quick Break
17:30					Quick Break
17:35	188: TOPCon structure fabricated by using sputtered a-Si:H layers Takumi Miyamoto				Quick Break
17:50					Quick Break
18:00	Closing Ceremony & Best paper Awards				