

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

As at 13 December 2021

Monday, 13 December 2021

AEDT				
	Chairs: Renate Egan & Bram Hoex			
	Welcome			
11:00	Photovoltaics: Where have we come from and where are we heading? Martin Green			
	Malcolm Turnbull			
	Chairs: Brett Hallam & Xiaojing Hao			
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			
	Chair: Renate Egan			
13:00-13:15	ACEX Sponsored Industry Session Key materials for the production of solution-processed perovskite solar cells at scale Anthony Chesman			
13:00-13:05	Photoluminescence Imaging Basics - Sponsored Industry Session			
13:00	Lunch Break			
	Chairs : Hieu Nguyen & Stephen Bremner			
14:00	248: Integrated Molecular and Process Engineering for Highly Efficient Organic Photovoltaics with Suppressed Recombination Loss Alex Jen			
14:30	246: Efforts to expand the applications of III-V ultra-high efficiency solar cells from space to the ground Tatsuya Takamoto			
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 15:50	A5 Perovskite materials & solar cells 15:00 16:00
	Chairs: Lachlan Black & Jingnan Tong	Chairs: Chang Yan & Tao Chen	Chairs: Yukiko Kamikawa and Ning Song	Chairs: Jueming Bing and Dechan Angmo
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} Sn _x Se 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	Afternoon Break	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		49: Homologous bromides treatment for improving the open-circuit voltage of perovskite solar cells Yong Li
16:05	Afternoon Break			Afternoon Break
16:30	A1 Silicon : Defect engineering for passivating contact and heterojunction solar cells 16:30 18:20	A2 CIGS solar cells: 16:30 17:50	A3 III-V, Space & Concentrator PV 16:30 18:10	A5 Perovskite cells & modules 16:30 17:45
	Chairs: Brett Hallam and Josua Stuckelberger	Chairs: Pablo-Reyes-Figueroa and Robert Patterson	Chairs: Stephen Bremner and Mitsuru Imaizumi	Chairs: Anthony Chesman and Adam Surmiak
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				
18:10	93: Bulk Defects and Hydrogenation Kinetics in Fired Passivating Contacts (FPC) Mario Lehmann			

Kesterite Workshop 15:00 22:00

View the detailed program at <https://pvsec-31.com/program/>

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

As at 13 December 2021

Tuesday, 14 December 2021

AEDT				
10:15				
10:45				
Early Bird Quiz				
Break				
Chairs: Anita Ho-Baille and Murad Tayebjee				
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 Nienhaus				
Chair: Muriel Watt				
12:00				
100% Renewable Energy Session Andrew Blakers, Thomas Reindl, Pierre Verlinden, Marta Victoria				
13:00				
Lunch Break				
14:00				
A1 Silicon Tandems: 14:00 15:30	A2 Inorganic thin-film 14:00 15:55	A6 New Materials & Discovery: 14:00 15:50	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
Chairs: Heping Shen and Gregory J. Wilson	Chairs: Arthur Onno and Hao Xin	Chair: Robert Patterson	Chairs: Prof. Hishikawa and Benjamin Duck	Chairs: Henner Kampwerth, Ivan Perez-Wurfi
14:00	18: 27% efficient monolithic perovskite/c-Si tandem featuring commercial TOPCon bottom cell Klaus Weber	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
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 Komagata	35: Recent Advances in Outdoor PL Imaging at UNSW Oliver Kunz
14:20	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
14:30	216: Techno-economic analysis of 2-junction and 3-junction Silicon Perovskite tandem cells Nathan Chang	209: Defect Energy Levels of Doped ZnO: A Hybrid DFT Study Md. Anower Hossain	190: A Study on Continuous Monitoring and Fault Detection of Photovoltaic Modules Yuta Okamura	130: Reducing greenhouse gas emissions by recycling end-of-life photovoltaic panels Rong Deng
14:35	89: Investigation of the contaminants from molecular beam epitaxy growth chamber for III-V/Si tandem solar cells Chuji Yi, Zhuangyi Zhou	135: Development of modulated surface texturing for high-efficiency, thin-film, flexible, silicon-based tandem solar cells Gianluca Limodio	146: Spray Technology for Flash and Controlled Infiltration of Active Materials in Solar Cells Tulja Bhavani Korukonda	175: Investigation of Thermal Induced Stress in Silicon PV Modules Interconnected with Multi Busbar Interconnection by Finite Element Modelling Zhimeng Wang
14:40	133: Energy Yield Modelling of Perovskite/Si Tandem Photovoltaics Ulrich Paetzold	213: Effect of H2S concentration for Cu2SnS3 thin films Yoji Akaki	139: Impact of substrate temperature on bandgap in ZnSnP2 thin films by MBE Taro Kuwano	190: A Study on Continuous Monitoring and Fault Detection of Photovoltaic Modules Yuta Okamura
14:45	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	144: Quasi-1D (Sb,Bi)2Se3 thin films for band-gap tuning in photovoltaic applications Ivan Caño Prades	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	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
14:50	14:55	15:00	15:05	15:10
15:15	15:20	15:25	15:30	15:35
15:40	15:45	15:50	15:55	16:00
16:05	16:10	16:15	16:20	16:25
16:30	16:35	16:40	16:45	16:50
16:55	17:00	17:05	17:10	17:15
17:20	17:25	17:30	17:35	17:40
17:45	17:50	17:55	18:00	18:05
18:10	18:15	18:20	18:25	18:30
18:35	18:40	18:45	18:50	18:55
19:00	19:05	19:10	19:15	19:20
19:25	19:30	19:35	19:40	19:45
19:50	19:55	20:00	20:05	20:10
20:15	20:20	20:25	20:30	20:35
20:40	20:45	20:50	20:55	21:00
Poster Presentations				

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

As at 13 December 2021

Wednesday, 15 December 2021

AEDT				
	Chairs: Chris Fell, Anastasia Soeriyadi, Iain Macgill, Anna Bruce			
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: The road to power system operation with 100% renewable energy Chris Davies			
12:30	271: Trends of global PV market and industry Izumi Kaizuka			
13:00	Lunch Break			
	Chair: Siva Karuturi			
14:00	Hamakawa & PVSEC Awards, including PVSEC Lecture			
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 16:15	A6 Novel PV devices: 14:45 16:00
	Chair: Anyao Liu	Chairs: Feng Yan and Kaiwen Sun	Chair: Md. Arafat Mahmud	Chairs: Fiona Beck and Stephen Bremner
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
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
15:05	44: Alumina-Titania Alloy Affords Low Contact Resistivity and Excellent Surface Passivation with J0 below 2 fA/cm2 Mohamed Ismael	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
15:15			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
15:20	211: Remarkably high carrier injection from MoOx passivating contacts with an amorphous silicon interlayer on silicon Borong Sang	272: Low-temperature ex-situ Group V doping for polycrystalline CdTe Solar cells Feng Yan	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
15:25			143: All-evaporated perovskites: challenges and opportunities for tandem photovoltaic devices Thomas Feeney	228: A cost-effective PV module passive cooling using vortex generator Zibo Zhou
15:30			268: High efficient CdTe solar cells with ZnMg1-xO/CdS/CdSe complex window layers Lili Wu	228: A cost-effective PV module passive cooling using vortex generator Zibo Zhou
15:35	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	228: A cost-effective PV module passive cooling using vortex generator Zibo Zhou
15:45			143: All-evaporated perovskites: challenges and opportunities for tandem photovoltaic devices Thomas Feeney	228: A cost-effective PV module passive cooling using vortex generator Zibo Zhou
15:50			143: All-evaporated perovskites: challenges and opportunities for tandem photovoltaic devices Thomas Feeney	228: A cost-effective PV module passive cooling using vortex generator Zibo Zhou
16:00	Afternoon Break			
16:05				
16:15				
16:30	A1 Silicon : Passivating contacts (2): 16:30 17:30	A2 New Material & Tandems: 16:30 17:50	IEA PVPS Task 17 16:30 17:50	A9 PV system integration: 16:30 17:30
	Chairs: Christophe Ballif and Delfina Munoz	Chairs: Tobias Bertram and Edgardo Saucedo	Chairs: Jessica Jiang & Ivan Perex-Wurfl	Chair: Niraj Lal
16:30	41: Laser Doped & Polysilicon Contact Bifacial Solar Cells over 24% Efficiency and 95% Bifacial Factor Kean Chern Fong	240: Antimony Selenosulfide Solar Cells Tao Chen	260: PV and Transport – Expected Benefits of PV-Powered Vehicles Keiichi Komoto	282: The History of Solar PV in Regional Australia Lyndon Frearson, Peter Renehan
16:45	52: Large-area monoPoly cells on 110 μm c-Si wafers with efficiency approaching 24% Naomi Nandakumar	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
16:50			261: Multidisciplinary study for PV-Powered Electric Vehicle Charging Stations: first approach and preliminary results Manuela Sechilaru	181: Material challenges for terawatt scale silicon PV production and technology choices for improved sustainability at the cell and module level Brett Hallam
17:00	92: Passivating polysilicon recombination junctions for crystalline silicon solar cells Franz-Josef Haug	270: Monolithic Perovskite/CIGSe tandem solar cells in two terminal configuration Tobias Bertram	193: THE INVESTIGATION OF IMPACTS AND POWER VALUES FROM PV GRID CONNECTION Sorraphat Bubpharam	119: European Member State Targets for Photovoltaics: Is it enough for the European Green Deal Arnulf Jäger-Waldau
17:10			262: Photovoltaic optimized charging of Electric Vehicles Urs Muntwyler	264: Analysis of Indium Availability: Not a Critical Issue for Large Scale Development of CIGS Technology Daniel Lincot
17:15	188: TOPCon structure fabricated by using sputtered a-Si:H layers Takumi Miyamoto			
17:30				
17:30	Quick Break			
17:50				
18:00	Chairs: Bram Hoex and Ned Ekins-Daukes			
	Closing Ceremony & Best paper Awards			

Poster Program

Tuesday 14 December 2021

19:00 - 21:00

This program is current as of 12 November 2021

Paper ID	Paper Title	Submitting Author	Theme/SubTheme
3	Industrially P-type TOPCon Solar Cells with Rear Emitter	Mr Chaihung Tsai	Area 1: Silicon PV + Silicon tandems
5	Quantitative measurement of active dopant density distribution in black silicon solar cell using scanning nonlinear dielectric microscopy	Prof Yasuo Cho	Area 1: Silicon PV + Silicon tandems
15	Fully air-processed all-inorganic perovskite solar approaching ~20% cells: New strategies for making cesium-lead halides	Dr Sawanta Mali	Area 5: Perovskite solar cells & modules
16	Record-efficiency GaAs//CuIn1-yGaySe2 3-junction solar cells with 28.06% fabricated using smart stack technology	Dr Kikuo Makita	Area 3: III-V compound semiconductor, concentrator & space technologies
19	Efficient Perovskite Solar Cells based on High Quality (MA0.5FA0.5)PbI3 Perovskite Thin Films by Thioacetamide Additive	Dr Jyoti Patil	Area 5: Perovskite solar cells & modules
22	Comparison of annual power generation characteristics of Cu(InGa)Se2 modules installed on the north, south, east and west planes	Prof Makoto Konagai	Area 7: Performance & reliability of PV modules
23	Evaluation of BIPV applicability based on four-terminal perovskite/silicon tandem cells under realistic environmental conditions	Dr C. Dong NGUYEN	Area 1: Silicon PV + Silicon tandems
24	Design and Fabrication of Rib Silicon Heterojunction Solar Cells	Prof Yukimi Ichikawa	Area 1: Silicon PV + Silicon tandems
25	Investigating the Gettering Rate of Polysilicon/oxide Passivating Contact Structures	Mr Zhongshu Yang	Area 1: Silicon PV + Silicon tandems
32	Fabrication and characterization of BaSi2 films on glass substrates by RF co-sputtering of BaSi2 and Ba targets	Mr Ryota Koitabashi	Area 6: Advanced concepts & new emerging materials for future PV power conversion
36	Crystalline silicon solar cells at elevated temperatures: thinner is better?	Dr Hitoshi Sai	Area 1: Silicon PV + Silicon tandems
40	A comparative study of blistering suppression in PECVD Si films by C, N, or O incorporation for application in SiOx-based passivating contacts for Si solar cells	Mr Rajiv Sharma	Area 1: Silicon PV + Silicon tandems
42	Titanium Oxide Thin Film Formed by Sputtering with Argon/Hydrogen Gas mixtures for n-type front emitters of Crystalline Silicon Solar Cells	Mr Takanori Shinozaki	Area 1: Silicon PV + Silicon tandems
45	Revealing the Dynamics of Thermal Reaction Between Cu and Mixed Halide Perovskite Solar Cells	Mr Jihoo Lim	Area 5: Perovskite solar cells & modules
50	Solar Deployment and Perceptions in the Social Work Sector - A Case Study of a Net Zero Home for the Aged	Miss Natasha Wu	Area 10: PV deployment, industry, market & policy

51	Optical Guide Substrate for Bifacial Multi-Junction Amorphous Silicon Solar Cells Working with Single-Sided Light Illumination	Prof Kimihiko Saito	Area 1: Silicon PV + Silicon tandems
53	Investigation of PV system application for mobile telecommunication base station.	Mr Phasapon Manosukritkul	Area 7: Performance & reliability of PV modules
54	Enhanced Hole-Carrier Selectivity in Wide Bandgap Halide Perovskite PV Devices for Indoor IoT Applications	Mr Minwoo Lee	Area 5: Perovskite solar cells & modules
57	Proposal of a Model Reproducing the I-V Characteristics of Photovoltaic System with BPD Open Failure	Mr Kumpei Yamamoto	Area 8: PV systems including BOS components
58	Accelerating photovoltaics material discovery and information extraction driven by machine learning and text mining	Mr Tong Xie	Area 1: Silicon PV + Silicon tandems
59	An accuracy improvement of single-diode modeling for photovoltaic system output prediction	Miss sasiwimon songtraï	Area 7: Performance & reliability of PV modules
60	Verification model of One Diode and Five Parameters (1D5P)-Based PV Models.	Miss sasiwimon songtraï	Area 7: Performance & reliability of PV modules
61	Suppression of Residual Saw Marks After Etching on Silicon Wafers by High-precision Slicing	Mr Yutaka Hara	Area 1: Silicon PV + Silicon tandems
62	Understanding the Electrical Performance of Black Silicon for High-Efficiency Solar Cell Applications	Mr Shaozhou Wang	Area 1: Silicon PV + Silicon tandems
63	Long-Distance Optical Wireless Power Transmission over 100 m using GaInP Solar Cell under 609 nm Laser Irradiation	Mr YiuLeung Wong	Area 3: III-V compound semiconductor, concentrator & space technologies
64	Evaluation of negative impact of PV power forecasting error on JEPX spot market price prediction by the simplified merit order model	Mr Kota Kikuchi	Area 9: PV system integration including smart grid & storage
65	JUMP2Excel Endeavour	Dr Vibhu Jately	Area 10: PV deployment, industry, market & policy
69	Elucidation of voltage loss in various structures, how charge accumulation can affect voltage loss?	Ms Naeimeh Mozaffari	Area 5: Perovskite solar cells & modules
72	Energy yield simulation of silicon-based tandem solar cells: impact of spectral variations calculated using reference climatic datasets	Dr Takeshi Tayagaki	Area 1: Silicon PV + Silicon tandems
76	Fabrication of silicon heterojunction solar cell with sputtered emitter structure	Mr Yuta Shiratori	Area 1: Silicon PV + Silicon tandems
78	DLTS analysis on RPD induced recombination-active defects	Mr Tomohiko Hara	Area 1: Silicon PV + Silicon tandems
79	Effects of defects generated by ITO reactive plasma deposition on minority carrier lifetime in silicon crystal	Mr Yuto Ifuji	Area 1: Silicon PV + Silicon tandems
81	Development of Si Hetero-junction Solar Cell Suitable for Bottom Cell of Tandem Solar Cell	Dr Kyotaro Nakamura	Area 1: Silicon PV + Silicon tandems
82	Demand Response Method Using Both Batteries of Base Transceiver Stations and Residences with PVs	Mr Daisuke Ohsaki	Area 9: PV system integration including smart grid & storage

83	Fabrication of all-solid-state semiconductor battery using TiOx:Nb for energy storage	Mr Kenta Watanabe	Area 9: PV system integration including smart grid & storage
85	Optimization of the recombination junction for perovskite-silicon tandem solar cells	Mr Calum McDonald	Area 1: Silicon PV + Silicon tandems
87	Impact of combination of intrinsic and doped amorphous silicon layers on passivation of n-type silicon wafers	Dr Sourav Mandal	Area 1: Silicon PV + Silicon tandems
88	Determining the minimum sample of reference PV systems for estimating aggregate distributed PV generation	Ms Phoebe Heywood	Area 10: PV deployment, industry, market & policy
90	Limited effectiveness of laser doping using AlOx as a dopant for silicon solar cells	Dr Ran CHEN	Area 1: Silicon PV + Silicon tandems
96	Influence of Dislocation Density on Light-Induced Degradation in PERC Cells: A Cast-Mono Ingot Study	Dr Brendan Wright	Area 1: Silicon PV + Silicon tandems
97	2-Terminal perovskite-carrier selective contact silicon tandem solar cells using molybdenum oxide hole selective layer	Mr Changhyun Lee	Area 1: Silicon PV + Silicon tandems
98	Evaluation of the Momentary Partial Shading Effect on Vehicle Integrated Photovoltaics Using Equivalent Circuit Model	Mr Kento Hirata	Area 1: Silicon PV + Silicon tandems
99	Advanced Hydrogen Passivation on SixGe1-x Solar Cells Grown on Silicon Substrate	Mr Fukun Lei	Area 1: Silicon PV + Silicon tandems
101	Investigation of Laser Wireless Power Transmission using InGaP/InGaAs/Ge 3-junction Solar Cells and Fly-eye Lenses	Mr Nozomi Matsuoka	Area 3: III-V compound semiconductor, concentrator & space technologies
102	Deposition of n-type SnSe thin films doped with Bi	A/Prof Yoshitaro Nose	Area 2: Thin-Film compound semiconductors
104	Improvement of InGaAs solar cell characteristics with a distributed Bragg reflector under 1550 nm laser irradiation	Mr Ryota Warigaya	Area 3: III-V compound semiconductor, concentrator & space technologies
106	Continuous variation of fixed charge from strongly negative to strongly positive in AlPxOy dielectric passivation layers on silicon	Dr Lachlan Black	Area 1: Silicon PV + Silicon tandems
108	Evaluation of damage in crystalline silicon substrate induced by plasma enhanced chemical vapor deposition of amorphous silicon films	Mr Haruki Kojima	Area 1: Silicon PV + Silicon tandems
115	The guideline for control of grain boundary configuration to suppress carrier recombination in multicrystalline silicon	Mr YUSUKE FUKUDA	Area 1: Silicon PV + Silicon tandems
117	Design and fabrication of nanoimprinted optical confinement structure specialized for near-infrared light	Mr Yuto Kimata	Area 1: Silicon PV + Silicon tandems
122	Performance Evaluation of CPV System Installed in Thailand.	Miss sasiwimon songtraï	Area 7: Performance & reliability of PV modules
123	Comparison of output variability from distributed PV fleets across different climate and solar variability zones in Australia	Dr Kanyawee Keeratimahat	Area 10: PV deployment, industry, market & policy

124	Investigation of carrier selective contact using two dimensional materials for solar cells	Mr Taiga Tsukushi	Area 1: Silicon PV + Silicon tandems
125	Application of In ₂ O ₃ :H as the front contact in Cu(In,Ga)(S,Se) ₂ mini-modules	Dr Pablo Reyes-Figueroa	Area 2: Thin-Film compound semiconductors
127	Modeling Dynamic Response of Commercial-scale FPV rigid-type structure installed in Windy Near-Shore Conditions; Sihwa Lake	Dr Charles Lawrence Waithiru	Area 8: PV systems including BOS components
132	Simulation of collection efficiency of back junction silicon solar cells	Dr Sieu Pheng Phang	Area 1: Silicon PV + Silicon tandems
136	Life cycle assessment of thin-film, flexible solar modules in the Netherlands	Dr Gianluca Limodio	Area 10: PV deployment, industry, market & policy
137	Impact of light soaking on SHJ solar modules under 2000 h illumination	Dr Jian Yu	Area 7: Performance & reliability of PV modules
142	Microwave processing techniques for silicon solar cells	Dr Binesh Veetil	Area 1: Silicon PV + Silicon tandems
147	A Deep Segmentation Framework To Calculate City-Scale Solar Energy Output Using Satellite Imagery	Mr DADAJON BOYKUZU UGLI JURAKUZIEV	Area 10: PV deployment, industry, market & policy
148	Spectroscopic study of hot carrier recombination and thermalization in III-V multi-quantum wells	Mr Muhammad Hanif	Area 3: III-V compound semiconductor, concentrator & space technologies
150	Improved photovoltaic properties of Ti- and La-doped BiFeO ₃ films for efficient inorganic perovskite solar cells	Dr Sergey Kozlov	Area 6: Advanced concepts & new emerging materials for future PV power conversion
151	Insights into thermal oxidation of ultra-thin SiO _x tunnel layers for passivated contacts	Dr Jingnan (Taffy) Tong	Area 1: Silicon PV + Silicon tandems
157	Quantifying the Environmental Impacts of EoL PV Module Transportation in Australia	Mr Shaun Falzarano	Area 10: PV deployment, industry, market & policy
158	Temperature correction formula of maximum output power P _{max} : Assessment of Applicability and Precision	Dr Yoshihiro Hishikawa	Area 7: Performance & reliability of PV modules
161	Near-Infrared Light Management in Silicon Heterojunction Solar Cells	Prof Hyunju Lee	Area 1: Silicon PV + Silicon tandems
162	Bulk Lifetime Changes in Cz-Si Due to Intermediate Temperature Cell Processing Treatments	Mr Vincenzo LaSalvia	Area 1: Silicon PV + Silicon tandems
166	Synthesis and Characterization of Cu ₃ BiS ₃ Particles	Dr Yasuhiro SHIRAHATA	Area 6: Advanced concepts & new emerging materials for future PV power conversion
167	Facile synthesis of novel CuO-NiO-ZrO ₂ nanocomposite for enhanced photocatalytic hydrogen production	Dr Karthik Kannan	Area 2: Thin-Film compound semiconductors
170	Mechanical fatigue life analysis of Solar Panels under cyclic load conditions for design improvement	Mr Matheus de Assis Rabelo	Area 7: Performance & reliability of PV modules
172	Very low saturation current densities (J ₀) of PECVD passivated boron doped emitter for industrial bifacial monoPoly™ solar cell applications	Dr Donny Lai	Area 1: Silicon PV + Silicon tandems
174	Ozone-assisted Atomic Layer Deposition on Large-size Silicon Wafer Achieved by an Industrial Batch Type Tube System	Mr Xinyuan Wu	Area 1: Silicon PV + Silicon tandems

177	Energy performance of detached houses in Ulaanbaatar city	Dr Bat-Erdene Bayandelger	Area 9: PV system integration including smart grid & storage
180	ALD recipe optimisation of HfON layer for singlet fission sensitised silicon solar cell	Mr Alvin Mo	Area 1: Silicon PV + Silicon tandems
182	Modeling and Economic Optimization of PV Module Assembly Supply Chain in a Global Market	Mr Mohammad Dehghanimadvar	Area 10: PV deployment, industry, market & policy
183	Binary Organic Cation (TMS)x(FA)1-xPbI3 Perovskite Solar Cells using aprotic Trimethylsulfonium Iodide	Mr Sanjay Sandhu	Area 5: Perovskite solar cells & modules
185	Passivation for Crystalline Silicon in Passivation Contacts by Catalytically Generated Hydrogen	Mr Yuli Wen	Area 1: Silicon PV + Silicon tandems
189	Potassium effects on the microstructure of CsPbI ₂ Br ₂ all-inorganic perovskite	Mr Qianying Guo	Area 5: Perovskite solar cells & modules
194	Simulation of Perovskite Solar Cells with Doped a-Si as a Carrier Transport Layer	Mr Kuan LIU	Area 5: Perovskite solar cells & modules
195	Cat-CVD SiNx /ultrathin SiO _x passivation stacks for high-efficiency crystalline Si solar cells	Mr Hiroki Nakajima	Area 1: Silicon PV + Silicon tandems
196	Defect Reduction in Polycrystalline Silicon Films Formed by Flash Lamp Annealing	Mr Yudai Yanagi	Area 1: Silicon PV + Silicon tandems
197	Fire-through Ag contact formation for c-Si solar cells with Cat-CVD SiNx	Mr Toshiki Itasaka	Area 1: Silicon PV + Silicon tandems
198	Effect of prior reverse bias application on the potential-induced degradation of n-type front-emitter crystalline Si photovoltaic modules	Mr Deqin Wu	Area 7: Performance & reliability of PV modules
199	Numerical simulations of optimizing Eg-grading profiles under various carrier diffusion lengths of CH ₃ NH ₃ (Sn _x Pb _{1-x})(I _{1-y} Br _y) ₃ perovskite absorbers	Dr Yu Kawano	Area 5: Perovskite solar cells & modules
201	Formation of n-poly-Si films on textured glass substrates by the flash lamp annealing of hydrogenated n-a-Si films	Mr WANG Zheng	Area 2: Thin-Film compound semiconductors
202	III-V solar cells with AlInGaP window layer grown by low-cost hydride vapor phase epitaxy	Dr Yasushi Shoji	Area 3: III-V compound semiconductor, concentrator & space technologies
203	EFFECT OF OVERNIGHT OXIDATION ON THE PERFORMANCE OF CO(III) DOPED SPIRO-OMeTAD BASED PEROVSKITE SOLAR CELLS	Ms Laxmi Nakka	Area 5: Perovskite solar cells & modules
204	Glare Analysis of Solar Rooftop in Airport, the First Project in Thailand	Miss sasiwimon songtra	Area 7: Performance & reliability of PV modules
205	Silicon Heterojunction Solar Cells with a Counter-Doped n-a-Si Film Treated by Flash Lamp Annealing	Mr Yujia LIU	Area 1: Silicon PV + Silicon tandems
206	Graphene oxide passivation films on passivated emitter and localized diffused silicon solar cells	Dr Michelle Vaqueiro-Contreras	Area 6: Advanced concepts & new emerging materials for future PV power conversion
207	The corrosion of the metallization using Pb-free glass frits in c-Si PV modules	Dr Taeko Semba	Area 7: Performance & reliability of PV modules

208	Tuning the crystalline and optical properties of sputtered polysilicon carbide contacts	Dr Ning Song	Area 1: Silicon PV + Silicon tandems
212	Determination of the Rear Irradiance driven Power Gain Yield on Bifacial n-Type Silicon Module.	Mrs Sirirat Tonsue	Area 1: Silicon PV + Silicon tandems
214	Dust accumulation profiles and its effect on PV performance in rice field and cassava farm environment	Miss Nattakarn Sakarapunthip	Area 7: Performance & reliability of PV modules
215	Impact of the 2019-20 Australian Bushfires on Photovoltaic Energy Production	Mr Ethan Ford	Area 10: PV deployment, industry, market & policy
220	In situ monitoring of monoclinic Cu ₂ SnS ₃ formation using Raman spectroscopy	Prof Hideaki Araki	Area 2: Thin-Film compound semiconductors
221	Enhanced hydrogenation for analysis of LeTID : explaining the hydrogen distribution in silicon wafer	Mr Sim MyeongSeob	Area 1: Silicon PV + Silicon tandems
223	ON THE APPLICATIONS OF ARTIFICIAL INTELLIGENCE ALGORITHMS FOR FABRICATION OF HIGH PERFORMANCE PEROVSKITE SOLAR CELLS	Dr Chandu DS	Area 5: Perovskite solar cells & modules
225	In-Silico Design of Low-Cost Transparent Semiconductors for Photocatalysis and Carrier Selective Contacts	Ms Ina Oestroem	Area 6: Advanced concepts & new emerging materials for future PV power conversion
226	Effect of fluorine implantation on passivation of poly-Si/SiO ₂ /Si structures	Dr Katsuto Tanahashi	Area 1: Silicon PV + Silicon tandems
227	An Analysis of the Degradation in Emerging Non-Fluoropolymer-Based Co-Extruded PV Backsheets	Dr Naila Al Hasan	Area 7: Performance & reliability of PV modules
229	AZO/Ag/AZO transparent conducting oxide films for solar cell application	Dr bidyut barman	Area 6: Advanced concepts & new emerging materials for future PV power conversion
230	Effect of Moisture Out-gassing from Encapsulant Materials on the Lifetime of Perovskite Solar Cells	Mr Luke Sutherland	Area 5: Perovskite solar cells & modules
233	Fabrication of durable double-layer anti-reflection coatings for encapsulant solar glass of PV modules	Dr Yiyu Zeng	Area 6: Advanced concepts & new emerging materials for future PV power conversion

The 4th Asia-Pacific Kesterite Workshop

13 Dec 2021, 15:00-22:00 (AEDT)

Time	Speaker	Title
15.00-15.10	Committee Chair Prof Xiaojing Hao	Welcome
Session 1	Xiaojing Hao & Yi Zhang (Nankai University)	Session Chairs
15.10-15.30	Hao Xin (Nanjing University of Posts and Telecommunications)	DMSO solution route to 13% efficient kesterite solar cell
15.30-15.50	Jin-Hyeok Kim (Chonnam National University)	Fabrication and Characterization of High-Efficiency Cu ₂ ZnSn(S,Se) ₄ Thin-Film Solar Cells with Distinct Cation Substitution Approach
15.50-16.10	Sixin Wu (Henan University)	Adjusting the deep-level defects in Cu ₂ ZnSn(S,Se) ₄ absorber layer via cation substitution for efficient kesterite solar cells
16.10-16.30	Break	
Session 2	Hitoshi Tampo (AIST)	Session Chair
16.30-16.50	Qinbo Meng (Chinese Academy of Science)	Kesterite Cu ₂ ZnSn (S, Se) ₄ Solar Cell: Opportunity and Challenge
16.50-17.10	Shuying Cheng (Fuzhou University)	Flexible CZTSSe thin film solar cells for indoor applications
17.10-17.30	Dae-Hwan Kim (DGIST)	Flexible thin film solar cells with an earth abundant and non-toxic CZTSSe chalcogenide
17.30-17.50	Fangyang Liu (Central South University)	Self-depleted CuSCN interlayer for back contact modification and fully solution-processed CZTSSe solar cells
17.50-18.10	Zhenghua Su (Shenzhen University)	Interface engineering for highly efficient Ag-alloyed Cu ₂ ZnSnS ₄ solar cell
18.10-18.30	Shiyong Chen (Fudan University)	Origin of Band-Tail and Deep-Donor States in Cu ₂ ZnSn(S,Se) ₄ Solar Cells
18.30-19.00	Break	

Session 3	Hao Xin (NUPT)	Session Chair
19.00-19.20	Xudong Xiao (Wuhan University)	Design and realization of Ga gradient in submicron Cu(In,Ga)Se ₂
19.20-19.40	Jiang Tang (Huazhong University of Science and Technology)	CdSe Solar Cells: A Promising Top Cell for Silicon Tandem Applications
19.40-20.00	Lydia H.Wong (Nanyang Technological University, NTU)	Next Generation Chalcogenide Photoabsorber for Solar Harvesting Devices
20.00-20.20	Tao Chen (University of Science and Technology of China)	Hydrothermal deposition of antimony chalcogenide films for solar cell applications
20.20-20.30	Break	
Session 4	Xiaojing Hao (UNSW)	Session Chair
20.30-20.50	Edgardo Saucedo (Polytechnic University of Catalonia, UPC)	Kesterite: where do we come from, where should we go?
20.50-21.10	Thomas Unold (Helmholtz-Zentrum Berlin, HZB)	What can the kesterite research community learn from halide perovskites?
21.10-21.30	Levent Gütay (University of Oldenburg)	Advanced Optimization Strategies for Kesterite: Solar Cells: About Pathways and Landscapes?
21.30-21.50	Marit Kauk-Kuusik (Tallinn University of Technology)	Detailed Insight into the CZTS/CdS Interface Modification in the Monograin Layer Solar Cells
21.50-22.00	Discussion	Summary & Close