

April 8 – 11, 2025 | Oxford, UK

Program

of the SiliconPV 2025 conference and the nPV Workshop 2025

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Conference Information

Welcome to SiliconPV 2025!

The 15th edition of SiliconPV takes place from April 8-11, 2025, and is hosted by the Department of Materials of Oxford University.

Like in recent years, SiliconPV continues its fruitful cooperation with the nPV Workshop.

SiliconPV Conference from April 8-10, 2025

SiliconPV is a well-established and world leading event in the PV community, gathering about 300 attendees from all over the world, including students, scientists, technologists, and PV experts from industry every year. The conference covers a spectrum of captivating subjects around crystalline silicon for photovoltaic application, reaffirming its status as the leading technology for solar electricity generation!

nPV Workshop from April 10-11, 2025

Scheduled immediately after the SiliconPV conference and overlapping for a day, the workshop provides a comprehensive overview of emerging trends, innovations and developments in n-type technology. The nPV Workshop is also hosted by the Department of Materials of the Oxford University and is seamlessly linked to the SiliconPV conference.



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Committees

SiliconPV Conference Chair

Sebastian Bonilla (Oxford Materials Department)

SiliconPV Conference Executive Committee

Christophe Ballif (EPFL)

Sébastien Dubois (CEA)

Stefan Glunz (Fraunhofer ISE)

Giso Hahn (University of Konstanz)

Robby Peibst (ISFH)

Jef Poortmans (imec)

Ron Sinton (Sinton Instruments)

Pierre Verlinden (Amrock Pty Ltd)

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Wilfried Favre (CEA-INES)

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Stefan Glunz (Fraunhofer ISE)

Ivan Gordon (IMEC)

Olindo Isabella (TU Delft)

Radovan Kopecek (ISC Konstanz)

Jan Schmidt (ISFH)

Barbara Terheiden (University of Konstanz)

Arthur Weeber (TU Delft)

Scientific Topics

1. Advances in industrial silicon solar cells

- Novel passivating contacts for PERC and TOPCon
- Advances in silicon heterojunction technology
- Back contact cell architectures
- Silicon defect engineering, bulk passivation and gettering
- Improved processes for wet-chemistry, junction formation, and surface passivation
- Advanced light management and ultra-thin devices

2. Silicon-based tandem solar cells

- Pvk on Si Tandem solar cells
- III-V on Si tandems
- Transparent Conducting Electrodes
- Recombination, interconnection, and optical coupling layers
- Metallisation approaches for tandem cells

3. Sustainable manufacturing for Terawatt solar energy

- Novel metallisation schemes to reduce use of Ag, Bi, Pb
- Indium-free transparent conductors
- Silicon feedstock, crystallization, wafering and kerf-lossless production
- Life cycle assessments and circularity
- Process integration, metrology, and advanced manufacturing tools
- Digitalization, data processing and machine learning in PV production

4. Characterisation, modelling and simulation

- Silicon material characterisation
- Charge transport at interfaces and contacts
- Tandem cell characterisation
- Machine learning methods in material, cell and module characterisation
- Advanced simulation of solar cells and modules

5. Module technologies and PV systems

- Interconnection, stringing, and advanced module architectures
- Integration into buildings, vehicles, and agriculture
- Module reliability and degradation mechanisms
- Energy yield modelling, including new ML methods
- Cost studies and bankability of industrial PV

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Conference Program

Program Overview

Program Overview					
<small>*as of 04 of April, subject to change</small>					
BST	Monday April 07, 2025	Tuesday April 08, 2025	Wednesday April 09, 2025	Thursday April 10, 2025	Friday April 11, 2025
	SiliconPV Conference			nPV Workshop	
07:45	Registration			Registration	
08:00			Registration		Registration
08:15	SiliconPV Opening Session			Welcome to nPV Workshop	
08:30					
08:45	Highlights Sessions	Session 5: Monitoring and understanding cell degradation		Session 9: Advances in TOPCon cells	Session 13: Challenges and Advances in PV Manufacturing
09:00					
09:15					
09:30					
09:45					
10:00	Coffee Break	Coffee Break		Coffee Break	Coffee Break
10:15					
10:30	Invited: Yifeng Chen, Tina Solar	Invited: Mariana Bertoni, ASU		Invited: Esma Ugur, KAUST	Invited: Jenny Chase, BloombergNEF
10:45					
10:55					
11:00	Session 2: Silicon materials: Manufacturing and understanding	Session 6: Innovation in solar cell architectures		Session 10: Interconnection and reliability in silicon cells	Session 14: Reaching Sustainable TW Scale Silicon PV
11:15					
11:30					
11:45					
11:55					
12:00					
12:10					
12:15					
12:30	Lunch Break	Lunch Break		Lunch Break	Lunch Break
12:45					
13:00					
13:15				Invited: Bernd Stannowski, HZB	Invited: Eszter Voroshazi, CEA
13:25					
13:30					
13:35	Poster Session I	Poster Session II		Session 11: Silicon-based tandem solar cells	Session 15: Operation and Integration of 1 GW+ PV Assets in the Real World
14:00					
14:15					Coffee Break
14:30	Short Break	Short Break			
14:35					Invited: Chris Case, Oxford PV
14:45	Invited: Chris Xixiang Xu, Longi	Invited: Nancy Haegel, NREL			
14:50				Coffee Break	Session 16: Next Generation Si-based Tandem PV Production
15:00					
15:15	Session 3: Improvements in surface passivation	Session 7: Sustainability in the TW era		Session 12: Characterisation and simulation	Closing nPV Workshop
15:30					
15:45					
16:00					
16:15	Coffee Break	Coffee Break		SiliconPV 2025 Awards + 2026 Announcement	
16:30					
16:45					
17:00	Session 4: Advances in passivating contacts	Session 8: Novel metallisation approaches		Walk to the city	
17:15					
17:30					
17:45					
18:00					
18:15				Oxford City Walk Tour (registration mandatory)	
18:30	Get-Together time tbc				
18:45					
19:00					
19:15		Conference Dinner			
19:30					
19:45					
20:00					

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Detailed Program

Tuesday, 08 April 2025

08:30 - 08:45 **Opening Session SiliconPV 2025**

L1

08:45 - 10:00 **Session 1: Highlights of best ranked abstracts**

L1

Session Chairs: Sebastian Bonilla, *Oxford Materials Department*, and Matthew Wright, *Oxford Materials Department*

08:45 - 09:00

[ID 54](#)

Ultra-Lean Silver Screen Printing for Sustainable Terawatt-Scale
Photovoltaics

Yuchao Zhang¹, Sisi Wang¹, **Li Wang**¹, Zhenyu Sun¹, Yuan-Chih Chang¹, Ran
Chen¹, Catherine Chan¹, Kuninori Okamoto³, Yiwei Ao³, Dongliang Wang³,
Marwan Dhamrin², Tsuji Kosuke², Brett Hallam¹

¹University of New South Wales, ²Toyo Aluminium K.K., ³Changzhou Fusion
New Materials Co., Ltd

09:00 - 09:15

[ID 58](#)

Recovery Procedures for TOPCon Modules after UV-Induced
Degradation

Paul Gebhardt¹, Esther Fokuhl¹, Sumeet Santosh Mujumdar¹, Hyrie Pashaj¹,
Angelika Beinert¹, Ingrid Haedrich¹

¹Fraunhofer Institute for Energy Systems ISE

09:15 - 09:30

[ID 128](#)

A non-destructive method to measure the bulk lifetime in high quality
silicon wafers

Nicholas Grant¹, Edris Khorani¹, Sophie Pain¹, John Murphy¹

¹School of Engineering, University of Warwick, Coventry, CV4 7AL, UK

09:30 - 09:45

[ID 135](#)

Characterisation Of TOPCon Cell Interfaces Using Time-of-Flight Elastic
Recoil Detection

Matthew Sharpe², Matthew Wright¹, Callum McAleese², Junke Wang¹, Ruy S
Bonilla¹

¹University of Oxford, ²Surrey Ion Beam Centre, University of Surrey

09:45 - 10:00

[ID 68](#)

The elasticity method: A new approach to determine recombination
parameters from injection dependent lifetime curves

Daniel Beck¹, Michael Winter¹, Jan Schmidt¹¹ISFH

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10:00 - 10:30	<p>Coffee Break South Mezzanine</p>	
10:30 - 10:55	<p>Invited Talk L1</p> <p>10:30 - 10:55</p> <p>Sustainable development of Silicon PV: learning from laboratory to industry</p> <p>Chen YiFeng¹ ¹Trina Solar</p>	<u>ID 156</u>
10:55 - 12:10	<p>Session 2: Manufacturing and understanding of silicon materials L1</p> <p><u>Session Chairs:</u> John D Murphy, <i>University of Warwick</i>, and Jana-Isabelle Polzin, <i>Fraunhofer ISE</i></p> <p>10:55 - 11:10</p> <p>Temperature Dependence of the Ambipolar Auger Coefficient in Crystalline Silicon</p> <p>Lachlan Black², Yan Zhu¹, Ziv Hameiri¹, Daniel Macdonald² ¹University of New South Wales, ²Australian National University</p> <p>11:10 - 11:25</p> <p>Spatial Distribution of Dopants and Oxygen-Related Defects in Antimony-Doped Czochralski Silicon</p> <p>Sebastien Dubois², Nicolas Enjalbert², Adrien Danel², Raphael Cabal², Wei Han¹, Yichun Wang¹ ¹LONGi, ²CEA-INES</p> <p>11:25 - 11:40</p> <p>Antimony-doped Cz silicon wafers: the next generation of n-type wafers for solar cells?</p> <p>Rabin Basnet⁴, Afsaneh Kashizadeh⁴, Chirag Mule¹, Wei Han², Heping Shen⁴, Craig Taylor³, Sumit Agarwal³, Yichun Wang², Pauls Stradins¹, Daniel Macdonald⁴ ¹National Renewable Energy Laboratory (NREL), ²LONGI Green Energy Technology Co., Ltd., ³Colorado School of Mines, ⁴The Australian National University</p> <p>11:40 - 11:55</p> <p>Impact of LeTID in industrial P- and Sb-doped n-type Cz-Si with melt recharging</p> <p>Joshua Kamphues¹, Juri Miech¹, Sarah-Marie Warmbold¹, Wei Han², Yichun Wang², Axel Herguth¹, Giso Hahn¹, Fabian Geml¹ ¹University of Konstanz, ²LONGI Green Energy Technology Co., Ltd</p> <p>11:55 - 12:10</p> <p>In-Situ-Gettering of Epitaxially Grown Silicon Wafers for Solar Cells with</p>	<p><u>ID 103</u></p> <p><u>ID 69</u></p> <p><u>ID 16</u></p> <p><u>ID 91</u></p> <p><u>ID 4</u></p>

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TOPCon

Clara Rittmann¹, Jana Polzin¹, Armin Richter¹, Pascal Messmer¹, Florian Schindler¹, Charlotte Weiss¹, Martin Schubert¹, Stefan Janz¹, Marion Drießen¹

¹Fraunhofer ISE

12:10 - 13:00

Lunch Break

South Mezzanine

13:00 - 14:15

Poster Session I

South Mezzanine

Poster Category: **Manufacturing and understanding of silicon materials**

Poster
Number

ID 15 - Thermally stable Epiwafers for PV applications

TUE-A-1

Rabin Basnet¹

¹The Australian National University

ID 53 - Correlating Structure Loss and Operational Conditions in Czochralski Silicon Ingot Growth using Machine Learning

TUE-A-2

Alfredo Sanchez¹

¹SINTEF

ID 151 - Fused quartz crucibles for PV applications: the role of Czochralski process parameters and sand quality on the bubble formation and growth

TUE-A-3

Marisa Di Sabatino¹

¹NTNU

ID 13 - On the Distribution of Defect States during LeTID in n-Type Cz-Si

TUE-A-4

Joshua Kamphues¹

¹University of Konstanz

ID 124 - Effect of Hydrogen-Plasma Treatment Temperature on the Stability of Acceptor-Hydrogen Pairs

TUE-A-5

Lahiruni Ranasinghe¹

¹University of New South Wales

ID 43 - Observation of an injection dependent lifetime effect in highly hydrogenated boron doped wafers

TUE-A-6

Rune Søndena¹

¹Institute for Energy Technology

ID 85 - Density-Functional Theory Simulations of Radiation Defects in Silicon Solar Cells

TUE-A-7

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Alex Fedoseyev¹

¹Solestial Inc

ID 123 - Impact of Thickness and Cutting Direction on the Mechanical Properties of Mono-Si Wafers

TUE-A-8

Nurhayat Yıldırım¹

¹KalyonPV

ID 64 - Effects of carbon and oxygen in Si crystal on defect generation due to solar cell fabrication process

TUE-A-9

Yoshio Ohshita¹

¹ Toyota Technological Institute

ID 116 - Rapid Thermal Annealing (RTA) and Diffusion Furnace Thermal Annealing Effects on Oxygen and Carbon Contamination in Mono-Silicon Wafers

TUE-A-10

Nurhayat Yıldırım¹

¹KalyonPV

ID 35 - Impact of Seed Crystal Quality on Dislocation-Free Single-Crystal Growth in Silicon Ingots for Photovoltaic Applications

TUE-A-12

Özlem Coşkun¹

¹Kalyon PV

ID 122 - Characterization and Performance Evaluation of Gallium-Doped Silicon Ingots for Solar Cell Applications

TUE-A-13

Ece Çamkara¹

¹KalyonPV

ID 115 - Production of Photovoltaic Silicon Ingots The Effect of Impurities on Electrical and Mechanical Performance

TUE-A-14

Fatma Beyza Kızıl¹

¹KalyonPV

Poster Category: **Improvements in surface passivation**

Poster Number

ID 27 - Advanced silicon solar cell and wafer degradation diagnostics using superacid-based passivation

TUE-B-1

Sophie Pain¹

¹University of Warwick

ID 100 - Identifying and Mapping Impurity Sources in Deposition-Prone

TUE-B-2

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Chemicals for Wafer Surface Wet Processing

Sneha R Iyer¹

¹Adani New Industries Limited

Poster Category: **Advances in passivating contacts**

Poster Number

ID 136 - Laser-Enabled Pinhole Creation in Polysilicon on Oxide
Passivating Contacts

TUE-C-1

Dirk Steyn¹

¹National Renewable Energy Laboratory

ID 71 - ALD-TiOx and PVD-MoOx in dopant-free silicon heterojunction
solar cells

TUE-C-2

Liqi Cao¹

¹Delft University of Technology

ID 107 - Transparent Conductive SnO2 Electrodes For Poly-Si/SiOx
Passivating Contact Based Photovoltaics

TUE-C-3

Paul Llontop¹

¹University of Twente

ID 47 - Development of a p-type interdigitated back contact solar cell
with passivated contacts

TUE-C-4

Lazhar Rachdi¹

¹ISC Konstanz

ID 14 - Understanding of Different B Diffusion Dynamics in In-situ and
Ex-situ doped p+ Poly-Si Passivation Contacts

TUE-C-5

Unsoo Kim¹

¹Korea Institute of Energy Research (KIER)

Poster Category: **Innovation in solar cell architectures**

Poster Number

ID 24 - Lifetime Enhancement of Nano-Crystalline SHJ Cells Using Heat
and Light Treatments

TUE-E-1

Maysa Sarsour¹

¹University of New South Wales (UNSW)

ID 32 - Analyzing the systemic effects of hydrogenated silicon nitride
film deposition on photovoltaic performance: A comprehensive study

TUE-E-2

Munse Kim¹

¹Korea Institute of Energy Research

ID 148 - Development of Doped nc-Si:H Thin-Film as Emitter Layer for

TUE-E-3

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SHJ Solar Cells

Arghavan Salimi¹

¹ODTÜ-GÜNAM

ID 40 - Hybrid dry- and wet-etching process for the preparation of photonic crystals in silicon

TUE-E-4

Jan Krügener¹

¹Institute of Electronic Materials and Devices

ID 141 - Numerical Simulation of Flexible Silicon Heterojunction Solar Cell with 27.2% Efficiency

TUE-E-5

Deep Shikha¹

¹Indraprastha Institute of Information Technology Delhi

ID 60 - Optimization of Material Parameters of Silicon Heterojunction Solar Cells at Low Illuminations for Enhancing Efficiency

TUE-E-6

Rupendra Kumar Sharma¹

¹Department of Electrotechnology, Faculty of Electrical Engineering, Czech Technical University in Prague

ID 74 - Nanosecond vs Picosecond: The Potential for Advanced Solar Cell Processing via Pulsed Laser Technology

TUE-E-7

Tarek Abdul Fattah¹

¹University of Oxford

Poster Category: **Interconnection and reliability in silicon modules**

Poster Number

ID 66 - Laser welding for interconnection of silicon solar cells - long-term stability and process simplification

TUE-F-1

Henning Schulte-Huxel¹

¹Institute for Solar Energy Research in Hamelin (ISFH)

ID 78 - Stretchable and Flexible Crystalline Silicon Photovoltaic Modules with Auxetic Rotating Isosceles Right Triangle Structure for Adjustable Transmittance

TUE-F-2

Chen Cao¹

¹University of Southampton

ID 139 - An Analysis of Photovoltaic Modules' Efficiency: A Comparative Study of HJT and TOPcon Modules under Different Light Intensity Conditions

TUE-F-3

Hong Yang¹

¹Xi'an Jiaotong University

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<p><u>ID 73</u> - Improving Single Passivated Emitter Rear Contact (PERC) Solar Cell Module Reliability and Regeneration by Applying ac Power to Reduce Light and Elevated Temperature-Induced Degradation</p> <p><u>Jaljalalul Abedin Jony</u>¹</p> <p>¹ICDL, Sungkyunkwan University</p>	<p><u>TUE-F-4</u></p>
<p><u>ID 81</u> - Outdoor Color Quantification and Electrical Performance Assessment of Colored Solar Panels</p> <p><u>Fallon Colberts</u>¹</p> <p>¹Zuyd University of Applied Sciences</p>	<p><u>TUE-F-5</u></p>
<p><u>ID 20</u> - Experimental and Simulated Modal Analysis of PV Modules Towards Vehicle-integrated PV Applications</p> <p><u>Bin Luo</u>¹</p> <p>¹imec</p>	<p><u>TUE-F-6</u></p>
<p><u>ID 22</u> - Simulating and Implementing Bypass Diodes and Parallel Connections in Standard-Like PV Modules towards Improved Shade Tolerance</p> <p><u>Jonathan Govaerts</u>¹</p> <p>¹imec</p>	<p><u>TUE-F-7</u></p>
<p><u>ID 37</u> - Comparative Analysis of Photo-oxidation Resistance in Polymeric Encapsulants of Different Types</p> <p><u>Ümran Dilmaç</u>¹</p> <p>¹Kalyon PV</p>	<p><u>TUE-F-8</u></p>
<p><u>ID 138</u> - Analysis of Measurement Reproducibility for Photovoltaic Modules under Outdoor Test Conditions</p> <p><u>Hong Yang</u>¹</p> <p>¹Xi'an Jiaotong University</p>	<p><u>TUE-F-9</u></p>
<p><u>ID 33</u> - Performance Comparisons of Bifacial Photovoltaic Modules on Surfaces with Different Albedo Values: PVsyst Simulation Study</p> <p><u>Nurgül Polat</u>¹</p> <p>¹Kalyon PV Kalyon Güneş Teknolojileri Fabrikası</p>	<p><u>TUE-F-10</u></p>
<p><u>ID 87</u> - Impact of Desert Climate on Photovoltaic Encapsulant and Backsheet</p> <p><u>Amir Abdallah</u>¹</p> <p>¹Qatar Environment and Energy Research Institute</p>	<p><u>TUE-F-11</u></p>
<p><u>ID 7</u> - Intelligent Neuro-Fuzzy Model for Fault Diagnosis in Photovoltaic</p>	<p><u>TUE-F-12</u></p>

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Systems

Mamadsho Ilolov¹

¹Center of Innovative Development of Science and New Technologies, NAST

ID 1 - Partial Shading Effect on Road-Integrated Photovoltaic Systems

TUE-F-14

Sarah Rajab¹

¹Julich FZ Research Center

ID 137 - Modelling of Solar Cell Junction Temperature for Crystalline Silicon Photovoltaic Module

TUE-F-15

Hong Yang¹

¹Xi'an Jiaotong University

ID 36 - Outdoor PV Performance Monitoring Stations

Alaattin Yağız Saydut¹

¹Kalyon PV

ID 86 - Evaluating the Performance of Bifacial PV Modules on Different Ground Surfaces

TUE-F-16

TUE-F-17

Merve tan¹

¹Kalyon PV

14:15 - 14:35

Short Break

South Mezzanine

14:35 - 15:00

Invited Talk

L1

Recent progress and development in high-efficiency silicon-based PV technology at LONGi

ID 155

Chris Xu¹

¹LONGI Solar Technologie GmbH

15:00 - 16:15

Session 3: Improvements in surface passivation

L1

Session Chairs: Raşit Turan, METU GUNAM, and Sophie Pain, University of Warwick

15:00 - 15:15

ID 46

Hafnium Oxide - A Promising Addition to the Zoo of Passivation Layers for Silicon Solar Cells?

Jan Schmidt², Michael Winter², Floor Souren¹, Jons Bolding¹, Hindrik de Vries¹

¹SALD B.V., ²ISFH

15:15 - 15:30

ID 108

Surface passivation from hafnium oxide films: processing, mechanisms and interface structures

Sophie Pain¹, Luke Wilkins¹, Anup Yadav¹, Yisong Han¹, Richard Beanland²,

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Nicholas Grant¹, **John Murphy**¹

¹School of Engineering, University of Warwick, Coventry, CV4 7AL, UK,

²Department of Physics, University of Warwick, Coventry, CV4 7AL, UK

15:30 - 15:45

[ID 94](#)

The Impact of Surface Electric Fields During Annealing for Passivation
of Si - SiO_x/AlO_x/SiN_x Interfaces

Xinya Niu¹, Shona McNab², Sebastian Bonilla¹

¹University of Oxford, ²University of New South Wales

15:45 - 16:00

[ID 93](#)

Approaches to reduce the Impact of Edge Recombination in Si Lifetime
Samples with Emitter

David Bäurle¹, Axel Herguth¹, Giso Hahn¹

¹University of Konstanz

16:00 - 16:15

[ID 67](#)

Low-Loss Singulation of TOPCon Solar Cells by TLS and Al₂O₃ Edge
Passivation

Elmar Lohmüller¹, Norbert Kohn¹, Felix Maischner¹, Homeira Hashemi¹,
Alexander Göbel¹, Jonas D. Huyeng¹, Pierre Saint-Cast¹, Vivek Beladiya³,
Saravanan Somasundaram², **Ralf Preu**¹

¹Fraunhofer ISE, ²Emmvee Photovoltaic Power Private Limited, ³Plasma
Electronic GmbH

16:15 - 16:45

Coffee Break

South Mezzanine

16:45 - 18:00

Session 4: Advances in passivating contacts

L1

Session Chairs: Robby Peibst, *ISFH*, and Audrey Morrisset, *CSEM*

16:45 - 17:00

[ID 5](#)

Efficient silicon solar cells with aluminum-doped zinc oxide-based
passivating contact

Xinbo Yang¹

¹Soochow University

17:00 - 17:15

[ID 110](#)

Impact of Precursor Dosing on the Surface Passivation of AZO/AlO_x
Stacks Formed Using Atomic Layer Deposition

Yan Wang¹, Sebastian Bonilla¹, Matthew Wright¹, Theodore Hobson¹

¹University of Oxford

17:15 - 17:30

[ID 127](#)

Excellent Surface Passivation with Hole-Selective Niobium Titanium
Oxide/Silicon Oxide Passivating Contact

Shohei Fukaya³, Kazuhiro Gotoh^{1, 2, 3}, Yasuyoshi Kurokawa³, Noritaka Usami^{3, 4}.

⁵

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¹Department of Electrical and Information Engineering, Niigata University,
²IRCNT, Niigata University Interdisciplinary Research, Niigata University,
³Graduate School of Engineering, Nagoya University, ⁴Institutes of Innovation
for Future Society, Nagoya University, ⁵IMaSS, Nagoya University

17:30 - 17:45

[ID 10](#)

Polycrystalline Silicon Passivating Contacts Hydrogenation by
Microwave Annealing

Thien Truong², Wensheng Liang¹, Rabin Basnet¹, William Nemeth², Pauls
Stradins², **David Young**², Daniel Macdonald¹, Kean Fong¹

¹Australian National University, ²National Renewable Energy Laboratory

17:45 - 18:00

[ID 147](#)

Ultra-Thin Polysilicon Passivated Contacts

Kean Chern Fong¹, Stephane Armand¹, Rabin Basnet¹, Marco Ernst¹, Gabriel
Bartholazzi¹, James Bullock², Di Yan², Xinyu Zhang³, Peiting Zheng³, Daniel
MacDonald¹

¹The Australian National University, ²Melbourne University, ³Jinko Solar

Wednesday, 09 April 2025

08:45 - 10:00

Session 5: Monitoring and understanding cell degradation

L1

Session Chairs: Giso Hahn, *University of Konstanz*, and Marisa Di Sabatino, *NTNU*

08:45 - 09:00

[ID 90](#)

Insights Into The Structure Of The Defect Responsible For LeTID Using
Electron Paramagnetic Resonance

Chirag Mule^{1,4}, Zhongcan Xiao⁵, Benjamin Hammann^{2,3}, Fabian Thome², P.
Craig Taylor⁴, Wolfram Kwapil^{2,3}, Matthew Page¹, Markus Kaupa¹, William
Nemeth¹, Yuanyue Liu⁵, Sumit Agarwal⁴, Pauls Stradins¹

¹National Renewable Energy Laboratory (NREL), Golden, Colorado, USA,

²Fraunhofer Institute for Solar Energy Systems, Freiburg, Germany, ³University
of Freiburg, Freiburg, Germany, ⁴Colorado School of Mines (CSM), Golden,
Colorado, USA, ⁵The University of Texas at Austin, Austin, Texas, USA

09:00 - 09:15

[ID 55](#)

Understanding Temporary Recovery: The Key to Modelling LeTID in
Gallium-Doped Silicon

Fabian Thome¹, Elvin Garashli¹, Florian Schindler¹, Wolfram Kwapil²

¹Fraunhofer Institute for Solar Energy Systems, ²University Freiburg, Institute
for Sustainable Systems Engineering (INATECH)

09:15 - 09:30

[ID 83](#)

Degradation and accelerated recovery of surface passivation in n+
poly-Si/SiO_x passivating contacts for TOPCon solar cells

Aditya Ratnapagol^{1,2}, William Nemeth², Pauls Stradins², Sumit Agarwal¹, David
Young²

¹Colorado School of Mines, ²NREL

09:30 - 09:45

[ID 26](#)

Insights on UV-induced degradation of SHJ solar cells

Hugo LAJOIE¹, Romain COUDERC¹, Frederic JAY¹

¹CEA

09:45 - 10:00

[ID 105](#)

A Failure Mode Affecting the Reliability of LECO Metallised
High-Efficiency TOPCon Solar Cells

Yuelin Xiong¹, Ruy Sebastian Bonilla¹

¹University of Oxford

10:00 - 10:30

Coffee Break

South Mezzanine

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10:30 - 10:55	<p>Invited Talk L1</p> <p>Insights into the hydrogen-induced defect dynamics in silicon heterojunction cells Mariana Bertoni¹ ¹Arizona State University</p>	<u>ID 154</u>
10:55 - 12:10	<p>Session 6: Innovation in solar cell architectures L1</p> <p>10:55 - 11:10 Selective laser ablation of single layers from SiO₂/poly-Si superlattices for patterning of highly efficient IBC solar cells Udo Römer¹, Michael Rienäcker¹, Robby Peibst¹ ¹ISFH</p> <p>11:10 - 11:25 Evaluation of Different Front Surface Passivation Schemes for p-type IBC Solar Cells Marius Meßmer¹, Lazhar Rachdi², Andreas Wolf¹, Stefan Schmidt¹, Nico Jung¹, Jan Lossen² ¹Fraunhofer ISE, ²ISC</p> <p>11:25 - 11:40 Charged oxide inversion layers using corona discharge at elevated temperature Jingyan Chen¹, Tarek Abdul Fattah¹, Anastasia Soeriyadi¹, Matthew Wright¹, Peter Wilshaw¹, Edris Khorani², John Murphy², Sebastian Bonilla¹ ¹University of Oxford, ²University of Warwick</p> <p>11:40 - 11:55 Interpretation and equivalent circuit modelling of the low temperature dependence of VOC of heterojunction silicon solar cells predicted by numerical simulations Moustafa Ghannam¹ ¹Kuwait University</p> <p>11:55 - 12:10 Silicon heterojunction solar cells featuring localized front contacts Sebastian Smits¹, Yifeng Zhao¹, Paul Procel Moya¹, Luana Mazzarella¹, Olindo Isabella¹ ¹Delft University of Technology</p>	<p><u>ID 96</u></p> <p><u>ID 12</u></p> <p><u>ID 106</u></p> <p><u>ID 75</u></p> <p><u>ID 111</u></p>
12:10 - 13:00	<p>Lunch Break South Mezzanine</p>	

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13:00 - 14:15

Poster Session II

South Mezzanine

Poster Category: **Sustainability in the TW era**

Poster
Number

ID 118 - Towards Silver- and Indium-Free Perovskite Solar Cells

WED-G-1

Jonas Bartsch¹

¹Fraunhofer ISE

ID 3 - Development of novel process enabling complete recycling of c-Si PV modules

WED-G-2

Pradeep Padhamnath¹

¹AGH University of Krakow

ID 109 - Investigation of structural changes in Al-doped PV quartz glass crucibles

WED-G-3

Bartłomiej Gawel¹

¹The Quartz Corp

ID 8 - Using thin AZO layers coupled with SiN as a way to decrease Indium consumption in SHJ cells and modules

WED-G-4

Tristan Gageot¹

¹CEA INES

ID 144 - Design - for - recycling of SHJ modules with drastic reduction of Ag and In contents

WED-G-5

Timea Béjat¹

¹Univ. Grenoble Alpes, CEA, Liten

ID 51 - Laser ablation for the recycling of PERC and TOPCon modules

WED-G-6

Toon IJzerman¹

¹TNO

Poster Category: **Novel metallisation approaches**

Poster
Number

ID 121 - Impact of Carrier Foil Configurations on the Reliability of Multiwire TWILL Interconnection technology for Si solar cells

WED-H-1

Hamed Javanbakht Lomeri¹

¹imec

ID 126 - Production-Ready Decomposition of Series Resistance into

WED-H-2

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Lateral and Fixed Components

Don Clugston¹

¹WAVELABS Solar Metrology Systems GmbH

ID 42 - Towards Highly Efficient All-Aluminum Screen-Printed Solar Cells

WED-H-3

Sebastian Junge¹

¹Institute for Solar Energy Research in Hamelin (ISFH)

ID 143 - Contact resistance increase in Ga-doped silicon solar cells at current injection and elevated temperature treatments

WED-H-4

Matthias Müller¹

¹TU Bergakademie Freiberg / Institute of Applied Physics

ID 41 - Reduction Of Silver Use In Low-Temperature Interconnection Of Solar Cells

WED-H-5

Nathalie Ronayette¹

¹CEA

ID 101 - The Bulk and Interface Properties of Cu Screen-printed Contacts on Silicon Solar Cells

WED-H-6

Harry Wright¹

¹University of Oxford

ID 150 - Local Series Resistance: Why the Model of Independent Diodes Fails and How to Understand Silicon Solar Cells in General by the LR-Rs Concept

WED-H-7

Jan-Martin Wagner¹

¹University of Kiel

ID 30 - Analyzing resistive loss in Topcon cell by introducing finger interruption using Quokka

WED-H-8

Rashi Dhanraj¹

¹Adani New Industries Limited

ID 132 - Development of Interconnection Process on Si Heterojunction Solar Cell Metallized with Screen Printed Cu Contacts

WED-H-9

E. Busra Kucuk¹

¹ Energy and Materials Transition, Solar Energy, Netherlands Organization for Applied Scientific Research (TNO)

ID 146 - Well Intended Contact Failures on Interdigitated Back Contact Solar Cells

WED-H-10

April 8 – 11, 2025 | Oxford, UK

Aloña Otaegi¹

¹Institute of Microelectronic Technology. University of the Basque Country

ID 104 - Copper Diffusion at the Copper/Silicon Interfaces: Is it really that big a problem?

WED-H-12

Yuelin Xiong¹

¹University of Oxford

Poster Category: **Advances in TOPCon solar cells**

Poster
Number

ID 17 - Enhancing thermal stability of tunnel oxide passivated contacts for high-efficiency rear-junction p-type silicon solar cells

WED-I-1

Yong-Jin Kim¹

¹Korea Institute of Energy Research

ID 28 - Hydrogen Management during Industrial TOPCon Solar Cell Fabrication

WED-I-2

Benjamin Hammann¹

¹University of Freiburg

ID 120 - ONE STEP PATTERNING OF POLY-SILICON LAYERS USING A SHADOW MASK AND ATMOSPHERIC GAS-PHASE ETCHING PROCESS

WED-I-3

Laurent Clochard¹

¹Nines PV

ID 48 - Excellent Ex-Situ Doped p+ Poly-Si/SiO_x Passivating Contacts Enabled by Poly-Si Pre-Annealing for Efficient TOPCon Based Single Junction and Tandem Solar Cells

WED-I-4

Yiğit Mert Kaplan¹

¹ODTÜ-GÜNAM

ID 18 - Computational Analysis of Tunnel Oxide Passivated Contact with Rear Emitter Solar Cells: Comparative Study of Hole-Selective Layer Localized under FrontSide Contact

WED-I-5

Eni Muka¹

¹ODTÜ-GÜNAM

ID 61 - Effect of Boron Doping Profiles on iTOPCon Solar Cell Performance

WED-I-6

Yiğit Mert Kaplan¹

¹ODTÜ-GÜNAM

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ID 31 - Numerical analysis of metal poly-Si contact in TOPCon solar cells through device simulations using Sentaurus TCAD

WED-I-7

Savita Kashyap¹

¹The Indian Institute of Technology Bombay (IIT Bombay)

Poster Category: **Silicon-based tandem solar cells**

Poster
Number

ID 95 - Lead Iodide By APCVD For Silicon-Perovskite Tandem Solar Cell Production

WED-J-1

Tom Burgard¹

¹University of Konstanz

ID 145 - The Input Parameters for Sentaurus TCAD Device Simulations of > 30% Perovskite-on-TOPCon Tandem Solar Cells

WED-J-2

Darshit Hemendra Trevadia¹

¹Department of Materials, University of Oxford

ID 76 - Cast Mono Silicon Wafers Integration for Low Carbon Footprint Perovskite-Si Tandem Solar Cells

WED-J-4

Thibaut Desrues¹

¹CEA-INES

ID 45 - Hydrogenated Aluminum Doped Zinc Oxide as Highly Transparent and Passivating Indium-Free Recombination Junction for TOPCon-Based Bottom Cell

WED-J-5

Gokhan Altiner¹

¹ODTÜ-GÜNAM

ID 49 - 2-Dimensional TCAD Simulation of Tandem Perovskite-Silicon Solar Cells

Pierre Lottigier¹

¹CEA INES, LITEN

WED-J-6

ID 25 - Low-Temperature Deposition of AZO as an Intermediate Layer for PVSK/SHJ Two-Terminal Tandem Solar Cells Using RF Sputtering

WED-J-7

TATSUMI NAKAMURA¹

¹Meiji University

ID 129 - Understanding the Link Between Band Alignment and Charge Transport at ZnOx-based TCO Interfaces for Tandem Solar Cells

WED-J-8

Theodore D C Hobson¹

April 8 – 11, 2025 | Oxford, UK

¹University of Oxford Department of Materials

ID 113 - Shingled Silicon Bottom Cells for Voltage-Matched 4 Terminals
Perovskite-Silicon Tandem Modules

WED-J-9

Thibaut Desrues¹

¹CEA-INES

ID 21 - Evaluation of Thickness Optimization and Electron Transport
Layers in Perovskite Solar Cells with Setfos-5.4 Simulation

WED-J-10

Özlem Coşkun¹

¹Kalyon PV

ID 89 - Development of ultra-thin SiNx :H layers for increased
passivation of poly-Si/SiOx stacks, in a Pk/Si tandem perspective

WED-J-11

Antoine Genet¹

¹CEA -LITEN

ID 63 - Comparative Analysis of Voltage-Matched III-V/Si Bifacial
Tandem Solar Cells with Various Silicon Bottom Cell Configurations

WED-J-12

Rafi Ur Rahman¹

¹Sungkyunkwan University

ID 117 - The Singlet Fission Route for >30% Efficient Solar Cells: Silicon
Cell Requirements

WED-J-13

Shona McNab¹

¹UNSW

Poster Category: **Novel characterisation and simulation**

Poster
Number

ID 19 - FT-IR studies of Hydrogen species in Si wafer during Light
Soaking

WED-K-1

Nicole Aßmann¹

¹Centre for Materials Science and Nanotechnology, University of Oslo

ID 29 - Simulation and Analysis of PECVD Process for Silicon Nitride
Deposition using CFD: Impact of Pressure on Deposition Uniformity

WED-K-2

VINAY PRASAD¹

¹Adani New Industries Limited

ID 97 - Microscopic Characterization of SHJ Interdigitated
Back-Contacts

WED-K-3

April 8 – 11, 2025 | Oxford, UK

Martin Ledinsky¹

¹Institute of Physics, AS CR

ID 125 - Influence of the depth and the recombination speed on the back side Sb of a silicon solar cell type n+pp+ under polychromatic illumination with matlab/Simulink.

WED-K-4

Babou DIONE¹

¹University Cheikh Anta DIOP of Dakar (SENEGAL)

ID 142 - Electron Paramagnetic Resonance Analysis of Photovoltaic-Grade Arsenic-Doped Czochralski Silicon Wafers

WED-K-5

Chirag Mule¹

¹NREL / Colorado School of Mines

ID 140 - Assessment of Series Resistance of HIT Dependence on Solar Irradiance and Temperature

WED-K-6

Hong Yang¹

¹Xi'an Jiaotong University

14:15 - 14:35

Short Break

South Mezzanine

14:35 - 15:00

Invited Talk

L1

Photovoltaics at the Cusp: Global Growth and Learning

ID 157

Nancy Haegel¹

¹National Renewable Energy Laboratory

15:00 - 16:15

Session 7: Sustainability in the TW era

L1

Session Chairs: Jan Schmidt, *ISFH*, and Li Wang, *UNSW*

15:00 - 15:15

ID 80

Low Embodied Energy and Carbon, High Lifetime Silicon Boules via a Combined Chemical Vapor Deposition Float Zone Process

David Young¹, Ethan Young¹, Xin He¹, Aubry Kleinsorge¹, Malik Hassanaly¹, Mark Loboda², Kevin Schulte¹

¹NREL, ²Hemlock Semiconductor

15:15 - 15:30

ID 34

Environmental Impact of Electricity Mix Decarbonisation on TOPCon Manufacturing and Deployment

Bethany L. Willis³, Oliver M. Rigby³, Sophie L. Pain¹, Nicholas E. Grant¹, John D. Murphy¹, Ruy S. Bonilla², Neil S. Beattie³

¹School of Engineering, University of Warwick, Coventry, CV4 7AL UK,

²Department of Materials, University of Oxford, Parks Rd, Oxford OX1

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4NH, United Kingdom, ³Department of Mathematics, Physics and
Electrical Engineering, Ellison Building, Northumbria University,
Newcastle upon Tyne NE1 8ST, UK

15:30 - 15:45

[ID 23](#)

Pathways to Low-Emissions and Sustainable PV Systems and
their Impact on Cost

Moonyong Kim¹, Mohammad Dehghanimadvar¹, Catherine Chan¹,
Nathan Chang¹, Brett Hallam¹

¹School of Photovoltaic and Renewable Energy Engineering, UNSW
Sydney, Sydney, NSW 2052, AUSTRALIA

15:45 - 16:00

[ID 9](#)

Recycling Silicon Kerf Waste and Quartz Pot scrap, for Silicon
Production via Carbothermic Reduction

Birgit Rynningen¹, Berhane Darsene Dimd¹, Nagarajan Somi Ganesan¹,
Pål Tetlie¹, Irene Bragstad¹, Martin Bellmann¹, Roar Jensen¹, Arvid
Inge Sørvik², Torfinn Krogstad²

¹SINTEF, ²Northern Silicon

16:00 - 16:15

[ID 52](#)

Laser assisted PV module separation for recycling

Maarten van der Vleuten¹, Remi Aninat¹, Mirjam Theelen¹, Johan
Bosman¹, Anne Biezemans¹, Henri Fledderus¹, Joao Gomes¹, Ando
Kuyppers¹, Toon Ijzerman²

¹TNO, ²Zuyd Hogeschool

16:15 - 16:45

Coffee Break

South Mezzanine

16:45 - 18:00

Session 8: Novel metallisation approaches

L1

Session Chairs: Brett Hallam, UNSW, and Nancy Haegel, NREL

16:45 - 17:00

[ID 82](#)

Copper Pastes for TOPCon Solar Cells

Ruvini Dharmadasa², **Thad Druffel**², Andreas Lorenz¹, Daniel
Ourinson¹, Fadi Maarouf¹, Jonas Huyeng¹

¹Fraunhofer ISE, ²Bert Thin Films

17:15 - 17:30

[ID 59](#)

Efficiency Improvement and Microstructural Working Principle
of LECO on Solar Cells with n-type and p-type TOPCon layers

Stefan Lange², Sina Swatek², Jan Hoß¹, Eve Krassowski³, Stephan
Großer², Saman Sharbaf Kalaghichi⁴, Jonathan Linke¹, Jan Lossen¹,
Marko Turek²

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¹International Solar Energy Research Center Konstanz e.V.,

²Fraunhofer Center for Silicon Photovoltaics CSP, ³CE Cell Engineering
GmbH

17:30 - 17:45

ID 98

Reactive Silver Ink: Reduced Ag Consumption for
Low-Temperature Substrates

Michael Martinez-Szewczyk¹, Steven DiGregorio^{2,3}, Owen Hildreth²,
Zhengshan Yu⁴, Mariana Bertoni¹

¹Arizona State University, ²Colorado School of Mines, ³Sandia National
Laboratory, ⁴Beyond Silicon

17:45 - 18:00

ID 57

Minimal Ag Consumption for Screen-Printed SHJ Cells in the
Terawatt Production Era

Sebastian Pingel¹, Fadi Mahmoud Maarouf¹, Noah Wengenmeyr¹,
Andreas Lorenz¹, Florian Clement¹, Jonas Huygen¹

¹Fraunhofer ISE

18:30 - 22:00

Conference Dinner

Oxford University Museum of Natural History
Parks Road
Oxford
OX1 3PW

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Thursday, 10 April 2025

08:30 - 08:45	Welcome to nPV Workshop L1	
08:45 - 10:00	Session 9: Advances in TOPCon cells L1	
	<u>Session Chairs</u> : Stefan Glunz, <i>Fraunhofer ISE</i> , and Mingzhe Yu, <i>LONGi Green Energy</i>	
	08:45 - 09:00	<u>ID 84</u>
	Tunnel Oxide Passivating Contact Solar Cells with Up to 25.77% Efficiency Achieved by Restraining Disruption of Tunnel SiOx	
	Lei Yang ¹ , Xuegong Yu ¹ , Deren Yang ¹ ¹ Zhejiang University	
	09:00 - 09:15	<u>ID 65</u>
	Rear-Junction Tunnel Oxide Passivated Contact Silicon Solar Cells on n-type Substrate	
	Vaibhav Venkat Kuruganti ¹ , Thomas Buck ¹ , Sebastian Veerman ¹ , Valentin Mihailetchi ¹ ¹ ISC Konstanz	
	09:15 - 09:30	<u>ID 38</u>
	Boron-Emitter Development for TOPCon c-Si Solar Cells based on Plasma-Deposited Boron Diffusion Source and Poly-Si(n) Passivating Contact	
	Thibault Schaller ¹ , Ezgi Genç ¹ , Julien Hurni ¹ , Christophe Ballif ^{1, 2} , Audrey Morisset ² , Franz-Josef Haug ¹ ¹ Ecole Polytechnique Fédérale de Lausanne, ² Centre Suisse d'Electronique et de Microtechnique	
	09:30 - 09:45	<u>ID 62</u>
	Maskless Patterning of Laser Activated p+ poly Si Layers for Advanced TOPCon Solar Cells	
	Saman Sharbaf Kalaghchi ¹ , Jan Hoß ¹ , Jonathan Linke ¹ , Florian Buchholz ¹ , Jan Lossen ¹ , Lejo Joseph Koduvelikulathu ¹ ¹ ISC Konstanz	
	09:45 - 10:00	<u>ID 79</u>
	TOPCon, TOPCoRE or TOPCon ² : A simulation-based efficiency analysis	
	Nico Wöhrle ¹ , Armin Richter ¹ , Andreas Wolf ¹ , Johannes Greulich ¹ ¹ Fraunhofer-Institute for Solar Energy Systems ISE	
10:00 - 10:30	Coffee Break South Mezzanine	

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10:30 - 10:55

Invited Talk

L1

Towards stable and efficient perovskite/silicon tandem solar cells

[ID 158](#)

Esma Ugur¹

¹King Abdullah University of Science and Technology

10:55 - 12:10

Session 10: Interconnection and reliability in silicon modules

L1

Session Chairs: Wilred Favre, *CEA-INES*, and Eszter Voroshazi, *CEA-INES*

10:55 - 11:10

[ID 102](#)

Tunnel IBC and SWCT modules: a smart combination to address PV challenges

Pierre Papet¹, Loris Barraud¹, Derk Baetzner¹, Clémence Carroubi¹, Walter Frammelsberger¹, Niels Holm¹, Till Koessler¹, Boris Legradic¹, Robert Kramer¹, Maxime Pujol¹, Ludovic Vuithier¹, Loann Baume², Jonathan Champiaud², Lison Marthey², Rainer Grischke³, Gizem Norgay³, Damien Lachenal¹

¹Meyer Burger Research, ²CSEM, ³Meyer Burger Switzerland AG

11:10 - 11:25

[ID 11](#)

Moisture-Induced Degradation of TOPCon Modules: Effects of Sodium and Moisture

Lucie Pirot-Berson^{1, 2, 3}, Romain Couderc³, Romain Bodeux^{1, 2}, Julien Dupuis¹

¹EDF R&D, ²IPVF, ³CEA

11:25 - 11:40

[ID 88](#)

Investigating Degradation of Advanced Monofacial and Bifacial PV Technologies using UV Fluorescence Imaging

Claudia BUERHOP LUTZ², Amir Abdallah¹, Oleksandr Stroyuk², Oleksandr Mashkov², Maulid Kivambe¹, Mohamed Abdelrahim¹, Mohamed Elgali¹, Ian Marius Peters²

¹QEERI, ²FZJ, HI ERN

11:40 - 11:55

[ID 44](#)

Ultrasonic Tinning Of Al Pads For Silver- And Lead-Free Cell Interconnection

Malte Brinkmann¹, Henning Schulte-Huxel¹, Christina Hollemann¹, Byungsul Min¹, Sebastian Junge¹, Till Brendemühl¹, Rolf Brendel^{1, 2}

¹Institute for Solar Energy Research Hamelin, ²Institute for Solid State Physics, Leibniz University Hannover

11:55 - 12:10

[ID 133](#)

Gaining Fundamental Understanding of Critical Failure Modes and Degradation Mechanisms in Fielded Photovoltaic Modules via Multiscale Characterization

Kristopher Davis¹

April 8 – 11, 2025 | Oxford, UK

¹University of Central Florida

12:10 - 13:00

Lunch Break

South Mezzanine

13:00 - 13:30

Invited Talk

L1

Scalable processes for monolithic silicon/perovskite tandem solar cells.

[ID 153](#)

Bernd Stannowski¹

¹Helmholtz-Zentrum Berlin

13:30 - 14:45

Session 11: Silicon-based tandem solar cells

L1

Session Chairs: David Young, *NREL*, and Monica Morales Masis, *University of Twente*

13:30 - 13:45

[ID 70](#)

Clustering Irradiance Spectra for Analyzing Perovskite/c-Si Tandem Module Performance by Irradiance and Temperature

Olindo Isabella², Paul Procel², Yilong Zhou⁴, Maarten Verkou⁴, Marco

Leonardi³, Diego Di Girolamo³, Giuliana Giuliano³, Olivier Dupré¹, Youri Blom²,

Malte Vogt², Rudi Santbergen², Francesco Rametta³, Marina Foti³, Cosimo

Gerardi³, Miro Zeman³

¹CEA-INES, ²Delft University of Technology, ³Sun, ⁴PV Works

13:45 - 14:00

[ID 6](#)

Titanium Oxynitride-Based Interconnection Layer Stacks for Perovskite-Silicon Tandem Solar Cells

Philipp Wagner¹, Anna Belen Morales Vilches¹, Florian Ruske¹, Lars Korte¹,

Bernd Stannowski¹

¹Helmholtz-Zentrum Berlin

14:00 - 14:15

[ID 50](#)

Optimization of TOPCon based Bottom Cells for Integration in High-Efficiency PK/Si Tandems

Julien Hurni¹, Kerem Artuk¹, Ezgi Genc¹, Christophe Allebe², Bertrand

Paviet-Salomon², Christophe Ballif^{1, 2}, Christian Wolff¹, Audrey Morisset²,

Franz-Josef Haug¹

¹PVlab-EPFL, ²CSEM

14:15 - 14:30

[ID 99](#)

Indium-free Materials in the Tunnel Recombination Junction for Perovskite/Silicon Tandem Solar Cells

Angelika Harter¹, Dorothee Menzel¹, Darja Erfurt¹, Bor Li¹, Sergei Trofimov¹,

Boris Naydenov¹, Steve Albrecht¹, Bernd Stannowski¹

¹HZB

14:30 - 14:45

[ID 114](#)

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Advanced Hydrogenation Approaches for p-Type Poly-Si Passivating

Contacts in Perovskite-Silicon Tandem Solar Cells

Jana-Isabelle Polzin¹, Anna Damm¹, Ivonne Vera Pauta¹, Mario Hanser¹, Armin Richter¹, Jan Benick¹

¹Fraunhofer Institute for Solar Energy Systems ISE

14:45 - 15:15

Coffee Break

South Mezzanine

15:15 - 16:15

Session 12: Novel characterisation and simulation

L1

Session Chairs: Ron Sinton, *Sinton Instruments*, and Esma Ugur, *KAUST*

15:15 - 15:30

[ID 131](#)

On the Impact of Lateral Inhomogeneity on PCD Lifetime
Measurements

Axel Herguth¹, Alexander Graf¹

¹University of Konstanz

15:30 - 15:45

[ID 92](#)

Contactless Measurement of Current-Voltage Characteristics of IBC
Solar Cells

Cyril Leon¹, **Johannes Greulich**¹, Stefan Rein¹

¹Fraunhofer Institute for Solar Energy Systems

15:45 - 16:00

[ID 39](#)

Assessment of Perovskite/Silicon Tandem Cell Defects and
Degradation by Spectral Imaging

Marko Turek², Stefan Lange², Patricia Schulze¹, Juliane Borchert¹, Martin Hermle¹

¹Fraunhofer ISE, ²Fraunhofer CSP

16:00 - 16:15

[ID 119](#)

Accurate Measurement of Charge Carrier Lifetime and Mobility Using
Photoconductance Technique

Dávid Krisztián¹, András Bojtor¹, Gergely Havasi¹, Krisztián Kis-Szabó¹, Ferenc Simon², Ferenc Korsós¹

¹Semilab Semiconductor Physics Laboratory Co. Ltd., ²Physics Department,
Budapest University of Technology and Economics

16:15 - 16:30

SiliconPV 2025 Awards and SiliconPV 2026 Announcement

L1

16:45 - 19:15

Oxford City Walk Tour

Friday, 11 April 2025

08:45 - 10:00	<p>Session 13: Challenges and Advances in PV Manufacturing L1</p> <p><u>Session Chairs</u>: Barbara Terheiden, <i>University of Konstanz</i>, and Franz Josef Haug, <i>EPFL</i></p> <p>08:45 - 09:00 ID 163</p> <p>LONGi TaiRay Wafers: A New Generation of High Efficiency Silicon Wafers <u>Yichun Wang</u>¹ ¹LONGi</p> <p>09:00 - 09:15 ID 164</p> <p>Challenges in Execution, Technology, and Training of Ingot & Wafer Process <u>Ugur Kaya</u>¹ ¹RCT Solutions</p> <p>09:15 - 09:30 ID 165</p> <p>95% Bifaciality of Efficient Topcon Solar Cells, 88% Bifaciality TOPCon module and field performance <u>Meng Xiajie</u>¹ ¹Tongwei Solar</p> <p>09:30 - 09:45 ID 166</p> <p>Technical Progress in Industrial TOPCon Solar Cells and Module Manufacturing <u>Jingming Zheng</u>¹ ¹Jinko Solar</p> <p>09:45 - 10:00 ID 167</p> <p>High Efficiency back contacted n-type ABC technology - current status and outlook <u>Christian Peter</u>¹ ¹AIKO Solar</p>
10:00 - 10:30	<p>Coffee Break South Mezzanine</p>
10:30 - 10:55	<p>Invited Talk L1</p> <p>The View from the Industry: BloombergNEF's Global PV Market Outlook ID 159 <u>Jenny Chase</u>¹ ¹BloombergNEF</p>
10:55 - 11:55	<p>Session 14: Reaching Sustainable TW Scale Silicon PV L1</p>

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Session Chairs: Arthur Weeber, *TU Delft*, and Olindo Isabella, *TU Delft*

10:55 - 11:10

[ID 168](#)

Screen-printing metallisation requirements for terawatt scale PV

Brett Hallam¹

¹UNSW Sydney

11:10 - 11:25

[ID 170](#)

Indium Reduction in TCOs: A Path to Sustainable, Economically Viable,
and High-Efficiency Solar Cells?

Monica Morales-Masis¹

¹University of Twente

11:25 - 11:40

[ID 169](#)

Cost-Effective Vacuum Coatings for GW Production: HJT, TOPCon, BC and
Tandem

Sebastian Gatz¹

¹Von Ardenne

11:40 - 11:55

[ID 171](#)

Is PV expansion on track for fulfilling the Paris Climate Agreement?

Pietro Altermatt¹

¹Trina Solar

12:00 - 13:00

Lunch Break

South Mezzanine

14:30 - 14:55

Invited Talk

L1

TW scale deployment: Role of Integrated PV development and application/climate specific
reliability and durability

Eszter Voroshazi¹

¹CEA-INES

13:15 - 14:00

Session 15: Operation and Integration of 1 GW+ PV Assests in the Real World

L1

Session Chairs: Bernd Stannowski, *HZB*, and Delfina Munoz, *CEA-INES*

13:15 - 13:30

[ID 172](#)

Finding the needle in a 100 MWp haystack - O&M of utility-scale PV
power plants

Marie Syre Wiig¹

¹IFE

13:30 - 13:45

[ID 173](#)

How critical light-sharing in solar parks effects module design

Kay Cesar¹

¹TNO

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	13:45 - 14:00		ID 174
	Exploring UV Degradation in SHJ and TOPCon Solar Modules: Challenges and Mitigation Strategies		
	<u>Olatz Arriaga Arruti</u> ¹		
	¹ CSEM		
14:00 - 14:30	Coffee Break South Mezzanine		
14:30 - 14:55	Invited Talk L1		
	Is perovskite solar ready to play a significant role in multi TW PV?		ID 160
	<u>Chris Case</u> ¹		
	¹ Oxford PV Germany GmbH		
14:55 - 15:40	Session 16: Next Generation Si-based Tandem PV Production L1		
	<u>Session Chairs:</u> Joris Libal, ISC Konstanz, and Olatz Arriaga Arruti, CSEM		
	14:55 - 15:10		ID 175
	Mainstream n-type cell adaptation for an efficient 2T-4T tandem R&D		
	<u>Joris Libal</u> ¹		
	¹ ISC Konstanz		
	15:10 - 15:25		ID 176
	Q.ANTUM NEO development at Q cells		
	<u>Ralf Albrecht</u> ¹		
	¹ Hanwha Q Cells		
	15:25 - 15:40		ID 177
	Scaling perovskite-silicon tandems: Test challenges for large-scale PV manufacturing		
	<u>Peter Pasmans</u> ¹		
	¹ Eternal Sun		
15:45 - 16:15	Closing nPV Workshop L1		

April 8 – 11, 2025 | Oxford, UK

Social Events

Get-Together-Event

The Get-Together Event will take place in the Turf Tavern on **Monday, April 7**. Good vibes and authentic settings will mark a wonderful start into the SiliconPV Week.

Day: Monday, April 7, 2025

Time: 17:00 - 19:00 (GMT)

Place: Turf Tavern

7 Bath Place, Oxford



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Please note that the event is on a self-pay basis

Conference Dinner

On the second conference day, our participants are welcome to enjoy the Conference Dinner in the Oxford University Museum of Natural History surrounded by the beauty of the museum's fascinating exhibits, all set in the truly unique and enchanting atmosphere of this historic space.

Day: Wednesday, April 9, 2025

Time: 18:30 - 23:00 (GMT)

Location: [Oxford University Museum of Natural History](#)

Oxford University Museum of Natural History
Parks Road
Oxford
OX1 3PW



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City Walking Tours

This year we would like to invite our participants to two walking tours around Oxford. These tours are not part of the conference program and must be booked separately with the tour organizer. Please note that the [registration](#) is mandatory and is open **until Tuesday, April 1**.

Monday Tour: Monday, April 7, at 14:00 BST (including Oxford College and Divinity School)

Thursday Tour: Thursday, April 10, at 17:30 BST (external evening tour)

Starting Location: Oxford Tourist Information, 15-16 Broad Street, OX1 3AS

All questions should be forwarded to [the tour organizer](#) directly: <https://footprints-tours.com/oxford/>

**Thank you for your
contributions and
participation**