EU PVSEC

EU PVSEC 2026

43rd European
Photovoltaic Solar Energy
Conference and Exhibition

14 — 18
September

WTC —
World Trade Center

Rotterdam —
The Netherlands

Conference Programme

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43rd European Photovoltaic Solar Energy Conference and Exhibition

Conference Programme

Monday, 14. September 2026

MONDAY MORNING

CONFERENCE OPENING

PLENARY PRESENTATIONS AP.1

08:30 - 09:30 PV in the Energy System

Chairpersons: Eszter Voroshazi *(i)*
CEA, Le Bourget-du-Lac, France
Grazia Barchi *(i)*
Eurac Research, Bolzano, Italy

AP.1.1 Limitless PV in Grids: Opportunities, Challenges and Stragies
Pierre-Jean Alet[1], Giovanna Adinolfi[2], Grazia Barchi[3], Venizelos Efthymiou[4], Marion Perrin[5], Maximilian Schönau[6], Elham Shirazi[7]
[1] CSEM, Neuchâtel, Switzerland; [2] ENEA, Portici, Italy; [3] EURAC Research, Bolzano, Italy; [4] EPL Technology Frontiers, Nicosia, Cyprus; [5] Energy Pool, Le Bourget du Lac, France; [6] smartblue, Munich, Germany; [7] University of Twente, Enschede, The Netherlands

AP.1.2 AI for PV and PV for AI: Linking Nanoscale to TeraWatt(h)
Jozef (Jef) Poortmans[1], Ivan Gordon[1], Arnaud Morlier[1], Olivier Dupon[1], Bart Onsia[1], Dounia Saadallah[1], Louis De Taeye[1], Ya-Mi Chuang[1], Matthias Strobbe[1], Chris Develder[2], Timon Evenblij[1], Marie Garcia-Bardon[1], Santiago Gaitan[1], Michael Daenen[3], Patrizio Manganiello[3]
[1] imec vzw, Leuven, Belgium; [2] University Ghent, Gent, Belgium; [3] University Hasselt, Hasselt, Belgium

AP.1.3 Smart Grid and Intelligent Energy Systems

9:30 - 12:15 Becquerel Prize Ceremony
Opening Addresses
Moderated Panel Discussion

ORAL PRESENTATIONS 2AO.1

13:30 - 15:00 New Concepts in CIGS and CdTe Solar Cells

Chairpersons: Mirjam Theelen
TNO/Solliance, Eindhoven, The Netherlands
Invited

2AO.1.1 Study of Eco-friendly Processed Widegap Cu(In,Ga)S2 Solar Cells
Takahito Nishimura[1], Yota Suzuki[1], Yuta Yoshino[1], Akira Yamada[1]
[1] Institute of Science Tokyo, Meguro-ku, Japan

2AO.1.2 Back-Contact Passivation as the Next Efficiency Leap for Ultrathin and Bifacial CIGS Solar Cells
Negar Naghavi[1], Stephane Collin[1], Loukiana Kozlov[1], Javid Hajhemati[1], Nathanaelle Schneider[1], D. Coutancier[2], J. F. Guillemoles[2], Romain Carron[3], Matteo De Marzi[3], Susanne Siebentritt[4], Saeed Bayat[4], Marika Edoff[5], Jan Keller[5], Eizaveta Yakovleva[5], Pedro Salome[6], Sascha Sadewasser[6], Antonio J. N. Oliveira[6], Andre F. Violas[6], Jennifer P. Teixeira[6], J. Fonseca[6], Heiko Kempa[7], Roland Scheer[7], Merve Demir[7], Matthias Maiberg[7], Dimitrios Hariskos[8], Wolfram Witte[8], Rico Gutzler[8], Capucine Tong[9]
[1] CNRS, Palaiseau, France; [2] IPVF, Palaiseau, France; [3] EMPA, Zurich, Switzerland; [4] University of Luxembourg, Luxembourg; [5] Uppsala University, Sweden; [6] INL, Braga, Portugal; [7] Martin-Luther-Universität Halle-Wittenberg, Halle, Germany; [8] ZSW, Stuttgart, Germany; [9] Saint-Gobain Research , Aubervillier, France

2AO.1.3 Buffer and Interface Engineering in 'Standard' and Low-gap Cu(In,Ga)Se2
Rico Gutzler[1], Ana Kanevce[1], Wolfram Witte[1], Dimitrios Hariskos[1]
[1] ZSW, Stuttgart, Germany

2AO.1.4 Bandgap Engineering of Ag-Alloyed Cu(In,Ga)Se_2 for High-Performance Perovskite/ACIGS Tandem Cells
Emilee Fortier[1], Thomas Tom[1], Jackson Lontchi[1], Vincent Dufoulon[1], Javid Hajhemati[1], Amelle Rebai[1], Peggy Marie[1], Philip Schulz[1], Negar Naghavi[1]
[1] IPVF, Palaiseau, France

2AO.1.5 Buried Junction and Efficient Carrier Separation in CdSexTe1-x/CdTe Thin Film Solar Cell
Deliang Wang[1], Hongxu Jiang[1], Yanbo Cai[1]
[1] University of Science and Technology of China, Hefei, China

2AO.1.6 CdTe Solar Cells for Tandem Application with Silicon Devices
Mariyam Mukhtar[1], Elisa Artegiani[1], Alessandro Romeo[1]
[1] University of Verona, Italy

ORAL PRESENTATIONS 1-3AO.4

13:30 - 15:00 **UV-Induced Degradation: From Cell Level Mechanisms to Module Reliability**

Chairpersons: Alison Ciesla *(i)*
UNSW, Sydney, Australia
Ferenc Korsós *(i)*
SEMILAB, Budapest, Hungary

1AO.4.1 **Revealing the Physical Mechanisms of Ultraviolet-induced Degradation in Silicon Solar Cells through Experiments and Theoretical Modelling**
Jiaxin Yang[1], Muhammad Umair Khan[1], Xinyuan Wu[1], Chandany Sen[1], Jessica Yajie Jiang[1], Bram Hoex[1], Fiacre Rougieux[1]
[1] UNSW, Sydney, Australia

1AO.4.2 **UV-Induced Degradation of TOPCon and Heterojunction Solar Cells: Impact of Spectrum, Temperature, Intensity and Post-UV Treatments**
Pascal Messmer[1], Benjamin Hammann[1], Salar Sedani[2], Tim Niewelt[1], Wolfram Kwapil[1], Ilker Yildiz[3], Paul Gebhardt[1], Martin C. Schubert[1], Florian Schindler[1]
[1] Fraunhofer ISE, Freiburg, Germany; [2] ODTÜ-GÜNAM, Ankara, Türkiye; [3] METU, Ankara, Türkiye

1AO.4.3 **UV-Induced Degradation in TOPCon: Self-Healing Effects and Consequences for Field Performance**
Muhammed Umair Khan[1], Shukla Poddar[1], Ho Yuet Rachel Yeung[1], Aeron Johns[1], Ting Huang[2], Liang Wu[2], Hao Song[2], Ruirui Lv[2], Yuanjie Yu[2], Phillip Hamer[1], Bram Hoex[1]
[1] UNSW, Sydney, Australia; [2] CSI Solar, Jiangsu, China

3AO.4.4 **Inter-Laboratory Comparative Study of UV-Induced Degradation (UVID) on N-Type PV Modules**
Ting Huang[1], Ruirui Lv[1], Liang Wu[1], Yuanjie Yu[1], Alan Xu[1], Bram Hoex[2]
[1] Canadian Solar, Suzhou, China; [2] UNSW, Sydney, Australia

3AO.4.5 **UV-Induced Degradation in TOPCon Modules: Linking Accelerated and Outdoor Testing**
Todd Karin[1], Archana Sinha[1], Jean-Nicolas Jaubert[1]
[1] Kiwa PVEL, Napa, United States of America

3AO.4.6 **Using El, Dlit and IR Imaging and Contactless El Imaging for Defect Detection in Thin-Film Solar Modules**
Peer Sluijs[1], Sreejith Koorthedath Pullayikody[1], Ravi Vasudevan[2], Arno H. M. Smets[1]
[1] Delft University of Technology, The Netherlands; [2] Lift PV, Arnhem, The Netherlands

ORAL PRESENTATIONS 4AO.7

13:30 - 15:00 **Accuracy of Solar Resource Measurement**

Chairpersons: Olympia Gounari *(i)*
European Commission JRC, Ispra, Italy
Jan Remund
Meteotest, Bern, Switzerland

4AO.7.1 **Comparison of Pyranometers for Measuring Global Horizontal Irradiance**
Adam R. Jensen[1], Ioannis Sifnaios[1], Nicholas C. Riedel-Lyngskær[2]
[1] DTU, Kgs. Lyngby, Denmark; [2] European Energy, Søborg, Denmark

4AO.7.2 **Standardization of PV Reference Cells for Field Performance and Yield Assessment**
Anton Driesse[1], James Blakesley[2]
[1] PV Performance Labs, Freiburg, Germany; [2] National Physical Laboratory, London, United Kingdom

4AO.7.3 **Evaluation of Data Quality and Measurement Uncertainty in Solar Data: Findings from NLR's SUNI Application Across 89 Stations**
Aron Habte[1], Manajit Sengupta[1], Sora Ryu[1], Stephen Wilcox[2], Thomas Stoffel[2]
[1] NLR, Golden, United States of America; [2] Solar Resource Solutions, Louisville, United States of America

4AO.7.4 **Uncertainty Propagation from Irradiance Measurements to Simulated Rear Side Irradiance and Bifacial Gain**
Elin Dypvik Sødahl[1], Heine Nygard Riise[1], Marie Syre Wiig[1], Magnus Moe Nygård[1]
[1] IFE, Kjeller, Norway

4AO.7.5 **Field Evaluation of Irradiance Sensing Methods for Single-Axis PV Tracker Optimization and Implications for Reverse Transposition Models**
Maddalena Bruno[1], Anton Driesse[2], Lena Ackermann[3], Matthew Berwind[1]
[1] Fraunhofer ISE, Freiburg, Germany; [2] PV Performance Labs, Freiburg, Germany; [3] ZIMMERMANN PV-Steel Group, Eberhardzell, Germany

4AO.7.6 **Assessing Ground Albedo in PV-Plants via Fisheyecamera and Satellite Images**
Niklas Blum[1], Bijan Nouri[1], Stefan Wilbert[1], Johannes Roeder[2], Luis F. Zarzalejo[3]
[1] DLR, Almería, Spain; [2] DLR, Oberpfaffenhofen, Germany; [3] CIEMAT, Madrid, Spain

VISUAL PRESENTATIONS 3AV.1

13:30 - 15:00 **PV Module Design and Manufacturing**

Detailed information on this session is presented in the section entitled 'EU PVSEC 2026 Visual Presentations'.

ORAL PRESENTATIONS 2AO.2

15:15 - 16:45 III-V and Organic Solar Cells | Contactless Measurement Techniques

Chairpersons: Invited
Christoph Messmer *(i)*
University of Freiburg, Germany

2AO.2.1 Effect of Incident Angle on the Device Performance of InGaAsP LPCs
Sho Aonuki[1], Takaya Oshimo[2], Kotona Tabata[2], Takeru Yamada[2], Masato Suzuki[1], Natsuha Ochiai[1], Yukiko Suzuki[1], Kazuto Kashiwakura[1], Yuka Oshima[1], Masakazu Arai[2], Yohei Toriumi[1], Madoka Takahashi[1]
[1] NTT, Musashino, Japan; [2] University of Miyazaki, Japan

2AO.2.2 Low Temperature GaAs Solar Cells Produced by RP-VPE and PE-CVD: A New Approach Towards Low Cost GaAs/c-Si Tandem Solar Cells
Alba Eurosi[1], Maxime Levillayer[2], Karim Ouaras[2], Lise Watrin[2], Ivan Garcia Vara[3], Ignacio Rey-Stolle[3], Alexandre Jaffre[4], Martin Ledinisky[5], Jakub Holovsky[6], Vesselin Donchev[7], Zdravko Slavov[7], Jose Alvarez[4], Jean-Paul Kleider[4], Pere Roca i Cabarrocas[2]
[1] IPVF, Palaiseau, France; [2] LPICM, Palaiseau, France; [3] IES, Madrid, Spain; [4] CNRS, Gif-sur-Yvette, France; [5] Institute of Physics, Academy of Sciences of the Czech Republic, Prague, Czech Republic; [6] Academy of Sciences of the Czech Republic, Prague, Czech Republic; [7] Sofia University, Bulgaria

2AO.2.3 Development of High-Efficiency Non-Fullerene Acceptor Organic Solar Cells using Novel Qx-Based Small Molecules
Meriç Caliskan Arslan[1], Duygu Yalvaç[1], Gönül Hızalan Özsoy[2], Ali Çırpan [1]
[1] METU, Ankara, Türkiye; [2] ODTÜ-GÜNAM, Ankara, Türkiye

2AO.2.4 Contactless Subcell-Resolved I–V Characterisation of Tandem Solar Cells
Shuai Nie[1], Felix Gayot[1], Yan Zhu[1], Ziv Hameiri[1]
[1] UNSW, Sydney, Australia

2AO.2.5 Rapid, High-Throughput, Multimodal Characterization of Emergent PV Materials and Device Insights
Ethan G. Schwartz[1], Amy E. Louks[2], Anthony T. Troupe[3], Brandon T. Motes[3], Axel F. Palmstrom[4], Zhaoyang Han[5], Qi Jiang[5], Joseph J. Berry[4], J. Devin MacKenzie[1], Minhal Hasham[3]
[1] University of Washington, Seattle, United States of America; [2] Colorado School of Mines, Golden, United States of America; [3] Optigon, Somerville, United States of America; [4] NLR, Golden, United States of America; [5] CAS, Beijing, China

2AO.2.6 Contactless Determination of the Series Resistance of Tandem Solar Cells - Possibilities and Limitations
Johannes M. Greulich[1], Andreas Fell[1], Oliver Fischer[1], Cyril Leon[2], Joël Wyttenbach[2], Martin C. Schubert[1], Stefan Rein[1]
[1] Fraunhofer ISE, Freiburg, Germany; [2] CEA, Le Bourget-du-Lac, France

ORAL PRESENTATIONS 1AO.5

15:15 - 16:45 Silicon Solar Cells; Hydrogen and Stability & Reduction of Silver Consumption

Chairpersons: Francesca Menchini *(i)*
ENEA, Rome, Italy
Wolfram Kwapil *(i)*
University of Freiburg, Germany

1AO.5.1 New Insights into Hydrogen Behaviour in PECVD SiNx: H Films
Lahiruni Ranasinghe[1], Muhammad Umair Khan[1], Shona McNab[1], Alvin Mo[1], Aeron Johns[1], Phillip Hamer[1], Saul Winderbaum[1], Alison Ciesla[1]
[1] UNSW, Sydney, Australia

1AO.5.2 UV Impact on Commercial nc-Si SHJ Structure
Maysa Sarsour[1], Alison Ciesla[1], John O'Sullivan[2], Shona McNab[1], Brendan Wright[1], Chukwuka Madumelu[1], Martin Green[1], Ned J. Ekins-Daukes[1], Ruy S. Bonilla[2], Jessica Yajie Jiang[1]
[1] UNSW, Sydney, Australia; [2] Oxford University, United Kingdom

1AO.5.3 Research on Ag-Coated Ni Paste Screen Printing for TOPCon Solar Cells
Fujian An[1], Ning Chen[2], Minghao Zheng[3], Zilu Shi[1], Qinghui Yin[2], Yong Du[1], Kai Li[1]
[1] Central South University, Changsha, China; [2] Wuxi Autowell Technology, Wuxi, China; [3] Changzhou Fusion New Material, Shanghai, China

1AO.5.4 Silver-Reduced PV Pastes via Composite and Hollow Particles
Wen Yu[1], Yiyu Zeng[1], Martin Green[1], Yajie Jiang[1]
[1] UNSW, Sydney, Australia

1AO.5.5 Towards Silver-free High-efficiency Solar Cells: Copper-plating of Advanced TOPCon Solar Cells with Local Passivated Front Contacts
Jan Hoß[1], Sven Kluska[2], Saman Sharbaf Kalaghichi[1], Pirmin Preis[1], Dominik Rudolf[1], Haifeng Chu[1], Mertcan Comak[1], Jan Lossen[1], Lejo J. Koduvelikulathu[1]
[1] ISC Konstanz, Germany; [2] Fraunhofer ISE, Freiburg, Germany

1AO.5.6 Ag-Lean Metallization Strategy for Poly-Si Layers in TOPCon Devices
Audrey Morisset[1], Agata Lachowicz[1], Nicolas Badel[1], Niels Holm[1], Jun Zhao[1], Reyu Sakakibara[2], Bertrand Paviet-Salomon[1], Christophe Ballif[2], Tonio Buonassisi[1]
[1] CSEM, Neuchâtel, Switzerland; [2] EPFL, Neuchâtel, Switzerland

ORAL PRESENTATIONS 4AO.8

15:15 - 16:45 Solar PV Forecasting

Chairpersons: Dunia Bachour *(i)*
HBKU, Doha, Qatar
Manajit Sengupta *(i)*
National Laboratory of the Rockies, Golden, United States of America

4AO.8.1 Task-aware Latent-Space Coupling for Generative Solar Forecasting
Yann Fabel[1], Bijan Nouri[1], Milon Miah[1], Niklas Blum[1], Luis F. Zarzalejo[2], Julia Kowalski[3], Robert Pitz-Paal[4]
[1] DLR, Almería, Spain; [2] CIEMAT, Madrid, Spain; [3] RWTH Aachen University, Germany; [4] DLR, Cologne, Germany

4AO.8.2 Sky Camera Forecasting of Solar Power Plant Ramp Rates
Jacob K. Thorning[1], Sergiu V. Spataru[1], Adam R. Jensen[2], Peter B Poulsen[1]
[1] DTU, Roskilde, Denmark; [2] DTU, Lyngby, Denmark

4AO.8.3 3-Month Nordic Benchmark of ASI-based Solar Nowcasting: Commercial Solutions and DL Literature Models
Erling Ween Eriksen[1], Magnus Moe Nygård[1], Yann Fabel[2], Bijan Nouri[2], Heine N. Riise[1]
[1] IFE, Kjeller, Norway; [2] DLR, Almeria, Spain

4AO.8.4 Optimizing Semantic Cloud Segmentation via Video Object Segmentation for Solar Forecasting
Eduardo Saez Martinez[1], Bijan Nouri[1], Raphael Gut[1], David Magiera[1], Yann Fabel[1], Niklas Blum[1], Luis F. Zarzalejo[2]
[1] DLR, Almeria, Spain; [2] CIEMAT, Madrid, Spain

4AO.8.5 Benchmarking Accuracy and Variability in Intra-Hour Solar Irradiance Forecasts from Satellite and Ground Observations
Thomas Schmidt[1], Bijan Nouri[2], Keisuke Tanaka[3], Jorge Lezaca[1], Yann Fabel[2], Annette Hammer[1], Niklas Blum[1], Marion Schroedter-Homscheidt[1], Frank Dressel[1], Stefan Wilbert[1]
[1] DLR, Oldenburg, Germany; [2] DLR, Almeria, Spain; [3] DLR, Dresden, Germany

4AO.8.6 Intraday Solar Energy Forecasting at National Scale using Satellite-based Solar Forecast Models
Luca Lanzilao[1], Angela Meyer[1]
[1] Bern University of Applied Sciences, Biel, Switzerland

VISUAL PRESENTATIONS 3AV.2

15:15 - 16:45 PV Module Durability and Reliability

Detailed information on this session is presented in the section entitled 'EU PVSEC 2026 Visual Presentations'.

ORAL PRESENTATIONS 2AO.3

17:00 - 18:30 Advanced Characterisation and Simulation of Perovskite and Tandem Cells

Chairpersons: Theresa Magorian Friedlmeier
ZSW, Stuttgart, Germany
Iñigo Ramiro
UPC, Barcelona, Spain

2AO.3.1 Measurement of Surface Recombination Velocities on Perovskite Layers Using Wavelength-dependent Time-resolved Photoluminescence (λ-TRPL)
Benjamin Grimm[1], Johannes Löhr[1], Chencheng Xu[1], Jan Schmidt[1]
[1] ISFH, Emmerthal, Germany

2AO.3.2 Transport Efficiency Mapping in Tandem Photovoltaic Cells Using Luminescence and Electrical Measurements
Ahmed Aissaoui[1], Hassanet Sodabanlu[2], Kentaroh Watanabe[2], Masakazu Sugiyama[2], Stéphane Collin[1], Amaury Delamarre[1]
[1] CNRS, Palaiseau, France; [2] RCAST, Tokyo, Japan

2AO.3.3 Understanding and Mitigating Non-Ohmic Transport Losses in High-Efficiency Perovskite-Silicon Tandem Solar Cells by Experiment and Simulation
Christoph Messmer[1], Oussama Er-Raji[1], Oliver Fischer[2], Andreas Fell[2], Patricia S.C. Schulze[2], Martin Bivour[2], Martin Hermle[2], Jonas Schön[1], Martin C. Schubert[2], Stefan W. Glunz[1]
[1] University of Freiburg, Germany; [2] Fraunhofer ISE, Freiburg, Germany

2AO.3.4 Metastability through Ion Migration – Impact of Scan Speed and Temperature on Current-Voltage Curve Measurements
Thomas Schleyerbach[1], Christoph Messmer[2], Alexander J. Bett[1], Johanna Modes[1], Jonas Schön[2], Benedikt Bläsi[1], Martin C. Schubert[1]
[1] Fraunhofer ISE, Freiburg, Germany; [2] INATECH, Freiburg, Germany

2AO.3.5 Uncovering hidden Phases in Evaporated Perovskite Thin Films by Combining In-Situ Reflectance and Photoluminescence
Adrian Adrian[1], Matthew Leyden[2], Nasim Rezaei-Hartmann[1], Claudine Groß[1], Enno Malguth[1], Christian Kaspari[1], Marcel Roß[2], Lars Korte[2], Jinyoung Noh[3], Jeffrey Lee[3], Steve Albrecht[2], Christian Camus[1]
[1] LayTec, Berlin, Germany; [2] HZB, Berlin, Germany; [3] Korea Kiyon, Seoul, South Korea

2AO.3.6 Physics-aware Solar Production Forecasting using SOLEY
Zacharie Jehl Li-Kao[1], Sergio Giraldo[1], Marcel Placidi[1], Alex Jimenez Arguijo[1], Edgardo Saucedo[1]
[1] UPC, Barcelona, Spain

ORAL PRESENTATIONS 1AO.6

17:00 - 18:30 Innovations in Passivating Contact Solar Cells

Chairpersons: Audrey Morisset
CSEM, Neuchâtel, Switzerland
Pere Roca i Cabarrocas *(i)*
LPICM-CNRS, Palaiseau, France

1AO.6.1 Decoration of POLO2 IBC Cells with Modulated Surface Texturing Methods Yielding in Power Conversion Efficiency above 26%
Engin Özkol[1], Katarina Kovačević[1], Udo Römer[2], Yifeng Zhao[1], Robby Peibst[3], Olindo Isabella[1]
[1] TU Delft, The Netherlands; [2] ISFH, Emmerthal, Germany; [3] LUH, Hannover, Germany

1AO.6.2 Direct Atomic Layer Processing Enabled Localized Edge Passivation of Laser Scribed TOPCon Cells
Dheeraj Sah[1], Karolis Parfeniukas[2], Roberto Boccardi[3], Narendra Bandaru[1], Agata Lachowicz[4], Bertrand Paviet-Salomon[4], Benjamin Borie[2], Mira Baraket[2], Maksym Plakhotnyuk[2], Gisele A. Dos Reis Benatto[3], Sune Thorsteinsson [3], Peter B. Poulsen[3], Rasmus Schmidt Davidsen[1]
[1] Aarhus University, Denmark; [2] ATLANT 3D, Taastrup, Denmark; [3] DTU, Roskilde, Denmark; [4] CSEM, Neuchâtel, Switzerland

1AO.6.3 Highly Effective Boron Doped ZnO Passivating Contacts for Crystalline Silicon Solar Cells
Piyumi Kodithuwakku[1], Christian Samundsett[1], Stephane Armand[1], Daniel H. Macdonald[1], Lachlan E. Black[1]
[1] ANU, Canberra, Australia

1AO.6.4 p-i-n Junctions in Polycrystalline Silicon on Oxide Passivating Contacts for Local Device-Integrated Bypass Diodes in IBC Solar Cells
Jan Krügener[1], Udo Römer[2], Leon Salomon[1], Robby Peibst[2]
[1] Leibniz University Hannover, Germany; [2] ISFH, Emmerthal, Germany

1AO.6.5 Bulk Degradation during LeTID Conditions in P-, Sb- and As-Doped Cz-Si Wafers and TOPCon Solar Cells
Joshua Kamphues[1], Chirag Mule[2], Thien Truong[3], Juri Miech[1], Sumit Agarwal[2], Pauls Stradins[3], Giso Hahn[1]
[1] University of Konstanz, Germany; [2] Colorado School of Mines, Golden, United States of America; [3] NLR, Golden, United States of America

1AO.6.6 Study on Weak Light Response of Back-contact Crystalline Silicon Photovoltaic Cells and Modules
Jikai Kang[1], Xian Jiang[1], Bo Zhang[1], Hansong Guo[1], Jiaqi Song[1], Zongyou Shen[1], Zhenguo Li[1]
[1] Longi Green Energy Technology, Xi'an, China

ORAL PRESENTATIONS 4AO.9

17:00 - 18:30 Long-term Solar Resource Datasets

Chairpersons: Ana Maria Gracia Amillo
CENER, Sarriguren, Spain
Adam Jensen
DTU, Kgs. Lyngby, Denmark

4AO.9.1 Extending the Capabilities of JRC-PVGIS for Energy Yield Estimation in Urban and Mountainous Environments
Olympia Gounari[1], Alexandros Falangas[2], Ana Martinez[1], Luis Mercado[1], Nigel Taylor[1]
[1] European Commission JRC, Ispra, Italy; [2] TRASYS International, Herstal, Belgium

4AO.9.2 Bias-Aware Dynamical Downscaling of Earth System Model Projections for Energy Applications
Manajit Sengupta[1], Jaemo Yang[1], Yu Xie[1]
[1] NLR, Golden, United States of America

4AO.9.3 Impact of Meteorological Dataset Selection on Photovoltaic Performance Modelling: A Canadian Case Study
Erin Tonita[1], Dylan Bardy[1], Galen Richardson[2], Lucio Mesquita[1]
[1] Natural Resources Canada, Ottawa, Canada; [2] University of Ottawa, Canada

4AO.9.4 Integration of GOES Data for Solar Resource Assessment of the Contiguous United States
Yu Xie[1], Manajit Sengupta[1], Brandon Benton[1], Aron Habte[1], Jaemo Yang[1], Michael Foster[2]
[1] NLR, Golden, United States of America; [2] University of Wisconsin, Madison, United States of America

4AO.9.5 Data-Driven P50–P90 PV Yield Estimation using Long-Term Historical Irradiance across Norwegian Sites
Alexander Severinsen[1], Heine Nygard Riise[2]
[1] Cofactor, Sætre, Norway; [2] IFE, Kjeller, Norway

4AO.9.6 Non-Autoregressive Transformer for High-Resolution Time Series Downscaling of Solar Irradiance
Cristian Javier Maza Merchan[1], Jose Alberto Cumbicos Romero[1], Gustavo Fraidenraich[1], Arttu Tuomiranta[2], Tarcio Andre dos Santos Barros[1]
[1] UNICAMP, Campinas, Brazil; [2] TotalEnergies, Palaiseau, France

VISUAL PRESENTATIONS 3AV.3

17:00 - 18:30 PV Module Performance – Modelling, Testing, Standards

Chairpersons: *Invited*
Invited

Detailed information on this session is presented in the section entitled 'EU PVSEC 2026 Visual Presentations'.

Tuesday, 15. September 2026

ORAL PRESENTATIONS 3BO.11

08:30 - 10:00 **Polymers and Encapsulation**

Chairpersons: Chiara Barretta
PCCL, Leoben, Austria
Christian Camus *(i)*
LayTec, Berlin, Germany

3BO.11.1 **Reliability Puzzle: Insight into the Role of Additives in EVA and POE Encapsulants in Damp Heat-Induced Failures**
Chandany Sen[1], Haoran Wang[1], Muhammad Umair Khan[1], Muhie Vasuthevan[2], Ziyi Zhao[2], Robert Sporne[2], Ting Huang[3], Hao Song[3], Ruirui Lv[3], Yuanjie Yu[3], Bram Hoex[1]
[1] UNSW, Sydney, Australia; [2] Tindo Solar, Sydney, Australia; [3] CSI Solar, Jiangsu, China

3BO.11.2 **Environmental Debonding of EVA and POE from Tinned Copper Interconnectors**
Gernot M. Wallner[1], Florian Fenyvesi[1], Gabriel Riedl[1]
[1] Johannes Kepler University Linz, Austria

3BO.11.3 **Can there be too Much Adhesion Promoter in POE Encapsulation? Molecular Insights from Damp-heat Weathering**
Jishnu Ramachandran Nair[1], Nishant Pradhan[1], Paul Schenk[1], Matthias Pander[1], Steffen Bornemann[2], Ralph Gottschalg[1], Anton Mordvinkin[1]
[1] Fraunhofer CSP, Halle (Saale), Germany; [2] Folienwerk Wolfen, Bitterfeld Wolfen, Germany

3BO.11.4 **New Insights into UV-Induced Degradation of EVA/POE Encapsulants and Iits Impact on SHJ Modules**
Hugo Lajoie[1], Maxime Babics[1], Frédéric Jay[1], Romain Couderc[1], Sandrine Therias[2]
[1] CEA, Le Bourget-du-Lac, France; [2] CNRS, Aubière, France

3BO.11.5 **Water Vapour Barrier Performance of Advanced Polymer Encapsulants for PV Modules: Effects of Structure, Colorants and Additives**
Gabriele C. Eder[1], Yuliya Voronko[1], Rayna Mutewsky[1], Markus Babin[2], Andreas Brandstätter[3], Markus Feichtner[4]
[1] OFI, Vienna, Austria; [2] DTU, Roskilde, Denmark; [3] Lenzing Plastics, Seewalchen, Austria; [4] Sonnenkraft, St.Veit/Glan, Austria

ORAL PRESENTATIONS 4BO.16

08:30 - 10:00 **BIPV Module and System Design**

Chairpersons: Simona Villa *(i)*
TNO, Eindhoven, The Netherlands
Markus Babin
DTU, Roskilde, Denmark

4BO.16.1 **PV Modules based on U-profiled Glass for Building Integration**
Kevin Meyer[1], Wael Mandow[1], Susanne Blankemeyer[1], Jonas Bollermann[1], Thomas Daschinger[1], Iris Kunze[1], Markus Buning[2], Thomas Schmidt[2], Federico Giovanetti[1], Henning Schulte-Huxel[1]
[1] ISFH, Emmerthal, Germany; [2] Flachglas Sülzfeld, Meiningen, Germany

4BO.16.2 **Free-space Luminescent Solar Concentrators for Improved Winter Performance of Building-integrated Photovoltaics**
Lisanne Einhaus[1], Rebecca Saive[1]
[1] University of Twente, Enschede, The Netherlands

4BO.16.3 **Fire Behavior Assessment of Polymer-based PV Encapsulants at Material and Module Level**
Gabriele C. Eder[1], Michael Bichler[1], Anna Stanzel[2], Dieter Moor[3]
[1] OFI, Vienna, Austria; [2] BVS, Linz, Austria; [3] Arconsol, Linz, Austria

4BO.16.4 **Silicon Photovoltaics on Metal Substrates: Investigating Cell Gap Changes in Modules with Aluminum Rear Cover**
Wiebke Wirtz[1], Kevin Meyer[1], Ulli Zeller[2], Matthias Pander[2], Ringo Koepge[2], Bengt Jaeckel[2], Rolf Brendel[1], Henning Schulte-Huxel[1]
[1] ISFH, Emmerthal, Germany; [2] Fraunhofer CSP, Halle (Saale), Germany

4BO.16.5 **Numerical Sensitive Analysis of the Thermal Behaviour of a Building-Integrated Photovoltaic Ventilated Facade**
Zeinab Aldroubi[1], Ya Brigitte Assoa[1], Christophe Menezo[2], Mohamed Amara[3]
[1] CEA, Le Bourget-du-Lac, France; [2] CNRS, Le Bourget-du-Lac, France; [3] INSA, Lyon, France

4BO.16.6 **Towards a New Approach for Certification of IPV Product Families Based on Semi-Fabricates**
Nikoleta Kyranaki[1], Alvaro De Gruijter Eguiluz[2], Dominika Chudy[3], Aldo Kingma[4], Remi Aninat[4], Andreas Haller[5], Ruben Roldan[6], Marcello La Rosa[7], Jasper Klomps[8], Arnaud Morlier[9], Roland Valckenborg[4], Michael Daenen[1]
[1] Hasselt University, Genk, Belgium; [2] Eurac Research, Bolzano, Italy; [3] SUPSI, Mendrisio, Switzerland; [4] TNO, Eindhoven, The Netherlands; [5] Ernst Schweizer, Metallbau, Switzerland; [6] iWin, Manno, Switzerland; [7] Glass to Power, Rovereto, Italy; [8] Wienerberger, Zaltbommel, The Netherlands; [9] imec, Genk, Belgium

ORAL PRESENTATIONS 2BO.1

08:30 - 10:00 Novel Materials and Processes for Perovskite Devices

Chairpersons: Solenn Berson *(i)*
CEA, Le Bourget-du-Lac, France
Rutger Schlatmann *(i)*
HZB, Berlin, Germany

2BO.1.1 CsPbCl3: Yb3+ Perovskite Nanocrystal-based Luminescent Down-Shifting Layers for Perovskite Solar Cells
Zeynep Durmaz[1], Mathis Van de Voorde[1], Tim Bekius[2], Rebecca Saive[1]
[1] University of Twente, Enschede, The Netherlands; [2] Univeristy of Twente, Enschede, The Netherlands

2BO.1.2 Full Process Development of Large-Scale Rigid and Flexible Perovskite Modules Using In-House Slot-Die Coating and Vacuum Quenching Technologies
Katsumi Araki[1]
[1] Alpha Precision Systems, Mckinney, United States of America

2BO.1.3 Understanding the Principles of Co-deposition of Mixed-SAMs in MAPbI3-based p-i-n Structure Perovskite Solar Cells
Haoxu Wang[1], Jin Yan[1], Mare Dijkstra[1], Engin Torun[1], Moumita Rana[1], Paul Procel Moya[1], Rudi Santbergen[1], Miro Zeman[1], Olindo Isabella[1], Luana Mazzarella[1]
[1] TU Delft, The Netherlands

2BO.1.4 Operation Window Engineering of Hybrid Evaporation–Solution Processed Perovskites for Building-Integrated Photovoltaics
Elshan Asadi[1], Cem Maden[1], Mustafa Yasa[1], Gorkem Gunbas[1], Selcuk Yerci[1]
[1] ODTÜ - GÜNAM, Ankara, Türkiye

2BO.1.5 Pb–Halide Bond Modulation and Morphology Enhancement in Wide-Bandgap Perovskites via Sequential Anti-Solvent Engineering
Owais Ahmad[1], Wonseok Chae[1], Jonghoon Han[1], Sandhuli Hettiarachchi[1], Long Hu[2], Shujuan Huang[1], Jincheol Kim[1]
[1] Macquarie University, Sydney, Australia; [2] UNSW, Sydney, Australia

2BO.1.6 Conjugated Diammonium A′-Cations for Enhanced Performance and Stability in Quasi-2D Lead and Lead-Tin Perovskite Solar Cells
Dzaky Ruhimat[1], Susana Ramos-Terron[2], Daniel Rammer[1], Alexander Holzer[1], Luis Camacho[2], Suman Mallick[1], Lakshmi Rajan[3], Egon Pavlica[3], Gustavo de Miguel[2], Gregor Trimmel[1], Thomas Rath[1]
[1] Graz University of Technology, Austria; [2] University of Cordoba, Spain; [3] University of Nova Gorica, Slovenia

ORAL PRESENTATIONS 4BO.6

08:30 - 10:00 Operational Levers for PV Asset Management: From Layouts to Repowering

Chairpersons: Marie Syre Wiig *(i)*
IFE, Kjeller, Norway
Dirk Stellbogen *(i)*
ZSW, Stuttgart, Germany

4BO.6.1 Impact of Incidence Angle in Photovoltaic Soiling Ratio Measurements
Alexander Eeles[1], João Marques[1], Pedro Salomé[1]
[1] INL, Braga, Portugal

4BO.6.2 Model and Field Validation of Partial-Shade Backtracking for Tracking PV Arrays with Half-Cut Cells
Kevin Anderson[1], Nicholas Riedel-Lyngskær[2], Adam Jensen[3]
[1] n/a, United States of America; [2] European Energy, Kongens Lyngby, Denmark; [3] DTU, Søborg, Denmark

4BO.6.3 Universal Analytical Model for Inter-Row Shading Loss Estimation in PV Plants
Maitheli Nikam[1], Karel De Brabandere[1], Julien Deckx[1], Gofran Chowdhury[1]
[1] 3E, Brussels, Belgium

4BO.6.4 Performance Analysis of Bifacial PV Arrays: Tilted and Vertical Configuration
Teodora Stoyanova Lyubenova[1], Stefano Alessandrini[1], Ewan D. Dunlop[1]
[1] European Commission JRC, Ispra, Italy

4BO.6.5 Quantifying Data Requirements for Transfer Learning in PV Defect Detection
Shayan Umar[1], Tarek EL-Fouly[1], Ahmed Al Durra[1]
[1] KAUST, Abu Dhabi, United Arab Emirates

4BO.6.6 Revamping and Repowering of Aging Solar Assets: Performance Drivers, Energy Gains, and Economics from a 14-Year-Old PV System in Tropical Singapore
Xiaoqi Xu[1], André M. Nobre[2], Qiying Ng[2], Ian Marius Peters[3], Thomas Reindl[1]
[1] SERIS, Singapore; [2] PV Doctor, Singapore; [3] FZJ, Erlangen, Germany

VISUAL PRESENTATIONS 1BV.1

08:30 - 10:00 Single Junction Silicon Cells | Silicon Bottom Cells for Tandem Photovoltaics | Characterisation & Modelling of Silicon Cells

Detailed information on this session is presented in the section entitled 'EU PVSEC 2026 Visual Presentations'.

ORAL PRESENTATIONS 4BO.7

10:30 - 12:00 **Smarter O&M: AI-Driven Inspections and Diagnostics for PV Systems**

Chairpersons: Anne Migan-Dubois *(i)*
GeePs, Gif-sur-Yvette, France
Marios Theristis
Sandia National Laboratories, Albuquerque, United States of America

4BO.7.1 **Augmentation of Computer Vision-Analysis using Tandem Visual and Thermal Field-Imaging of Photovoltaic Modules**
Thøger Kari[1], Sergiu V. Spataru[1], Rodrigo del Prado Santamaría[1], Mahmoud Dhimish[1], Gisele A. dos Reis Benatto[1], Peter Behrensdorff Poulsen[1]
[1] DTU, Roskilde, Denmark

4BO.7.2 **Choosing the Right AI Approach for PV Inspections: A Practical Comparison of Machine Learning and Deep Learning on Drone IR Imagery**
Philippe Marechal[1], Ioannis (John) Tsanakas[1]
[1] CEA / INES, Le Bourget-du-Lac, France

4BO.7.3 **Attention-Based Hybrid Deep Learning for Interpretable PV Fault Detection with Temporal Analysis**
Yegane Bagheri[1], Sandra Gallmetzer[1], Lukas Koester[1], Luis Fialho[1]
[1] Eurac Research, Bolzano, Italy

4BO.7.4 **Design and Application of a Generalizable Time-Aware Intelligent Fault Detector for Commercial Photovoltaics: DEFNE v2**
Mücahid Candan[1], David Melgar[1]
[1] Fraunhofer ISE, Freiburg, Germany

4BO.7.5 **Integrated Probabilistic and Logic-Based Machine Learning Approach for Photovoltaic Fault Diagnosis**
Peyman Ghaedi[1], Aref Eskandari[2], Mohammadreza Aghaei[3]
[1] Amirkabir University of Technology, Tehran, Iran; [2] Iran University of Science and Technology, Tehran, Iran; [3] Norwegian University of Science and Technology, Ålesund, Norway

4BO.7.6 **A Search-Based Tracking Schedule for Row-to-Row Shading Mitigation in Irregular Terrain**
Robinson Cavieres[1], Felipe Valencia[1], Carlos Cardenas-Bravo[2]
[1] ATAMOSTEC, Antofagasta, Chile; [2] USM, Santiago, Chile

ORAL PRESENTATIONS 3BO.12

10:30 - 12:00 **Indoor/Outdoor Correlations and Degradation**

Chairpersons: Timea Bejat
CEA, Le Bourget-du-Lac, France
Ralph Gottschalg
Fraunhofer CSP, Halle (Saale), Germany

3BO.12.1 **Defining the 50-year Module: Luck, Design, or Both?**
Silvana Ovaitt[1], Dirk Jordan[1], Heather Mirletz[1], Brian Mirletz[1], Teresa Barnes[1]
[1] NLR, Golden, United States of America

3BO.12.2 **A Correlative Indoor-Outdoor Study of Degradation Mechanisms in Silicon Heterojunction and TOPCon Modules: Benchmarking against PERC and Evaluating Bill-of-Materials Dependence**
Amir A. Abdallah[1], Mohamed Abdelrahim[1], Mohamed Elgaili[1], Maulid Kivambe[1], Oleksandr Mashkov[2], Claudia Buerhop-Lutz[2]
[1] QEERI, Doha, Qatar; [2] HI ERN, Erlangen, Germany

3BO.12.3 **What Solar Module Test Failures Reveal in 2026: Key Takeaways from Kiwa PVEL's PV Module Reliability Scorecard**
Todd Karin[1], Jean-Nicolas Jaubert[1], Archana Sinha[1], Tristan Erion-Lorico[1]
[1] Kiwa PVEL, Napa, United States of America

3BO.12.4 **Challenges in Predicting PV Module Degradation from Accelerated Aging Tests**
Paul Gebhardt[1], Suraj Ravindrababu[1], Ingrid Hädrich[1], Daniel Philipp[1]
[1] Fraunhofer ISE, Freiburg, Germany

3BO.12.5 **Outdoor Evidence of UV-Induced Degradation in Silicon PV Modules Supported by Advanced Materials Analysis**
Dominik Bagrowski[1], Jonathan Kriening[1], Philipp von Bismarck[1], Maximilian Engel[1], Dirk Stellbogen[1], Wolfram Hempel[1], Theresa Magorian Friedlmeier[1], Roland Einhaus[1]
[1] ZSW, Stuttgart, Germany

3BO.12.6 **A Methodology for Climate-driven Global Mapping of Photovoltaic Degradation Risk using Laboratory Ageing Data**
Ismail Kaaya[1], Patrizio Manganiello[2], Lara Vissers[3], Gauvain Jago[3], Stijn Scheerlinck[3], Arnaud Morlier[1]
[1] imo-imomec, Genk, Belgium; [2] UHasselt, Belgium; [3] Engie Laborelec, Linkebeek, Belgium

ORAL PRESENTATIONS 4BO.17

10:30 - 12:00 Colour and BIPV

Chairpersons: Gabriella Gonnella *(i)*
Eurac Research, Bolzano, Italy
Simon Boddaert
CSTB, Sophia Antipolis, France

4BO.17.1 21%-Efficient Colour-tuneable Silicon Solar Cells Enabled by Ultra-Stable Perovskite Quantum Dots/EVA Composite Films
Minya Zhou[1], Hanchen Li[1], Shujuan Huang[2], Martin Green[1], Yajie Jiang[1]
[1] UNSW, Sydney, Australia; [2] Macquarie University, Sydney, Australia

4BO.17.2 Flexible MorphoColor® Technology Integrated for Coloured Perovskite Solar Cells
Sophie Gledhill[1], Stefanie Ritter[1], Martin Mattenheimer[1], Andreas Wessels[1], Marjan Akbari Famileh[1], Markus Kohlstädt[1], Thomas Kroyer[1], Hubert Hauser[2]
[1] Fraunhofer ISE, Freiburg, Germany; [2] temicon, Freiburg, Germany

4BO.17.3 Modelling of Coloured BIPV Façade Systems – Results and Learnings from the 1st IEA PVPS Task 15 Blind Modelling Intercomparison
Markus Babin[1], Sune Thorsteinsson[1], Maximilian Riedel[2], Björn Rau[2], Hua Ge[3], Konstantinos Kapsis[4], Gabriele C. Eder[5]
[1] DTU, Roskilde, Denmark; [2] HZB, Berlin, Germany; [3] Concordia University, Montréal, Canada; [4] University of Waterloo, Canada; [5] OFI, Vienna, Austria

4BO.17.4 Third Edition of the Dutch BIPV Award
Ruud Derks[1], Kevin Verpaalen[2], Wilfried G.J.H.M. van Sark[3]
[1] IM efficiency, Helmond, The Netherlands; [2] Kameleon Solar, Roosendaal, The Netherlands; [3] Utrecht University, The Netherlands

4BO.17.5 Optical Design Strategies for Scalable Luminescent Solar Concentrators beyond PLQY Optimization
Yuan-Chih (Atom) Chang[1], Guozheng Shi[1], Sandhuli Hettiarachchi[1], David Payne[1], Binesh Puthen Veettil[1], Shujuan Huang[1]
[1] Macquarie University, Sydney, Australia

4BO.17.6 Balancing Aesthetics, Efficiency and Durability in Colored Building-Integrated Photovoltaic Modules: A Systematic Comparison
Eleonora Tomasino[1], Gabriella Gonnella[1], Jordi Veirman[1], Martina Pelle[1], Tom Melkert[2], Bjorn Petter Jelle[3], Gabriele Lobaccaro[3], Andrea Spedicato[4], Luis Fialho[1], Laura Maturi[1]
[1] Eurac Research, Bolzano, Italy; [2] Soluxa, Nijmegen, The Netherlands; [3] NTNU, Trondheim, Norway; [4] GruppoSTG, Bergamo, Italy

ORAL PRESENTATIONS 1BO.2

10:30 - 12:00 Silicon Heterojunction Solar Cells

Chairpersons: Paola Delli Veneri *(i)*
ENEA, Portici, Italy
Kaining Ding
Forschungszentrum Jülich, Germany

1BO.2.1 Silicon Heterojunction Solar Cells Featuring TCO-free Localized Front Contacts
Sebastian Smits[1], Brian Istvan Giam[1], Maryam Manesh[1], Paul Procel-Moya[1], Yifeng Zhao[1], Luana Mazzarella[1], Olindo Isabella[1]
[1] TU Delft, The Netherlands

1BO.2.2 Inhomogeneity and Shunt Analysis in PECVD p-type nc-Si:H for Silicon Heterojunction Solar Cells
Amanda Merino Leiva[1], Jean Patrice Rakotoniaina[1], Tristan Gageot[1], José Alvarez[2], Jean-Paul Kleider[2], Delfina Muñoz[1]
[1] CEA / INES, Le Bourget-du-Lac, France; [2] CNRS, Gif-sur-Yvette, France

1BO.2.3 Evaporated C60 as Electron-Selective Contact in Dopant-Free Silicon Heterojunction Solar Cells
Riccardo Brondolin[1], Yifeng Zhao[1], Yi Zheng[1], Paul Procel Moya[1], Luana Mazzarella[1], Olindo Isabella[1]
[1] TU Delft, The Netherlands

1BO.2.4 Room Temperature Sputtered SnOx Contact Layers for Silicon Heterojunction Solar Cells
Hassan Mohamed Osman[1], Alexandr Zamchiy[1], Alexander Eberst[1], Benjamin Klingebiel[1], Karsten Bittkau[1], Henrike Gattermann[1], Andreas Lambertz[1], Kaining Ding[1]
[1] FZJ, Jülich, Germany

1BO.2.5 From Proof-of-concept towards 24 % Efficiency: Advancing IBC-SHJ Solar Cells Featuring MoOx Blanket Layer
Katarina Kovačević[1], Yifeng Zhao[1], Paul Procel[1], Liqi Cao[1], Engin Özkol[1], Luana Mazzarella[1], Olindo Isabella[1]
[1] TU Delft, The Netherlands

1BO.2.6 Reinforcement of FlexTrail Seeds by Electrodeposited Copper for Sustainable Metallization of Heterojunction Cells
Agata Lachowicz[1], Jörg Schube[2], Roman Keding[2], Sven Kluska[2], Jun Zhao[1], Bertrand Paviet-Salomon[1], Christophe Ballif[3], Tonio Buonassisi[1]
[1] CSEM, Neuchâtel, Switzerland; [2] Fraunhofer ISE, Freiburg, Germany; [3] EPFL, Neuchâtel, Switzerland

VISUAL PRESENTATIONS 2BV.2

10:30 - 12:00 Compound (Chalcogenide, Kesterite, III-V) and Organic Devices

Detailed information on this session is presented in the section entitled 'EU PVSEC 2026 Visual Presentations'.

ORAL PRESENTATIONS 2BO.8

13:30 - 15:00 **Novel Architectures and Advanced Materials for Enhanced Efficiency and Versatility**

Chairpersons: Rebecca Saive
University of Twente, Enschede, The Netherlands
Jozef (Jef) Poortmans
imec, Leuven, Belgium

2BO.8.1 **First Demonstration of Photoresponsivity in Polycrystalline GeSn Thin Films toward Versatile Infrared Photovoltaic Application**
Shintaro Maeda[1], Takamitsu Ishiyama[1], Takashi Suemasu[1], Kaoru Toko[1]
[1] University of Tsukuba, Japan

2BO.8.2 **Optoelectronic Properties of Low-temperature-processed Chalcogenide Perovskite Thin Films**
Elvira Cánovas-Corbalán[1], Inés Durán[1], Kiruba Catherine Vincent[2], Shubhanshu Agarwal[2], Jorge Rodríguez-Muro[1], Antonio Martí[1], Rakesh Agrawal[2], Simon Svatek[1], Elisa Antolin[1]
[1] UPM, Madrid, Spain; [2] Purdue University, West Lafayette, United States of America

2BO.8.3 **Hot Carrier-Induced Photocurrent as an Extra Loss Mechanism in Solar Cell Operation**
Jonas Gradauskas[1], Oleksandr Masalskyi[1], Ihor Zharchenko[2], Steponas Ašmontas[2], Algirdas Sužiedėlis[2], Aurimas Čerškus[1]
[1] VGTU, Vilnius, Lithuania; [2] CPST, Vilnius, Lithuania

2BO.8.4 **Enhancing Outdoor Durability of Cu_2O Top Cell by Passivation Treatment for High Efficiency Cu_2O/Si Tandem Solar Cells**
Atsushi Wada[1], Sara Yoshio[1], Soichiro Shibasaki[1], Naoyuki Nakagawa[1], Yuya Honishi[1], Yukitami Mizuno[1], Takashi Yamamoto[1], Motohiro Toyota[1], Mutsuki Yamazaki[1], Yasutaka Nishida[1], Kanta Sugimoto[1], Junji Sano[1], Kazushige Yamamoto[1], Eduardo Román[2], Asier Sanz[2]
[1] Toshiba, Kawasaki, Japan; [2] Tecnalia, Derio, Spain

2BO.8.5 **Towards Scalable Free-space Luminescent Solar Concentrators for Year-round Photovoltaic Yield Enhancement**
Mathis Van de Voorde[1], Twan Kalthof[1], Jelle Westerhof[1], Lisanne Einhaus[1], Rebecca Saive[1]
[1] University of Twente, Enschede, The Netherlands

2BO.8.6 **Revisited CIGS Solar Cells for Standalone Solar-to-X**
Lèo Choubrac[1], Hichem Ichou[2], Garen Suna[2], Vincent Marignoni[3], Afridi Zamader[3], Fabrice Odobel[2], Julien Bonin[3], Marc Robert[3], Nicolas Barreau[2]
[1] SATT Ouest Valorisation, Nantes, France; [2] Nantes University, France; [3] Sorbonne University, Paris, France

ORAL PRESENTATIONS 2-3BO.3

13:30 - 15:00 **Performance Characterisation of Perovskite-based Cells and Modules**

Chairpersons: Lili Wang *(i)*
Technology Innovation Institute, Abu Dhabi, United Arab Emirates
Blago Mihaylov *(i)*
European Commission JRC, Ispra, Italy

2BO.3.1 **Industrial Full-Size Perovskite–Silicon Bifacial Tandem Modules under Real-World Conditions**
Natalia Schiwon[1], Bashini Mahaarachchi[1], Freya Leyland[1], Marko Remec[1], Daniel Kirk[2], Ulrich Kentsch[3], Simon Kirner[3], Rutger Schlatmann[1], Mark Khenkin[1], Carolin Ulbrich[1]
[1] PVcomB, Berlin, Germany; [2] Oxford PV, United Kingdom; [3] Oxford PV Germany, Brandenburg an der Havel, Germany

2BO.3.2 **Comparison of Cross-Location Outdoor Testing of Perovskite-based Solar Cells**
Kristijan Brecl[1], Marko Jošt[1], Mark Khenkin[2], Carolin Ulbrich[2], Quentin Jeangros[3], Marko Topič[1]
[1] University of Ljubljana, Slovenia; [2] HZB, Berlin, Germany; [3] CSEM, Neuchatel, Switzerland

2BO.3.3 **Bifacial 2T Large Area Perovskite-Silicon Devices: from Processing to Modules and Outdoor Measurements**
Sinclair R. Ratnasingham[1], Marcel Simor[1], Radha Kothandaraman[1], Yu Wu[2], Melvin ten Kate[2], Hande Ciftpinar[2], Victor Rosca[2], Petra Manshanden[2], Corné Frijters [1], Johannes Lambooij [1], Bart J. Geerligs[2], Sjoerd Veenstra[1], Valerio Zardetto[1]
[1] TNO, Eindhoven, The Netherlands; [2] TNO, Petten, The Netherlands

3BO.3.4 **Pre-Conditioning and Reliable Measurement Procedures on Large Size Perovskite PV Modules**
Hanna Ellis[1], Harald Müllejans[1], Ewan Dunlop[1]
[1] European Commission JRC, Ispra, Italy

3BO.3.5 **Rapid Determination of Stabilized Power Output for Perovskite PV Modules via Kinetic Modeling**
Yating Zhang[1], Christos Monokroussos[1], Frank Xu[1], Mengdi Liu[1], Giorgio Bardizza[2], Max Koentopp[3]
[1] TUV Rheinland, Shanghai, China; [2] TUV Rheinland, Pogliano Milanese, Italy; [3] TUV Rheinland, Cologne, Germany

3BO.3.6 **Study on I-V Testing and Stability of Large-Area Perovskite and Perovskite/Silicon Tandem Solar Cell Modules**
Hexian Zhang[1], Shuiwei Wang[1], Jia Lü[1], Jian Li[1]
[1] Shaanxi Zhongsen Electric Power Technology, Xi'an, China

VISUAL PRESENTATIONS 4BV.3

13:30 - 15:00 Solar Resource and Forecasting

Detailed information on this session is presented in the section entitled 'EU PVSEC 2026 Visual Presentations'.

PANEL DISCUSSION

13:30 - 15:00 BO.13 Geographical Diversification of PV Manufacturing

ORAL PRESENTATIONS 2BO.9

15:15 - 16:45 Advanced Characterisation and Stability im Perovskite Devices

Chairpersons: Mirella Al Katrib *(i)*
IPVF, Palaiseau, France
Sjoerd Veenstra
TNO Energy Transition, Eindhoven, The Netherlands

2BO.9.1 Analysis of Field Performance Data for Perovskite Solar Cells with Fixed Load Resistors
Takeshi Tayagaki[1], Kohei Yamamoto[1], Takurou Murakami[1], Masahiro Yoshita[1]
[1] AIST, Tsukuba, Japan

2BO.9.2 Photocurrent Imaging of Perovskite PV Devices using Structured Illumination
George Koutsourakis[1], James C. Blakesley[1], Andrew Thompson[1], Nathan Hill[2], Sophia Baker[2], David Beynon[3], Ershad Parvazian[3], Trystan Watson[3]
[1] NPL, Teddington, United Kingdom; [2] Power Roll, Seaham, United Kingdom; [3] Swansea University, United Kingdom

2BO.9.3 Perovskite Stability and Degradation – Materials Analyses after Long-Term Outdoor Testing
Cordula Wessendorf[1], Theresa Magorian Friedlmeier[1], Wolfram Hempel[1], Jonas Hanisch[1], Stefanie Spiering[1], Ana Kanevce[1], Erik Ahlswede[1], Mark Khenkin[2], Steven Melendez[2], Carolin Ulbrich[2], Eva-Maria Hammer[1]
[1] ZSW, Stuttgart, Germany; [2] HZB, Berlin, Germany

2BO.9.4 Unravelling Performance Metastability in Perovskite Solar Cells
Aimad-Eddine Admane[1], Anne Migan Dubois[2], Anyssa Derj[1], Johan Parra[3], Marion Provost[1], Armelle Yaiche[4], Jordi Badosa[5], Jorge Posada[4], Jean Rousset[4], Philip Schulz[6], Karim Medjoubi[1]
[1] IPVF, Palaiseau, France; [2] GeePs, Gif-sur-Yvette, France; [3] Sorbonne University, Palaiseau, France; [4] EDF R&D, Palaiseau, France; [5] LMD, Palaiseau, France; [6] CNRS, Palaiseau, France

2BO.9.5 Outdoor Stress Tests of Perovskite Photovoltaic Modules over three Seasons: S-shape and Hysteresis
Ceri Sophia Hommerich[1], Sara Golroodbari[1], Aranzazu Aguirre[2], Yinghuan Kuang[2], Tamara Merckx[2], Anurag Krishna[2], Tom Aernouts[2], Wilfried G.J.H.M. van Sark[1]
[1] UU, Utrecht, The Netherlands; [2] imec, Genk, Belgium

2BO.9.6 Accurate Performance and Stability Characterization of Commercial Perovskite PV Devices
Peter Pasmans[1], Stefan Roest[1], Lukas Ziegler[2], Bernhard Mitchell[2]
[1] Eternal Sun | WAVELABS, The Hague, The Netherlands; [2] Eternal Sun | WAVELABS, Leipzig, Germany

ORAL PRESENTATIONS 3BO.14

15:15 - 16:45 Environmental and Mechanical Stresses on PV Modules

Chairpersons: Ulrike Jahn
Fraunhofer CSP, Halle (Saale), Germany
Olatz Arriaga Arruti
CSEM, Neuchâtel, Switzerland

3BO.14.1 Durability Assessment of Anti-Soiling Coating Under Accelerated Multi-Environmental Stress
Pavan Fuke[1], Sandeep Kumar[1], Ganesh C[1], Praneeth Reddy[1], Narendra Shiradkar[1], Anil Kottantharayil [1]
[1] IIT, Mumbai, India

3BO.14.2 Accelerated Product Development for Alpine PV Modules
Anika Gassner[1], Ebrar Özkalay[2], Gabriele C. Eder[1], Gabi Friesen[2], Markus Feichtner[3]
[1] OFI, Vienna, Austria; [2] SUPSI, Mendrisio, Switzerland; [3] Sonnenkraft, St. Veit a. d. Glan, Austria

3BO.14.3 Standardization of Photovoltaic Modules Equipped with Snow Melting Heater (Snow-PV)
Akio Sato[1], Michio Kondo[2], Mauro Caccivio[3], Giovanni Bellenda[3], Ze Guo[4], Simon Boddaert[5], Jan Mastny[6]
[1] VDE Global Services Japan, Osaka, Japan; [2] Waseda University, Tokyo, Japan; [3] SUPSI, Mendrisio, Switzerland; [4] CSA Group, Shanghai, China; [5] CSTB, Sophia Antipolis, France; [6] Ernst Schweizer, Hedingen, Switzerland

3BO.14.4 Evaluating Mechanical Strength of PV Modules under Non-standard Mechanical Load Test Conditions
Jan M. Kroon[1], Eelko Hoek[1], Paul Sommeling[1], Thomas Kaltenbach[2], Jochen Markert[2], Enzo Job[2], Halvard Fjaer[3], Nathan Roosloot[3]
[1] TNO, Petten, The Netherlands; [2] Fraunhofer ISE, Freiburg, Germany; [3] IFE, Kjeller, Norway

3BO.14.5 Evaluation of the Reliability of Hailstorm-damaged PV Modules using a Post-impact Stress Methodology
Dominika Chudy[1], Evelyn Bamberger [2], Andreas Bohren[2], Mauro Caccivio[1]
[1] SUPSI, Mendrisio, Switzerland; [2] OST, Rapperswil, Switzerland

3BO.14.6 Determination of the Compressive Surface Pre-Stress on PV-Module Glass with a Scattered Light Polariscope
Jochen Markert[1], Frank Schneider[2], Ruth Kasper[3], Ingrid Hädrich[1], Daniel Philipp[1]
[1] Fraunhofer ISE, Freiburg, Germany; [2] Technical University Darmstadt, Germany; [3] Cologne University of Applied Sciences, Germany

ORAL PRESENTATIONS 1BO.4

15:15 - 16:45 Manufacturing of Silicon Solar Cells and Technologies to Reduce Ag Consumption
Chairpersons: Marina Foti *(i)*
3Sun, Catania, Italy
Peter Fath
RCT-Solutions, Konstanz, Germany

1BO.4.1 Lessons Learned Implementing Solar Cell Mass Production in India, Focus on Topcon, Maybe Equipment Comparison European/Chinese

1BO.4.2 Industry-relevant Plasma Oxidation Technologies for TOPCon-based Solar Cells
Jana-Isabelle Polzin[1], Silvère Dufour-Robbe[1], Ivonne Vera Pauta[1], Jeffrey Dobkowski[1], Philipp Ehnes[1], Mathias Bories[1], Thomas Pernau[2], Amandine Guissart[3], Thomas Schütte[4], Jan-Peter Urbach[4], Marc Hofmann[1]
[1] Fraunhofer ISE, Freiburg, Germany; [2] centrotherm international, Blaubeuren, Germany; [3] MUEGGE, Reichelsheim, Germany; [4] PLASUS, Mering, Germany

1BO.4.3 Stability Boundaries of Double Screen Printing for Crystalline Silicon Solar Cells
Guofeng Yu[1], Maik Albrecht[1], Andrea Kühne[1], Klaus Messmer[1], Tobias Neuber[1]
[1] Jonas & Redmann Automationstechnik, Berlin, Germany

1BO.4.4 Comparative Study of 100% Copper-Based Metallization via Printing and Plating Strategies for Silicon Heterojunction Solar Cells
Gustavo Rodrigues Lopes[1], Felix Wiedenmann[2], Stéphane Bastide[3], Johann Jourdan[1], Thibaud Hatt[2], Wilfried Favre[1]
[1] CEA / INES, Le Bourget-du-Lac, France; [2] PV2+, Freiburg, Germany; [3] CNRD, Thiais, France

1BO.4.5 High-Efficiency Silver-Free Silicon Heterojunction (SHJ) Solar Cells: towards Deeper Insights and Perspectives for Sustainable Metallization
Mohamed Issifi Yacouba[1], Andreas Lambertz[1], Henrike Gattermann[1], Karsten Bittkau[1], Uwe Rau[1], Ruth Schwaiger[1], Nicolas J. Peter[1], Kaining Ding[1]
[1] FZJ, Jülich, Germany

1BO.4.6 Enabling 45 µm Wide Screen-Printed Aluminum Front Fingers Using Knot-Less Screens and Advanced Paste Engineering
Sebastian Junge[1], Byungsul Min[1], Verena Mertens[1], Till Brendemühl[1], Kosuke Tsuji[2], Marwan Dhamrin[2], Rolf Brendel[1]
[1] ISFH, Emmerthal, Germany; [2] Toyo Aluminium, Higashiyama, Japan

VISUAL PRESENTATIONS 4BV.4

15:15 - 16:45 PV and Buildings

Detailed information on this session is presented in the section entitled 'EU PVSEC 2026 Visual Presentations'.

ORAL PRESENTATIONS 2BO.10

17:00 - 18:30 Towards Industrial Processing of Perovskite Devices
Chairpersons: Ioanna Vareli *(i)*
Empa, Duebendorf, Switzerland
Tom Aernouts *(i)*
imec, Genk, Belgium

2BO.10.1 Up-Scaling of Perovskite Solar Cells via Slot-DDie Coating with Green Solvents: Towards Semi-Transparent n-i-p Modules
Giulia Lucarelli[1], Felipe Vinocour Pacheco[1], Drishya Rajan Pillai[1], Corné Frijters[1], Klaas Bakker[1], Flavio Linardi[2], Gorkem Gunbas[3], Anne Biezemans[1], Johan Bosman[1], Ilker Dogan[1], Sjoerd Veenstra[1]
[1] TNO, Eindhoven, The Netherlands; [2] Avantama, Stafa, Switzerland; [3] ODTÜ-GÜNAM, Ankara, Türkiye

2BO.10.2 Processing and Scaling of Fully Evaporated Perovskite Solar Devices: Influence of Air Exposure between Layer Depositions
Pablo Reyes Figueroa[1], Arindam Mallick[1], Muhammad Faraz Ud Din[1], Joao Silvano[1], Bastian Jarmer[1], Janina Moereke[1], Christian Schubbert[1], Stefan Grünsteidl[1], Marko Stölzel[1], Peter Borowski[1], Patrick Eraerds[1], Thomas Dalibor[1]
[1] Avancis, Munich, Germany

2BO.10.3 High Thermal Budget Processing Route for Flexible Thin-Film Perovskite Solar Cells and Modules: The Temporary 'Superstrate' Based on Al-Foil and Transparent Etch-Stop Barrier Layers
Paula Perez Rodriguez[1], Govind Padmakumar[1], Federica Saitta[1], Peer Sluijs[1], Reinder Boekhof[1], Lara van der Poll[1], Niels van Silfhout[1], K.P. Sreejith[1], Luana Mazzarella[1], Tom Savenije[1], Malte Vogt[1], Rudi Santbergen[1], Arno Smets[1]
[1] TU Delft, The Netherlands

2BO.10.4 From Lab Scale to High Throughput: Optimization of Spray Coating Processes for Silicon-Perovskite Tandem Solar Cell Manufacturing
Martin Zimmer[1], Lena Emmer[1], Leon Metz[1], Ulrike Hatt[1]
[1] Fraunhofer ISE, Freiburg, Germany

2BO.10.5 Sequentially Processed High-Quality Perovskite Films for High-Performance, Large-Area Perovskite Solar Modules
Young Yun Kim[1]
[1] KRICT, Daejeon, South Korea

2BO.10.6 R2R Scalable Perovskite Solar Cells with High Efficiency and Long Term Stability via Scalable Encapsulation Methods
Georgia Gkouzia[1], Anuja Vijayan[1], Manvika Singh[1], Chandu Mohan[1], Dorrit Roosen-Melsen[1], Casper van Kessel[1], Harrie Gorter[1], Thomas Exlager[1], Sjoerd Veenstra[1], Ilker Dogan[1]
[1] TNO, Eindhoven, The Netherlands

ORAL PRESENTATIONS 3BO.15

17:00 - 18:30 UV-ID; PID and Metallization Reliability
Chairpersons: Teresa Barnes *(i)*
National Laboratory of the Rockies, Golden, United States of America
Stefan Mitterhofer *(i)*
NIST, Gaithersburg, United States of America

3BO.15.1 Comparative Study of Four Recovery Methods and Subsequent Dark Storage Metastability in UV-induced Degradation (UVID) Affected TOPCon PV Modules
Aziz Nairi[1], Johnson Wong[2], John Derek Arcebal[1], Srinath Nalluri[1], Thomas Reindl[1]
[1] SERIS, Singapore; [2] Quantified Energy, Singapore

3BO.15.2 Balancing Degradation and Recovery: Temperature Effects on UVID in TOPCon PV Modules
Paul Gebhardt[1], Angelika M. Beinert[1], Esther Fokuhl[1], Florian Schindler[1], Ingrid Hädrich[1], Daniel Philipp[1]
[1] Fraunhofer ISE, Freiburg, Germany

3BO.15.3 Sequential UV/DH Aging Tests to Validate Silver-coated Copper Particles Paste on SHJ Solar Cells
Timea Bejat[1], Hugo Lajoie[1], Rémi Monna[1], Adeline Lanterne[1]
[1] CEA-INES, Le Bourget du Lac, France

3BO.15.4 From Silver to Copper: Reliability of Copper-based Metallization with Multi-wire Twill Interconnection in SHJ Modules
Hamed Javanbakht Lomeri[1], Valerie Depauw[1], Jonathan Govaerts[1], Bart Reekmans[1], Mihir Mahajan[1], Mohamed Issifi Yacouba[2], Andreas Lambertz[2], Henrike Gattermann[2], Karsten Bittkau[2], Kaining Ding[2], Yi Zheng[3], Engin Özkol[3], Olindo Isabella[3], Hariharsudan Sivaramakrishnan Radhakrishnan[1]
[1] imec, Genk, Belgium; [2] FZJ, Jülich, Germany; [3] TU Delft, The Netherlands

3BO.15.5 Testing System Voltage Potential-Induced Degradation with the Factor of Light
Peter Hacke[1], Kent Terwilliger[1], Sven Rissland[2]
[1] NLR, Golden, United States of America; [2] Hanwha Q Cells, Bitterfeld-Wolfen, Germany

ORAL PRESENTATIONS 4BO.5

17:00 - 18:30 BIPV Performance Modelling and Reliability
Chairpersons: Rebecca Yang *(i)*
RMIT University, Melbourne, Australia
Francesco Frontini *(i)*
SUPSI, Mendrisio, Switzerland

4BO.5.1 City-Scale Evaluation of the Energy Yield of Perovskite Solar Cells Installed on Urban Building Surfaces
Tomoya Kawashima-Hirano[1], Akito Ozawa[1], Kazuki Yamaguchi[2], Yuya Takane[3], Tomohiko Ihara[4]
[1] Global Zero Emission Research Center, Tsukuba, Japan; [2] TEPCO Research Institute, Yokohama, Japan; [3] Center for Climate Change Adaptation, Tsukuba, Japan; [4] The University of Tokyo, Kashiwa, Japan

4BO.5.2 Lightweight Curved PV Modules for Structurally Constrained Rooftops: Performance Assessment and Modelling
Simona Villa[1], Mirza Khalid Baig[1], Harm Visscher[2], Ruud van de Voort[3], Corry de Keizer[1]
[1] TNO, Eindhoven, The Netherlands; [2] Solarge, Weert, The Netherlands; [3] Soltronergy, Roermond, The Netherlands

4BO.5.3 Integrating Balcony Photovoltaics into Urban Energy Systems: A Scalable Framework for Assessing Solar Potential in High-rise Residential Buildings in India
Shantanu Roy[1], Mahesh Kalshetty[2], Saptak Ghosh[2], Madhusree Bhattacharjee[1], Sheikh Madiha Syed[2]
[1] CSTEP, Noida, India; [2] CSTEP, Bengaluru, India

4BO.5.4 Outdoor Performance and Degradation of Photovoltaic Roof Tiles under Realistic BIPV Operating Conditions
Florian Ollagnon[1], Paul Rémondeau[1], Gaétan Carrier[2], Alba Finelli[3], Xavier Bulliard[3], Torsten Rößler[4], Kléber Nicolet[1], John Morello[2], Antonin Faes[1], Christophe Ballif[1]
[1] EPFL, Neuchâtel, Switzerland; [2] FREESUNS, Colombier, Switzerland; [3] CSEM, Neuchâtel, Switzerland; [4] Fraunhofer ISE, Freiburg, Switzerland

4BO.5.5 Horizontal Spread of Fire under Photovoltaic Systems on Flat Roofs
Christine Hani[1]
[1] Technical University of Munich, Germany

4BO.5.6 Synergies between Vertical Bifacial PV and Green Roofs: Microclimate and Energy Balance Analysis
Ammar Tummalieh[1], Bruno Bueno[1], Fatima Abdelrhman[1], Andreas Beinert[1]
[1] Fraunhofer ISE, Freiburg im Breisgau, Germany

VISUAL PRESENTATIONS 1BV.5

17:00 - 18:30 Silicon Material Science and Technology | Manufacturing of Silicon Cells

Detailed information on this session is presented in the section entitled 'EU PVSEC 2026 Visual Presentations'.

Wednesday, 16. September 2026

PLENARY PRESENTATIONS CP.1

08:30 - 10:00 Thin-Film PV Technologies Towards Impact

Chairpersons: Nicola Beaumont *(i)*
Oxford PV, United Kingdom
Michael Saliba *(i)*
University of Stuttgart, Germany

CP.1.1 Perovskites Advancement of Next-Generation Photovoltaic Technologies

CP.1.2 Thin-Film PV Production in Europe – Opportunities and Research Perspective

Eva-Maria Hammer[1], Jonas Hanisch[1], Theresa Magorian Friedlmeier[1], Erik Ahlswede[1], Michael Powalla[1]

[1] ZSW, Stuttgart, Germany

CP.1.3 Perovskite/Silicon Triple Junction Devices: Achievements and Learnings from the TRIUMPH Project Funded under Horizon Europe

Hariharsudan Sivaramakrishnan Radhakrisnan[1], Kerem Artuk[2], Luis Restat[3], Oliver Fischer[3], Lian Duan[4], Alejandra Galarza[4], Estelle Gervais[5], Felipe Saenz[6], Maryamsadat Heydarian[5], Paul Sommeling[7], Cristian Villalobos Meza[1], Jonathan Parion[1], Yinghuan Kuang[1], Selin Seyrek[1], Valerie Depauw[1], Ismail Kaaya[1], Minasadat Heydarian[5], Aïcha Hessler-Wyser[2], Christoph Messmer[3], Mathias Kamp[8], Martin Fischer[9], René Köhler[9], Jons Bolding[10], Petra Manshanden[7], Henrik Pettersson[11], Martin Karlsson[11], Jose Alvarez[12], Henry Weber[13], Ralf G. Niemann[13], Fabian Fertig[13], Mustafa Yasa[14], Jean-Baptiste Puel[15], Juliane Borchert[5], Selcuk Yerci[14], Martin Späth[7], Martin C. Schubert[5], Pilar Lopez-Varo[4], Jonas Schön[3], Martin Bivour[5], Sebastian Nold[5], Christophe Ballif[2], Quentin Jeangros[6], Christian Wolff[2]

[1] imec, Genk, Belgium; [2] EPFL, Neuchatel, Switzerland; [3] University of Freiburg, Germany; [4] IPVF, Palaiseau, France; [5] Fraunhofer ISE, Freiburg, Germany; [6] CSEM, Neuchatel, Switzerland; [7] TNO, Petten, The Netherlands; [8] RENA, Freiburg, Germany; [9] Von Ardenne, Dresden, Germany; [10] SALD, Eindhoven, The Netherlands; [11] Dyenamo, Stockholm, Sweden; [12] CNRS, Palaiseau, France; [13] Qcells, Thalheim, Germany; [14] ODTU-GUNAM, Ankara, Türkiye; [15] EDF, Palaiseau, France

CP.1.4 Designing and Manufacturing of a 34.21 % World-record Efficiency Non-Concentrating Terrestrial PV Module with Optimized Optics and Shingle Interconnection of III-V Solar Cells

Laura Stevens[1], Leonhard Böck[1], Li Carlos Rendler[1], Tim Kubera[2], Hubert Hauser[3], Oliver Gochermann[4], Marc André Schüler[1], Najwa Abdel Latif[1], Christian Reichel[1], Martin Heinrich[1]

[1] Fraunhofer ISE, Freiburg, Germany; [2] Azur Space Solar Power, Heilbronn, Germany; [3] temicon holotools, Freiburg, Germany; [4] Gochermann Solar Technology, Wedel, Germany

PLENARY PRESENTATIONS CP.2

10:30 - 12:30 Silicon PV Design, Manufacturing and Circularity

Chairpersons: Veronica Bermudez Benito
BERBETIN, Antibes, France
Wilfried G.J.H.M. van Sark
Utrecht University, The Netherlands

CP.2.1 Towards 28% Efficient Silicon Solar Cells in Mass Production

Daniel Macdonald[1], Rabin Basnet[1], Zhongshu Yang[1], Kean Fong[1], Gabriel Bartholazzi[1], AnYao Liu[1], Lachlan Black[1], Di Yan[2], James Bullock[2], Peiting Zheng[3], Menglei Xu[3], Jie Yang[3], Xinyu Zhang[3], Hao Jin[3]

[1] ANU, Canberra, Australia; [2] University of Melbourne, Australia; [3] Jinko Solar, Haining, China

CP.2.2 Latest Development of TOPCon and Back Contact Solar Cells in China

CP.2.3 Module Technology Innovations – An Important Driver for Performance and Cost Improvements as well as New Applications in Photovoltaics

CP.2.4 The PVMD Toolbox v2: A Modular Framework for Modeling Advanced Photovoltaic Systems

Youri Blom[1], Malte Ruben Vogt[1], Olindo Isabella[1], Rudi Santbergen[1]

[1] TU Delft, The Netherlands

CP.2.5 Towards Circular PV Modules

CP.2.6 Time-Resolved Circular Energy Flows in TOPCon Solar Cell Production

Peter Brailovsky[1], Dilara Subasi[1], Tobias Dannenberg[2], Lisbeth Rochlitz[3], Leonard Rohde[4], Jascha Reich[5], Wolfgang Kramer[1], Sebastian Mack[1], Baljeet Singh Goraya[1], Thomas Fluri[1], Nico Wöhrle[1], Martin Weber[2], Sebastian Nold[1]

[1] Fraunhofer ISE, Freiburg, Germany; [2] RENA Technologies, Gütenbach, Germany; [3] Pfeiffer Fab Solutions, Blaubeuren, Germany; [4] VON ARDENNE, Dresden, Germany; [5] TU Berlin, Germany

ORAL PRESENTATIONS 1CO.1

13:30 - 15:00 Optimization of Manufacturing of Silicon Solar Cells

Chairpersons: Vanesa Fano *(i)*
UPV/EHU, Zamudio, Spain
Karsten Bothe *(i)*
ISFH, Emmerthal, Germany

1CO.1.1 Optimization of Metallization in TOPCon and SHJ Silicon Solar Cells for Shingle and TWILL Interconnection

Špela Tomšič[1], Sven Kluska[2], Marco Galiazzo[3], Jonathan Govaerts[4], Marko Topič[1], Matevž Bokalič[1]

[1] University of Ljubljana, Slovenia; [2] Fraunhofer ISE, Freiburg, Germany; [3] Applied Materials Italia, Olmi, Italy; [4] imec, Genk, Belgium

1CO.1.2 Baseline for Edge Passivated TOPCon Shingle Solar Cells and (Matrix) Shingle Solar Modules

Elmar Lohmüller[1], Daniel von Kutzleben[1], Sabrina Lohmüller[1], Norbert Kohn[1], Alexander Göbel[1], Alexander Krieg[1], Sebastian Mack[1], Andreas Wolf[1], Marc Hofmann[1], Jale Schneider[1], Jörg Schube[1], Johannes M. Greulich[1], Jonas De Rose[1], Torsten Rößler[1], Achim Kraft[1], Holger Neuhaus[1], Florian Clement[1], Ralf Preu[1]

[1] Fraunhofer ISE, Freiburg, Germany

1CO.1.3 Physics-informed Machine Learning for Solar Cell Diagnosis and Measurement Data Compression

Alexandra Wörnhör[1], Wilkin Wöhler[1], Andreas Fell[1], Ralf Preu[1], Stefan Rein[1], Matthias Demant[1]

[1] Fraunhofer ISE, Freiburg, Germany

1CO.1.4 Bayesian Optimization for Fabricating TOPCon Solar Cells

Byungsul Min[1], Sebastian Junge[1], Verena Mertens[1], Rolf Brendel[1]

[1] ISFH, Emmerthal, Germany

1CO.1.5 High Intensity Line Laser Light Soaking of Silicon Heterojunction Solar Cells

Benedikt Fischer[1], Hitoshi Sai[2], Zhihao Xu[2], Maurice Nuys[1], Andreas Lambertz[1], Volker Lauterbach[1], Kaining Ding[1], Uwe Rau[1], Takuya Matsui[2]

[1] FZJ, Jülich, Germany; [2] AIST, Tsukuba, Japan

1CO.1.6 From Bimodal to Trimodal AgCu/Ag Microstructures: Tuning Percolation and Sintering for Low Temperature Solar Cell Metallization

Oumaima Mhirsi[1], M. Noah Wengenmeyr[1], Jonas Bartsch[1]

[1] Fraunhofer ISE, Freiburg, Germany

ORAL PRESENTATIONS 5CO.4

13:30 - 15:00 Combining PV and Energy Storage

Chairpersons: Marion Perrin *(i)*
Energy Pool, Le Bourget-du-Lac, France
Pierre-Jean Alet
CSEM, Neuchâtel, Switzerland

5CO.4.1 System Economics of Flexibility, Storage, and Curtailment in Renewable Grids

Jan Remund[1], Richard Perez[2], Marc Perez[3], Marco Pierro[4]

[1] Meteotest, Bern, Switzerland; [2] SUNY, Albany, United States of America; [3] Clean Power Research, Napa, United States of America; [4] EURAC, Bolzano, Italy

5CO.4.2 Research on the System Electricity Supply Cost of Replacing Fossil-Fuel Generation with Photovoltaics

Dong Zhang[1], Yunzhou Zhang[2]

[1] State Grid Energy Research Institute, Beijing, China; [2] China Renewable Energy Society, Beijing, China

5CO.4.3 **Validating Robust MPC and Reinforcement Learning for Utility-Scale PV+BESS Dispatch using High-Fidelity Multi-Physics Simulation**
Cristóbal Parrado Riquelme[1]
[1] Andrés Bello University, Santiago, Chile

5CO.4.4 **Assessing the Reliability of Battery Systems in Solar Power Plants in Operation**
Erik Stensrud Marstein[1], Christian Messner[2], Patrik Ollas[3], Jonathan Fagerström[1], Mengjie Li[4], Dan-Eric Archer[5], Roger H. French[6]
[1] IFE, Kjeller, Norway; [2] AIT, Vienna, Austria; [3] RISE, Gothenburg, Sweden; [4] UCF, Orlando, United States of America; [5] Checkwatt, Gothenburg, Sweden; [6] CWRU, Cleveland, United States of America

5CO.4.5 **High-Temperature Heat Pumps as Demand-Side Integration Assets for Renewable Curtailment Mitigation: A Case Study in Chilean Copper Mining**
Maylin Moraga[1], Carlos Jose Felbol[1], Francisco Moraga[1]
[1] Fraunhofer Chile Research, Santiago de Chile, Chile

5CO.4.6 **Potential of PV+BESS as a Fast-deployment Option for Data Center Energy**
Harry Apostoleris[1], Matteo Chiesa[2]
[1] EPRI Gulf, Abu Dhabi, United Arab Emirates; [2] Khalifa University, Abu Dhabi, United Arab Emirates

VISUAL PRESENTATIONS 4CV.1

13:30 - 15:00 **Design, Engineering and Installation of PV Systems; BoS**

Detailed information on this session is presented in the section entitled 'EU PVSEC 2026 Visual Presentations'.

PANEL DISCUSSION

13:30 - 15:00 **CO.7 Perovskites: Evolution or Revolution?**

ORAL PRESENTATIONS

13:30 - 15:00 **Late News.10**

ORAL PRESENTATIONS 1CO.2

15:15 - 16:45 **Recombination, Degradation, and Diagnostics in Silicon Photovoltaics**

Chairpersons: Barbara Terheiden *(i)*
University of Konstanz, Germany
Ronald Sinton
Sinton Instruments, Boulder, United States of America

1CO.2.1 **Improved Methodology for a Precise Extraction of the Surface Recombination Current Density J0 of Well-passivated Silicon Wafers**
Daniel Beck[1], Michael Winter[1], Jan Schmidt[1]
[1] ISFH, Emmerthal, Germany

1CO.2.2 **Quantifying Light-Trapping in Silicon Solar Cells and Wafers via Photoluminenscence Spectra**
Aneeqa Shaikh[1], Anh Din Bui[1], Marco Ernst[1], Kean Chern Fong[1], Thorsten Trupke[2], Daniel Macdonald[1]
[1] ANU, Canberra, Australia; [2] UNSW, Sydney, Australia

1CO.2.3 **Minimizing Surface-related Degradation of Poly-Si-on-Oxide Passivation Stacks by Controlling the Hydrogen Incorporated during Fast-firing**
Michael Winter[1], Daniel Beck[1], Jan Schmidt[1]
[1] ISFH, Emmerthal, Germany

1CO.2.4 **Efficiency–Breakdown Trade-Offs in IBC Solar Cells with Embedded Poly-Si Bypass Junctions**
Paul Procel Moya[1], Yifeng Zhao[1], Rene van Swaaij [1], Olindo Isabella[1]
[1] TU Delft, The Netherlands

1CO.2.5 **Degradation of TOPCon Surfaces: Influence of poly-Si Deposition, Doping and Thermal Anneals**
Wolfram Kwapil[1], Parth Sachin Sawant[2], Benjamin Hammann[2], Sebastian Mack[2], Jana-Isabelle Polzin[2], Florian Schindler[2], Martin C. Schubert[2]
[1] University of Freiburg, Germany; [2] Fraunhofer ISE, Freiburg, Germany

1CO.2.6 **Revealing the Mechanism of Reversible UVID in TOPCon Solar Cells Using a Non-Destructive Raman Characterisation**
Pengfei Zhang[1], Caixia Li[1], Ziheng Liu[1], Jialiang Huang[1], Jialin Cong[1], Jingwen Cao[1], Martin Green[1], Xiaojing Hao[1]
[1] UNSW, Sydney, Australia

ORAL PRESENTATIONS 5CO.5

15:15 - 16:45 Recycling & Reuse of PV Modules

Chairpersons: Sonja Feldbacher
PCCL, Leoben, Austria
Alberto Pico *(i)*
EPRI, Santiago de Compostela, Spain

5CO.5.1 Physical and Chemical Separation of Backsheet Powders Obtained during Novel Sanding Delamination of PV Panels
Fabrice Coustier[1], Xavier Mackré-Delannoy[1], Roland Riva[1], Jérémie Aimé[1], Romain Duwald[2]
[1] CEA/INES, Le Bourget du Lac, France; [2] CEA, Grenoble, France

5CO.5.2 Laser-Assisted Height-Adaptive Milling for Selective Delamination of End-of-Life Photovoltaic Modules
Josefina Maria Ottitsch[1], Julia Singer[1], Gerhard Wiesinger[1], Christoph Einspieler[1], Friedrich Bleicher[1]
[1] Institute of Production Engineering and Photonic Technologies, Vienna, Austria

5CO.5.3 Recycling of Polymeric Backsheets from PV Modules
Katrin Nord-Varhaug[1], Tina Kristiansen[1], Iselin Grauer Moen[1], Asbjørn Iveland[1], Wolfram Palitzsch[2]
[1] Norner, Porsgrunn, Norway; [2] LuxChemtech, Freiberg, Germany

5CO.5.4 Recycling of Lightweight Photovoltaic Module
Umang Desai[1], Melissa Kundert[1], Antonin Faes[1], Christophe Ballif[1]
[1] EPFL, Neuchâtel, Switzerland

5CO.5.5 From Operation to Reuse: A System-Level Assessment of Decommissioned PV Modules
Christoph Metzger[1], Vincent Gerber[2], Natasa Vulic[2]
[1] FHNW, Brugg, Switzerland; [2] FHNW, Muttenz, Switzerland

5CO.5.6 From Wastes to Demonstrator: A Qualification Protocol for the Reuse of PV Modules
Lionel Sicot[1], Jérémie Aimé[1], Marie Lacombe[2], Anaïs Gouabault[2], Stéphane Gresset[3]
[1] CEA, Le Bourget du Lac, France; [2] SOREN, Paris, France; [3] Certisolis, Le Bourget du Lac, France

ORAL PRESENTATIONS 4CO.8

15:15 - 16:45 Reliably Assessing PV Plants: Monitoring, Metrics and Field Practices

Chairpersons: Gisele A. dos Reis Benatto
DTU, Roskilde, Denmark
Ioannis (John) Tsanakas
CEA, Le Bourget-du-Lac, France

4CO.8.1 Best Practices in PV Plant Performance Testing: Filters, Tolerances, Uncertainties, and Field Implementation
Lucas Nascimento[1], Eduardo Martins Deschamps[1], André Cechinel[1], Gustavo Xavier[1], João Paulo Veríssimo[1], Helena Flávia Naspolini[1], Ricardo Rüther[1]
[1] UFSC, Florianópolis, Brazil

4CO.8.2 Uncertainty, Transparency and Trust in PV O&M Analytics
Marios Theristis[1], Kevin Anderson[1]
[1] Sandia National Laboratories, Albuquerque, United States of America

4CO.8.3 Reliable and Actionable Performance Metrics for Heavily Curtailed Plants
Julien Deckx[1], Maitheli Nikam[1], Karel De Brabandere [1], Gofran Chowdhury[1]
[1] 3E, Brussels, Belgium

4CO.8.4 Measurement of Single-Axis Tracker Availability and Yield Impact for a >100 GW Operating Fleet Across 6 Continents
Aron Dobos[1], Amir Asgharzadeh Shishavan[1], John Obrecht[1], Andre Persechino[1]
[1] Nextpower, Fremont, United States of America

4CO.8.5 The Impact of Irradiance Sensor Installation Position on the Performance Ratio Calculation
Marc A. N. Korevaar[1], Shuo Wang[2], Hesan Ziar[1], Damon Nitzel[1], Silvana Ovaitt[3]
[1] OTT Hydromet, Delft, The Netherlands; [2] Turku University of Applied Science, Finland; [3] NLR, Golden, United States of America

ORAL PRESENTATIONS 3CO.11

15:15 - 16:45 PV Module Materials and Processes for Sustainability

Chairpersons: Invited
Max Mittag
Fraunhofer ISE, Freiburg, Germany

3CO.11.1 Optimising Lamination, Debonding and Environmental Reliability for Laminates Made with Debonding-on-Demand Encapsulants
Arvid van der Heide[1], Bart Reekmans[1], Jonathan Govaerts[1], Arthur Maufort[2], Fábio Silva[2], Kristof Proost[2], Tatjana Vavilkin[3], Stefan Dewallef[3], Wouter Marchal[4]
[1] imec vzw, Genk, Belgium; [2] IP FAB, Mechelen, Belgium; [3] Soltech, Genk, Belgium; [4] Hasselt University, Belgium

3CO.11.2 Debonding-on-Demand Chemistry in the Encapsulant Layers for Enhanced PV Module Recycling
Arthur Maufort[1], Fabio Silva[1], Bernard Noppen[2], Tatjana Vavilkin[3], Stefan Dewallef[3], Wouter Marchal[2], Jan D'Haen[2], Arvid van der Heide[4], Kristof Proost[1]
[1] IP FAB, Mechelen, Belgium; [2] UHasselt, Diepenbeek, Belgium; [3] Soltech, Genk, Belgium; [4] imec, Genk, Belgium

3CO.11.3 Liquid-Encapsulated Photovoltaic Modules for Circular Manufacturing: Scalability, Performance and Industrial Validation
Alberto Poli[1], Ian Lin[1], Mona T. Hassel[1], Zola Fung-A-Jou[1], Urvashi Bothra[2], Malte R. Vogt[2], Mirco Riganti[3], Michele Manca[3]
[1] Biosphere Solar, Rotterdam, The Netherlands; [2] TU Delft, The Netherlands; [3] Leitat Technological Center, Barcelona, Spain

3CO.11.4 Towards Circular PV Modules: High-Performance and Fully Cell-Recoverable with Non-Adhesive Interlayers
Asier Murillo Marrero[1], Alicia Buceta[1], Ines Salomon[1], Jaione Bengoechea[1]
[1] FUNDACION CENER, Sarriguren, Spain

3CO.11.5 Developments Towards Lead-Free Low-Temperature Soldering Pastes for Economical Soldering below 120 °C
Maria Ignacia Devoto Acevedo[1], Nils Kopp[2], Kazuki Watanabe[2], Tobias Meßmer[1]
[1] ISC Konstanz, Germany; [2] TAMURA ELSOLD, Ilsenburg, Germany

3CO.11.6 Improving the LCOE of PV using Multilayer Anti-reflection and Fluorine-free Hydrophobic Coatings
Luke O. Jones[1], Adam M. Law[1], John Michael Walls[1]
[1] Loughborough University, United Kingdom

VISUAL PRESENTATIONS 2CV.2

15:15 - 16:45 New Materials, Devices and Conversion Concepts | New Modelling and Characterisation Techniques

Detailed information on this session is presented in the section entitled 'EU PVSEC 2026 Visual Presentations'.

ORAL PRESENTATIONS 5CO.3

17:00 - 18:30 Challenges for Manufacturing in Europe
Chairpersons: Maria Getsiou *(i)*
European Commission DG RTD, Brussels, Belgium
Gaëtan Masson
Becquerel Institute, Brussels, Belgium

5CO.3.1 Analysis of the Practical Application of the Net Zero Industry Act - Impact of Awards and Prequalification Mechanisms in Auctions
Max Mittag[1], Pamela Molina[1], Peter Brailovsky[1], Sebastian Nold[1], Holger Neuhaus[1]
[1] Fraunhofer ISE, Freiburg, Germany

5CO.3.2 The Socio-economic Impacts of Reshoring the PV Supply Chain to Europe and the Associated Policy Costs
Tommaso Ferraresi[1], Renato Paniccià[1], Leonardo Piccini[1], Giulio Mela[2], Andrea Danelli[2], Pierpaolo Girardi[2], Elisabetta Brivio[2], Nicola Baggio[3]
[1] IRPET, Florence, Italy; [2] RSE, Milan, Italy; [3] FuturaSun, Cittadella, Italy

5CO.3.3 From Manufacturing Sites to Industrial Eco-Systems: Applying Gibrat's Law to PV Manufacturing Growth
Pietro P. Altermatt[1], Hannes Wagner-Mohnsen[1], Ye Xu[1], Jing Pan[1], Yao Wang[1], Yifeng Chen[1]
[1] Trinasolar, Changzhou, China

5CO.3.4 Draft Concept of a Tradable Certificate Framework for Achieving 40 % "Made in Europe" Content in PV and BESS Manufacturing
Johan Lindahl[1], Jens Holm[1], Christoph Podewils[1]
[1] European Solar Manufacturing Council, Brussels, Belgium

5CO.3.5 European Market Potential of Perovskite-Based Modules until 2050: Multi-Parameter Diffusion Scenarios by PV Segments
Damien Gautier[1], Philippe Macé[2], Melodie de l'Epine[1]
[1] Becquerel Institute France, Lyon, France; [2] Becquerel Institute, Brussels, Belgium

5CO.3.6 Circularity as a Strategic Lever for EU Solar PV Manufacturing under the Net-Zero Industry Act
Alexander Fréderic Degen Székely[1]
[1] Utrecht University, The Netherlands

ORAL PRESENTATIONS 5CO.6

17:00 - 18:30 Raw Materials Recovery and Utilisation from End-of-Life PV Modules
Chairpersons: Paula Sanchez-Friera
Solkeys, Gijón, Spain
Gabriele C. Eder
OFI, Vienna, Austria

5CO.6.1 Advanced Utilization Strategies for Silicon-Based Industrial Residues
Wolfram Palitzsch[1], Ingo Röver[1], Arvid Killenberg[1]
[1] LuxChemtech, Freiberg, Germany

5CO.6.2 High-purity Silicon from Photovoltaic Modules using Nanosecond Laser Processing and HF-free Chemical Treatment
Toon IJzerman[1], Maarten van der Vleuten[2], Quentin Mottet[2], Francesc Puchal-Salat[2], Jelle Rohlfs[2], Remco Koper[2], Bas Raaijmakers[2], Johan Bosman[2], Olaf van der Sluis[3], Fallon Colberts[1], Remi Aninat[2], Mirjam Theelen[2]
[1] Zuyd University of Applied Sciences, Heerlen, The Netherlands; [2] TNO, Eindhoven, The Netherlands; [3] TU Eindhoven, The Netherlands

5CO.6.3 Challenges and Opportunities for Solar Glass Recovered from High-Value Recycling
Claire Agraffeil[1], Xavier Mackre-Delannoy[1], Wim Merket[2], Danny Timmers[2], Wolfram Palitzsch[3]
[1] CEA / INES, Le Bourget-du-Lac, France; [2] Maltha, Lommel, Belgium; [3] LuxChemtech, Freiberg, Germany

5CO.6.4 Reintegrating Purified Recycled EVA from End-of-Life PV Modules into New Encapsulant Films

Lison Marthey[1], Hengyu Li[1], Jacques Levrat[1], Romain Duwald[2], Cécile Flassayer[2], Fabrice Coustier[3], Roland Riva[3], Xavier Mackré-Delannoy[3], Bénédicte Bonnet-Eymard[1], Tonio Buonassisi[1], Christophe Ballif[1]

[1] CSEM, Neuchâtel, Switzerland; [2] CEA Liten, Grenoble, France; [3] CEA INES, Le Bourget du Lac, France

5CO.6.5 Fluorine Content in Photovoltaic Backsheets: Evolution, Quantification, and Implications for End-of-Life

Anika Gassner[1], Gabriele C. Eder[1], Jakob Anger[2], Vasilaki-Maria Archodoulaki[3]

[1] OFI, Vienna, Austria; [2] 2nd Cycle Flexco, Amstetten, Austria; [3] Vienna University of Technology, Austria

5CO.6.6 Low-Energy Conversion of Photovoltaic Manufacturing Wastes into Zeolitic Materials

Selin Cansu Gölboylu[1], Ramona Davoudnezhad Apaydın[1], Meriç Çalışkan Arslan[1], Burcu Akata Kurç[2]

[1] Kalyon PV, Ankara, Türkiye; [2] METU, Ankara, Türkiye

ORAL PRESENTATIONS 4CO.9

17:00 - 18:30 Understanding and Detecting Degradation and Losses in PV Systems

Chairpersons: Mari Øgaard
IFE, Kjeller, Norway
Peter Hacke *(i)*
National Laboratory of the Rockies, Golden, United States of America

4CO.9.1 Degradation is not PLR

Bert Herteleer[1], Ebrar Özkalay[1], Gabi Friesen[1]

[1] SUPSI, Mendrisio, Switzerland

4CO.9.2 Degradation Pathways in PERC, TOPCon and SHJ Modules after Medium-term Desert Exposure

Hugo Quest[1], Dhanup Somasekharan Pillai[2], Alessandro Virtuani[1], Olatz Arriaga Arruti[1], Maulid Kivambe[2], Bénédicte Bonnet-Eymard[1], Matthieu Despeisse[1], Amir Abdallah[2], Sertac Bayhan[2], Brahim Aissa[2], Tonio Buonassisi[1], Christophe Ballif[1]

[1] CSEM, Neuchâtel, Switzerland; [2] QEERI, Doha, Qatar

4CO.9.3 Spectrally Resolved Prediction of UV-Induced Degradation for Field-Deployed TOPCon PV Modules

Shukla Poddar[1], Muhammad Umair Khan[1], Ho Yuet Rachel Yeung[1], Phillip Hamer[1], Bram Hoex[1]

[1] UNSW, Sydney, Australia

4CO.9.4 Studying Real-World Evolution of Cell Cracks in Silicon PV Modules

Claudia Buerhop-Lutz[1], Thilo Winkler[1], Bernhardt Kaesser[1], Oleksandr Mashkov[1], Ernst Wittmann[1], Ian Marius Peters[1]

[1] HI ERN, Erlangen, Germany

4CO.9.5 Investigation of Low-Energy Glass Crack Detection in Photovoltaic Modules During Daylight Electroluminescence Inspections

Rodrigo del Prado Santamaría[1], Thøger Kari[1], Gisele Alves dos Reis Benatto[1], Mahmoud Dhimish[1], Peter B. Poulsen[1], Sergiu V. Spataru[1]

[1] DTU, Roskilde, Denmark

4CO.9.6 Field Assessment on the Impact of Robotic Cleaning on PV Modules and Anti-Reflective Coating Degradation in Harsh Climates

Dhanup Somasekharan Pillai[1], Ben Figgis[2], Damien Cosme[3], Lluvia Ochoa[4], Maulid Kivambe[1], Brahim Aissa[1], Sertac Bayhan[1]

[1] QEERI, Doha, Qatar; [2] UWA, Perth, Australia; [3] TotalEnergies Research Center, Doha, Qatar; [4] TotalEnergies OneTech, La Défense, France

ORAL PRESENTATIONS 3CO.12

17:00 - 18:30 Innovation in PV Module Manufacturing

Chairpersons: Invited
Hamed Hanifi
AESOLAR, Königsbrunn, Germany

3CO.12.1 Increasing the Flexibility and Versatility of Integrated-Photovoltaics (iPV) Manufacturing Lines through the Adoption of Pre-laminated Strings

Lison Marthey[1], Albin Servais[1], Hengyu Li[1], Matthieu Despeisse[1], Bénédicte Bonnet-Eymard[1], Christophe Ballif[1], Tonio Buonassisi[1], Alessandro Virtuani[1]

[1] CSEM, Neuchâtel, Switzerland

3CO.12.2 Impact of Ag-Diffusion into Sn-based Solder Alloys during Interconnection on the Reliability of TOPCon Solar Cells and Modules

Benjamin Grübel[1], Derya Güldali[1], Dirk Eberlein[1], Stephan Hoffmann[1], Achim Kraft[1]

[1] Fraunhofer ISE, Freiburg, Germany

3CO.12.3 Manufacturing Process and Reliability Assessment of Flexible IBC Mini-Modules

Paola Jakuza[1], Giacomo Garbelotto[1], Matteo Buffolo[1], Alessandro Caria[1], Carlo De Santi[1], Nicola Trivellin[1], Stefano Rampino[2], Francesco Pattini[2], Gabriella Gonnella[3], Laura Maturi[3], Gaudenzio Meneghesso[1], Enrico Zanoni[1], Matteo Meneghini[1]

[1] University of Padua, Padova, Italy; [2] IMEM-CNR, Parma, Italy; [3] Eurac Research, Bolzano, Italy

3CO.12.4 Anti-glare Module Glass Textures with Enhanced Light In-coupling

Benedikt Bläsi[1], Lasse Bienkowski[1], Janina Willmann[1], Martin Zimmer[1], Bernd-Uwe Sander[2], Erdmut Schnabel[1], Andreas A. Brand[1], Marc Hofmann[1], Thomas Kroyer[1], Jan Nekarda[1]

[1] Fraunhofer ISE, Freiburg, Germany; [2] RENA Technologies, Gütenbach, Germany

3CO.12.5 Fabrication Strategies for High-Performance Perovskite Solar Modules on FTO Substrates

Yuzhe Liu[1], Tsvetelina Merdzhanova[1], Oleksandr Astakhov[1], Christoph Zahren[1], Stefan Haas[1], Gaosheng Huang[1], Christoph Brabec[1], Thomas Kirchartz[1]

[1] FZJ, Jülich, Germany

3CO.12.6 Exploring the Boundary Conditions of Multiwire Interconnection for Perovskite/Silicon Tandems

Valerie Depauw[1], Bart Reekmans[1], Hamed Javanbakht Lomeri[1], Jonathan Govaerts[1], Felipe Saenz[2], Quentin Jeangros[2], Hariharsudan Sivaramakrishnan Radhakrishnan[1]

[1] imec, Genk, Belgium; [2] CSEM, Neuchâtel, Switzerland

VISUAL PRESENTATIONS 2CV.3

17:00 - 18:30 Perovskite-based Tandem and Multijunction Devices | Perovskites

Detailed information on this session is presented in the section entitled 'EU PVSEC 2026 Visual Presentations'.

Thursday, 17. September 2026

ORAL PRESENTATIONS 4DO.1

08:30 - 10:00 Solar PV Forecasting in Urban Areas | Yield in Bifacial PV Plants

Chairpersons: Bijan Nouri
German Aerospace Center, Almería, Spain
Invited

4DO.1.1 Integrating All Sky Imager-Based Hybrid AI Forecasting into Building Energy Management: Predictive Battery Control and Operational Validation in Positive Energy Buildings

Khadija Barhmi[1], Sara Golroodbari[1], Wilfried Van Sark[1]

[1] Utrecht University, The Netherlands

4DO.1.2 Impact of Intraday Solar Forecasting on Household Demand-Side Management in PV Self-Consumption

Sylvain Cros[1], Venkat Aashray Nayini[1], Valentin Duchemin[1], Jordi Badosa[1]

[1] Sorbonne University, Palaiseau, France

4DO.1.3 Improving Physical PV Forecasts with Data-Driven Shading Estimation: a Comparison with Black-Box Methods

Karel De Brabandere[1], Julien Deckx[1], Maitheli Nikam[1], Gofran Chowdhury[1]

[1] 3E, Brussels, Belgium

4DO.1.4 Beyond Expected Gains: Measured Performance and Cost Limits of Reflective Ground Covers for Utility-Scale Bifacial PV Plants

Marília Braga[1], Rafael Antunes Campos[1], Gustavo Xavier de Andrade Pinto[1], Kevin Luiz Rocha de Azevedo[1], Anelise Medeiros Pires[1], Helena Flávia Naspolini[1], Ricardo Rüther[1]

[1] UFSC, Florianópolis, Brazil

4DO.1.5 Understanding Energy Yield Bias in Bifacial PV: Lessons from a 300 MWp Utility Scale Plant

Marie Syre Wiig[1], Magnus Moe Nygard[1], Elin Dypvik Sødahl[1]

[1] IFE, Kjeller, Norway

4DO.1.6 Maximizing Revenues: Vertical Bifacial PV and South PV with Storage

Yannick Kloos[1], Marc-André Schüler[1]

[1] Next2Sun Technology, Freiburg, Germany

ORAL PRESENTATIONS 1DO.6

08:30 - 10:00 Silicon Bottom Cells & Perovskite/Silicon Tandems

Chairpersons: Delfina Muñoz *(i)*
CEA, Le Bourget-du-Lac, France
Patricia Schulze *(i)*
Fraunhofer ISE, Freiburg, Germany

1DO.6.1 A Silicon-based Recombination Junction for >31 % Efficient TCO-free Interconnection Perovskite-Silicon Tandem Solar Cells
Julien Hurni[1], Kerem Artuk[2], Michele De Bastiani[2], Audrey Morisset[2], Quentin Jeangros[2], Bertrand Paviet-Salomon[2], Christian Wolff[1], Christophe Ballif[1], Franz-Josef Haug[1]
[1] EPFL, Neuchâtel, Switzerland; [2] CSEM, Neuchâtel, Switzerland

1DO.6.2 Impact of Nanoscale Pyramidal Textures on the Mechanical and Device Performance of Si Bottom Cells for Perovskite/Si Tandem Solar Cells
Yuya Sato[1], Takuto Ikeda[1], Takuya Matsui[1], Hiroyuki Wada[2], Hitoshi Sai[1]
[1] AIST, Tsukuba, Japan; [2] Institute of Science Tokyo, Yokohama, Japan

1DO.6.3 Impact of TCO-Based Recombination Layer on Selfassembled Monolayers Hole Selectivity for Monolithic Two Terminal Perovskite/Silcon Tandem Solar Cells
Sofia Flores Bahamondez[1], Perrine Carroy[1], Delfina Muñoz[1], David Muñoz[2]
[1] CEA, Le Bourget-du-Lac, France; [2] CNRS, Grenoble, France

2DO.6.4 Controlling Hybrid Route Perovskite Conversion via Substrate Surface Properties in Fully-Textured Perovskite/Silicon Tandem Solar Cells
Oussama Er-Raji[1], Sandhya Padmaraj[1], Bhushan P. Kore[1], Martin Bivour[1], Patricia S. C. Schulze[1], Stefan W. Glunz[1], Juliane Borchert[1]
[1] Fraunhofer ISE, Freiburg, Germany

2DO.6.5 Inorganic Scaffold Engineering for Scalable Hybrid Processing of Perovskite Thin Films in High Performance Perovskite/Silicon Tandems
Ulrich W. Paetzold[1], Julian Petry[1], Ronja Pappenberger[1], Raphael Pesch[1], Kristina Geistert[1], Renjun Guo[1], Jinzhao Li[1], Paul Fassl[1]
[1] KIT, Karlsruhe, Germany

2DO.6.6 Optimal Energy Alignment and Surface Adhesion Improvement for Highly Efficient Perovskite-Silicon Tandem Solar Cells
Gaosheng Huang[1], Yanxun Li[2], Nan Sun[1], Bingbing Chen[1], Niklas Scheer[1], Benjamin Klingebiel[1], Andreas Lambertz[1], Alex K.-Y. Jen[2], Thomas Kirchartz[1], Uwe Rau[1], Kaining Ding[1]
[1] FZJ, Jülich, Germany; [2] City University of Hong Kong, Hong Kong

ORAL PRESENTATIONS 5DO.11

08:30 - 10:00 Supporting Innovative PV Deployment for the TW Era

Chairpersons: Sandra Gallmetzer *(i)*
Eurac Research, Bolzano, Italy
Invited

5DO.11.1 A Building-Resolution Assessment of Rooftop and Façade PV, Towards a Solar Europe
Georgia Kakoulaki[1], Sandor Szabo[1], Christian Thiel[1], Robert Kenny[1], Arnulf Jäger-Waldau[1]
[1] European Commission JRC, Ispra, Italy

5DO.11.2 Projection of Photovoltaic System Deployment in Japan Toward 2040
Koichi Sugibuchi[1], Naofumi Ezawa[1], Yoshiyuki Ohashi[1], Haruki Yamaya[1], Satsuki Kanai[1], Izumi Kaizuka[1], Osamu Ikki[1]
[1] RTS Corporation, Tokyo, Japan

5DO.11.3 Defining Agrivoltaics: An Evolving Regulatory Landscape
Celeste Mellone[1], Giulia Guidetti[2], Chiara Grotto[2], Valeria Viti[3], Lorenzo Massaro[4], Cesare Gatti[3], Alessandra Scognamiglio[5], Fabio Salis[6]
[1] Green Horse Legal Advisory, Rome, Italy; [2] Green Horse Legal Advisory, Milan, Italy; [3] Pedersoli Gattai, Milan, Italy; [4] Pedersoli Gattai, Rome, Italy; [5] ENEA - AIAS, Naples, Italy; [6] Iberdrola, Rome, Italy

5DO.11.4 Climate Change Impacts on Renewables Energy Resources
Gaetana Anamiati[1], Gerardo Guerra[1], Pau Mercade Ruiz[1], Lars Landberg[2], Asuncion Lera St. Clair[3], Pragya Vishwakarma[4], Annika Wybrow[5]
[1] DNV, Barcelona, Spain; [2] DNV, Copenhagen, Denmark; [3] DNV, Hovik, Norway; [4] DNV, Bristol, United Kingdom; [5] DNV, London, United Kingdom

5DO.11.5 Geospatial Mapping for Localization of Utility-Scale PV Power Plants on Java, Madura, and Bali Islands
Martin Opatovsky[1], Juraj Betak[1], Maryam Karimah[2], Solene Gondrexon[2]
[1] Solargis, Bratislava, Slovakia; [2] Trama TecnoAmbiental, Barcelona, Spain

5DO.11.6 Strengthening Climate-Resilient Photovoltaics through Coordinated Research Infrastructures: Outcomes of the CACTUS EU–Latin America Project
Ioannis (John) A. Tsanakas[1], Delfina Muñoz[1], Romain Couderc[1], Hervé Colin[1], Aitor Marzo[2], Asier Sanz[3], Jose Domingo Santos[3], Cristina Polacchi[4], Felipe Valencia[5], Luis Alejandro Cardenas[6], Fernando Augusto Herrera Leon[6], Ernesto Perez Gonzalez[6], Thu Nhi Tran Caliste[7], Edward Mitchell[7], Mark Robert Johnson[8], Thomas Saerbeck[8], Sarah Essam[9], Jose V. de Seoane[10]
[1] CEA / INES, Le Bourget du Lac, France; [2] University of Granada, Spain; [3] Tecnalia, Bilbao, Spain; [4] Eurac Research, Bolzano, Italy; [5] ATAMOS-TEC, Santiago, Chile; [6] UNAL, Bogota, Colombia; [7] ESRF, Grenoble, France; [8] ILL, Grenoble, France; [9] EU-SOLARIS, Almeria, Spain; [10] Becquerel Institute, Brussels, Belgium

ORAL PRESENTATIONS 3DO.16

08:30 - 10:00 **Advanced Imaging and AI-Based Diagnostics for Photovoltaic Modules**

Chairpersons: Maria Hadjipanayi *(i)*
University of Cyprus, Nicosia, Cyprus
Mario Martinez Gonzalez *(i)*
Enertis Applus+, Madrid, Spain

3DO.16.1 **Comparison of Daylight Luminescence Methods during Inverter Operation for Fault Detection in Solar Modules**
Chencheng Xu[1], Andrej Wentnagel[1], Michael Siebert[1], Marc Köntges[1]
[1] ISFH, Emmerthal, Germany

3DO.16.2 **A First-Principles Algorithm for Solar-Cell Feature-Segmentation, for Benchmarking, Labeling, and AI-Model Enhancement**
Thøger Kari[1], Rodrigo Del Prado Santamaría[1], Mahmoud Dhimish[1], Gisele del Reis Bennato[1], Peter Behrensdorff Poulsen[1], Sergiu Spataru[1]
[1] DTU, Roskilde, Denmark

3DO.16.3 **Quantitative Evaluation of Open-Circuit Voltage Losses from Electroluminescence Images of Si Solar Modules**
João Victor Oliveira Santos[1], Daniel Ory[2], Damien Barakel[3], Olivier Palais[3], Christine Abdel Nour[1], Julien Dupuis[1]
[1] EDF R&D, Moret Loing Orvanne, France; [2] EDF R&D, Palaiseau, France; [3] Aix Marseille Université, Marseille, France

3DO.16.4 **In Situ Degradation Monitoring of PID-p in Crystalline Silicon Photovoltaic Modules with Electroluminescence Imaging**
Aysha Mahmood[1], Sune Thorsteinsson[1], Peter Hacke[2], Gisele Alves dos Reis Benatto[1], Peter B. Poulsen[1], Sergiu V. Spataru[1]
[1] DTU, Roskilde, Denmark; [2] NREL, Golden, United States of America

3DO.16.5 **Long-Tail Challenges in Electroluminescence-Based Photovoltaic Defect Detection**
Irfan Haider[1], Sandra Gallmetzer[1], Lukas Koester[1], Luis Fialho[1]
[1] Eurac Research, Bolzano, Italy

3DO.16.6 **Accelerating EL Defect Annotation in PV Modules via a Web-Based, AI-Assisted Workflow**
Ayyoub Ahar[1], Camilo Velázquez-Rodríguez[1], Pieter-Jan Delvaux[1], Pol Bikhan[1], Steven Sagaert[1], Laurent Declercq[1], Abdellatif Bey-Temsamani[1], Raf Vranken[1]
[1] Flanders Make, Lommel, Belgium

VISUAL PRESENTATIONS 4DV.1

08:30 - 10:00 **Agri-PV | Other PV Applications (Floating, Infrastructure, etc.); CPV; PV in Space | Hybrid Systems and Storage; Direct Uses of PV Generated Electricity**

Detailed information on this session is presented in the section entitled 'EU PVSEC 2026 Visual Presentations'.

ORAL PRESENTATIONS 4DO.2

10:30 - 12:00 **Hybrid Systems and Storage; Direct Uses of PV Generated Electricity**

Chairpersons: Gerhard Mütter *(i)*
Gerhard Mütter e.U., Waldneukirchen, Austria
Jennifer Braid *(i)*
Sandia National Laboratories, Albuquerque, United States of America

4DO.2.1 **Impacts of Climate Change on the Irradiance Distributions for Floating Photovoltaic Technology within the Context of a Hybrid Wind-PV Offshore Energy Park**
Claudio Francesco Nicolosi[1], Giuseppe Marco Tina[1], Amr Osama[2], Sara Golroodbari[3]
[1] University of Catania, Italy; [2] Port-Said University, Port Fuad, Egypt; [3] Utrecht University, The Netherlands

4DO.2.2 **Modeling and Quantifying Dynamic Wind-Turbine Shading Losses in Hybrid Wind–Solar Systems: Onshore PV and Offshore Floating PV**
Sathya Shanka Vasuki[1], Vasiliki Psaraki[1], Tijn Weij[1], Teddy Simanjuntak[2], Olindo Isabella[1], Rudi Santbergen[1]
[1] TU Delft, The Netherlands; [2] Shell Global Solutions International, Amsterdam, The Netherlands

4DO.2.3 **Photovoltaic Power-to-heat Conversion with Seasonal Underground Thermal Energy Storage for Winter Heating: A Modelling Study**
Zain Ul Abdin[1], Friso Lems[1], Farnaz Pourbarghisofiyani[1], Olindo Isabella[1], Rudi Santbergen[1]
[1] TU Delft, The Netherlands

4DO.2.4 **Performance and Resilience Impacts of EV-Charging and V2H in Residential PV/BES Systems**
Michiel van Noord[1], Patrik Ollas[2], Mohammad Kharezy[3], Georgios Foskolos[4]
[1] RISE, Stockholm, Sweden; [2] RISE, Gothenburg, Sweden; [3] RISE, Borås, Sweden; [4] Swedish Energy Agency, Eskilstuna, Sweden

4DO.2.5 **Breaking Solar Electrolysis Constrains: Batteries Boost Efficeincy, Stability and Reduced Electrolyzer Stress**
Tsvetelina Merdzhanova[1], Thérèse Cibaka[1], Uchechi Chibuko[1], Sergey Shcherbachenko[1], Oleksandr Astakhov[1], Christoph Brabec[1], Peter Strasser[2]
[1] FZJ, Jülich, Germany; [2] TU Berlin, Germany

4DO.2.6 **Direct Solar Water Splitting using Photovoltaic Thin-Film Technology**
Marko Turek[1], Robert Maßmann[1], Stefan Eiternick[1], Sina Swatek[1], Stefan Lange[1], Syed Mubeen[2]
[1] Fraunhofer CSP, Halle (Saale), Germany; [2] SunHydrogen, Santa Barbara, United States of America

ORAL PRESENTATIONS 2DO.7

10:30 - 12:00 **Novel Materials and Device Architectures for Perovskite based Multijunctions**

Chairpersons: Carolin Ulbrich *(i)*
HZB, Berlin, Germany
Invited

2DO.7.1 **30%-Efficient Perovskite-Perovskite-Silicon Triple-Junction Solar Cells**

Kerem Artuk[1], Deniz Turkay[2], Austin Kuba[2], Stefan Riemelmoser[3], Julian A. Steele[4], Julien Hurni[2], Joël Alexandre Spitznagel[2], Hugo Quest[2], Michele De Bastiani [1], Jun Zhao[1], Jonas Diekmann[2], Chiara Ongaro[2], Mostafa Othman[2], Maryamsadat Heydarian[5], Oliver Fischer[5], Huagui Lai[6], Jonathan S. Austin[6], Stefan Zeiske[7], Rafael López-Arteaga[7], Cheng Liu[7], Mounir D. Mensi[3], Andrés-Felipe Castro-Méndez[8], Muzhi Li[9], Thomas W. Gries[10], Siddha Hill[10], Felipe Saenz[1], Lisa Champault[1], Hilal Aybike Can[2], Mohammad Reza Golobostanfard[2], Umang Desai[2], Paul Rémondeau[2], Eduardo Solano[11], Giuseppe Portale[12], Antonin Faes[2], Felix Lang[8], Artem Musiienko[10], Nicholas Rolston[9], Fan Fu[6], Martin C. Schubert[5], Florian Schindler[5], Bin Chen[7], Alfredo Pasquarello[3], Edward H. Sargent[7], Aïcha Hessler-Wyser[2], Quentin Jeangros[1], Christophe Ballif[2], Christian M. Wolff[2]
[1] CSEM, Neuchâtel, Switzerland; [2] EPFL, Neuchâtel, Switzerland; [3] EPFL, Lausanne, Switzerland; [4] The University of Queensland, Brisbane, Australia; [5] Fraunhofer ISE, Freiburg, Germany; [6] EMPA, Dübendorf, Switzerland; [7] Northwestern University, Evanston, United States of America; [8] University of Potsdam, Potsdam, Germany; [9] Arizona State University, Tempe, United States of America; [10] HZB, Berlin, Germany; [11] ALBA Synchrotron, Cerdanyola del Vallès, Spain; [12] University of Groningen, The Netherlands

2DO.7.2 **Manufacturing Flexible Two-terminal All-perovskite Tandem Solar Devices via Scalable Methods**

Mehrdad Najafi[1], Nitish Rai[1], Klaas Bakker[1], Anne Biezemans[1], Subhadra Venkataraman[1], Chandu Mohan[1], Drishya Rajan Pillai[1], Johannes Lambooij[1], Markos Rikos[1], Casper Van Kessel[1], Dorrit Roosen[1], Marie-Sarah Regragui[1], Corne Frijters[1], Johan Bosman[1], Wiljan Verhees[1], Joris De Riet[1], Remi Aninat[1], Marcel Simor[1], Ryley Ratnasigham[1], Mirjam Theelen[1], Hindrik de Vries[2], Adriana Creatore[3], Urs Aeberhard[4], Valerio Zardetto[1], Ilker Dogan[1], Hadi Dashtaki Hesari[1], Sjoerd Veenstra[1]
[1] TNO Energy Transition, Eindhoven, The Netherlands; [2] SALD, Eindhoven, The Netherlands; [3] Plasma & Materials Processing, Eindhoven, The Netherlands; [4] Fluxim, Winterthur, Switzerland

2DO.7.3 **Novel Indium-free Recombination Junction and Hole Transport Layer Using Spatial Atomic Layer Deposition for Tandem Solar Cells**

Jons Bolding[1], Radha Kothandaraman[2], Floor Souren[1], Hindrik De Vries[1], Ivo Aretz[1], Hande Ciftpinar[3], Valerio Zardetto[2], Mert Kaplan[4], Hisham Nasser[4], Bart Geerlings[3]
[1] SALD, Eindhoven, The Netherlands; [2] TNO Solar Technologies and Application, Eindhoven, The Netherlands; [3] TNO Solar Energy, Petten, The Netherlands; [4] METU, Ankara, Türkiye

2DO.7.4 **Integrating Inkjet-Printed Green Solvent-based Perovskite Layer into Perovskite/Silicon Tandem Solar Cells**

Uma Kousalya Dangudubiyyam[1], Raphael Pesch[1], Ozan Karakaya[1], Theresa Kuechle[1], Faranak Sadegh[1], Henry Weber[2], Ralf Niemann[2], Fabian Fertig[2], Johannes Sutter[1], Jinzhao Li[1], Gerardo Hernandez Sosa[1], Ulrich W Paetzold[1]
[1] KIT, Karlsruhe, Germany; [2] Hanwha Q CELLS, Karlsruhe, Germany

2DO.7.5 **Systematic Study of Functional Groups Leads to the Development of a Novel Efficient and Stable Passivation Molecule for Perovskite-Based Solar Cells**

Jann B. Landgraf[1], Yashika Gupta[1], Aleksandra Oranskaia[2], Oliver Fischer[3], Sofiia Kosar[2], Adi Prasetio[2], Christian Schwarz[1], Christoph Messmer[1], Sithisak Chanthalavong[1], Stefaan De Wolf[2], Udo Schwingenschloegl[2], Patricia S. C. Schulze[3], Anna Fischer[1], Stefan W. Glunz[3], Juliane Borchert[1]
[1] University of Freiburg, Germany; [2] KAUST, Thuwal, Saudi Arabia; [3] Fraunhofer ISE, Freiburg, Germany

2DO.7.6 **High-Efficiency Solvent-Free Solar Cells for Tandem Applications: from Sequentially-Evaporated Perovskites to Evaporated Contacts Optimisations**

Mohamed A. A. Mahmoud[1], Juan S. O. Vivas[1], Oliver Fischer[1], Adi Prasetio[2], Salma Al Khuwaitem[2], Bhushan P. Kore[1], Stephan Riepe[1], Ulrike Hatt[1], Oussama Er-Raji[1], Martin Bivour[1], Martin Hermle[1], Stefaan De Wolf[2], Stefan W. Glunz[1], Andreas W. Bett[1], Juliane Borchert[1]
[1] Fraunhofer ISE, Freiburg, Germany; [2] KAUST, Thuwal, Saudi Arabia

ORAL PRESENTATIONS 3DO.12

10:30 - 12:00 **Circularity and Materials in Modules Design**

Chairpersons: Silvia Maria Pietralunga *(i)*
CNR, Milano, Italy
Antonin Faes *(i)*
CSEM, Neuchâtel, Switzerland

3DO.12.1 **PV Module Layouts for Silicon Perovskite Tandem Solar Cells: Electrical Parameters and Shading Behavior**

Li Carlos Rendler[1], Leonhard Böck[1], Torsten Rößler[1], Alexander Aguilar-Protti[2], Christian Reichel[1], Martin Heinrich[1]
[1] Fraunhofer ISE, Freiburg, Germany; [2] University of Freiburg, Germany

3DO.12.2 **Module Efficiency of 31.3% with Monolithic III-V//Si Tandem Solar Cells using Automated Shingling Interconnection**

Leonhard Böck[1], Jonas D. De Rose[1], Tadeo Schweigstill[1], Jan Benick[1], Ralph Müller[1], Julian Weber[2], Torsten Rößler[1], Gerald Siefer[1], Holger Neuhaus[1], Frank Dimroth[1], Florian Clement[1], Oliver Höhn[1]
[1] Fraunhofer ISE, Freiburg, Germany; [2] PV Freelancer, Freiburg, Germany

3DO.12.3 **3D Multi-Ribbon Interconnection for Bifacial Interdigitated Back Contact (IBC) Solar Modules**

Tom Borgers[1], Hamed Javanbakht Lomeri[1], Filip Duerinckx[1], Jonathan Govaerts[1], Hariharsudan Sivaramakrishnan Radhakrishnan [1], Jef Poortmans[1]
[1] imec vzw, Genk, Belgium

3DO.12.4 Material Matters: Understanding EPE Encapsulants
Nikolina Pervan[1], Gabriele C. Eder[2], Yuliya Voronko[2], Gernot Oreski[1]
[1] PCCL, Leoben, Austria; [2] OFI, Vienna, Austria

3DO.12.5 A New Prelamination Technique based on a Robust and Fast Curing Process
Philippe Thony[1], Antoine Bardin[1], Mathieu Rouaud[1], Antonio Valor [2], Endika Martin[2], Jean-Philippe Aguerre [2], Aitor Apraiz [2]
[1] CEA, Le Bourget-du-Lac, France; [2] Mondragon Assembly, Aretxabaleta, Spain

3DO.12.6 Numerical Simulation and Experimental Validation of Mechanical Stress in High-efficiency Zebra-Life Modules with 95 % Less Encapsulant Material
Christoph Pönisch[1], Guy Beaucarne[2], Julius Reiner[1], Daniel Kray[1]
[1] Offenburg University of Applied Sciences, Germany; [2] Dow Silicones Belgium, Seneffe, Belgium

ORAL PRESENTATIONS 4DO.17

10:30 - 12:00 Floating PV "Onshore"
Chairpersons: Josefine Helene Selj *(i)*
IFE, Kjeller, Norway
Thomas Reindl *(i)*
SERIS, Singapore

4DO.17.1 STEWART: Science-based Environmentally Friendly Layouts for Floating PV — First-Year Insights to Sustainability Assessment of FPV
Karolina Baltins[1], Çağla Meral Akgül[2], Reza Mohajer Barough[2], Mete Çubukçu[3], Alexander Graef[1], Maria Ikhennicheu[4], Konstantin Ilgen[1], Alexandra Klyuvak[5], Stefano Lucarini[6], Leonardo Micheli[7], Polina Vasilenko[5], Esra Sirch[1], Simon Tonnel[4]
[1] Fraunhofer ISE, Freiburg, Germany; [2] METU, Ankara, Türkiye; [3] Ege University, Izmir, Türkiye; [4] OWC, Nantes, France; [5] HelioRec, Nantes, France; [6] Tonucci&Partners , Rome, Italy; [7] Sapienza University of Rome, Italy

4DO.17.2 Development of a Multi-Domain System-Level Model for Performance Simulation of Floating Photovoltaic Systems
Oreoluwa Lawale[1], Simon P. Philbin[1], Sahand Hosouli[1]
[1] Kingston University London, United Kingdom

4DO.17.3 Thermal–Radiative–Shading Coupled Modelling and Performance Optimization of Floating Photovoltaic Systems with Back-Side Reflectors
Konstantinos Polychronakis[1], Dimitrios N. Korres[2], Christos Sammoutos[1], Christos Tzivanidis[1]
[1] National Technical University of Athens, Greece; [2] CERTH, Athens, Greece

4DO.17.4 Target-Costing Analysis of Bifacial Modules in Floating Photovoltaic Systems Across Europe
Leonardo Micheli[1], Diego L. Talavera[2], Giuseppe Marco Tina[3], Wilfried van Sark[4]
[1] Sapienza University of Rome, Italy; [2] University of Jaén, Spain; [3] University of Catania, Italy; [4] Utrecht University, The Netherlands

4DO.17.5 Assessing Floating Photovoltaic Potential in the Netherlands: a Spatial Evaluation of Solar Energy Production and Evaporation Reduction
Eline Bouma[1], Mehmet Seren Korkmaz[2], Olindo Isabella[1], Rudi Santbergen[1]
[1] TU Delft, The Netherlands; [2] Samsun University , Samsun, Türkiye

4DO.17.6 Integrating Inland Floating Solar into the Dutch Grid
Annanta Kaul[1], Sara Golroodbari[1], Wilfried van Sark[1]
[1] Utrecht University, The Netherlands

VISUAL PRESENTATIONS 5DV.2

10:30 - 12:00 Sustainability of PV

Detailed information on this session is presented in the section entitled 'EU PVSEC 2026 Visual Presentations'.

ORAL PRESENTATIONS 4DO.3

13:30 - 15:00 Modeling and Optimization of PV Systems / Power Electronics for 4-Terminal Modules
Chairpersons: Invited
Kari Lappalainen
Tampere University, Finland

4DO.3.1 Dual Input MPPT Circuit Design for 4T Tandem PV Modules
Baris Dai[1]
[1] TNO, Eindhoven, The Netherlands

4DO.3.2 Submodule-Level Power Electronics for 4-Terminal Perovskite/Silicon Tandems Under Partial Shading: A Modeling Study
Imran Zeb Durrani[1], Youri Blom[1], Rudi Santbergen[1], Olindo Isabella[1]
[1] TU Delft, The Netherlands

4DO.3.3 A Comparative Assessment of TMY and SCADA Data for DC Electro-Mechanical Design of Utility-Scale PV Plants
Ricardo Velasco[1], Jose Muñoz[2], Imke Meyer[3]
[1] Mott MacDonald, Bogota, Colombia; [2] Mott MacDonald, Seville, Spain; [3] Mott MacDonald, Brighton, United Kingdom

4DO.3.4 Simulation-based Analysis of Energy Yield and Profitability of PV Tracking Systems in Europe - Revealing the Importance of Hourly Electricity Price Fluctuation
Tibo Martens[1], Youri Blom[1], Malte Ruben Vogt[1], Olindo Isabella[1], Rudi Santbergen[1]
[1] TU Delft, The Netherlands

4DO.3.5 Worldwide Operational Benchmarking of SolarFarmer for PV Energy Yield Modeling
Anja Neubert[1], Camelia Farchado[2], Javier Lopez-Lorente[3]
[1] DNV, Oldenburg, Germany; [2] DNV, Paris, France; [3] DNV, Arnhem, The Netherlands

4DO.3.6 Influence of Climate on Microgrid Energy Systems
Josselin Le Gal La Salle[1], Philippe Lauret[1], Charles Voivret[1], Mathieu David[1]
[1] University of La Reunion, Saint-Pierre, Réunion

ORAL PRESENTATIONS 2DO.8

13:30 - 15:00 **Scalability and Real-world Performance of Perovskite based Tandems**

Chairpersons: Annamaria Petrozza *(i)*
IIT POLIMI, Milan, Italy
Invited

2DO.8.1 **Industrial Progress and Challenges of Silicon and Perovskite/Silicon Tandem Photovoltaics Devices**
Yifeng Chen[1], Xueling Zhang[1], Shu Zhang[1], Daming Chen[1], Yanfeng Cui[1], Guangtao Yang[1], Zhigang Xie[1], Jifan Gao[1]
[1] Trina Solar, Changzhou, China

2DO.8.2 **Crystallization Modulated by Thermal Field for 2T Efficient Perovskite/Silicon Tandem Solar Cells**
Yuan Qin[1], Yajun Gao[1], Hua Zhang[1], Qi Jia[1], Longqing Li[1], Chengjian Hong[1], Fu Zhang[1], Yongcai He[1], Bo He[1], Xixiang Xu[1]
[1] LONGi Green Energy Technology, Xi'an City, China

2DO.8.3 **Sustainable and Scalable Perovskite/Silicon Tandem Devices based on Vacuum Processes: Three Years of Development under the Horizon Europe-funded NEXUS Project**
Perrine Carroy[1], Vincent Barth[1], Amandine Boulanger[1], Delfina Muñoz[1], Jordi Veirman[2], Atse Louwen[2], Cristina Polacchi[2], Ulrich W. Paetzold[3], Paul Fassl[3], Thomas Feeney[3], Alexander Diercks[3], L. Jan Anton Koster[4], Sander Heester[4], Jons Bolding[5], Floor Souren[5], Hendrik J. Bolink[6], Sofía Chozas[6], Manuel Piot[6], Federico Ventosinos[6], Melodie De l'Epine[7], Anna Barguès[7], Damien Gautier[8], Henry J. Snaith[9], Ece Aktas[9], David McMeekin[9], Rahul Nambiar[9], Xinji Shen[9], Sam Teale[9], Fionnuala Grifoni[10], Severin Habisreutinger[10], Markus Lenz[11], Victor Misev[11], Anika Sidler[11], Hisham Nasser[12], Diego Di Girolamo[13], Marina Foti[13]
[1] CEA / INES, Le Bourget-du-Lac, France; [2] Eurac Research, Bolzano, Italy; [3] KIT, Karlsruhe, Germany; [4] Rijksuniversiteit Groningen, The Netherlands; [5] SALD, Eindhoven, The Netherlands; [6] University of Valencia, Spain; [7] Becquerel Institute, Lyon, France; [8] Becquerel Institute, Bruxelles, Belgium; [9] University of Oxford, United Kingdom; [10] Oxford PV, United Kingdom; [11] University of Applied Sciences and Arts Northwestern Switzerland, Basel, Switzerland; [12] ODTÜ-GÜNAM, Ankara, Türkiye; [13] 3SUN, Catania, Italy

2DO.8.4 **High-Throughput Perovskite–Silicon Tandem Solar Cells Enabled by Transport-Gas-Assisted Sequential Evaporation**
Hajar Moumine[1], Jens Baumann[2], Arman Mahboubi Soufiani[1], Tobias Bertram[1], Max Wander Bernardes[1], Viktor Skorjanc[1], Marcel Roß[1], Stefanie Severin[1], Steve Albrecht[1], Angelika Harter[1], Bernd Stannowski[1], Jona Kurpiers[1]
[1] HZB, Berlin, Germany; [2] VON ARDENNE, Dresden, Germany

2DO.8.5 **Process-driven Material Selection of Encapsulants for Perovskite-Silicon Tandem Module Lamination**
Chiara Barretta[1], Petra Christoefl[1], Marcel Kuehne[2], Markus Franke[2], Frans Op den Buijsch[3], Roland Milatz[3], Lisa Champault[4], Quentin Jeangros[4], Quiterie Emery[5], Mark Khenkin[5], Carolin Ulbrich[5], Gernot Oreski[1]
[1] PCCL, Leoben, Austria; [2] Hanwha Q CELLS, Bitterfeld-Wolfen, Germany; [3] The Compound Company, Enschede, The Netherlands; [4] CSEM, Neuchâtel, Switzerland; [5] HZB, Berlin, Germany

2DO.8.6 **Bringing Control Outdoors: Temperature-Regulated Monitoring and Energy Yield Modeling of Perovskite–Silicon Tandem Solar Cells**
Špela Tomšič[1], Marko Jošt[1], Kristijan Brecl[1], Gašper Matič[1], Marko Jankovec[1], Jueming Bing[2], Guoliang Wang[2], Runmin Tao[2], Suer Zhou[2], Anita Ho-Baillie[2], Marko Topič[1]
[1] University of Ljubljana, Slovenia; [2] University of Sydney, Australia

ORAL PRESENTATIONS 3DO.18

13:30 - 15:00 **Metrology and Performance Characterisation of PV Modules**

Chairpersons: Jaione Bengoechea
CENER, Sarriguren, Spain
Mauro Pravettoni *(i)*
Technology Innovation Institute, Abu Dhabi, United Arab Emirates

3DO.18.1 **Spectral Linearity of Spectroradiometers Definition, Assessment and Impact on PV Performance Measurements**
Diego Pavanello[1], Stefano Alessandrini[1], Davide Tome[1], Antonio Romano[2], Luigi Stingo[2], Elisabetta Canuti[1], Edoardo Celi[3], Alessandro Minuto[3], Rodrigo Costa[4], Andre Goncalves[4], Sylvio Luis Mantelli Neto[5], Fernando Matrins[6], Flavio Valoti[7], Juan Jose Stivanello[8], Pietro Raffaelli[8], Marco Potenza[9], Luca Teruzzi[9], Fabio Fribbi[9], Leonardo Longo[9], Stefano Rimoldi[9], Aziz Nairi[10], Paola Russo Ganon[11], Kevin Murray[12], Aodhan Murray[12], Fatemeh Behrouznejad[13], Tobias Weigner[14]
[1] European Commission JRC, Ispra, Italy; [2] ENEA, Portici, Italy; [3] RSE, Piacenza, Italy; [4] INPE, Sao Jose dos Campos, Brazil; [5] UFSC, Sao Paulo, Brazil; [6] NIFESP, Sao Paulo, Brazil; [7] SUPSI, Mendrisio, Switzerland; [8] EURAC, Bolzano, Italy; [9] University degli Studi Milan, Italy; [10] SERIS, Singapore; [11] University de la Republica LES, Montevideo, Uruguay; [12] Solar PI, Derry, United Kingdom; [13] University Rome Tor Vergata, Rome, Italy; [14] PVLAB Germany, Potsdam, Germany

3DO.18.2 **A Comparison of Direct Sunlight Method and Sunlight Simulator for Measuring PV Module Power**
Frank Weinrich[1], Stefan Riechelmann[1], Stefan Winter[1]
[1] PTB, Braunschweig, Germany

3DO.18.3 **A New Non-Destructive Method to Quantify the Antireflective Properties of PV Modules**
Julien Dupuis[1], Christine Abdel Nour[1], Lorena Hernandes da Silva Leme[1]
[1] EDF R&D, Moret Loing et Orvanne, France

3DO.18.4 Improving Photovoltaic System Modeling with High-Accuracy Measurement of the Incidence Angle Modifier
Todd Karin[1], Jean-Nicolas Jaubert[1]
[1] Kiwa PVEL, Napa, United States of America

3DO.18.5 How to Deal with Agile Metastable Effects on Current Cell - Respectively Module Architectures
Alexandra Schmid[1], Ulli Kräling[1], Daniel Philipp[1]
[1] Fraunhofer ISE, Freiburg, Germany

3DO.18.6 Power Rating of PV Modules – An International Round-Robin Comparison on G-T Power Matrix Measurements in Accordance with IEC 61853-1
Giorgio Bardizza[1], Werner Herrmann[2], Alexandra Schmid[3], Michael Raurer[3], Giovanni Bellenda[4], Gabriele Friesen[4], Chencheng Xu[5], Stefan Riechelmann [6], Hendrik Sträter[6], Stefan Winter[6], Hanna Ellis[7], Diego Pavanello[7], Harald Müllejans[7]
[1] TÜV Rheinland Italy, Milan, Italy; [2] TÜV Rheinland Solar, Cologne, Germany; [3] Fraunhofer ISE, Freiburg, Germany; [4] SUPSI, Mendrisio, Switzerland; [5] ISFH, Emmerthal, Germany; [6] PTB, Braunschweig, Germany; [7] European Commission JRC, Ispra, Italy

VISUAL PRESENTATIONS 5DV.3

13:30 - 15:00 Grid Integration and Flexibility Enablers | Scenarios for Renewables, Policy, Resilience, Global Challenges | Costs, Economics, Finance and Markets | Societal Challenges; Citizens' Participation, Awareness

Detailed information on this session is presented in the section entitled 'EU PVSEC 2026 Visual Presentations'.

PANEL DISCUSSION

13:30 - 15:00 DO.13 Floating PV (Panel Discussion)

ORAL PRESENTATIONS 4DO.4

15:15 - 16:45 Agrivoltaic Systems: Design, Monitoring and Digital Modelling
Chairpersons: Carmen Alonso-García *(i)*
CIEMAT, Madrid, Spain
Invited

4DO.4.1 Vertical Agrivoltaic Systems Support Crop Growth
Erlend Hustad Honningdalsnes[1], Erik Stensrud Marstein[1], Helge Bonesmo[2], Dag Lindholm[1], Jonathan Rizzi[3], Heine Nygard Riise[1]
[1] IFE, Kjeller, Norway; [2] NIBIO, Trondheim, Norway; [3] NIBIO, Ås, Norway

4DO.4.2 The Power of Agrivoltaic Control Systems to Achieve Required Crop Yield Limits
Leonhard Gfuellner[1], Matthew Berwind[1], Maddalena Bruno[1]
[1] Fraunhofer ISE, Freiburg, Germany

4DO.4.3 Modelling Heat and Mass Transfer in Open-Field Agrivoltaic Orchards: A Tool to Estimate Temperature Distribution
Marta Amorós-Trepat[1], Odysseas Alexandros Katsikogiannis[1], Rudi Santbergen[1], Olindo Isabella[1], Hesan Ziar[1]
[1] TU Delft, The Netherlands

4DO.4.4 Leveraging CFD and ML to Predict Convection and Air Temperature within Photovoltaic Power Plants
Joseph Vernier[1], Baptiste Berlioux[2], Baptiste Amiot[1], Sylvain Edouard[3], Eric Dupont[1], Vincent Trotin[4], Didier Combes[3], Patrick Massin[1]
[1] CEREA, Champs-sur-Marne, France; [2] CETHIL, Ecuelles, France; [3] INRAE, Lusignan, France; [4] EDF PS, Nanterre, France

4DO.4.5 Precipitation Model for Land Based PV Systems
Anna Carr[1], Latifa El Boujdaini[1], Bas Van Aken[1]
[1] TNO Energy Transition, Petten, The Netherlands

ORAL PRESENTATIONS 5DO.14

15:15 - 16:45 Environmental Impact and Sustainability; Life Cycle Analysis
Chairpersons: Claire Agraffeil *(i)*
CEA, Le Bourget-du-Lac, France
Garvin Heath *(i)*
National Laboratory of the Rockies, Golden, United States of America

5DO.14.1 Relocating Photovoltaic Manufacturing to Europe: A Necessary but Insufficient Condition for Sustainable Photovoltaics by 2050
Déborah Moerlen[1], Nouha Gazbour[1]
[1] CEA / INES, Le Bourget-du-Lac, France

5DO.14.2 Environmental Impacts of Repowering Across European Solar Farms
Kyle Richard Affleck[1], Bethany L. Willis[1], Sophie L. Pain[2], John D. Murphy[2], Nicholas E. Grant[3], Ruy Sebastian Bonilla[4], Antonio Saponaro[5], Neil S. Beattie[1]
[1] Northumbria University, Newcastle upon Tyne, United Kingdom; [2] University of Birmingham, United Kingdom; [3] University of Warwick, United Kingdom; [4] University of Oxford, United Kingdom; [5] Island Green Power, London, United Kingdom

5DO.14.3 Conceptional Engineering and Environmental Trade-offs of 3 GW Perovskite-Silicon Tandem Module Manufacturing
Julian Reichle[1], Mehul Raval[1], Markus Beck[1], Wolfgang Jooss[1], Peter Fath[1]
[1] RCT Solutions, Konstanz, Germany

5DO.14.4 Key Drivers of Low Environmental Impact Triple-Junction Perovskite/Perovskite/Silicon Tandem Modules at Industrial-Scale Manufacturing
Alejandra Galarza[1], Sebastian Nold[2], Lars Oberbeck[3]
[1] IPVF, Palaiseau, France; [2] Fraunhofer ISE, Freiburg, Germany; [3] TotalEnergies OneTech, Paris, France

5DO.14.5 A Comparative Life Cycle Assessment of Alternative Agrivoltaic System Configurations
Maria Anna Cusenza[1], Andrea Danelli[1], Sofia Spagnolo[1], Pierpaolo Girardi[1]
[1] Research on Energy System, Milan, Italy

5DO.14.6 Circularity Evaluation for Agrivoltaic Support Structures: A MIVES-based Comparison of Galvanized Steel and Timber
Angel Campos-González[1], Marcel Macarulla[2], Irene Josa[3], Santiago Gassó-Domingo[1]
[1] UPC, Barcelona, Spain; [2] Polytechnic University of Catalonia, Barcelona, Spain; [3] University College London, United Kingdom

ORAL PRESENTATIONS 5DO.19

15:15 - 16:45 PV in the Electricity Grid
Chairpersons: Elham Shirazi
University of Twente, Enschede, The Netherlands
Grazia Barchi *(i)*
Eurac Research, Bolzano, Italy

5DO.19.1 Risk-Averse Bidding for Stand-Alone Photovoltaic Power Plants in the Balancing Market Based on Time-Series Decomposition
Jindan Cui[1], Yuzuru Ueda[1]
[1] Tokyo University of Science, Japan

5DO.19.2 Comparative Analysis of Regional PV Production Models: from Regional to Municipality Resolution
Mohamed Ennhiri[1], Alessia Boccalatte[1], Stéphan Plassart[2], Boris Nérot[1], Martin Thebault[1]
[1] LOCIE, Le Bourget-du-Lac, France; [2] LISTIC, Annecy-le-Vieux, France

5DO.19.3 Effects of Power Consumption Temporal Resolution on Photovoltaic Hosting Capacity Studies in Nordic Distribution Grids
Lauri Aaltonen[1], Kari Lappalainen[1]
[1] Tampere University, Finland

5DO.19.4 Nowcasting of Austrians PV Power Plants based on Satellite Image Data
Stefan Übermasser[1], Fabian Leimgruber[1], Mufaddal Kapasi[2], Robert Höller[2]
[1] AIT, Vienna, Austria; [2] FH Oberösterreich, Wels, Austria

5DO.19.5 Firm Power Generation 2026
Jan Remund[1], Richard Perez[2], Marc Perez[3]
[1] Meteotest, Bern, Switzerland; [2] SUNY, Albany NY, United States of America; [3] Clean Power Research, Napa CA, United States of America

5DO.19.6 Does Curtailment Impact Inverter Lifetime? A Study on a 40 GWp Portfolio
Giuliano Luchetta Martins[1], Lucas Sergio[1], Maitheli Nikam[2], Gofran Chowdhury[2], Elena Koumpli[1], Jan Muller[1]
[1] Statkraft UK, London, United Kingdom; [2] 3E, Brussels, Belgium

VISUAL PRESENTATIONS 4DV.4

15:15 - 16:45 Advances in PV Performance and O&M: Bridging Research with Field Practices

Detailed information on this session is presented in the section entitled 'EU PVSEC 2026 Visual Presentations'.

ORAL PRESENTATIONS

15:15 - 16:45 Late News.9

ORAL PRESENTATIONS 4DO.5

17:00 - 18:30 Agrivoltaics: Crop Performance, Materials, Field Experiments and Applications
Chairpersons: Alessandra Scognamiglio *(i)*
ENEA, Portici, Italy
Anatoli Chatzipanagi
European Commission JRC, Ispra, Italy

4DO.5.1 Assessing the Impact of Transmittance and Light Scattering on Lettuce Growth under c-Si PV Modules for Agrivoltaics: from Prototyping to Outdoor Testing
Marco Memminger[1], Alessandro Minini[1], Bouchra El Omari[1], Pietro Raffaelli[1], Enrico Dalla Maria[1], Alvaro De Gruijter Eguiluz[1], Jordi Veirman[1], Luis Fialho[1]
[1] EURAC Research, Bolzano, Italy

4DO.5.2 Agrivoltaics in a Mediterranean Vineyard: First-Season Evidence for Synergistic Energy Gains and Maintained Grapevine Performance
Marco Ernst[1], Billy Xynas[2], Arjun Pandey[2], Christopher Jones[1], Chris Barnes[2], Sabine Tausz-Posch[2]
[1] ANU, Canberra, Australia; [2] University of Melbourne, Australia

4DO.5.3 Semi-transparent Blue, Red, and Magenta Thin-film PV Modules in Agrivoltaics: Insights from Basil Cultivation
Silvia Ma Lu[1], Reyhaneh Gorji[1], Arash Khosravi[1], Giovanni Urso[2], Simone Coluccia[3], Pietro Elia Campana[1]
[1] Mälardalen University, Västerås, Sweden; [2] University of Palermo, Italy; [3] University of Naples Federico II, Italy

4DO.5.4 Optimizing Agrivoltaic Systems in the Netherlands: A Design Framework for CIGS Technology Integration
Marios Mechilis[1], Sara Mirbagheri Golroodbari[1], Pita Verweij[1], Wilfried van Sark[1]
[1] Utrecht University, The Netherlands

4DO.5.5 AGRIPV with Cattle and Single-Axis Trackers
Ricardo Nery de Castro[1], Victor Eduardo Cauvilla de Oliveira[1]
[1] FIT Nextpower, Sorocaba, Brazil

4DO.5.6 Experimental Evidence for Improved Vegetation Growth in Dense PV Systems by Using Optical Elements
R.O. Apaydin[1], A.R. Burgers[1], B.B. Van Aken[1], F.F. van der Zee[2], E.M. de Goede[2], S. Leone[3], S. De Boer[4], I. Cesar[1]
[1] TNO, Petten, The Netherlands; [2] Wageningen University Research, The Netherlands; [3] Novar, Groningen, The Netherlands; [4] Pyrasied, Leeuwarden, The Netherlands

ORAL PRESENTATIONS 4DO.10

17:00 - 18:30 Environmental Impacts on PV Systems Performance and O&M

Chairpersons: Stephanie Malik *(i)*
Fraunhofer CSP, Halle (Saale), Germany
Erik Stensrud Marstein
IFE, Kjeller, Norway

4DO.10.1 Extreme Weather Events: Impact, Risks and Research Perspectives
Alireza Khaksar[1], Mounir Abraim[2], Abdellatif Ghennioui[2], Leonardo Micheli[1]
[1] Sapienza University of Rome, Italy; [2] Green Energy Park, Ben Guerir, Morocco

4DO.10.2 Optimized Machine Learning Framework for Predicting Photovoltaic Soiling in Arid Desert Climates
Usman Zafar[1], Dhanup Somasekharan Pillai[1], Mohamed Abdelrahim[1], Farhat Mahmood [1], Tareq A. Al-Ansari[1], Brahim Aissa[1]
[1] QEERI, Doha, Qatar

4DO.10.3 Multi-Year Performance, Soiling and Ageing Assessment of a 14 MW Floating PV Plant Using Multi-Scale Diagnostics
Hervé Colin[1], Lionel Sicot[1], Frédéric Mezzasalma[1], Alexandre Mignonac[1], Ioannis (John) A. Tsanakas[1]
[1] CEA / INES, Le Bourget-du-Lac, France

4DO.10.4 From Droppings to Losses: a Statistical Framework for Bird Soiling Losses on Floating PV Systems
Maarten Dörenkämper[1], Khalid Baig[1], Marcus Reitz[1], Minne de Jong[1], Jan Kroon[1]
[1] TNO, Eindhoven, The Netherlands

4DO.10.5 Improving Snow Loss Modeling for PV Systems Using Hybrid Deep Learning Methods
Shuo Wang[1], Mayur Patel[1], Hugo Medina Huerta[1], Juha A. Karhu[2], Anders V. Lindfors[2], Mari Benedikte Øgaard[3], Mattias Lindh[4], Alexander Granlund[5], Samuli Ranta[1]
[1] TUAS, Turku, Finland; [2] Finnish Meteorological Institute, Helsinki, Finland; [3] IFE, Kjeller, Norway; [4] RISE, Umeå, Sweden; [5] RISE, Piteå, Sweden

4DO.10.6 Alternative PV System Designs to Tackle Snow and Wind in High Latitude Conditions: Empirical First Winter Results from Northern Sweden
Mattias Lindh[1], Atse Louwen[1], Alexander Granlund[2], Gabriel Sabau[3], Anna Malou Petersson[2], Robin Andersson[4]
[1] RISE, Umeå, Sweden; [2] RISE, Piteå, Sweden; [3] RISE, Borås, Sweden; [4] Luleå University of Technology, Sweden

ORAL PRESENTATIONS 5DO.15

17:00 - 18:30 Circular Economy and Waste Streams of PV Modules

Chairpersons: Invited
Wolfram Palitzsch
LuxChemtech, Freiberg, Germany

5DO.15.1 Development of a Dashboard for Exploring PV Waste Stream Scenarios in Europe
Anna Rebecca Siemer[1], Stefan N. Grösser[1]
[1] Bern University of Applied Sciences, Biel, Switzerland

5DO.15.2 A Data-Driven Approach to Forecasting End-of-Life Photovoltaic Module Waste
Michael Straub-Mück[1], Andreas W. Rathgeber[1]
[1] University of Augsburg, Germany

5DO.15.3 Silicon Recovery from PV Panel End-of-Life: Towards More Closing Loop Scenarios
Mattia Gianvincenzi[1], Enrica Leccisi[1], Concetta Lodato[1], Fabrice Mathieux[1]
[1] European Commission JRC, Ispra, Italy

5DO.15.4 From Throughput to Value Retention: a KPI-based Sustainability Assessment Framework for PV Recycling Technologies
Ferozan Azizi[1], Josefina Ottitsch[2], Sonja Feldbacher[3], Anika Gassner[4], Gabriele Eder[4], Milutin Bjelic[1], Roland Fürbacher[2], Daniel Schwabl[5], Daniel Forstner[6], Ewald Perndorfer[7], Thomas Nigl[1]
[1] Technical University of Leoben, Austria; [2] Technical University of Vienna, Austria; [3] PCCL, Leoben, Austria; [4] OFI, Vienna, Austria; [5] Circulyzer, Niklasdorf, Austria; [6] MGG Müller Guttenbrunn, Amstetten, Austria; [7] Perndorfer Maschinenbau , Kallham, Austria

5DO.15.5 Assessment of Allowed Economic and Environmental Thresholds for Delamination-based PV Recycling
Elina Bosch[1], Ian Kenchington[1], Philippe Macé[1], Gaëtan Masson[1]
[1] Becquerel Institute, Brussels, Belgium

5DO.15.6 Who Pays, Who Collects, Who Enforces? End-of-Life PV Regulation Across 63 Jurisdictions
Penelope Crossley[1]
[1] The University of Sydney Law School, Australia

ORAL PRESENTATIONS 3DO.20

17:00 - 18:30 Thermal Performance of PV Modules in Operation

Chairpersons: Hanna Ellis
European Commission JRC, Ispra, Italy
Juan Lopez-Garcia *(i)*
STS-Certified, Boadilla del Monte, Spain

3DO.20.1 High-Irradiance PV Modules Performance: Experimental Insights and Implications for Design
Anelise Medeiros Pires[1], Marília Braga[1], Ana Carolina Oliveira Machado[1], Thamires Alves Silva[1], Ícaro Eiras da Cunha[1], Helena Flávia Naspolini[1], Ricardo Rüther[1]
[1] UFSC, Florianópolis, Brazil

3DO.20.2 Evolution of Temperature Coefficients in Degraded PV Modules: Evidence from Long-term High-Precision Field Monitoring
Andreas Schneider[1], Thomas Nierhoff[1]
[1] University of Applied Sciences Gelsenkirchen, Germany

3DO.20.3 Impact of Photovoltaic Module Degradation on the Temperature Coefficients
Christine Abdel Nour[1], Julien Dupuis[1], Daniel Ory[2], Tom Chargos[1], Paul Lefillastre[3]
[1] EDF R&D, Moret Loing et Orvanne, France; [2] EDF R&D, Palaiseau, France; [3] EDF Power Solutions, Nanterre, France

3DO.20.4 Nominal Module Operating Temperature of TOPCon, HJT and Back-Contact Photovoltaic Modules: Experimental and Model-Based Comparative Analysis
Jun Wu[1], Jun Wang[1], Yuanjie Yu[1]
[1] Canadian Solar, Suzhou, China

3DO.20.5 First Results from a Rooftop Mock-up Covered with PV Panels for Temperature Flux Measurements
Michael Schrempf[1], Stefan Riechelmann[1]
[1] PTB, Braunschweig, Germany

3DO.20.6 Albedo-Dependent Thermal Modeling of Bifacial PV Modules
Aline Kirsten Vidal de Oliveira[1], Isadora Maciel Queiroz[1], Marília Braga[1], Helena Flávia Naspolini[1], Ricardo Rüther[1]
[1] UFSC, Florianópolis, Brazil

OTHER PRESENTATIONS

17:00 - 18:30 Poster Awards Winners Session

Friday, 18. September 2026

ORAL PRESENTATIONS 5EO.1

08:30 - 10:00 PV Markets, Value of Storage and Manufacturing Economics

Chairpersons: Izumi Kaizuka *(i)*
RTS Corporation, Tokyo, Japan
Invited

5EO.1.1 A Snapshot of the Global PV Market – 2025
Gaetan Masson[1], Melodie de l'Epine[1], Arnulf Jäger-Waldau[2], Izumi Kaizuka[3], Johan Lindahl[4], José Donoso[5]
[1] IEA PVPS Task 1, Brussels, Belgium; [2] European Commission JRC, Ispra, Italy; [3] RTS Corporation, Tokyo, Japan; [4] Becquerel Sweden, Stockholm, Sweden; [5] UNEF, Madrid, Spain

5EO.1.2 Energy Storage and Vertical Installation as Potential Answer to Societal Challenges: Cannibalisation, Soil Ecology and Grid Connection
Bas B. Van Aken[1], Latifa El Boujdaini[1], Ilkay Cesar[1]
[1] TNO Energy Transition, Petten, The Netherlands

5EO.1.3 Framework for Back-testing PV+BESS Revenue Stacks Using Satellite-based Solar Resource and Historical Forecast Data
Daniel Chrkavy[1]
[1] Solargis, Bratislava, Slovakia

5EO.1.4 A Decommissioning and Repowering Cost Model and a Modeling Framework for Operating Utility-Scale PV Systems
Hanan Wehbi[1], Joseph Simon[1], Heather Mirletz[1], Silvana Ovaitt[1], Brian Mirletz[1], Matthew Prilliman[1], Garvin Heath[1], Chris Deline[1], Jal Desai[1], Cara Libby[2], Robin Bedilion[2], Anand Kumar[2]
[1] NLR, Golden, United States of America; [2] EPRI, Palo Alto, United States of America

5EO.1.5 Cost Drivers & Manufacturing Pathways for Shingled Integrated Solar PV Modules in Europe
Juan Ignacio Martinez[1], Philippe Macé[2], José María Vega de Seoane[1], Torsten Rößler[3], Mehdi Sahli[4], Maria Planells Valencia[5], Gaétan Carrier[6], John Morello[6]
[1] Becquerel Institute Spain, San Sebastian, Spain; [2] Becquerel Institute, Brussels, Belgium; [3] Fraunhofer ISE, Freiburg, Germany; [4] Voltec Solar, Dinsheim-sur-Bruche, France; [5] Heliup, Chambéry, France; [6] Freesuns, Vaud, Switzerland

5EO.1.6 All-Perovskite Tandem Manufacturing Cost at Gigawatt Scale
Matthew Hull[1], Lian Duan[2], Van-Son Nguyen[2], Iwan Zimmermann[2], Lars Oberbeck[3], Sebastien Lizin[1]
[1] Hasselt University, Belgium; [2] IPVF, Palaiseau, France; [3] TotalEnergies, Paris La Défense, France

ORAL PRESENTATIONS 4EO.2

08:30 - 10:00 Floating PV "Offshore"; VIPV; Space PV; CPV

Chairpersons: Bonna Newman *(i)*
Lightyear, Helmond, The Netherlands
Ignacio Antón Hernández
UPM, Madrid, Spain

4EO.2.1 Thermal Resistive Model for Offshore Floating PV Systems
Sathya Shanka Vasuki[1], Aryeshah Akbar[1], Ioannis Patokas[1], Teddy Simanjuntak[2], Olindo Isabella[1], Rudi Santbergen[1]
[1] TU Delft, The Netherlands; [2] Shell Global Solutions International, Amsterdam, The Netherlands

4EO.2.2 Effect of Waves on the Electrical Performance of an Offshore Floating Solar Pilot System at the North Sea
Mirza Khalid Baig[1], Minne M. de Jong[1], Maarten Dörenkämper[1]
[1] TNO, Eindhoven, The Netherlands

4EO.2.3 Benchmark of VIPV Versus Static PV
Lenneke H. Slooff[1], Anna J. Carr[1], Rene van Gijlswijk[2]
[1] TNO Energy Transition, Petten, The Netherlands; [2] TNO Mobility and Built Environment, The Hague, The Netherlands

4EO.2.4 Asymmetric Concentration of Diffuse Light for Photovoltaic Applications
Jelle Westerhof[1], Casper van den Berg[1], Mathis Van de Voorde[1], Jian-Yao Zheng[1], Lisanne Einhaus[1], Rebecca Saive[1]
[1] University of Twente, Enschede, The Netherlands

4EO.2.5 Radiation Tolerant Ultrathin InP Solar Cells with Rear Reflectors for Space Applications
Toluwalase Agoro[1], Venkata Chaluvadi[1], Stefan Diesing[2], James Shin[1], Iwan Davies[3], Louise Hirst[1]
[1] University of Cambridge, United Kingdom; [2] University of Sheffield, United Kingdom; [3] IQE, Cardiff, United Kingdom

4EO.2.6 Impact of Reverse Current on CPV Module Degradation
Elizabeth M. Hagemann[1], Frederik J. Vorster[1], E. Ernest van Dyk[1]
[1] Nelson Mandela University, Port Elizabeth, South Africa

ORAL PRESENTATIONS 5EO.3

08:30 - 10:00 Photovoltaics for and with Society

Chairpersons: Silvia Caneva
WIP Renewable Energies, Munich, Germany
Cisel Ekiz Gokmen *(i)*
University of Mugla, Türkiye

5EO.3.1 Gender Diversity in Photovoltaics: Experiences and Support Mechanisms in the EU
Pinar Derin Gure[1], Ezgi Pehlivanli[1], Chiara Busto[2], Niki Fodor[3], Ivan Gordon [4], Ulrike Jahn[5], Perine Fluery[6], Ioannis Tsanakas [7], Busra Yilmaz [8], Delfina Munoz[7], Eren Cihan Gülsoy [1], Rita Ebner [9], Hande Eryılmaz[10]
[1] METU, Ankara, Türkiye; [2] Eni, Rome, Italy; [3] SolarPower Europe, Brussels, Belgium; [4] imec, Leuven, Belgium; [5] Fraunhofer CSP, Halle, Germany; [6] Biosphere Solar, Rotterdam, The Netherlands; [7] CEA, Paris, France; [8] Kameleon Solar, Roosendaal, The Netherlands; [9] AIT, Vienna, Austria; [10] ODTÜ-GÜNAM, Ankara, Türkiye

5EO.3.2 Potential-Normalized Rooftop PV Adoption Reveals Persistent Equity Gaps
Lamprini Papargyri[1]
[1] Stanford University, United States of America

5EO.3.3 Changing the Paradigm: Lessons Learned from Establishing a Rooftop Photovoltaic System Crowdsourced by Local Neighbours at a Spanish School
Ana Belen Cristóbal[1], Luis Miguel Carrasco[1], Luis Narvarte[1], Genoveva Lopez[2], Laura Feijoo[2], Mario Sánchez-Herrer[2]
[1] UPM, Madrid, Spain; [2] Ecooo, Madrid, Spain

5EO.3.4 From Labs to Labour Market: Educating the Next Generation of Solar-PV Professionals in SolarNL
Renee Heller[1], Ruud Bakker[1], Elgin Blankwater[1], Yannick Busser[2], Fallon Colberts[3], Ferrie van Hattum[2], Bas Kluft[1], Arnette Overweel-Vogelaar[4]
[1] Amsterdam University of Applied Sciences, The Netherlands; [2] Saxion University of Applied Sciences, Enschede, The Netherlands; [3] Zuyd University of Applied Sciences, Heerlen, The Netherlands; [4] Hanze University of Applied Sciences, Groningen, The Netherlands

5EO.3.5 Testing Multi-Level Co-Design Approaches in Agrivoltaic Systems: Learnings from the Symbiosyst Research Project
Paolo Picchi[1], Lucia Montoni[1], Gaetano Calise[1], Silvia Tomasi[2], Angela Grassi[1], Pascal Vullo[3], Anna Maria Gras[4], Marcel Macarulla Martí[4], Giovanni Borz[2], Federica Colucci[5], Agata Buscemi[6], Alessandra Scognamiglio[7]
[1] ETA Florence, Italy; [2] Eurac Research, Bolzano, Italy; [3] Südtiroler Bauernbund , Bolzano, Italy; [4] UPC, Barcelona, Spain; [5] ENEA, Rome, Italy; [6] B2B Arquitectes, Barcelona, Spain; [7] ENEA, Naples, Italy

5EO.3.6 Conceptualization and Implementation of an Automated Pipeline for Big Data Analysis of Vocal Minority vs. Silent Majority in Social Media Discourse on the Energy Transition using Machine Learning
Jannik Achenbach[1], Eva-Maria Grommes[1], Valérie Varney[1]
[1] University of Applied Sciences Cologne, Germany

PLENARY PRESENTATIONS EP.1

10:30 - 12:30 Reliable PV Everywhere

Chairpersons: Alessandro Virtuani
CSEM, Neuchâtel, Switzerland
Claudia Buerhop-Lutz *(i)*
HI ERN, Erlangen, Germany

EP.1.1 What do PV Module Warranties Reveal about Reliability? Insights from Financial Disclosures and Independent Testing
Bert Herteleer[1], Silvana Ovaitt[2]
[1] SUPSI, Mendrisio, Switzerland; [2] NLR, Golden, United States of America

EP.1.2 IEA PVPS Task 13 Highlights - Extreme Weather, Multiple Use, Failure Modes, and Energy Security

EP.1.3 Reframing PV Inspections at Scale: Techno-Economic Benchmarking and a Roadmap for Intelligent PV O&M and Market Transformation
Ioannis (John) A. Tsanakas[1], David Moser[2], Dhanup S. Pillai[3], Juan Lopez Garcia[4], Veronica Bermudez Benito[5]
[1] CEA / INES, Le Bourget-du-Lac, France; [2] Becquerel Institute Italia, Trento, Italy; [3] QEERI, Doha, Qatar; [4] Senergy Technical Services, Lyon, France; [5] Berbetin, Saint-Malo, France

EP.1.4 Global Assessment of Wave-Induced Losses for Offshore Floating PV using the SWIFT Surrogate Model
Sathya Shanka Vasuki[1], Teddy Simanjuntak[2], Olindo Isabella[1], Rudi Santbergen[1]
[1] TU Delft, The Netherlands; [2] Shell Global Solutions International, Amsterdam, The Netherlands

EP.1.5 The Italian PNRR Funding Programme for Agrivoltaics: Overview, Preliminary Results and Future Perspectives

EP.1.6 PV/Sustainable Energy and the Global South

12:30 – 13:30 CONFERENCE CLOSING

EU PVSEC 2026 VISUAL PRESENTATIONS

Monday, 14. September 2026

VISUAL PRESENTATIONS 3AV.1

13:30 - 15:00 PV Module Design and Manufacturing

3AV.1.1 Light Transmitting Conductive Substrate for Bifacial Back-Contact Modules
Nicolas Guillevin[1], Eelko Hoek[1], Jan Kroon[1]
[1] TNO Solar Energy, Petten, The Netherlands

3AV.1.2 Investigation of Polybutadiene as a Co-Reagent for the Peroxide Crosslinking of Photovoltaic Encapsulants
Michael Wendt[1], Lionel Riou[2], Pauline Vitoux[2], Megan Casey[2], Anton Mordvinkin[1], Robert Heidrich[1]
[1] Fraunhofer CSP, Halle (Saale), Germany; [2] TotalEnergies Cray Valley, Saint-Avold Cedex, France

3AV.1.3 Thermoplastic Busbars – Reversible Low Temperature Interconnection for Solar Cells
Fabian Glaum[1], Tillman Finger[1], Norbert Willenbacher[1]
[1] KIT, Karlsruhe, Germany

3AV.1.4 Water-based Fluxes for Cu + Ag Metallization
Karl Wienands[1], Tobias Messmer[1], Markus Geßner[2], Andre Bremser[2]
[1] International Solar Energy Research Center Konstanz , Constance, Germany; [2] Emil Otto Flux- und Oberflächentechnik, Eltville , Germany

3AV.1.5 Encapsulant Selection and Accelerated Lamination for TOPCon PV Modules: from Material Screening to Full-Size Validation
Aksel Kaan Öz[1], Christine Wellens[1], Angelika Beinert[1], Meric Caliskan Arslan[2], Cansel Düz[3], Martin Heinrich[1]
[1] Fraunhofer ISE, Freiburg, Germany; [2] Kalyon PV, Ankara, Türkiye; [3] Kalyon PV, Ankara, Germany

3AV.1.6 Mitigating Module Power Dispersion via Systematic Sorting Strategies
Soohyun Bae[1]
[1] KIER, Daejeon, South Korea

3AV.1.7 Effect of Silicone Repair Coating on Degradation of PV Modules with Faulty Backsheet
Guy Beaucarne[1], Emmanuel Jadot[1], Berhane Darsene Dimd[2], Martin Bellmann[2], Sean McGibbon[3], Jo Gjessing[4]
[1] Dow Silicones Belgium, Seneffe, Belgium; [2] Sintef, Trondheim, Norway; [3] Scatec, Cape Town, South Africa; [4] Scatec, Oslo, Norway

3AV.1.8 Inkjet Printing for Mass Production of Perovskite Modules: High-Throughput Patterned Deposition and Enhanced Manufacturing Consistency
Tian Hou[1], Yuelong Huang[1], Yue Ma[1]
[1] Huzhou Phoenixolar, Huzhou, China

3AV.1.9 Scalable Electrospun PVA/SiO_2 Nanofiber Mats Enabling Daytime Passive Radiative Cooling

Rameeja T. Abdul Rasheed[1], Sneha Mohanan[1], Akhil A. C.[1], Dhanya P. Jacob[1], Aldrin Antony[1]

[1] Cochin University of Science and Technology, Ernakulam, India

3AV.1.10 Honeycomb-structured Light-Weight Photovoltaic Module with High Strength and Durability

Taiyufei Liu[1], Takuto Ikeda[1], Michio Kondo[2], Hiroyuki Wada[1]

[1] Institute of Science Tokyo, Yokohama, Japan; [2] Waseda University, Tokyo, Japan

3AV.1.11 Integrated Photovoltaic Façades for Industrial Buildings: Adhesion Approaches between Backsheet and Galvanized Steel

Nikolina Pervan[1], Lukas Geymayer[2], Martin Fleischanderl[3], Hannes Kurz[3], Gregor Kitzberger[3], Friedrich Füreder-Kitzmueller[3], Gernot Oreski[1]

[1] Polymer Competence Center Leoben, Leoben, Austria; [2] voestalpine Stahl, Linz, Austria; [3] voestalpine Stahl , Linz, Austria

3AV.1.12 Investigation of P1/P2/P3 Laser Patterning using Femtosecond and Nanosecond Regimes in Kesterite Thin-Film Solar Cells

Fernando Zahid Anguiano Olivares[1], D. Canteli[2], Cristina Muñoz García [2], David Muñoz Martín[2], Jacob Antonio Andrade Arvizu[3], Victor Izquierdo Roca[3], Pedro Vidal Fuentes [3], Gilberto Gomez Rosas[1], Miguel Morales Furió[2], Carlos Molpeceres Álvarez[2]

[1] University of Guadalajara, Jalisco, Mexico; [2] UPM, Madrid, Spain; [3] IREC, Barcelona, Spain

3AV.1.13 Ultrasonic Monitoring of Ethylene-Vinyl Acetate Encapsulants during Glass-Glass Module Lamination

Christopher Bruce Konu[1], Rico Meier[1]

[1] HTW Berlin, Berlin, Germany

3AV.1.14 A Lamination-Stage Soldering Approach for Lead-Free, Low-Temperature Cell Interconnection: Towards Industrially Relevant Interconnection Solutions

Raphael Shanmugam[1], M. Ignacia Devoto Acevedo[1], Jonas Buddgard[2], Torgny Lagerstedt[2], Anirudh Inginshetty[2], Abhinav Mulasi[2], Tobias Meßmer[1]

[1] ISC Konstanz, Konstanz, Germany; [2] Sticky Solar Power, Sollentuna, Germany

3AV.1.15 A Self-Healing and Self-Cleaning Transparent Coating for Photovoltaic Solar Panels

Mehmet Bilgehan Bilgic[1], Ceylan Zafer[1]

[1] Ege University, Izmir, Türkiye

3AV.1.16 Cost of Ownership Comparison of 3-cut and Shingled Modules with Standard TOPCon Half-cut PV Modules

Sraisth Sraisth[1], Julian Reichle[1], Hardik Gohil[2], Mehul Raval[1], Markus Beck[1], Xinyang Li[3], Ehtesham Anwer[4], Wolfgang Jooss[1]

[1] RCT Solutions, Constance, Germany; [2] RCT Solutions India, Hyderabad, India; [3] Wuhan RCT PV Technology, Wuhan, Germany; [4] RCT Solutions India, Hyderabad, Germany

3AV.1.17 Design and Manufacture of Hybrid Photovoltaic Thermal Module using Aluminium Tube Based Thermal Absorber

Paulius Laurikėnas[1], Julius Denafas[1], Povilas Lukinskas[1], Pal Tetlie[2], Martin Bellmann[2], Yijiang Xu[2]

[1] SoliTek R&D, Vilnius, Lithuania; [2] SINTEF Industry, Trondheim, Norway

3AV.1.18 Understanding and Mitigating Encapsulation-Induced Voltage Losses in Perovskite Solar Modules

Yves Abou Khalil[1], Cynthia Farha[1], Mathis Duplouy[1], Van Son Nguyen[1], Liam Gollino[1], Marion Provost[1], Thomas Guillemot[1], Jean Rousset[2], Karim Medjoubi[1]

[1] IPVF, Palaiseau, France; [2] EDF, Palaiseau, France

3AV.1.19 Platform for Process Development for Glass Cutting, Glass Drilling, Glass-Glass and Glass-Metal wWlding on 1m2 Substrates

Stefan Bergfeld[1], Tsvetelina Merdzhanova[2]

[1] Aachen University of Applied Science, Jülich, Germany; [2] FZJ, Jülich, Germany

3AV.1.20 Flexible Lamination Concepts for Durable CIGS Photovoltaic Modules

Nikolina Pervan[1], Nikoleta Kyranaki[2], Casper van Kessel[3], Dorrit Roosen-Melsen[3], Michaël Daenen[4], Gernot Oreski[1]

[1] PCCL, Leoben, Austria; [2] Hasselt University, Genk, Belgium; [3] TNO, Eindhoven, The Netherlands; [4] imec, Leuven, Belgium

3AV.1.21 New Developments of Transparent Polymer Materials in Frontsheet Films as Valid Alternative to Glass

Alessandro Anderlini[1]

[1] Coveme, Gorizia, Italy

3AV.1.22 Implementation of an Industrial Process for Interconnection of Busbar-less IBC ZEBRA Cells using Ribbons with Electrically Conductive and Non-Conductive Adhesive Pads

Tudor Timofte[1], Jolina Schmid[1], Simon Emmerich[2], Susana Soto[3], Jean Philippe Aguerre[3], Xabier Hernandez[3], Maximilian Pospischil[4], Andreas Dörflinger[4], Jonas Albrecht[4], Maximilian Weil[4], Stephan Großer[5], Giuseppe Galbiati[6], Tobias Nitsche[6], Daniel Buckland[6], Joris Libal[1], Tobias Messmer[1]

[1] ISC Konstanz, Konstanz, Germany; [2] Mondragon Assembly, Radolfzell, Germany; [3] Mondragon Assembly, Aretxabaleta, Spain; [4] HighLine Technology, Freiburg, Germany; [5] Fraunhofer CSP, Halle (Saale), Germany; [6] Henkel, Düsseldorf, Germany

3AV.1.23 Multi-Wire Module Modeling, Measuring and More

Jonathan Govaerts[1], Bart Reekmans[1], Hamed Javanbakht Lomeri[1], Tom Borgers[1], Mihir Mahajan[1], Valerie Depauw[1], Hariharsudan Sivaramakrishnan Radhakrishnan[1]

[1] imec-EnergyVille-UHasselt, Genk, Belgium

3AV.1.24 Development of a Photovoltaic Facade Module

Ringo Koepge[1], Matthias Pander[1], Sophia Jahreis[1], Nick Schröter[1], Paul Schenk[1], Ali Kanou[1], Wiebke Wirtz[2], Kevin Meyer[2], Henning Schulte-Huxel[2], Stephan Großer[1], Bengt Jaeckel[1]

[1] Fraunhofer CSP, Halle (Saale), Germany; [2] ISFH, Emmerthal, Germany

VISUAL PRESENTATIONS 3AV.2

15:15 - 16:45 PV Module Durability and Reliability

3AV.2.1 Experimental Repair Technique for Glass Defects of Glass-glass Photovoltaicmodules – A Performance Assessment
Chris Heynen[1], Mathijs Tas[2], Maurice Goris[3], Petra Manshanden[4], Pim Broekhuizen[2], Ben Reijntjes[5], Veronique Gevaerts[4], Wilfried Van Sark[1]
[1] Utrecht University, Utrecht, The Netherlands; [2] Boldz, Amsterdam, The Netherlands; [3] TNO, Petten, The Netherlands; [4] TNO, Eindhoven, The Netherlands; [5] Glass Solution Windowfilm, Purmerend, The Netherlands

3AV.2.2 Country-Scale Monitoring of PV Soiling and Atmospheric Conditions: The Qatar Dust Atlas
Brahim Aissa[1], Atef Zekri[1], Mohamed Abdellrahim[1], Mosab Subeh[1], Mohammad Hossain[1], Dhanup Somasekharan Pillai[1]
[1] QEERI, Doha, Qatar

3AV.2.3 PVSPICE: Integration of Electrical Circuit Simulations for PV Degradation Simulations
Norman Jost[1], Brandon K. Byford[1], Jennifer L. Braid[2], Clifford W. Hansen[2]
[1] Sandia National Laboratories, Albuquerque, United States of America; [2] Sandia National Labs, Albuquerque, United States of America

3AV.2.4 UVID Test Results and Early Indicators
Matthias Pander[1], Bengt Jaeckel[1]
[1] Fraunhofer CSP, Halle (Saale), Germany

3AV.2.5 Determination of the Optical Properties of Encapsulants during UV Weathering Using a Four-Flux Model
Rosa Zaigouche-Feldis[1], Mathieu Hebert[2], Maxime Darnon[2], Philippe Thony[1]
[1] CEA / INES, Le Bourget-du-Lac, France; [2] LabHC, Saint-Etienne, France

3AV.2.6 UV-Induced Degradation of PV Modules: a Comparative Study of Light Spectra and Encapsulants
Markus Babin[1], Yuliya Voronko[2], Gabriele C. Eder[2], Sune Thorsteinsson[1], Markus Feichtner[3]
[1] DTU, Roskilde, Denmark; [2] OFI, Vienna, Austria; [3] Sonnenkraft, St. Veit/Glan, Austria

3AV.2.7 Evaluation of a Custom-built Integrated Setup for Microscopic Characterization of the Mechanical Stability of Flexible Perovskite Solar Cells
Andreas Bartelt[1], Rico Meier[1]
[1] University of Applied Science Berlin, Berlin, Germany

3AV.2.8 Outdoor Degradation Assessment from Field Measurements: Isolating Irreversible Degradation from Measured Performance Indicators
Robinson Cavieres[1], Felipe Valencia[1]
[1] ATAMOSTEC, Antofagasta, Chile

3AV.2.9 Indoor Characterizations of Modules made from Recycled Silicon
Mickael Albaric[1], Etienne Pihan[2], Marion Serasset[3], Guillaume Capron[2]
[1] CEA / INES, Le Bourget du Lac, France; [2] CEA/INES, Le Bourget du Lac, France; [3] CEA/INES, Le Bourget du lac, France

3AV.2.10 NIR Spectroscopy and Chemometrics as a Tool for Non-Destructive Polymer Degradation Analysis in PV Modules
Anika Gassner[1], Gabriele C. Eder[1], Benedikt Hufnagl[2], Vasilaki-Maria Archodoulaki[3]
[1] OFI, Vienna, Austria; [2] Hufnagl Chemometrics, Mödling, Austria; [3] Vienna University of Technology, Vienna, Austria

3AV.2.11 PVcracks: Python Repository for Electroluminescence Image Processing, Current-voltage Curve Fitting and Power Loss Estimation
Norman Jost[1], Brandon K. Byford[1], Rodrigo d. Prado Santamaria[2], Clifford W. Hansen[1], Jennifer L. Braid[1]
[1] SNL, Albuquerque, United States of America; [2] DTU, Roskilde, Denmark

3AV.2.12 Acceleration of Thermal Cycling Test for PV Modules
Ebrar Özkalay[1], Anika Gassner[2], Gabriele C. Eder[2], Gabi Friesen[1], Markus Feichtner[3]
[1] SUPSI, Mendrisio, Switzerland; [2] OFI, Vienna, Austria; [3] Sonnenkraft Energy, St.Veit a.d. Glan, Austria

3AV.2.13 Reliability Comparison of P-Type PERC and N-Type TOPCon PV Modules Based on IEC Testing and Encapsulation Materials
San-Yu Ting[1], Yung-Jen Shyong[1], Sheng-Cong You[1], Min-An Tsai[1]
[1] ITRI, Hsinchu, Taiwan

3AV.2.14 ReBEL Imaging to Understand Reverse Bias Breakdown Behaviour in Perovskite Devices
Remi Aninat[1], Klaas Bakker[1], Jonathan Henzel[1], Mehrdad Najafi[1], Sjoerd Veenstra[1], Mirjam Theelen[1]
[1] TNO, Eindhoven, The Netherlands

3AV.2.15 Lightweight SHJ Modules with Reduced Environmental Impact: an Iterative Approach of BOM Development and Validation
Timea Bejat[1], Lison Marthey[2], Adeline Lanterne[1]
[1] CEA-INES, Le Bourget du Lac, France; [2] CSEM, Neuchâtel, Switzerland

3AV.2.16 New Encapsulants Polymers in Photovoltaic Modules
Francesco Levi[1], Valeria Fiandra[2], Lucio Sannino[2], Concetta Andreozzi[2], Antonella De Maria[2], Paola Delli Veneri[2], Lucia Vittoria Mercaldo[2], Odda Ruiz de Ballesteros[1], Finizia Auriemma[1]
[1] University of Naples Federico II, Naples, Italy; [2] ENEA, Portici, Italy

3AV.2.17 Research on IEC Test Method to Assess Resistance of PV Modules to Foot Traffic During Installation or Maintenance
Tong Yu[1]
[1] Jinko Solar, Jiaxing, China

3AV.2.18 Usage, Market Trends, and Moisture Ingress Simulation of Edge Sealants for Photovoltaics Modules
Ashish D. Rana[1], Nikoleta Kyranaki[1], Ismail Kaaya[2], Loic Guillemot[3], Camille Bainier[3], Michael Daenen[4]
[1] UHasselt, Hasselt, Belgium; [2] imec, Genk, Belgium; [3] Total Energies , Paris, France; [4] UHasselt, Hasselt, France

3AV.2.19 Two Years Outdoor Performance Measurement of Two Different 35cm² Perovskite Mini-modules
Jonathan Lehmann[1], Aranzazu Aguirre[2], Tom Aernouts[2], Yinghuan Kuang[2], Tamara Merckx[2], Anurag Krishna[2], Stijn Scheerlinck[1], Quentin Van Nieuwenhoven[1]
[1] ENGIE Laborelec, Linkebeek, Belgium; [2] imec, Genk, Belgium

3AV.2.20 FEM Model Development and Extensive Verification of Glass/Backsheet and Glass/Glass PV Modules Using Solar Cell Integrated Stress Sensors
Pascal Romer[1], Eric Heppner[1], Andreas J. Beinert[1], Jochen Markert[1], Christof Erban[2]
[1] Fraunhofer ISE, Freiburg, Germany; [2] SUNOVATION, Freiburg, Germany

3AV.2.21 Investigating the Impact of Mounting Clamps and Frame Adhesive Joints on Glass Breakage of PV Modules
Pascal Romer[1], Andreas J. Beinert[1], Jochen Markert[1], Dennys Koch[2]
[1] Fraunhofer ISE, Freiburg, Germany; [2] RWE Renewables, Hannover, Germany

3AV.2.22 Understanding TOPCon Glass-Backsheet PV Modules Damp Heat Degradation: why 'Standard' BOM Should be Avoided?
Sraisth Sraisth[1], Mehul Raval[1], Oliver Voigt[1], Xinyang Li[2], Hardik Gohil[3], Marius Luedemann[4], Michael Wendt[4], Jishnu Ramachandran Nair[4], Markus Beck[1], Wolfgang Jooss[1], Anton Mordvinkin[4], Robert Heidrich[4]
[1] RCT Solutions, Constance, Germany; [2] Wuhan RCT PV Technology, Wuhan, China; [3] RCT Solutions India, Hyderabad, India; [4] Fraunhofer CSP, Halle (Saale), Germany

3AV.2.23 Strength Testing of Full-Size Solar Glass
Matthias Pander[1], Paul Schenk[1], Bengt Jaeckel[1]
[1] Fraunhofer CSP, Halle (Saale), Germany

3AV.2.24 Non-Destructive Detection of Moisture Ingress in PV Modules Using NIR Spectroscopy and Hyperspectral Imaging
Lukas Neumaier[1], Martin De Biasio[1], Anika Gassner[2], Markus Feichtner[3], Simon Prüller[4], Gabriele C. Eder[2]
[1] SAL, Villach, Austria; [2] OFI, Vienna, Austria; [3] Sonnenkraft, St.Veit/Glan, Austria; [4] 2nd Cycle FlexCo, Amstetten, Austria

3AV.2.25 Characterization Methods for Perovskite Mini-Module Analysis
Claudia Buerhop-Lutz[1], Ones Ghaffari[1], Shudi Qiu[2], Michael Wagner[1], Oleksandr Stroyuk[1], Ian Marius Peters[1]
[1] HI ERN, Erlangen, Germany; [2] FAU, Erlangen, Germany

3AV.2.26 Degradation Mechanisms of Perovskite Solar Cells Under Arid Environmental Conditions
Mohammad Istiaque Hossain[1], Alaa Elsafi[1], Brahim Aissa[1]
[1] QEERI, Doha, Qatar

3AV.2.27 Reliability of Screen-Printed Copper Metallization in SHJ Modules
E. Busra Kucuk[1], Lars A. G. Okel[1], Yu Wu[1], Astrid Gutjahr[1], Bart Geerligs[1], Victor Rosca[1]
[1] TNO, Petten, The Netherlands

3AV.2.28 Mechanical Behaviour of Framed Glass/Backsheet PV Modules: Influence of Frame Geometry and Mounting Configuration
Paul Messaoudi[1], Maxime Babics[1], Francesco Giordano[2], Vincent Barth[1], Timea Bejat[1]
[1] CEA / INES, Le Bourget-du-Lac, France; [2] 3SUN, Catania, Italy

3AV.2.29 Reverse-bias Onset under Bird-Dropping Soiling: a Parametric Electrical Model for PV Module Hotspot Risk
Baris Dai[1], Minne de Jong[1], Jan Kroon[2]
[1] TNO, Eindhoven, The Netherlands; [2] TNO, Petten, The Netherlands

3AV.2.30 Reliability of TOPCon Super Multi Busbar Modules: Role of the Soldering Flux
Germain Rey[1], Marion Serasset[1], William Denis[1], Lucie Pirot-Berson[1], Rémi Monna[1]
[1] CEA / INES, Le Bourget du Lac, France

3AV.2.31 New Encapsulants Polymers in Photovoltaic Modules
Francesco Levi[1], Valeria Fiandra[2], Lucio Sannino[2], Concetta Andreozzi[2], Antonella De Maria[2], Paola Delli Veneri[2], Lucia Vittoria Mercaldo[2], Odda Ruiz de Ballesteros[3], Finizia Auriemma[1]
[1] University of Naples Federico II, Naples, Italy; [2] ENEA, Portici, Italy; [3] ENEA, Naples, Italy

3AV.2.32 UV-induced Degradation in State-of-the-Art HJT and TOPCon Solar Cells and Its Mitigation through Encapsulants
Shilpi Shital[1], Carlo Fanara[1], Philip Hart[1], Aziz Nairi[2], Lili Wang[1]
[1] TII, AbuDhabi , United Arab Emirates; [2] SERIS, Singapore, Singapore

3AV.2.33 Investigation of the UV-Induced Degradation of Lightweight Silicon Heterojunction Solar Modules
Rongda Zhang[1], Kai Zhang[1], Andreas Lambertz[1], Luo Bin[1], Henrike Gattermann[1], Karsten Bittkau[1], Andreas Gerber[1], Benedikt Fischer[1], Yanxin Liu[1], Uwe Rau[1], Sebastian Münstermann[2], Kaining Ding[1]
[1] FZJ, Jülich, Germany; [2] RWTH Aachen University, Aachen, Germany

3AV.2.34 New Method for Evaluation of Resistances inside PV Modules
Ilya Chebunin[1], Jonathan Govaerts[1]
[1] Imec, Genk, Belgium

3AV.2.35 Increased Degragation of n-type PV Modules in Field Operational Systems
Ariel Holin[1], Rafael Fleischman[1], Lior Sarig[1]
[1] SolarEdge Technologies, Herzliya, Israel

3AV.2.36 Accelerated Life Testing for Photovoltaic Modules: Correlating Damp Heat (DH) and Pressure Cooker Test (PCT)
Jiaqi Song[1], Xian Jiang[1], Jikai Kang[1], Hansong Guo[1], Yu Chen[1], Chen Li[1], Zhenguo Li[1]
[1] Longi Green Energy Technology, Xi'an, China

3AV.2.38 Anti-Soiling and Anti-Reflective Properties of a Durable Coating for Solar Cover Glass
Carmen Wang[1], Madupa Abeywardena[1], QianFeng Xu[2], Alan Lyons[1]
[1] City University of New York, New York, United States of America; [2] ARL Designs, Summit, United States of America

3AV.2.39 Development of Polymer-Modified Polyvinylidene Fluoride and Glass Fiber Composites for the Functional Repair of Photovoltaic Backsheets
Carlos González Montesdeoca[1], Luis Manuel Ocaña González[1], Benjamín González-Díaz[2], Sara González-Pérez[2], María Elena Llarema García[1]
[1] ITER, Granadilla de Abona, Spain; [2] ULL, San Cristóbal de La Laguna, Spain

3AV.2.40 Investigating Liquid vs Vapor Moisture Ingress and Resulting Degradation in TOPCon Modules
Nathan Roosloot[1], Gaute Otnes[1], Jan Kroon[2], Oguzhan Apaydin[2], Thomas Kaltenbach[3], Josefine Selj[1]
[1] IFE, Kjeller, Norway; [2] TNO, Petten, The Netherlands; [3] Fraunhofer ISE, Freiburg, Germany

3AV.2.41 When Spectra Speak: AI Maps Hidden Polymer Degradation
Brahim Anis Belferkous[1], Chiara Barretta[1], Gernot Oreski[1]
[1] PCCL, Leoben, Austria

3AV.2.42 Examples of Real-Life Failure and Claim Challenges of PV Modules at Different Stages of the Life-Cycle from Planning and Production to O&M and Monitoring
Hamed Hanifi[1]
[1] AESOLAR, Königsbrunn, Germany

VISUAL PRESENTATIONS 3AV.3

17:00 - 18:30 PV Module Performance – Modelling, Testing, Standards

3AV.3.1 Cell-Resolved Quantification of Shunt Resistance in Photovoltaic Modules via Electroluminescence Imaging
Riya Sharma[1], K. L. Narasimhan[1], B. M. Arora[1], Anil Kottantharayil[1], Narendra Shiradkar[1]
[1] IIT Bombay, Mumbai, India

3AV.3.2 Development and Light Transmittance Measurements of Semitransparent c-Si PV Modules for Agrivoltaics
Shu-Ngwa Asa'a[1], Arvid van der Heide[2], Giacomo Bizinoto Ferreira Bosco[3], Hariharsudan Sivaramakrishnan Radhakrishnan[2], Jef Poortmans[2], Michael Daenen[1]
[1] UHasselt, Hasselt, Belgium; [2] imec, Leuven, Belgium; [3] FOTONIQ, Delft, The Netherlands

3AV.3.3 Energy Yield and Lifetime Climate Classification via Machine Learning for Optimizing PV Module Designs and Bill of Materials
Youri Blom[1], Sofia Dutto[2], Jing Sun[1], Rudi Santbergen[1], Olindo Isabella[1], Malte Ruben Vogt[1]
[1] TU Delft, Delft, The Netherlands; [2] University of Naples Federico II, Naples, Italy

3AV.3.4 Implementation of an Optimized Multi-Spectrum Method for Determining the Spectral Responsivity of Solar Cells and Modules
Ronak Mahpeyma[1], Ingo Kröger[1], Hendrik Sträter[1], Stefan Winter[1]
[1] PTB, Braunschweig, Germany

3AV.3.5 Characterizing Early Commercial Perovskite Modules
Claudia Buerhop-Lutz[1], Ones Ghaffari[1], Bernhardt Kaesser[1], Ian Marius Peters[1]
[1] HI ERN, Erlangen, Germany

3AV.3.6 Scanning System for Field Photoluminescence Imaging of PV Modules based on Modulated Light Source
Gisele A. dos Reis Benatto[1], Carl Emil Elling[2], Jeppe Elias Ekberg Jensen [1], Peter Behrensdorff Poulsen [1], Liviu Stoicescu[3], Sergiu V. Spataru[1]
[1] DTU, Roskilde, Denmark; [2] Danish PV Service, Roskilde, Denmark; [3] Solarzentrum Stuttgart, Stuttgart, Germany

3AV.3.7 Energy-yield Modelling of Low-footprint SHJ Modules with Transparent Passivating Contacts
M. Zeman[1], P. Procel Moya[2], Y. Zhou[1], M. Verkou[1], M. Leonardi[3], D. Di Girolamo[3], G. Giuliano[3], F. Rametta[3], M. Foti[3], C. Gerardi[4], K. Bittkau[5], A. Eberst[5], K. Ding[5], Y. Blom[2], M. R. Vogt[2], R. Santbergen[2], O. Isabella[2]
[1] PV Works, Delft, The Netherlands; [2] TU Delft, Delft, The Netherlands; [3] 3SUN, Catania, Italy; [4] 3SUN, Catania, The Netherlands; [5] FZJ, Jülich, Germany

3AV.3.8 Temperatur Behaviour of Different Solar Cells Architectures for Reverse Breakdown
Bengt Jaeckel[1], Matthias Pander[1], Hamed Hanifi[2]
[1] Fraunhofer CSP, Halle (Saale), Germany; [2] AESOLAR, Koenigsbrunn, Germany

3AV.3.9 Impact of Spectral Response Variability on Power Determination of Single-Junction Perovskite Modules
Wenhao Xu[1], Yating Zhang[1], Mengdi Liu[1], Christos Monokroussos[1], Giorgio Bardizza[2], Max Koentopp[3], Zhen Li[4], Ralph Gottschalg[5]
[1] TÜV Rheinland (Shanghai), Shanghai, China; [2] TÜV Rheinland (Italy), Milan, Italy; [3] TÜV Rheinland Solar, Cologne, Germany; [4] UNSW, Sydney, Australia; [5] Fraunhofer CSP, Halle, Germany

3AV.3.10 Soiling Dynamics and Performance Mitigation in Bifacial Photovoltaic Modules Enabled by Anti-Dust Coatings
Brahim Aissa[1], Amir Abdallah[1], Mohammad I. Hossain[1], Dhanup Somasekharan Pillai[1]
[1] QEERI, Doha, Qatar

3AV.3.11 Investigation of Soiling Losses on Ethylene Tetrafluoroethylene (ETFE) Front-sheets for Flexible Thin-film PV Applications
K. P. Sreejith[1], Kenneth Mathew[1], Peer Sluijs[1], Arno H. M. Smets[1]
[1] TU Delft, Delft, The Netherlands

3AV.3.12 Characterization and Reliability Testing of Segmented PV Modules and their Main Components based on a Practical Outdoor Test
Simon Karl[1], Jens Schneider[2], Jens Froebel[1], Matthias Pander[1], Pouya Pourshafi[3], Andreas Maixner[3], Bengt Jaeckel[1], Hamed Hanifi[3]
[1] Fraunhofer CSP, Halle (Saale), Germany; [2] HTWK, Leipzig, Germany; [3] AESOLAR, Koenigsbrunn, Germany

3AV.3.13 Wind-Interactive Surface Micro-Elements for Mitigating Light Soiling on PV Modules: Performance Mechanism and Preliminary Evaluation
Yoel Sefi[1], Hadar Sefi[1]
[1] Dustoss, Malkiya, Israel

3AV.3.14 Exploring fast and low Cost I-V Characterization Techniques to extract PV Module Characteristics

Tommaso Michelon[1], Giacomo Peruzzi[1], Andrea Targa[1], Alessandro Caria[1], Matteo Meneghini[1], Gaudenzio Meneghesso[1], Alessandro Pozzebon[1], Nicola Trivellin[1]

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3AV.3.15 Innovative Urban PV Installations using Matrix Shingle Technology – Solar Tiles, Noise Barriers and Carports

Paul Rémondeau[1], Florian Ollagnon[1], Gaétan Carrier[2], Mehdi Sahli[3], Jacob Forster[4], Christian Reise[4], Davide Avantaggiato[5], John Morello[6], Antonin Faes[1], Christophe Ballif[1]

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3AV.3.16 Soiling Loss Study of Solar Photovoltaics using Glass Coupons Approach in Outdoor Conditions of Sydney, Australia

Naveed Hussain[1], Stephen Bremner[1], Fiacre Rougieux[1], Abhnil Prasad[1], Merlinde Kay[1]

[1] UNSW, Sydney, Australia

3AV.3.17 Assessment of Bifacial PV Modules Power Matrix under Indoor Conditions

Teodora Stoyanova Lyubenova[1], Ewan D. Dunlop[1]

[1] Joint Research Centre, Ispra, Italy

3AV.3.18 Review of WPVS Missuses in Solar Simulator Calibration

Gilles Arnoux[1], Christian Dreier[1], Damien Etienne[1], Bertrand Paviet-Salomon[2], Jonas Geissbühler[2], Tonio Buonassisi[2], Vincent Paratte[1]

[1] PASAN , Neuchâtel, Switzerland; [2] CSEM, Neuchâtel, Switzerland

3AV.3.19 Uncertainty in I–V Measurements of IBC Photovoltaic Modules using Spire and Pasan Sun Simulators

Nishant Kumar[1], K. L. Narasimhan[1], B. M. Arora[1], Narendra Shiradkar[1]

[1] IIT Bombay, Mumbai, India

3AV.3.20 Daily and Seasonal Investigation of the Spectral Mismatch Factor of Perovskite Based Devices

Sumeet Santosh Mujumdar[1], Matthew Norton[1], Vasiliki Paraskeva[1], Elias Peraticos[1], Andreas Kyprianou[1], George E. Georghiou[1], Maria Hadjipanayi[1]

[1] University of Cyprus, Nicosia, Cyprus

3AV.3.21 Comparative Field Validation of an Integrated Agrivoltaic System in a Desert Environment

Sagarika Kumar[1], Min Hsian Saw[1], Mauro Pravettoni[1]

[1] TII, Abu Dhabi, United Arab Emirates

3AV.3.22 Wireless In-situ Monitoring of Temperature, Humidity and Outgassing in Encapsulated Perovskite Solar Cells

Marko Jankovec[1], Mark Urbančič[1], Arslan Ali[1], Kristijan Brecl[1], Špela Tomšič[1], Antonin Faes[2], Marko Jošt[1], Marko Topič[1]

[1] University of Ljubljana, Ljubljana, Slovenia; [2] EPFL, Neuchâtel, Switzerland

3AV.3.23 Modular and Tunable Open-source LED Solar Simulatior for Enhanced Spectral Fidelity

Leonardo Sollazzo[1], Rachele Grazzi[1], Valentina Diolaiti[1], Nazim Aslam[1], Fabio Rossi[1], Diego Bernardoni[1], Eleonora Baccega[1], Donato Vincenzi[2]

[1] University of Ferrara, Ferrara, Italy; [2] Consorzio Futuro in Ricerca, Ferrara, Italy

3AV.3.24 Impact of Wind on Vertical Bifacial Photovoltaic Systems: Thermal Modeling and CFD Analysis

Amr Osama[1], Giuseppe Marco Tina[1], Antonio Gagliano[1], Stefano Aneli[1]

[1] University of Catania, Catania, Italy

3AV.3.25 Extension of Analytical Thermal Models to Assess Integrated Photovoltaics and Mobile Applications

Max Mittag[1], Alexander Protti[1], Christian Reichel[1], Holger Neuhaus[1]

[1] Fraunhofer ISE, Freiburg, Germany

3AV.3.26 Spectral Mismatch Uncertainty in Energy Rating Calculations in Accordance with IEC 61853

Werner Herrmann[1], Giorgio Bardizza[2], Christos Monokroussos[3], Harald Müllejans[4], Lorenz Rimmelspacher[5]

[1] TÜV Rheinland, Cologne, Germany; [2] TÜV Rheinland, Milan, Italy; [3] TÜV Rheinland, Shanghai, China; [4] European Commission JRC, Ispra, Italy; [5] Lorenz Rimmelspacher, Cologne, Germany

3AV.3.27 Comparative Analysis of I-V Curve Correction Methods for WPVS Reference Cells

Wenhao Xu[1], Yating Zhang[1], Mengdi Liu[1], Christos Monokroussos[1], Giorgio Bardizza[2], Werner Herrmann[3], Max Koentopp[3], Ingo Kröger[4], Stefan Winter[4]

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3AV.3.28 Passive Geothermal-Assisted Thermal Regulation for Enhanced Photovoltaic Module Performance in Desert Environments

Saji Salkalachen[1], Lokabhiraman Subbaraya[1]

[1] Independent Researcher, Bangalore, India

3AV.3.29 Effect of Metastable States of Modern Solar Modules on Module Calibrations and Dark I-V-Curves

Hasan Manavbasi[1], Stefan Riechelmann[1], Stefan Winter[1]

[1] PTB, Braunschweig, Germany

3AV.3.30 Long-term Reliability Study of the Oldest PV System in Sweden

Yusuf Rostom[1], Emmanouil Psimopoulos[1], André Augusto[1]

[1] Dalarna University, Borlange, Sweden

3AV.3.31 Reducing PV Operational Temperature by Radiative Cooling Coatings: a Thermal Transport Modeling Approach Using COMSOL

Or Gindi[1], Sara Golroodbari[1], Wilfried Van Sark[1]

[1] Utrecht University, Utrecht, The Netherlands

3AV.3.32 Estimation of the Effective DC Power Rating for Bifacial PV Arrays in an Arid Climate

José R. Angulo Abanto[1], Juan de la Casa[2], Jan Amaru Töfflinger[1]

[1] PUCP, Lima, Peru; [2] University of Jaén, Jaén, Spain

3AV.3.33 Performance Assessment of Bifacial and Monofacial PERC Modules using an Accurate Method based on Superellipse Model

Khadija El Ainaoui[1], Mhammed Zaimi[2], Said Elhamaoui[1], Yasmine El mrabet[1], Khadija Ibaararen[2], Youssef Bouasria[2], Abdellatif Ghennioui[1], El Mahdi Assaid[2]

[1] Green Energy Park, Benguerir, Morocco; [2] Chouaïb Doukkali University, El Jadida, Morocco

3AV.3.34 Beyond Efficiency: Shading Tolerability as a Driver for Architecture Selection in Perovskite-on-Silicon Modules

Jose Maria Cuevas Davila[1], Hariharsudan Sivaramakrishnan Radhakrishnan[2], Patrizio Manganiello[1], Quentin Jeangros[3], Jozef (Jef) Poortmans[2]

[1] imec, Genk, Belgium; [2] imec, Leuven, Belgium; [3] CSEM, Switzerland, Slovenia

3AV.3.35 Thermo-Mechanical Analysis and Prediction of Shear Stresses by FEM in ECA/NCA Interconnects of IBC Solar Cells

Matthias Pander[1], Stephan Grosser[1], Tudor Timofte[2], Tobias Nitsche[3], Daniel Buckland[3], Giuseppe Galbiati[3], Bengt Jaeckel[1]

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3AV.3.36 Orientation-based Optimization of BIPV Colored Module Arrangement

Hyoungbeen Kim[1], Jaehyeong Lee[2]

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Tuesday, 15. September 2026

VISUAL PRESENTATIONS 1BV.1

08:30 - 10:00 Single Junction Silicon Cells | Silicon Bottom Cells for Tandem Photovoltaics | Characterisation & Modelling of Silicon Cells

1BV.1.1 Optimization of n-type nc-SiOx:H Window Layer for Silicon Heterojunction Solar Cells via CO2-H2 Pretreatment, Oxygen Content, and Thickness Variation

Vahdet Özyahni[1], Karsten Bittkau[1], Andreas Lambertz[1], Alexander Eberst[1], Uwe Rau[1], Kaining Ding[1]

[1] FZJ, Jülich, Germany

1BV.1.2 Approaches to Enhance the VOC of Moly-Poly Hybrid c-Si Solar Cells

Yingwen Zhao[1], Yi Zheng[1], Liqi Cao[1], Paul Procel[1], Martijn Tijssen[1], Engin Özkol[1], Luana Mazzarella[1], Yifeng Zhao[1], Miro Zeman[1], Olindo Isabella[1]

[1] Delft University of Technology, Delft, The Netherlands

1BV.1.3 Optimization of Boron-Doped Polycrystalline Silicon Passivating Contacts on Textured Silicon Surfaces

Clarisse Laurens-Berge[1], Raphaël Cabal[1], Sébastien Dubois[1]

[1] CEA, Le-Bourget-du-Lac, France

1BV.1.4 Application of nc-SiC:H as Transparent Passivation Contacts in Silicon Heterojunction (SHJ) Solar Cells on Industrial Sizes

Karsten Bittkau[1], Alexandr Zamchiy[1], Binbin Xu[1], Alexander Werner[1], Andreas Lambertz[1], Alexander Eberst[1], Kaining Ding[1]

[1] FZJ, Jülich, Germany

1BV.1.5 Viability of Ultrathin Crystalline Silicon Solar Cells below 70 µm

Vanesa Fano[1], Mario Cruz[1], Alvaro Briones[1], Alona Otaegi[1], Eneko Cereceda[1], Nekane Azkona[1], Eneko Ortega[1], Federico Recart[1], Jose Ruben Gutierrez[1], Juan Carlos Jimeno[1]

[1] UPV/EHU, Bilbao, Spain

1BV.1.6 Research on the Dark-annealing-induced Passivation Degradation of TOPCon Solar Cell

Bangzhao Hong[1], Weiwei Deng[1], Haiyan Chen[1], Tao Xu[1]

[1] Canadian Solar, Suzhou, China

1BV.1.7 Organic-Inorganic Hybrid Layer as a Passivating Electron-Selective Contact in Silicon Solar Cells

Milad Ghasemi[1], Naser Beyraghi[1], Selcuk Yerci[1], Rasit Turan[1], Hisham Nasser[1]

[1] ODTÜ-GÜNAM, Ankara, Türkiye

1BV.1.8 High-Pressure Sputtered Sub-Stoichiometric TiO_x Electron-Selective Contacts Formed by In-Situ Plasma Oxidation for Crystalline Silicon Solar Cells

Francisco José Pérez-Zenteno[1], Sebastian Duarte[1], Rafael Benitez-Fernandez[1], Ignacio Torres[2], Rocio Barrio[2], Sari Algaidy[3], Rodrigo García-Hernansanz[1], Javier Olea[1], David Pastor[1], Álvaro del Prado[1], Eric García-Hemme[1], Enrique San Andrés[1]

[1] Complutense University of Madrid, Madrid, Spain; [2] CIEMAT, Madrid, Spain; [3] UPM, Madrid, Spain

1BV.1.9 Greener TOPCon processing using UV/O3 Oxidation and Microwave Annealing

Rafael Benítez-Fernández[1], Cecilia Mata-Alonso[1], Francisco Pérez-Zenteno[1], Sebastián Duarte-Cano[1], Ignacio Torres[2], Rocio Barrio[2], Nieves Gonzalez[2], Sari Algaidy[1], Javier Olea[1], David Pastor[1], Álvaro del Prado[1], Ignacio Mártil[1], Enrique San Andrés[1], Rodrigo García-Hernansanz[1], Eric García-Hemme[1]

[1] Complutense University of Madrid, Madrid, Spain; [2] CIEMAT, Madrid, Spain

1BV.1.10 Optimization of Back-Contacted polyZEBRA Solar Cell Characteristics for Industrial Fabrication and Application

Jonathan Linke[1], Saman Sharbaf Kalaghichi[1], Jan Hoß[1], Florian Buchholz[1], Lejo Joseph Koduvelikulathu[1]

[1] International Solar Energy Research Center Konstanz , Konstanz, Germany

1BV.1.11 Gettering Effects of Topcon Processing on N-Type and P-Type CZ Silicon Substrates

Nerea Dasilva Villanueva[1], Yiğit Mert Kaplan[2], Hisham Nasser[2], Rasit Turan[2], David Fuertes Marrón[1], Luis Jaime Caballero[1], Usman Shah[1], Andrés David Pardo[1], Cristian Miguel Luis Antoine[1], Özlem Coşkun[3], Çağrı Taha Delikanlı[3], Ece Çamkara[3], Meriç Çalışkan Arslan[4], Carlos del Cañizo[1]

[1] UPM, Madrid, Spain; [2] ODTÜ-GÜNAM, Ankara, Türkiye; [3] Kalyon PV, Ankara, Türkiye; [4] Kalyon PV, Ankara, Spain

1BV.1.12 Suitability and Validation of Different Lignosulfonates for Silicon Wafer Texturing in Photovoltaic Applications

Rocío Barrio Martín[1], Nieves González Peñalba[1], Ignacio Torres Almarza[1], Jose Javier Gandía Alabau[1], Rafael Benítez-Fernández[2], Francisco José Pérez-Zenteno[2], Enrique San Andrés[2], Rodrigo García-Hernansanz[2], Eric García-Hemme[2]

[1] CIEMAT, Madrid, Spain; [2] UCM, Madrid, Spain

1BV.1.13 Improved Sustainability of Heterojunction Cells by Nanometer Pyramid Texturization for Silicon

Sebastian Pingel[1], Katrin Krieg[1], Stefan Schmidt[1], Winfried Wolke[1], Andreas Wolf[1], Jonas De Rose[1], Benedikt Bläsi[1]

[1] Fraunhofer ISE, Freiburg, Germany

1BV.1.14 Laser Annealing for the Crystallization of Amorphous Silicon Layers in TOPCon Solar Cells

David Canteli[1], Rocio Barrio[2], Vladimir Garcia Rodriguez[3], Nieves Gonzalez[2], David Munoz-Martin[1], Ignacio Torres[2], Jose Javier Gandia[2], Carlos Molpeceres[1]

[1] UPM, Madrid, Spain; [2] CIEMAT, Madrid, Spain; [3] National Polytechnic Institute, Mexico City, Mexico

1BV.1.15 In-situ Plasma-Grown Tunnel Oxides via Noble-Gas (He, Ar) Diluted CO2 Precursors for TOPCon Silicon Solar Cells

Ignacio Torres[1], Rocío Barrio[1], Nieves González[1], J. Javier Gandía[1], Rafael Benítez-Fernández[2], Francisco J. Pérez-Zenteno[2], Enrique San Andrés[2], Rodrigo García-Hernansanz[2], Eric García-Hemme[2]

[1] CIEMAT, Madrid, Spain; [2] UCM, Madrid, Spain

1BV.1.16 Enhanced Light Trapping in Black Silicon: Comparative Study of Scalable Hybrid NaOH and H2SO4 Chemical Etching and Inductively Coupled Plasma Reactive Ion Etching (ICP-RIE)

Aleena Nadeem[1], Ozan Aydin[1], Gokhan Altiner[1], Agageldi Muhammetgulyyev[2], Ayca Berfin Aydogdu[2], Rasit Turan[1], Hisham Nasser[1]

[1] METU, Ankara, Türkiye; [2] CW Energy Research and Development Center, Antalya, Türkiye

1BV.1.17 PECVD Preparation of Silicon Carbide Layers as Passivating Contacts for POLO Solar Cells

Steffen Börnert[1], Frank Wünsch[1], Robby Peibst[2], Jan-Dirk Kähler[3], Thomas Pernau[3], Jan Krügener[1]

[1] Leibniz University Hannover, Hannover, Germany; [2] Leibniz University Hannover, Hamelin, Germany; [3] centrotherm international, Blaubeuren, Germany

1BV.1.18 Advanced TCAD Modelling of High-Efficiency Bifacial TOPCon Silicon Solar Cells

Savita Kashyap[1], Adarsh Kumar Mishra[1], Sanjeev Kumar[1], Arun Kumar Singh[1]

[1] Punjab Engineering College, Chandigarh, India

1BV.1.19 Laser-Assisted Doping of Crystalline Silicon Using Doped Amorphous Silicon Source for Local Electrical Property Control in Photovoltaic Applications

Narendra Bandaru[1], Asbjørn Moltke[2], Ole Bang[2], Rasmus Schmidt Davidsen[1]

[1] Aarhus University, Aarhus, Denmark; [2] DTU, Lyngby, Denmark

1BV.1.20 Influence of Inkjet Deposition Temperature on the Passivation and Stability of PEDOT:PSS/Amorphous Silicon Hybrid Silicon Structures

Narendra Bandaru[1], Devabharathi Nehru[1], Dheeraj Sah[1], Mohammadhossein Mohammadi[1], Roberto Boccardi[2], Rasmus Schmidt Davidsen[1]

[1] Aarhus University, Aarhus, Denmark; [2] DTU, Roskilde, Denmark

1BV.1.21 Interface Engineering of ALD-TiO_x Electron-Selective Contacts in Dopant-Free Silicon Heterojunction Solar Cells

Liqi Cao[1], Roel Theeuwes[2], Leonard Simeonov[2], Yifeng Zhao[1], Paul Procel Moya[1], Luana Mazzarella[1], Erwin Kessels[2], Olindo Isabella[1]

[1] Delft University of Technology, Delft, The Netherlands; [2] Eindhoven University of Technology, Eindhoven , The Netherlands

1BV.1.22 Low-Cost Conversion of Existing TOPCon Production Lines Toward High-Efficiency Back-Contact Solar Cells

Chun-Ping Lin[1], Han-Chen Chang[1], Sung-Yu Chen[1], Ying-Yuan Huang[2]

[1] Industrial Technology Research Institute, Tainan, Taiwan; [2] National Cheng Kung University, Tainan, Taiwan

1BV.1.23 Stability of Indium-Free Antireflective Layer Based on Aluminum-Doped Zinc Oxide for Heterojunction Solar Cells
Anthony Valla[1], Benjamin Thiriot[1], Frédéric Jay[1], Anne-Sophie Ozanne[1], Rémi Monna[1], Christine Denis[1], Florence Naudin[1], Wilfried Favre[1]
[1] CEA / INES, Le Bourget-du-Lac, France

1BV.1.24 Transparent Conductive Electrodes with Reduced Indium Content Based on Ultra-Thin ITO/SnO_2/ITO Stacks for Silicon Heterojunction Solar Cells
Emine Hande Ciftpinar[1], Corné Frijters[2], Astrid Gutjahr[1], Eric Kossen[1], Johannes Lambooij[2], L.J. (Bart) Geerligs[1]
[1] TNO, Petten, The Netherlands; [2] TNO, Eindhoven, The Netherlands

1BV.1.25 Synergistic Interface Engineering in Hybrid Silicon/Organic Solar Cells: the Role of 1D/2D Nanocomposites and Surface Texturing
Sergii Mamykin[1], Tetiana Lunko[1], Iryna Mamontova[1], Olga Kondratenko[1], Volodymyr Romanyuk[1]
[1] National Academy of Sciences of Ukraine, Kiev, Ukraine

1BV.1.26 Corona-Induced Field-Effect Passivation and Injection-Dependent Current Extraction in Carrier Selective Silicon Solar Cells
Rameeja T. Abdul Rasheed[1], Ajmal Mon A.[1], Aldrin Antony[1]
[1] Cochin University of Science and Technology, Ernakulam, India

1BV.1.27 Innovative Tin Oxide Deposition Solutions for In-free SHJ Solar Cells
Adeline Lanterne[1], Frédéric Jay[1], Pia Javiera Vasquez Rivera[2], Virginie Brizé[1], Florence Naudin[1], David Muñoz-Rojas[2]
[1] CEA / INES, Le Bourget-du-Lac, France; [2] CNRS, Grenoble, France

1BV.1.41 Reproducibility Challenges of Ultrathin Transparent Conductive Oxides in Perovskite–Silicon Tandem Solar Cells
Nan Sun[1], Vahdet Özyahni[1], Gaosheng Huang[1], Bingbing Chen[1], Jürgen Hüpkes[1], Alexander Eberst[1], Karsten Bittkau[1], Thomas Kirchartz[1], Kaining Ding[1]
[1] FZJ, Jülich, Germany

1BV.1.42 Direct Current Sputtered Ce-Doped In2O3 Thin Films for Silicon-Based Tandem Solar Cell Applications
Hyunju Lee[1], Yoshio Ohshita[2], Atsushi Ogura[1]
[1] Meiji University, Kanagawa, Japan; [2] Toyota Technological Institute, Nagoya, Japan

1BV.1.43 Optimizing the Optoelectronic Trade-off in TOPCon2 Bottom Cells for High-Efficiency Tandem Applications
Yiğit Mert Kaplan[1], Seda Kılıçkaya Ünver[1], Gökhan Altıner[1], Hisham Nasser[1], Raşit Turan[1]
[1] ODTÜ-GÜNAM, Ankara, Türkiye

1BV.1.44 Dopant Free Carrier Transport Layers for C-Si Heterojunction Solar Cells
Laura Lancellotti[1], Eugenia Bobeico[1], Marco Della Noce[1], Giuseppe Nasti[1], Elena Santoro[1], Gennaro Vincenzo Sannino[1], Pietro Scognamiglio[1], Iurie Usatii[1], Paola Delli Veneri[1], Lucia Vittoria Mercaldo[1]
[1] ENEA, Portici, Italy

1BV.1.45 Silver- and Indium-Free Half TBC IBC Silicon Bottom Cells for Tandem Applications
Veysel Unsur[1], Melisa Korkmaz Arslan[1], Seda Kilickaya[1], Busra Altinsoy[1], Mustafa Buyukguzel[1]
[1] ODTÜ-GÜNAM, Ankara, Türkiye

1BV.1.46 Performance Comparison of TOPCon2 and Silicon Heterojunction Based Tandems from 1 to 60 cm2 Scale
Julien Hurni[1], Kerem Artuk[2], Michele De Bastiani[2], Audrey Morisset[2], Quentin Jeangros[2], Bertrand Paviet-Salomon[2], Christian Wolff[1], Christophe Ballif[1], Franz-Josef Haug[1]
[1] EPFL, Neuchâtel, Switzerland; [2] CSEM, Neuchâtel, Switzerland

1BV.1.51 Plasma-Induced Control of Fixed Charges in PECVD SiN_x Films via N_2O Treatment
Ayşe Can[1], Seda Kılıçkaya Ünver[1], Hasan Hüseyin Canar[2], Gökhan Altıner[3], İlker Yıldız[4], Hisham Nasser[1], Raşit Turan[1]
[1] ODTÜ-GÜNAM, Ankara, Türkiye; [2] Aselsan, Ankara, Türkiye; [3] Middle East Technical University, Center for Solar Energy Research and Applications (ODTU-GUNAM), Ankara, Türkiye; [4] ODTÜ Central Laboratory, Ankara, Türkiye

1BV.1.52 Microscopic Characterization of SHJ Interdigitated Back-Contacts
Swarnendu Banerjee[1], Robert Hlaváč[1], Aleš Vlk[1], Roman Dvořák [1], Matěj Hývl [1], Antonín Fejfar [1], Boris Legradic [2], Loris Barraud [2], Niels Holm [2], Damien Lachenal [2], Martin Ledinský [1]
[1] Czech Academy of Sciences, Prague, Czech Republic; [2] Meyer Burger Research, Hauterive, Switzerland

1BV.1.53 Spatially Resolved Characterization of TOPCon Precursors and Copper-Plated Solar Cells via Photoluminescence Imaging
Gisele Alves dos Reis Benatto[1], Roberto Boccardi[1], Rodrigo Del Prado Santamaria [1], Markus Babin[1], Peter Behrensdorff Poulsen[1], Sune Thorsteinsson[1]
[1] DTU, Roskilde, Denmark

1BV.1.54 Performance Evolution of Aged Mono-Crystalline Silicon Solar Cells under Outdoor, Thermal, and Combined Stress Conditions
Jaeyoung Jang[1], Jeong-eun Jeon[2], Yoon-Sung Lee[1], Sumi Yang[1]
[1] Far East University, Eumseong-gun, South Korea; [2] Far East University, Eumseong-gun, CB, South Korea

1BV.1.55 A Reactive Molecular Dynamics Study of Oxygen Concentration Effects on Silicon Nanocrystal Growth
Genta Tamura[1], Kazuhiro Gotoh[2], Noritaka Usami[3], Takashi Tokumasu[1]
[1] Tohoku University, Sendai-shi, Japan; [2] Niigata University, Niigata-shi, Japan; [3] Nagoya University, Nagoya-shi, Japan

1BV.1.56 The Effect of Front-Contacting Configurations on Measuring SMBB TOPCon Solar Cell Efficiency
Yung-Tsung Liu[1], Yean-San Long[1], San-Yu Ting[1], Min-An Tsai[1], Cho-Fan Hsieh[1]
[1] ITRI, Hsinchu, Taiwan

1BV.1.57 Modeling I-V and Luminescence Characteristics of Bifacial Solar Cells Affected by Potential Induced Degradation using Griddler
Aysha Mahmood[1], Sune Thorsteinsson[1], Rodrigo Del Prado Santamaria[1], Gisele Alves dos Reis Benatto[1], Peter B. Poulsen[1], Sergiu V. Spataru[1]
[1] DTU, Roskilde, Denmark

1BV.1.58 Self-Calibrated Photoconductance Decay measurement: Application to TOPCon Precursor Structures
Gergely Havasi[1], David Krisztián[1], Ferenc Korsós[1], Saman Sharbaf[2], Lejo Joseph Koduvelikulathu[2]
[1] SEMILAB, Budapest, Hungary; [2] ISC Konstanz, Konstanz, Germany

1BV.1.60 Impact of the Intrinsic a-Si:H(i) Spacer Resistance on the Open Circuit Voltage and Temperature Coefficient of Heterojunction Silicon Solar Cells
Moustafa Y. Ghannam[1]
[1] Kuwait University, Safat, Kuwait

1BV.1.61 Non-Destructive Evaluation of Surface Recombination and Interface States in Textured Solar Silicon via Spectral Surface Photovoltage
Beyza Durusoy[1], Maaz Soomro[1], Stefan Lange[2], Nadine Schüler[3], Christian Hagendorf[1]
[1] Anhalt University of Applied Sciences, Köthen, Germany; [2] Fraunhofer CSP, Halle, Germany; [3] Freiberg Instruments, Freiberg, Germany

VISUAL PRESENTATIONS 2BV.2

10:30 - 12:00 Compound (Chalcogenide, Kesterite, III-V) and Organic Devices

2BV.2.1 Epitaxial 19.4% Efficient InGaP/GaAs/Si Triple-junction Solar Cell with 1.7 eV Wide Bandgap n-AlGaAs Buffer
Hyun-Beom Shin[1], Yeonhwa Kim[2], Yunki Min[2], In-Hwan Lee[3], Won Jun Choi[2], Ho Kwan Kang[1], Daehwan Jung[2]
[1] KANC, Suwon, South Korea; [2] KIST, Seoul, South Korea; [3] Korea University, Seoul, South Korea

2BV.2.2 Silver Introduction to Cu(In,Ga)Se2 to overcome the Copper-rich Growth Stage
Oliver Klement[1], Christian A. Kaufmann[2], Daniel Schildhammer[1], Damilola Adeleye[2], Felix Mai[3], Nikolaus Weinberger[1]
[1] University of Innsbruck, Innsbruck, Austria; [2] HZB, Berlin, Germany; [3] Berlin University of Applied Sciences, Berlin, Germany

2BV.2.3 Deposition and Characterization of High Mobility Titanium Doped Indium Oxide for Thin Film PV Devices
Ana Jurado Estrada[1], Kieran Curson[1], Samuel Machin[1], Luke Jones[1], Mustafa Togay[1], Jake Bowers[1], Michael Walls[1]
[1] Loughborough University, Loughborough, United Kingdom

2BV.2.4 Comparative Degradation Behavior of Emerging Photovoltaic Technologies under Indoor Storage
Özcan Bazkir[1], Hatice İlhan[2]
[1] National Metrology Institute, Kocaeli, Türkiye; [2] İzmir Institute of Technology, İzmir, Türkiye

2BV.2.5 Sustainable Magnetron-Sputtered Sub-Micrometre CIGSSe Flexible Solar Cells Via H2S Sulfurization and Inkjet Ag Grid Contacts
Ana R. Pires[1], André F. Violas[1], João B. Vilão[1], Rui Bastos[1], Andrés Perdomo[1], António J. N. Oliveira[1], Ricardo M. L. Silva[1], Xavier L. Pinheiro[1], Bárbara L. Sieira[1], Diogo Carvalho[1], Jennifer P. Teixeira[1], Paulo A. Fernandes[1], Pedro M. P. Salomé[1]
[1] INL, Braga, Portugal

2BV.2.6 Photovoltaic Properties of Hydroxy Minerals in Polymer Electrolytes on Dye-Sensitized Solar Cells
Mi-Ra Kim[1], Sungsoo Park[1]
[1] Dong-Eui University, Busan, South Korea

2BV.2.7 How the Molybdenum Process Influences the Growth of CZTS: a Comparative Study of Different Lab-Grown and Commercial Molybdenum Substrates
Alessandro Veneri[1], Ikram Anefnaf[1], Elisa Artegiani[1], Alessandro Romeo[1]
[1] University of Verona, Verona, Italy

2BV.2.8 Numerical Simulation of CIGS/Si Tandem Solar Cells
Juan Carlos Jimeno[1], Alejandro Garcia[1], Nekane Azkona[1], Vanesa Fano[1], Aloña Otaegi[1], Eneko Cereceda Moris[1], Rubén Gutiérrez[1], Federico Recart[1]
[1] EHU, Bilbao, Spain

2BV.2.9 Comparison of Sb2Se3 Thin Films Deposited by Vacuum Evaporation and Vapor Transport Deposition
Elisa Artegiani[1], Sharmiladevi Ramamoorthy[1], Alessandro Veneri[1], Mariyam Mukhtar[1], Alessandro Romeo[1]
[1] University of Verona, Verona, Italy

2BV.2.10 CdCl2 Treatment for Either Doping or Alloying Cu2ZnSn(S,Se)4 to Enhance the Solar Cell Performance
Alessandro Romeo[1], Prabeesh Punathil[2], Solidea Zanetti[1], Elisa Artegiani[1]
[1] University of Verona, Verona, Italy; [2] University of Northumbria, Newcastle, United Kingdom

2BV.2.11 Impact of AM1.5G Co-illumination on the Device Performance of Laser Power Converters
Sho Aonuki[1], Takaya Oshimo[2], Kotona Tabata[2], Takeru Yamada[2], Junichi Suzuki[3], Reo Aoyama[3], Shiro Uchida[3], Kouichi Akahane[4], Masato Suzuki[1], Natsuha Ochiai[1], Yukiko Suzuki[1], Kazuto Kashiwakura[1], Yuka Oshima[1], Kensuke Nishioka[2], Masakazu Arai[2], Yohei Toriumi[1], Madoka Takahashi[1]
[1] NTT, Musashino, Japan; [2] University of Miyazaki, Miyazaki, Japan; [3] Chiba Institute of Technology, Narashino, Japan; [4] National Institute of Information and Communications Technology, Koganei, Japan

2BV.2.12 Fabrication of High Efficient Alkali-Alloyed CZTSSe Solar Cells
Namunundari Otgontamir[1], Md Matiur Rahman[1], Md Hamin Sharif [1], Haehoon Jeong[1], JunHo Kim[1]
[1] Incheon National University, Incheon, South Korea

2BV.2.13 Enhanced Near-Infrared Photo-Absorption of Copper-Indium-Selenide Thin Film
Temujin Enkhbat[1], Hyun-Beom Shin[2], Ho Kwan Kang[2], Seongju Park[1], Jae-Hyung Jang[1]
[1] Korea Institute of Energy Technology, Naju, South Korea; [2] Korea Advanced Nanofab Center, Suwon, South Korea

2BV.2.14 Metallic Nanoparticles through Solid State Dewetting for Light Trapping in Ultrathin Solar Cells
Antonio J. N. Oliveira[1], Jennifer P. Teixeira[1], Bruna S. Tinoco[1], Enzo J. Ribeiro[1], André F. Violas[1], Vitor Lopes[1], Paulo A. Fernandes[1], Pedro M. P. Salomé[1]
[1] INL, Braga, Portugal

2BV.2.15 Broad Spectrum Absorption Enhancement in GaAs-based Quantum Dot Solar Cells with the Two-Dimensional Photonic Crystal Trapping Layer
Xiaoling Chen[1], Yidi Bao[1], Chunxue Ji[1], Xiaoyang Zhao[1], Wen Liu[1], Xiaodong Wang[1]
[1] Chinese Academy of Sciences, Beijing, China

2BV.2.16 New Approach to Enhance the Efficiency of Organic Solar Cells Using Azobenzene Derivatives
Beata Derkowska-Zielinska[1], Seyedeh Arasteh Jahani[1], Robert Czaplicki[1], Vitaliy Smokal[2], Oksana Krupka[3], Dorota Kowalska[1]
[1] Nicolaus Copernicus University in Toruń, Torun, Poland; [2] Taras Shevchenko National University of Kyiv, Kyiv, Ukraine; [3] University of Angers, Angers, France

VISUAL PRESENTATIONS 4BV.3

13:30 - 15:00 Solar Resource and Forecasting

4BV.3.1 Ensemble Learning and Model Transfer in Machine Learning Algorithms for Photovoltaics Performance Prediction
Nina Sophie Sturm[1], Marcus Rennhofer[2], Bernhard Kubicek[2], Stefan Übermasser[2]
[1] University of Vienna, Vienna, Austria; [2] AIT, Vienna, Austria

4BV.3.2 Diffuse Irradiance Modeling in Sub-Hourly PV System Yield Simulations
Michele Oliosi[1], Luca Antognini[1], Auriane Canesse[1], André Mermoud[1], Robin Vincent[1], Bruno Wittmer[1]
[1] PVsyst SA, Satigny, Switzerland

4BV.3.3 Satellite-driven Convolutional Neural Network for Near-Term Irradiance Forecasting to Support PV Power Nowcasting Models
Jacopo Baldacci[1], Ciro Lanzetta[1], Antonio Piazzi[1]
[1] I-EM, Livorno, Italy

4BV.3.4 Limitations of Typical Meteorological Year Datasets for High DC/AC PV Systems in Yield Assessments
Bassel Helmy[1], Scott McKecknie[2]
[1] Orsted, 2 Lochrin, United Kingdom; [2] Orsted, 2 Lochrin Square, United Kingdom

4BV.3.5 Improving Data Quality in Solar Monitoring: An Automated Cleaning Approach for Pyranometers and All-Sky Imagers
Andreas Boschert[1], Lorenz Glonner[1], Paul Matteschk[2], Frank Buttinger[1], Martin Heigl[1]
[1] Rosenheim Technical University of Applied Sciences, Rosenheim, Germany; [2] Wematics FlexCo, Salzburg, Austria

4BV.3.6 Implementation of Uncertainty Information to the CAMS Radiation Service Irradiance Estimates
Jorge Lezaca[1], Arindam Roy[1], Marion Schrödter-Homscheidt[1]
[1] DLR, Oldenburg, Germany

4BV.3.7 The Effect of Climatic Change on Austrian PV Production
Bernhard Kubicek[1], Marcus Rennhofer[1], Kristofer Hasel[1], Marianne Bügelmayer-Blaschek[1], Nina Sturm[1], Kerstin Haslehner[2], Manfred Dorninger[2]
[1] AIT, Vienna, Austria; [2] University of Vienna, Vienna, Austria

4BV.3.8 Vehicle Integrated PV Potential for Europe-Results of a European Wide Measurement Campaign
Christian Braun[1], Moditya Gupta[1], Barbaros Inak[1], Lenneke Slooff[2], Anna Carr[2]
[1] Fraunhofer ISE, Freiburg, Germany; [2] TNO, Den Haag, The Netherlands

4BV.3.9 All-Sky Images Foundation Models for PV-relevant Cloud Analysis and Irradiance Nowcasting
Yassine Ribouh[1], Andreas Boschert[2], Grit Behrens[1], Mike Zehner[2]
[1] Bielefeld University of Applied Science and Art, Minden, Germany; [2] Technical University of Applied Science, Rosenheim, Germany

4BV.3.10 Photovoltaic and Wind Power Forecasting Using Kernel Recursive Least Squares with WSN Based Data Acquisition
Sarvar Hussain Nengroo[1]
[1] KFUPM, Dharan, Saudi Arabia

4BV.3.11 Zero-Shot Foundation Models for Solar Power Forecasting: a Systematic Benchmarking Study
Mohamed Abdelmagid[1]
[1] Khalifa University, Abu Dhabi, United Arab Emirates

4BV.3.12 Short-Term PV Forecasting with Heterogeneous Sensor Data using Transfer Learning
Naheel Faisal Kamal[1], Amir Abdallah[1], Sertac Bayhan[1]
[1] Qatar Environment and Energy Research Institute (QEERI), Hamad Bin Khalifa University, Doha, Qatar, Doha, Qatar

4BV.3.13 Physics-Conditioned PatchGAN Refinement for Long-Horizon All-Sky Nowcasting and PV Irradiance Uncertainty
Naoufal El Atmioui[1], Andreas Boschert[2], Grit Behrens[1], Mike Zehner[2]
[1] Bielefeld University of Applied Science and Art, Minden, Germany; [2] Technical University of Applied Sciences, Rosenheim, Germany

4BV.3.14 SkyDiff: All Sky Scenario Nowcasting using Diffusion Models
Max Aragon[1], Quentin Paletta[2], Jose Gomez[1], Nicolas Courty[3], Yves-Marie Saint-Drenan[1]
[1] Mines Paris PSL, Sophia Antipolis, France; [2] European Space Agency, Frascati, Italy; [3] University Bretagne Sud, Vannes, France

4BV.3.15 Short-Term Multistep PV Power Forecasting Using Deep Learning: Performance Comparison of CNN–LSTM and Transformer Architectures
Caixia Li[1], Ziheng Liu[1], Pengfei Zhang[1], Xiaojing Hao[1]
[1] UNSW, Sydney, Australia

4BV.3.16 IEA PVPS Task 16 – Phase IV
Jan Remund[1], Manajit Sengupta[2], Stefan Wilbert[3], Elke Lorenz[4], Rodrigo Amaro e Silva[5], Yehia Eissa[6], Adam R. Jensen[7]
[1] Meteotest AG, Bern, Switzerland; [2] NLR, Boulder, United States of America; [3] German Aerospace Center, Almeria, Spain; [4] Fraunhofer ISE, Freiburg, Germany; [5] University of Lisbon, Lisbon, Portugal; [6] Mines Paris - PSL, Sophia Antipolis, France; [7] Technical University of Denmark, Lyngby, Denmark

4BV.3.17 Deep Learning-based Sky Image Analysis for Solar Irradiance Prediction in Arid Regions
Nassma Mohands[1], Dunia Bachour[1], Daniel Perez-Astudillo[1]
[1] Hamad Bin Khalifa University/Qatar Environment and Energy Research Institute, Doha, Qatar

4BV.3.18 Improving the National Solar Radiation Data Base using PSM V4
Manajit Sengupta[1], Yu-Konsta Xie[1], Aron Habte[1], Brandon Benton[1], Paul Edwards[1], Jaemo Yang[1], Michael Foster[2], Andy Heidinger[3]
[1] NLR, Golden, United States of America; [2] University of Wisconsin, Madison, United States of America; [3] NOAA, Madison, United States of America

4BV.3.19 Characterizing Temporal and Spatial Variability of DNI and GHI in Moroccan Mining Sites: Insights from Ben Guerir
Abdellatif Ghennioui[1], Mounir Abraim[1], Mohamed Smouni[1]
[1] Green Energy Park, Ben Guerir, Morocco

4BV.3.20 Evaluation of Data Augmentation Techniques for Overirradiance Event Detection in Photovoltaic Systems
Alan Rodrigues de Sousa[1], João Vìtor Fonseca Mendonca[1], Lucio Carlos Pimentel Paiva[2], Samira de Azevedo Santos Emiliavaca[1]
[1] SENAI, Natal, Brazil; [2] Casa dos Ventos, Fortaleza, Brazil

4BV.3.21 Quantification of Alpine Irradiance Peaks on PV Modules under Consideration of Aggregation Windows
Christof Bucher[1], Matthias Hügi[1], Vincent Guerdat[1], Marcus Rennhofer[2], Bernhard Kubicek[2], Jan Remund[3]
[1] Bern University of Applied Science (BFH), Burgdorf, Switzerland; [2] Austrian Institute of Technology (AIT), Wien, Austria; [3] Meteotest, Bern, Switzerland

4BV.3.22 Evaluating Pyranometer Uncertainties with Novel Tools
Bernhard Kubicek[1], Mariella Josefina Rivera Aguilar[2], Kazadzis Stelios[3], Bert Herteleer[4], Fredrik Edhborg[5], Marko Jankovec[6], Marcus Rennhofer[1]
[1] AIT, Vienna, Austria; [2] Fraunhofer ISE, Freiburg, Germany; [3] PMOD WRC, Davos, Switzerland; [4] SUPSI, Manno, Switzerland; [5] RISE, Borås, Sweden; [6] University of Ljubljana, Ljubljana, Slovenia

4BV.3.23 Temporal Downscaling of Solar Radiation at Different Spatial Scales: Larger Domains Ease the Task
Rodrigo Amaro e Silva[1]
[1] University of Lisbon, Lisbon, Portugal

4BV.3.24 Data-driven Solar Irradiance Forecasting under Aerosol Variability: Performance Analysis in Semi-Arid Region
Samira Abousaid[1], Abdelatif Ghennioui[1]
[1] Green Energy Park, Benguerir, Morocco

4BV.3.25 Impact of Multi-Instrument Quality Control on Reliability of Solar Measurements
Oliver Osvald[1], Peter Mihalik[1], Rastislav Hrncirik[1], Tomas Cebecauer[1], Marketa Hulik Jansova[1], Assa Camara[1], Katarina Blstak Catlosova[1], Martin Jakubik[1]
[1] Solargis, Bratislava, Slovakia

4BV.3.26 Analysis of Geographical Smoothening and Variability Reduction in a Cluster of Solar PV Plants
Rhythm Singh[1], Manoj Bisht[1]
[1] IIT, Roorkee, India

4BV.3.27 Satellite-Based Nowcasting with U-Net for Improving Blended Solar Irradiance Forecasting: a Tropical Island Case Study
Anthony Voitus[1], Clément Caron[1], Benjamin Adrien[1], Mathieu Turpin[1], Nicolas Sébastien[1], Nicolas Schmutz[1]
[1] Reuniwatt, Sainte-Clotilde, France

4BV.3.28 Joint Spatial and Temporal Modeling for Township-Level Photovoltaic Power Forecasting
Jhang Shuo Luo[1], Hsin Fu Huang[1], Ya-Ching Hsu[2], Winston H. Hsu[2]
[1] thingnario, Taipei, Taiwan; [2] National Taiwan University, Taipei, Taiwan

4BV.3.29 Assessing the Impact of Cloud Parameters on Solar Irradiance for PV Systems Using Keogram- and ASI-Based Analysis
Mike Zehner[1], Konrad Randl[1], Blerim Zeka[1], Fabian Pauls[1], Grit Behrens[2], Bernhard Mayer[3]
[1] Rosenheim Technical University of Applied Sciences, Rosenheim, Germany; [2] University of Applied Sciences Bielefeld, Minden, Germany; [3] LMU, Munich, Germany

VISUAL PRESENTATIONS 4BV.4

15:15 - 16:45 PV and Buildings

4BV.4.1 Vertical Photovoltaic Systems with Multi-Azimuth Orientation Integrated into Noise Barriers: Experimental, Modeling, and Economic Assessment
Matas Rudzikas[1], Juras Ulbikas[1], Algirdas Baležentis[1], Aušra Brokė[2], Tomas Barakauskas[2], Vitas Mačiulis[1]
[1] Applied Research Institute for Prospective Technologies, Vilnius, Lithuania; [2] House Tech Construction Company, Klaipėda, Lithuania

4BV.4.2 Colored BIPV Panels By Multilayer Interference Coatings: Tailored Lab and Outdoor Performance Monitoring
Fallon Colberts[1], Mustafa Abed Alrhman[1], Raymond Dresens[1], Roberto Habets[2], Daniel Mann[2], Stefan Hiller[1], Stefan Consten[1], Peter van Nijnatten[3], Serge Timmermans[3], Jurgen de Wolf[3], Chiraag Reddy[4], Pascal Buskens[2], Zeger Vroon[1]
[1] Zuyd University, Heerlen, The Netherlands; [2] TNO, Geleen, The Netherlands; [3] OMT Solutons, Eindhoven, The Netherlands; [4] Kameleon Solar, Roosendaal, The Netherlands

4BV.4.3 Simulation-based Study of Building Photovoltaics and Passive Cooling Strategies on Indoor Heat Stress: Integration and Sensitivity Analysis
Yingxin Feng[1], Guang Hu[1], Roel Loonen[1], Angele Reinders[1]
[1] Eindhoven University of Technology, Eindhoven, The Netherlands

4BV.4.4 Color Degradation of Wall-Mounted BIPV Modules in the Nordics Compared with Temperate Climates

Sigrid Rønneberg[1], Chang Chuan You[1], Bent Thomassen[1], Nathan Roosloot[1], Gaute Otnes[1]

[1] Institute for Energy Technology, Kjeller, Norway

4BV.4.5 Validation in Operation of Key Performance Indicators of BIPV Solutions for Decision-Makers

Simon Boddaert[1], Yoann Servant[1], Olaia Aurrekoetxea Arratibel[2], Julius Jacob[3], Simone Germani[4], Hervé Lamblot[5], Tatjana Vavilkin[6], Maria Jimenes[7], Tonis Eelma[8]

[1] CSTB, Sophia Antipolis, France; [2] TECNALIA, San Sébastien , Spain; [3] METABUILD, Berlin, Germany; [4] CEI, Milano, Italy; [5] SUNSTYLE, Paris, France; [6] SOLTECH, Genk, Belgium; [7] ONYX SOLAR, Avila, Spain; [8] IBS, Tartu, Estonia

4BV.4.6 Integrated Solar Roofing: Ceramic Tiles back with Style

Alicia Buceta[1], Jaime Polo[1], Daniel Sánchez[2], Roberto Díaz[3], María Martínez[2], Eugenia Zugasti[1], Jaione Bengoechea[1]

[1] FUNDACION CENER, Sarriguren, Spain; [2] ISFOC, Puertollano, Spain; [3] NOTIO, Toledo, Spain

4BV.4.7 Outdoor Performance Assessment of Aluminum-based PV-activated Façade Elements in Comparison to Glass-backsheet Photovoltaic Modules

Kevin Meyer[1], Stefan Bordihn[1], Wiebke Wirtz[1], Iris Kunze[1], Jonas Bollermann[1], Michael Siebert[1], Christof Basener[1], Fynn Klopp[2], Danny Lorenz[2], Henning Schulte-Huxel[1]

[1] ISFH, Emmerthal, Germany; [2] MN Metall, Neustadt (Holstein), Germany

4BV.4.8 Significance of Product Diversity in Building-Integrated Photovoltaic (BIPV) Modules and Associated Manufacturing Challenges

Thomas Friesen[1]

[1] Megasol Energie, Deitingen, Switzerland

4BV.4.9 Wind-Driven Rain Tightness of Building-Integrated Photovoltaic Systems: Experimental Investigations and Design Recommendations

Tom Melkert[1], Hedda Victoria Kielland[1], Gabriele Lobaccaro[1], Tao Gao[1], Bjørn Petter Jelle[1]

[1] NTNU, Trondheim, Norway

4BV.4.10 Semi-Transparent Line-Pattern Photovoltaics for BIPV Windows

Elias Peraticos[1], Vasiliki Paraskeva[1], Sumeet Santosh Mujumdar[1], Matthew Norton[1], Omur Bugra Gunduz[2], Ipek Gursel Dino[2], Francesco De Nicola[3], Nuno Rodrigues[4], Sascha Sadewasser[4], Pedro Anacleto[4], George E. Georghiou[1], Maria Hadjipanayi[1]

[1] University of Cyprus, Lefkosia, Cyprus; [2] METU, Ankara, Türkiye; [3] ISM-CNR, Roma, Italy; [4] International Iberian Nanotechnology Laboratory, Braga, Portugal

4BV.4.11 Study on Improvement of Power Generation for a Semi-transparent Photovoltaic Module Equally Arranged Linear Bifacial Solar Cells

Kazuhiko Umeda[1], Nobusato Kobayashi[1], Akira Yamaguchi[2], Sadaaki Miyajima[1]

[1] TAISEI , Tokyo, Japan; [2] TAISEI, Tokyo, Japan

4BV.4.12 High-Resolution Urban Microclimate and Solar Potential Modeling: a Case Study of Strijp-S, Eindhoven

Guang Hu[1], Roel Loonen[1], Angèle Reinders[1]

[1] Eindhoven University of Technology, Eindhoven, The Netherlands

4BV.4.13 A Multi-Criteria Decision Framework for Early-Stage Feasibility Assessment of Building-Integrated Photovoltaics in India

Shantanu Roy[1], Saptak Ghosh[2], Madhusree Bhattacharjee[1]

[1] CSTEP, Noida, India; [2] CSTEP, Bengaluru, India

4BV.4.14 Experimental Assessment of Power Optimizers in Small-String Vertical Façade BIPV

Junyoung Lee[1], Dongsu Kim[1], Ruda Lee[1], Gyeong Yun[1], Jongho Yoon[1]

[1] Hanbat National University, Daejeon, South Korea

4BV.4.15 A Design-driven Framework for Photovoltaic Integration in the Urban Built Environment

Lucia Montoni[1], Yingxin Feng[2], Guang Hu[3], Roel Loonen[2], Angele Reinders[4], Antonella Trombadore[1]

[1] University of Florence, Florence, Italy; [2] Eindhoven Uiversity of Technology, Eindhoven, The Netherlands; [3] Eindhoven Unversity of Technology, Eindhoven, The Netherlands; [4] Eindhoven University of Technology, Eindhoven, The Netherlands

4BV.4.16 From Modeling to Operation: Experimental Validation of Different Control Strategies for BAPV-T Ventilation

Iñaki Cornago[1], Aritz Legarrea[1], Jaione Bengoechea[1], Mikel Ezquer[1]

[1] FUNDACION CENER, Sarriguren, Spain

4BV.4.17 CALECHE: Performance Prediction of Photovoltaic Installations for Heritage Buildings Demonstrations

Ya-Brigitte Assoa[1], Laure-Emmanuelle Perret[2], Keith Boxer[3], Marco Larcher[4], Dario Bottino[4], Nina Hunter[5], Virginie Renzi[1], Stephanie Petit[6], Etienne Wurtz[1], Rickard Nygren[3], Barbara Vogt[3], Daniela Palomba[7]

[1] CEA / INES, Le Bourget-du-Lac, France; [2] LMNT Consultancy, Neuchâtel, Switzerland; [3] White Arkitekter, Gothenburg, Sweden; [4] EURAC Research, Bolzano, Italy; [5] Munster Technological University, Cork, Ireland; [6] DOWEL Innovation, Valbonne Sophia Antipolis, France; [7] University of Napoli Federico II, Naples, Italy

4BV.4.18 Colour-Accurate, Angle-Resolved Visualisation of BIPV Installations

Janina Willmann[1], Helen Rose Wilson[1], Bruno Bueno[1]

[1] Fraunhofer ISE, Freiburg, Germany

4BV.4.19 Yield Optimization of Building-Integrated Photovoltaics: Integration of Realistic Shading Behavior Using a Digital Twin

Fabian Gruber[1], Maximilian Engel[1], Dennis Huschenhöfer[1], Heiko Wirth[1]

[1] ZSW, Stuttgart, Germany

4BV.4.20 Overloads in Building Electrical Installations caused by Plug-and-Play Photovoltaic Systems

David Joss[1], Christof Bucher[1]

[1] Berne University of Applied Science, Burgdorf, Switzerland

4BV.4.21 Performance–Color Trade-Off in Photonic-Glass-Based Colored PV Modules for BIPV Applications

Parisa Sharif[1], Ilknur Ozbayrak[2], Sahin Coskun[3], Husnu Emrah Unalan[2], Alpan Bek[2], Talat Ozden[1]

[1] ODTU-GUNAM, Ankara, Türkiye; [2] METU, Ankara, Türkiye; [3] ESOGU, Eskisehir, Türkiye

4BV.4.22 Performance Assessment of two Solar PV Power Plants at Cuenca University Campus
Aaron Ortiz-Pena[1], Mahamadou Abdou-Tankari[2], Andrés Honrubia-Escribano[1], Emilio Gómez-Lázaro[1]
[1] University of Castilla-La Mancha, Albacete, Spain; [2] UPEC , Creteil, France

4BV.4.23 Performance Loss Rates of a Vertical cBIPV Test Facade after 3.5 Years of Operation
Nanna Lysgaard Andersen[1], Yuli Ding[1], Markus Babin[1], Sune Thorsteinsson[1]
[1] DTU, Roskilde, Denmark

4BV.4.24 Lightweight BIPV Façade Modules: Innovation and Performance Approach
Fabio Parolini[1], Leire Herrero[2], Francisco J. Cano[2], Giovanni Bellenda[1], Dominika Chudy[1], Jamal Abdul Ngoyaro[1], Claudio Pirotta[3], Stefano Magaddino[3], Francesco Frontini[1]
[1] SUPSI, Mendrisio, Switzerland; [2] Tecnalia, San Sebastián, Spain; [3] PIZ, Cosio Valtellino, Italy

4BV.4.25 Structural Durability and Performance Overview of PV Noise Barrier Projects in Lithuania
Paulius Laurikėnas[1], Julius Denafas[1], Povilas Lukinskas[1], Pascal Romer[2], Andreas Beinert[2]
[1] SoliTek R&D, Vilnius, Lithuania; [2] Fraunhofer ISE, Freiburg, Germany

4BV.4.26 Abstract of Exploring Energy Efficiency Procurement Strategy (ESCO Model) @ Saudi Aramco NJBP Plant
Riyadh M. AL-Zahrani[1]
[1] Saudi Aramco, Thuwal, Saudi Arabia

VISUAL PRESENTATIONS 1BV.5

17:00 - 18:30 Silicon Material Science and Technology | Manufacturing of Silicon Cells

1BV.5.1 Process-Engineered Nano-Silicon Particles from End-of-Life Photovoltaic Waste with Controlled Metal Impurities for High-Performance Lithium-Ion Batteries
Ju Hee Son[1], Jin-Seok Lee[1]
[1] KIER, Daejeon, South Korea

1BV.5.2 Wafer Thermal Treatment: a Way to Improve Bulk Quality of Wafer made from Recycled Silicon from PV Module
Mickael Albaric[1], Etienne Pihan[1], Nicolas Enjalbert[1], Saliha Edouard[1]
[1] CEA / INES, Le Bourget-du-Lac, France

1BV.5.3 Electron Irradiation-Induced Degradation of SHJ Cells for the Low Earth Orbit Constellation Application
Fanying Meng[1], Yue Yuan[1], Qiang Shi[1], Zhengxin Liu[1]
[1] CAS, Shanghai, China

1BV.5.4 Defect Characterisation and Lifetime Stability in Gallium-Doped Crystalline Silicon for Stable High-Efficiency Solar Cells
Marija Demicoli[1], Aaron Piculo Perez[1], Nurhayat Yıldırım[2], Bülent Arıkan[3], Melisa Korkmaz Arslan[3], Adela Veronica Gonzalez Perez[1], Ece Çamkara[2], Meriç Çalışkan Arslan[2], Raşit Turan[3], Luciano Mule' Stagno[1]
[1] University of Malta, Marsaxlokk, Malta; [2] KalyonPV Research and Development Center, Ankara, Türkiye; [3] Middle East Technical University, Center for Solar Energy Research and Applications (ODTU-GUNAM) and Middle East Technical University, Ankara, Türkiye

1BV.5.5 Czochralski Crystal Puller for PV Ingot Production Including Machine Learning Driven Process Automation
Frank Mosel[1], Michael Haydn[1], Christoph Grammig[1], Peter Richert[1], Olli Anttila[2], Oyvind Nielsen[2]
[1] PVA Crystal Growing Systems, Wettenberg, Germany; [2] CZ-Tech, Tarnasen, Norway

1BV.5.6 A Metal- and Ceramic-Impurity Controlled Silicon Material Recovery Process from Photovoltaic Waste and Its Conversion to Silicon Nitride
Jin-Seok Lee[1], Seong-Pyo Lee[1], Gi-Hwan Kang[1]
[1] KIER, Daejeon, South Korea

1BV.5.7 A Theoretical-Experimental Model for High-Temperature Nitrogen Diffusion and Defect Suppression in Monocrystalline Silicon Wafers
Veronica Gonzalez[1], Marija Demicoli[1], Luciano Mule'Stagno[1]
[1] University of Malta, Marsaxlokk, Malta

1BV.5.8 Reducing Kerf Loss in Industrial Wafering: Impact of Tungsten Diamond Wire on Yield and Cost
Çağrı Taha Delikanli[1], Gamze Çekerek[1], Özlem Coskun[1], Kaan Görgisen[1], Yasemen Deniz[1], Runahi Altintas[1], Meriç Çaliskan Arslan[1]
[1] KalyonPV, Ankara, Türkiye

1BV.5.9 Investigating the Role of Hydrogen in UV-induced Degradation and Recovery in p-type c-Si Structures
Aeron Johns[1], Muhummad Umair Khan[1], Alison Ciesla[1], Lahiruni Ranasinghe[1], Chandany Sen[1], Bram Hoex[1]
[1] UNSW, Sydney, Australia

1BV.5.10 Addressing UVID in TOPCon Solar Cells by Engineering the Front Surface Dielectric Stack
Muhammad Umair Khan[1], Xinyuan Wu[1], Aeron Johns[1], Chandany Sen[1], Baochen Liao[2], Alison Ciesla[1], Haoran Wang[1], Xutao Wang[1], Bram Hoex[1]
[1] UNSW, Kensington, Australia; [2] Nantong University, Nantong, China

1BV.5.25 Triangular Front Contacts on Heterojunction Solar Cells: Performance and Fabrication
Jonas Valentijn[1], Rebecca Saive[1]
[1] University of Twente, Enschede, The Netherlands

1BV.5.26 Silane- and Phosphine-free PVD Process Technologies for Industrial TOPCon Solar Cells
Eric Schneiderlöchner[1], Volker Linß[1], Tina Dietsch[1], Uwe Graupner[1], Sebastian Gatz[1], Henning Nagel[2], Winfried Wolke[2], Pierre Saint-Cast[2], Sebastian Mack[2]
[1] VON ARDENNE , Dresden, Germany; [2] Fraunhofer ISE, Freiburg, Germany

1BV.5.27 Process Optimization of Boron Diffusion via In-situ Central Gas Injection System to Eliminate B2O3 Byproducts and Enhance Cell Efficiency

Cheng-Wen Kuo[1], Ta-Ming Kuan[1], Yung-Chih Li[1], Chun-Wei Lee[1], Wei-Lo Chueh[1], Li-Guo Wu[1], Cheng-Yeh Yu[1]

[1] TSEC Corporation, Hsinchu, Taiwan

1BV.5.28 Achieving Module Ready Silver-lean TOPCon Cells with Copper Electroplating

Jonas Eckert[1], René Haberstroh[1], Christian Schmiga[1], Damian Brunner[2], Mathias Kamp[2], Dirk Eberlein[1], Sven Kluska[1]

[1] Fraunhofer ISE, Freiburg, Germany; [2] RENA Technologies, Freiburg, Germany

1BV.5.29 Modeling the Influence of Bipolar Waveform Modulation on SiH_4–H_2 Plasmas for Amorphous Silicon Deposition

Tim Gehring[1], Mateusz Wiosna[2], Mohammad Afaque Hossain[1], Daniel Loch[1], Michalina Perron[2], Wojciech Gajewski[2]

[1] TRUMPF Hüttinger, Freiburg, Germany; [2] TRUMPF Hüttinger, Zielonka, Poland

1BV.5.30 Industrial-Compatible Selective Patterning of poly-Si/SiOx Passivating Contacts Using Screen-Printed Etch-Resist Masking

Eni Muka[1], Seda Kılıçkaya Ünver[1], Yiğit Mert Kaplan[1], Gökhan Altiner[1], Agageldi Muhammetgulyyev[2], Ayca Berfin Aydogdu[2], Hisham Nasser[1], Raşit Turan[1]

[1] ODTÜ-GÜNAM, Ankara, Türkiye; [2] CW Energy Research and Development Center, Antalya, Türkiye

1BV.5.31 Laser Scribing of Semitransparent Amorphous Silicon Cells for Thin-Film Module Interconnection

Fernando Anguiano[1], David Canteli[2], David Munoz-Martin[2], Gustavo Alvarez-Suarez[3], Gerard Masmitja[3], Pau Estarlich[3], Cristobal Voz[3], Gilberto Gomez Rosas[1], Miguel Morales[2], Carlos Molpeceres[2]

[1] University of Guadalajara, Guadalajara, Mexico; [2] UPM, Madrid, Spain; [3] UPC, Barcelona, Spain

1BV.5.32 Selective Poly-Si Patterning via 532nm Picosecond Laser and Alkaline Etching

Shojaa Abusakha[1], Bülent Arıkan[1], Yiğit Mert Kaplan[1], Gökhan Altıner[1], Hisham Nasser[1], Raşit Turan[1]

[1] ODTÜ-GÜNAM, Ankara, Türkiye

1BV.5.33 Seed Layer for Ni/Cu Plated Metallization of Wet Etch Opened TOPCon Solar Cells: Parameters Optimization and Nickel Silicide Formation

Roberto Boccardi[1], Gisele Alves dos Reis Benatto[1], Clara Bolette Brendstrup Møller[1], Irene Tosi[2], Peter Torben Tang[2], Io Mizushima[3], Rasmus Schmidt Davidsen[4], Peter Behrensdorff Poulsen[1], Sune Thorsteinsson[1]

[1] DTU, Roskilde, Denmark; [2] IPU, Virum, Denmark; [3] Elplatek, Espergærde, Denmark; [4] Aarhus University, Aarhus, Denmark

1BV.5.34 Evaluating Curing Mechanisms in Copper Based Low-Temperature Metallization Pastes for Solar Cells

Oumaima Mhirsi[1], M. Noah Wengenmeyr[1], Jonas Bartsch[1]

[1] Fraunhofer ISE, Freiburg, Germany

1BV.5.35 Busbarless TOPCon Solar Cell Design with Finger-Bypass Connections and Ribbon Composition Optimization

Mert Kahraman[1], Halil Eldemir[1]

[1] Kalyon Solar Technologies Production, Ankara, Türkiye

Wednesday, 16. September 2026

VISUAL PRESENTATIONS 4CV.1

13:30 - 15:00 Design, Engineering and Installation of PV Systems; BoS

4CV.1.1 Impact of Albedo Parameterization on Bifacial Gain Estimation: A Comparative Study on a Utility-Scale PV Plant in Sicily
Ida Bruno[1], Camilla Lops[1], Mariano Pierantozzi[1], Sergio Montelpare[1]
[1] University "G. D'Annunzio" of Chieti-Pescara, Pescara, Italy

4CV.1.2 Simplified Methodology for Estimating the Shading Effect in Rooftop PV Potential in the Framework of a Web Platform for Energy Communities in Catalonia
Marina Calcagnotto[1], Jordi Pascual[1], Joana Ortiz[1], Jaume Salom[1]
[1] IREC, Sant Adrià de Besòs, Spain

4CV.1.3 From Steady-State to Transient: Implications of Subhourly Temperature Modelling in PVsyst
Auriane Canese[1], Luca Antognini[1], André Mermoud[1], Michele Oliosi[1], Robin Vincent[1], Bruno Wittmer[1]
[1] PVsyst, Satigny, Switzerland

4CV.1.4 Modeling Solar PV Glare and Its Implications for Aviation Operations at Marmul Airport, Oman
Mazin Al Shidhani[1], Waleed Al Washahi[1]
[1] Petroleum Development Oman, Muscat, Oman

4CV.1.5 Proposal for Structural Serviceability Criteria for Single-Axis PV Tracker
Arianna di Mauro[1], Max Dinkelaker[1], Alf Oschatz[1]
[1] sbp sonne, Stuttgart, Germany

4CV.1.6 First Standard for Plugin-PV and Further Development in Germany
Udo Siegfriedt[1], Ralf Haselhuhn[1]
[1] Deutsche Gesellschaft für Sonnenenergie LV Berlin Brandenburg, Berlin, Germany

4CV.1.7 New Guideline for Critical Glare along German Highways and its Implication for Mitigation Measures
Anne Forstinger[1], Marvin Listl[1], Giorgio Bardizza[2], Magnus Herz[1]
[1] TÜV Rheinland, Cologne, Germany; [2] TÜV Rheinland, Milan, Italy

4CV.1.8 Smart Tracker Control: a new Autonomous Architecture Enabling Safer, Faster and More Resilient Solar Tracker
Giuseppe Demofonti[1], Andrea Monni[1], Matteo Frapparelli[1], Giammarco Andriulli[1]
[1] Valmont Solar - Convert Italia, Rome, Italy

4CV.1.9 PV Balancer, the Ultimate Solution for High Performance Solar Modules Systems with and without Shade
Nicolaas J.J. Dekker[1], Simona Villa[2], Menno N. van den Donker[3], Michiel Roelofs[4]
[1] TNO, Petten, The Netherlands; [2] TNO, Eindhoven, The Netherlands; [3] Durin, Weert, The Netherlands; [4] Taylor Technologies, Eindhoven, The Netherlands

4CV.1.10 Inverter loading: A Regional Analysis
Rodrigo Amaro e Silva[1], Carolina Crespo[2]
[1] University of Lisbon, Faculty of Sciences, Instituto Dom Luiz, Lisboa, Portugal; [2] University of Lisbon, Lisboa, Portugal

4CV.1.11 Solarfarmer Proven Accuracy for Bankable Energy Assessments
Luca Vignoni[1], Nathalia Ferrari[2]
[1] DNV, Barcelona, Spain; [2] DNV, Porto Alegre, Brazil

4CV.1.12 Comprehensive Performance Assessment of Bifacial Photovoltaic Modules Considering Ground Albedo and Installation Conditions
Dongsu Kim[1], Junyoung Lee[1], Wonseok Choi[1], Hyunjoong Kim[1], Jongho Yoon[1]
[1] Hanbat National University, Daejeon, South Korea

VISUAL PRESENTATIONS 2CV.2

15:15 - 16:45 New Materials, Devices and Conversion Concepts | New Modelling and Characterisation Techniques

2CV.2.1 Selective Laser Ablation of Copper Nitride Thin Films for Photovoltaic Applications
David Canteli[1], Andrés de Diego[2], Susana Fernández[3], Orlando Guarneros[4], Cristina Munoz-Garcia[2], Jose Javier Gandia[3], Carlos Molpeceres[2]
[1] Technical University of Madridrsidad Politécnica de Madrid, Madrid, Spain; [2] Technical University of Madrid, Madrid, Spain; [3] CIEMAT, Madrid, Spain; [4] Autonomous University of San Luis Potosí, San Luís Potosí, Mexico

2CV.2.2 Wide-Bandgap p-Type $BaCu_4S_3$ Thin Films via Sputtering–Sulfurization
Younes Lablali[1], Olivier Donzel-Gargand[2], Jonathan J. Staaf Scragg[2], Mohammed Makha[1]
[1] Mohammed VI Polytechnic University, Ben Guerir, Morocco; [2] Uppsala University, Uppsala, Sweden

2CV.2.3 Van Der Waals Assembled Schottky-Junction Solar Cells Based on Substitutionally Doped p-Type MoS_2
Jorge Rodríguez-Muro[1], Elvira Cánovas[1], Inés Durán[1], Rafailia Rountou[1], Der-Yuh Lin[2], Elisa Antolín[1], Simon A. Svatek[1]
[1] UPM, Madrid, Spain; [2] National Changhua University of Education, Changhua, Taiwan

2CV.2.4 Synthesis of Zinc Oxide Quantum Dots as Downshifting Materials for Enhanced Photovoltaic Performance
Nazim Aslam[1], Valentina Diolaiti[1], Leonardo Sollazzo[1], Donato Vincenzi[1]
[1] University of Ferrara, Ferrara, Italy

2CV.2.5 Hyperuniform Nanopatterning by Polymer-blend Lithography for Light-trapping in Solar Cells
Simon Ryckaert[1], Sylvain Finot[2], Jeronimo Buencuerpo[3], Inès Revol[4], Stéphane Collin[1]
[1] C2N, Palaiseau, France; [2] IPVF, Palaiseau, France; [3] IMN-CSIC, Madrid, Spain; [4] LAAS, Toulouse, France

2CV.2.6 Plasmonic Enhancement of Perovskite Absorber Layers Using Stable Metal Nanoparticles
Mohammad Istiaque Hossain[1], Alaa Elsafi[1], Brahim Aissa[1]
[1] QEERI, Doha, Qatar

2CV.2.7 Resonant Nanostructures for Colored Photovoltaics
Tom Veeken[1], Cathalijne Hupkens[1], Evert Bende[2], Albert Polman[1]
[1] AMOLF, Amsterdam, The Netherlands; [2] Solarix, Weesp, The Netherlands

2CV.2.8 III-V Growth on Patterned Graphene for Transferable Thin-Films
Naomie Messudom [1], Carlos Macìas[1], Antonella Cavanna[1], Ali Madouri[1], Gilles Patriarche[1], Nathaniel Findling[1], Stefano Pirotta[1], Jean-Baptiste Rodriguez[2], Laurent Travers[1], Nathalie Bardou[1], Stéphane Collin[1], Jean-Christophe Harmand[1], Amaury Delamarre[1]
[1] CNRS, Palaiseau, France; [2] CNRS, Montpellier, France

2CV.2.9 Laser Patterning of MoO_x-Based DMD Electrodes for Photovoltaic Applications: Thresholds and Process Windows
Daniele Arduino[1], David Canteli[2], David Munoz-Martin[2], Umer Aziz[3], Ana Luz Muñoz-Rosas[3], Julià Lopez-Vidrier[3], Joan Bertomeu[3], Miguel Morales[2], Carlos Molpeceres[2]
[1] Polytechnic University of Turin, Torino, Italy; [2] UPM, Madrid, Spain; [3] University of Barcelona, Barcelona, Spain

2CV.2.25 Dual-Chopping Spectral Responsivity System for Advanced Photovoltaic Device Calibration
Blago Mihaylov[1], Harald Müllejans[1], Ewan D. Dunlop[1]
[1] European Commission, Ispra, Italy

2CV.2.26 Interpretable Physics-informed Bayesian Optimization in Photovoltaic Materials Acceleration Platforms
Joseph Chakar[1], James Connolly[2], Stefania Cacovich[3], Jean-Paul Kleider[2], Jean-François Guillemoles[3], Jean-Baptiste Puel[4], Philip Schulz[3]
[1] IPVF, Palaiseau, France; [2] CentraleSupelec (GeePs), Gif-sur-Yvette, France; [3] CNRS, Palaiseau, France; [4] EDF, Palaiseau, France

2CV.2.27 Varied Intensity I-V Measurement of the Emerging PV under Indoor Lighting
Yean-San (Mickey) Long[1], Yung-Tsung Liu[1], San-Yu Ting[1], Min-An Tsai[1], Cho-Fan Hsieh[1]
[1] ITRI, Hsinchu, Taiwan

2CV.2.28 First-Principles Investigation on the Influence of Molecular Orientation, Defects, and Doping on the Optical Properties of MAPbI3
Engin Torun[1], Paul Procel Moya[1], Luana Mazzarella[1], Olindo Isabella[1], Ferdinand Grozema[1], Rudi Santbergen[1]
[1] Delft University of Technology, Delft, The Netherlands

2CV.2.29 Materials Chemical Composition Impacts on the Band Alignments: the Case of the 3D/2D Perovskite Interfaces
Philippe Baranek[1]
[1] EDF R&D, Palaiseau, France

2CV.2.30 Understanding the Role of Haze in Indoor Perovskite Solar Cells
Eugenia Zugasti[1], Alicia Buceta[1], Cristina Pinto[1], Iñaki Cornago[1], Asier Murillo[1], Jaione Bengoechea[1], Antonio Urbina[2]
[1] CENER, Sarriguren, Spain; [2] UPNA, Pamplona, Spain

2CV.2.31 Advanced Synchrotron X-Ray and Neutron Techniques to Reveal Early-Stage Degradation Mechanisms in PV Devices
Hugo Lajoie[1], Tristan Gageot[1], Romain Couderc[1], Pierre Everaere[2], Thu Nhi Tran Caliste[2], Edward Mitchell[2], Thomas Saerbeck[3], Mark Robert Johnson[3], Ioannis (John) A. Tsanakas[1]
[1] CEA / INES, Le Bourget-du-Lac, France; [2] ESRF, Grenoble, France; [3] ILL, Grenoble, France

2CV.2.32 Disentangling Ion Migration from Artifacts in High-Fidelity ToF-SIMS Depth Profiling of Perovskite Solar Cells
Nico Fransaert[1], Jean V. Manca[1], Shabnam Ahadzadeh[1], Bart Ruttens[2], Jan D'Haen[1], Dirk Valkenborg[1], Bart Cleuren[1], Bart Vermang[1], Aslihan H. Babayigit[1]
[1] Hasselt University, Diepenbeek, Belgium; [2] Imec, Diepenbeek, Belgium

2CV.2.33 Spatial and Spectral Analysis of Short-Term Changes in Perovskite Photoluminescence Signal via Hyperspectral Imaging
Ivar Loland Råheim[1], Åsmund Cornelius Hamre[1], Espen Olsen[1]
[1] NMBU, Ås, Norway

2CV.2.34 Quantifying the Mobile Ion Density and Mobility in Perovskite Solar Cells with Impedance Spectroscopy
Fransien Elhorst[1], Yieon Park[1], Patricia Martin Fernandez[1], Javier Sebastián Alonso[2], Henk Bolink[2], Jan Anton Koster[1]
[1] University of Groningen, Groningen, The Netherlands; [2] University of Valencia, Valencia, Spain

2CV.2.35 Impedance Spectroscopy on Perovskite Solar Cells: Why is Short-Circuit Better than Open-Circuit?
Sander Heester[1], Natália P. Neme[1], L. Jan Anton Koster[1]
[1] University of Groningen, Groningen, The Netherlands

2CV.2.36 Improving Surface Photovoltage Measurements in Photovoltaic Materials by Synchronized Modulation KPFM
Zeinab Eftekhari[1], Ariane Ufer[2], Ursula Wurstbauer[2], Rebecca Saive[1]
[1] University of Twente, Enschede, The Netherlands; [2] University of Münster, Münster, Germany

2CV.2.37 Multisource LED Solar Simulation for Accurate and Wavelength-Resolved Photovoltaic Characterization
Reza Khodabakhsh[1]
[1] G2V Optics, Edmonton, Canada

2CV.2.38 Mapping Carrier Dynamics: Combining Time-Resolved Photoluminescence and Spatial Imaging for Advanced Semiconductor Research
Emilio Gutierrez-Partida[1], Eugeny Ermilov[1], Volker Buschmann[1], Christian Oelsner[1], Felix Koberling[1], Jürgen Breitlow[1], Rainer Erdmann[1]
[1] PicoQuant, Berlin, Germany

VISUAL PRESENTATIONS 2CV.3

17:00 - 18:30 Perovskite-based Tandem and Multijunction Devices | Perovskites

2CV.3.1 All-Perovskite Tandem Solar Cells
Dewei Zhao[1]
[1] Sichuan University, Chengdu, China

2CV.3.2 Up-Scaling Perovskite Growth using Hybrid Methods for Silicon/Perovskite Tandem Solar Cells
Kristell Carreric[1], Polyxeni Tsoulka[1], Louis Grenet[2], Elodie Gerente[2], Solenn Berson[1]
[1] CEA / INES, Bourget du Lac, France; [2] CEA, Grenoble, France

2CV.3.3 Comparative Studies of III-V/Si and Perovskite/Si Tandem Solar Cells for Solar-powered Vehicle Applications
Masafumi Yamaguchi[1], Tatsuya Takamoto[2], Takashi Mabuchi[3], Seira Yamaguchi[3], Kenichi Okumura[3], Ryo Ozaki[1], Nobuaki Kojima[1], Yoshio Ohshita[1]
[1] Toyota Technological Institute, Nagoya, Japan; [2] University of Miyazaki, Miyazaki, Japan; [3] Toyota Motor Corporation, Toyota, Japan

2CV.3.4 Two-Step Crystallization Modulation of Wide-Bandgap Perovskite Films on Commercially Compatible Crystalline Silicon for High-Efficiency Perovskite-Silicon Tandem Solar Cells
Lin Wu[1], Jiawei Zhang[1], Jiawen Li[1], Haowen Luo[1], Yifeng Zhang[1], Yuchao Hu[1]
[1] Tongwei Solar, Chengdu, China

2CV.3.5 High Volume Manufacturing of Perovskite Cell Stacks using Linear Evaporators
Jens Baumann[1], Frank Löffler[1], Bruno Heimke[1], Martin Fischer[1]
[1] VON ARDENNE, Dresden, Germany

2CV.3.6 Enhancing the Electrical Properties of nc-Si:H / NiOx Interfaces in Perovskite-Silicon Tandem Cells using Aluminum doped Nickel Oxide Deposited by ALD
Yann Pinal[1], Chandralina Patra[2], Damien Coutancier[1], Solène Béchu[3], Muriel Bouttemy[3], Jose Alvarez[4], Erik Johnson[2], Nathanaelle Schneider[1]
[1] IPVF, Palaiseau, France; [2] LPICM, Palaiseau, France; [3] ILV-UVSQ, Versailles, France; [4] GEEPS, Gif sur Yvette, France

2CV.3.7 Perovskite Coating Process Control: from Laboratory Diagnostics to Industrial Scale Metrology Systems
Jens Baumann[1], Jona Kurpiers[2], Christian Camus[3], Löffler Frank[1], Heimke Bruno[1]
[1] VON ARDENNE, Dresden, Germany; [2] HZB, Berlin, Germany; [3] LayTec, Berlin, Germany

2CV.3.8 Methylammonium Free Perovskite Top Cell via 2-step Hybrid Method for Perovskite/Si Tandem Application
Anna De Girolamo Del Mauro[1], Manuela Ferrara[1], Gennaro V. Sannino[1], Maria Federica Caso[1], Marco Della Noce[1], Eugenia Bobeico[1], Pietro Scognamiglio[1], Iurie Usatii[1], Paola Delli Veneri[1], Lucia V. Mercaldo[1]
[1] ENEA, Portici, Italy

2CV.3.9 Scalable Low Damage PVD Methods for TCOs for Perovskite Solar Cells
Martin Dimer[1], Barbara Gebhardt[1], Boris Rivkin[2], Vishnupriya Rajukumar Hegden[2], Yana Vaynzof[2], Oliver Haustein[1], Holger Pröhl[1]
[1] VON ARDENNE, Dresden, Germany; [2] IFW, Dresden, Germany

2CV.3.10 A Curated, AI-Extracted Database for Accelerating the Development of Perovskite-Silicon Tandem Solar Cells
Mohammad Moaddeli[1], Branoosh Afshari[1], Negin Nezamloo[2], Mansour Kanani[1], Mohammadreza Aghaei[3]
[1] Shiraz University, Shiraz, Iran; [2] Imam Khomeini International University, Qazvin, Iran; [3] Norwegian University of Science and Technology, Aalesund, Norway

2CV.3.11 Back-Contact 2-Terminal Perovskite-Silicon Tandem Solar Cells and Modules by Metal Wrap-Through Technology
Melvin ten Kate[1], Yu Wu[1], Eric Kossen[1], Nicolas Guillevin[1], Eelko Hoek[1], Martijn Ronchetti[1], Victor Rosca[1], Johan Bosman[2], Anne Biezemans[2], Marcel Simor[2], Giulia Lucarelli[2], Valerio Zardetto[2], Bart Geerligs[1]
[1] TNO, Petten, The Netherlands; [2] TNO, Eindhoven, The Netherlands

2CV.3.12 Fast Reverse Bias Characterization of Perovskite-Silicon Tandem Solar Cells
Ivanol Jaurece Djeukeu[1], Jonas Horn[2], Michael Meixner[2], Enno Wagner[3], Stefan W. Glunz[4], Klaus Rampseck[2]
[1] halm elektronik / Albert-Ludwigs-University Freiburg, Frankfurt am Main/Freiburg, Germany; [2] halm elektronik, Frankfurt am Main, Germany; [3] Frankfurt University of Applied Sciences, Frankfurt am Main, Germany; [4] Fraunhofer ISE/Albert-Ludwigs-University Freiburg, Freiburg, Germany

2CV.3.13 Scalable Perovskite/Silicon Tandems for Mass Production – Critical Cell Processes and Module Design
Jiawei Zhang[1], Lin Wu[1], Jiawen Li[1], Haowen Luo[1], Yuchao Hu[1], Yifeng Zhang[1], Wei Long[1]
[1] Tongwei Solar, Chengdu, China

2CV.3.14 Laser Processes for Perovskite and Organic Solar Cells and Modules for Large Substrates with Multi-Wavelength at Film Side and Glass Side Processing
Stefan Bergfeld[1], Tsvetelina Merdzhanova[2]
[1] Aachen University of Applied Science, Jülich, Germany; [2] FZJ, Jülich, Germany

2CV.3.15 Upscaling of the Perovskite Top Cell for 2T Perovskite-CIGS Tandem Cells
Denise Kreugel[1], Radha Krishnan Kothandaraman[1], Corné Frijters[1], Sinclair Ryley Ratnasingham[1], Marcel Simor[1], Drishya Rajan Pillai[1], Chandu Mohan[1], Johannes Lambooij[1], Hero 't Mannetje[1], Damilola Adeleye[2], Guillermo Farias Basulto[2], Reiner Klenk[2], Christian A. Kaufmann[2], Kousumi Mukherjee[3], Mariadriana Creatore[3], Veronique Gevaerts[1], Valerio Zardetto[1]
[1] TNO, Eindhoven, The Netherlands; [2] HZB, Berlin, Germany; [3] Eindhoven University of Technology, Eindhoven, The Netherlands

2CV.3.16 Energy Yield Modelling of Tandem Monofacial and Bifacial Modules in the IEC 61853-4 Standard Climates
James Blakesley[1], Emily O'Connor[1], Lavanya Malarkannan[1], George Koutsourakis[1]
[1] National Physical Laboratory, Teddington, United Kingdom

2CV.3.17 Influence of Dimethyl Sulfoxide Additives on Inkjet-Printed Perovskite-Silicon Tandem Solar Cells
Parisa Aktepe[1], Leon Brenner [1], Raphael Efinger[1], Roman Keding[1]
[1] Fraunhofer ISE, Freiburg, Germany

2CV.3.18 Passivation-Induced Interfacial Reconstruction Probed by Cross-sectional TEM in 2T Perovskite/Silicon Tandem Solar Cells
Chandralina Patra[1], Anna Capitaine[1], Van-Son Nguyen[1], Junkang Wang[2], Kassiogé Dembélé[2], Pavel Bulkin[2], Jean Rousset[3], Pere Roca i Cabarrocas[2], Erik V. Johnson[2]
[1] IPVF, Palaiseau, France; [2] LPICM - CNRS, Palaiseau, France; [3] EDF R&D, Palaiseau, France

2CV.3.19 The Difference Between Stabilized Power Point and Swept Power Point with Various JV Sweep Parameters
Sercan Aslan[1], Sercan Aslan[2], Amir Afshord Zarean[1], Samah Akel[1], Thomas Kirchartz[1], Thomas Kirchartz[3], Uwe Rau[1], Uwe Rau[2], Kaining Ding[1], Kaining Ding[2]
[1] FZJ, Jülich, Germany; [2] Aachen University, Aachen, Germany; [3] University of Duisburg-Essen, Duisburg, Germany

2CV.3.20 Unravelling Perovskite Degradation Mechanisms on Textured Silicon for Tandem Photovoltaics
Mingrui He[1], Hongjae Shim[1], Xiaojing Hao[1]
[1] UNSW, Sydney, Australia

2CV.3.21 Laser Annealing-Assisted Perovskite Thin Film Preparation and Tandem Device Fabrication
Jianbo Liu[1], Meng Zhang[2], Chunlan Zhou[3], Ke Xin[4], Yue Ma[5], Yuelong Huang[5]
[1] Huzhou Phoenixolar , Huzhou, China; [2] University of New South Wales, Sydney, Australia; [3] Chinese Academy of Sciences, Beijing, China; [4] Huzhou Phoenixolar, Huzhou, China; [5] Huzhou Phoenixolar, Huzhou , China

2CV.3.22 Ambient-air Processed Slot-die Coated 2T Perovskite-Silicon Tandem Solar Cells with Green Solvent Formulations and Non-Fullerene Transport Layers
Radha Krishnan Kothandaraman[1], Denise Kreugel[1], Felipe Vinocour Pacheco[1], Sinclair Ryley Ratnasingham[1], Marcel Simor[1], Manvika Singh[1], Corné Frijters[1], Johannes Lambooij[1], Giulia Lucarelli[1], Ilker Dogan[1], Bart (L.J.) Geerligs [2], Valerio Zardetto[1]
[1] TNO, Eindhoven, The Netherlands; [2] TNO, Petten, The Netherlands

2CV.3.37 Crystallization Control using Molecular Additives for High-Efficiency, Large-Area Perovskite Modules
Zi-Fan He[1], Amit Kumar Harit[1], Anurag Krishna[1]
[1] IMEC, Genk, Belgium

2CV.3.38 Interplay of Cross-Reading, Pressure and Co-evaporation Speed on Triple-Source FA-Based Perovskite Films and Devices
Reinder K. Boekhof[1], Lara M. van der Poll[1], Jin Yan[1], Aidan le Roux[1], Daan Bakker[1], Judah Robson[1], Arno H.M. Smets[1], Tom J. Savenije[1], Luana Mazzarella[1]
[1] TU Delft, Delft, The Netherlands

2CV.3.39 Dual Vapor-Phase Treatment Driven Subsurface Reorganization for 3D Passivation Networks towards Ultralow Interfacial Energy Loss in Perovskite Photovoltaics
Xianzhao Wang[1], Han He[1], Ying Zhao[1], Xiaodan Zhang[1]
[1] Nankai University, Tianjin, China

2CV.3.40 Stability under Illumination of FAPbBr3 Perovskite Cells and Modules: Effects of Device Upscaling and Different Operating Conditions
Noah Tormena[1], Andrea Quagliotto[1], Alessandro Caria[1], Matteo Buffolo[1], Carlo De Santi[1], Andrea Cester[1], Gaudenzio Meneghesso[1], Enrico Zanoni[1], Jessica Barichello[2], Fabio Matteocci[2], Aldo Di Carlo[2], Nicola Trivellin[1], Matteo Meneghini[1]
[1] University of Padova, Padova, Italy; [2] University of Rome, Rome, Italy

2CV.3.41 Metal-Organic Framework-Assisted Buried Interface Engineering for Stabilization of Perovskite-Based Solar Cells
Nicolas Pernès[1], Thomas Gomes[1], Yifan Xu[2], Farid Nouar[2], Stéphane Cros[1]
[1] CEA / INES, Le Bourget-du-Lac, France; [2] ESPCI, Paris, France

2CV.3.42 Tin-Lead Perovskite Solar Cells with Outstanding Stability
Andrea Arreola Vargas[1], Qianshan Feng[1], David Garcia Romero[1], Maria Antonietta Loi[1]
[1] University of Groningen, Groningen, The Netherlands

2CV.3.43 Understanding the Electronic Consequences of Geometry: Nanotexturing in Perovskite Solar Cells
Klaus Jäger[1], Dilara Abdel[2], Jacob Relle[1], Thomas Kirchartz[3], Patrick Jaap[2], Jürgen Fuhrmann[2], Sven Burger[4], Christiane Becker[1], Patricio Farrell[2]
[1] HZB, Berlin, Germany; [2] Weierstrass Institute for Applied Analysis and Stochastics (WIAS), Berlin, Germany; [3] FZJ, Jülich, Germany; [4] Zuse Institute Berlin, Berlin, Germany

2CV.3.44 Anti-Soiling Electrodes in Extreme Operating Conditions
Mohammad Istiaque Hossain[1], Brahim Aissa[1]
[1] QEERI, Doha, Qatar

2CV.3.45 Achieving High Open-Circuit Voltage in Wide-Bandgap Bromide Perovskite Solar Cells through Hole Transport Material Engineering
Mohammad Istiaque Hossain[1], Brahim Aissa[1]
[1] QEERI, Doha, Qatar

2CV.3.46 2D Perovskite Formation at the EDAI2-passivated Surface of a Triple-cation Triple-halide Perovskite Resulting in High Efficiencies
Johannes Löhr[1], Hannah Genath[2], Robby Peibst[1], Jan Schmidt[1]
[1] ISFH, Emmerthal, Germany; [2] Leibniz University, Hannover, Germany

2CV.3.47 Durability of Mixed-Halide Aziridinium Perovskite Thin films under Environmental Stress
Witchaya Arpavate[1], Young Un Jin[1], Lars Leander Schaberg[2], Marianela Escobar-Castillo[1], Niels Benson[2], Doru C. Lupascu[1]
[1] University of Duisburg-Essen, Essen, Germany; [2] University of Duisburg-Essen, Duisburg, Germany

2CV.3.48 Roll-to-Roll Slot-Die Coating of Flexible n-i-p Perovskite Devices
Giulia Lucarelli[1], Felipe Vinocour Pacheco[1], Drishya Rajan Pillai[1], Harrie Gorter[1], Thomas Exlager[1], Chandu Mohan[1], Johannes Lambooij[2], Ilker Dogan[1], Sjoerd Veenstra[1]
[1] TNO, Eindhoven, The Netherlands; [2] TNO, Eindhoven, United States of America

2CV.3.49 Mechanisms of Crystallization in Sequentially Evaporated Tin-Lead Perovskite
Niels van Silfhout[1], Lara van der Poll[1], Reinder Boekhoff[1], Luana Mazzarella[1], Tom Savenije[1], Arno Smets[1]
[1] Delft University of Technology, Delft, The Netherlands

2CV.3.50 Insights into the Degradation of Hybrid Lead Halide Perovskite Thin Films and Solar Cell Devices During Outdoor Exposure
Maria Hadjipanayi[1], Vasiliki Paraskeva[2], Aliki Souzou[2], Modestos Athanasiou[2], Aranzazu Aguirre[3], Anurag Krishna[3], Tamara Merckx[3], Alexandros Themistokleous[2], Sophia Hayes[2], Grigorios Itskos[2], Sumeet Mujumdar[2], Elias Peraticos[2], Tom Aernouts[3]
[1] University of Cyprus, Ncosia, Cyprus; [2] University of Cyprus, Nicosia, Cyprus; [3] IMEC, Genk, Belgium

2CV.3.51 Impact of Water Ingress and Damp Heat on POE-Encapsulated Perovskite Solar Cells
Arslan Ali[1], Marko Jošt[1], Kristijan Brecl[1], Marko Topič[1], Marko Jankovec[1]
[1] University of Ljubljana, Ljubljana, Slovenia

2CV.3.52 Functional PEAI-Based Salts for Interface Passivation in Inverted Perovskite Solar Cells
Sude Çebi[1], Gül Simge Özdemir[1], Cem Maden[1], Figen Varlıoğlu Yaylalı[1], Mustafa Yaşa[1], Görkem Günbaş[1], Selçuk Yerci[1]
[1] ODTÜ-GÜNAM, Ankara, Türkiye

2CV.3.53 Thermally Evaporated Self-Assembled Monolayers for Fully Evaporated Perovskite Solar Cells
Niels Uythoven[1], Huagui Lai[1], Rui-Tung Kuo[2], Ioanna Vareli[1], Frank Nüesch[1], Tzu-Ying Lin[2], Fan Fu[1]
[1] Empa, Dübendorf, Switzerland; [2] National Tsing Hua University, Hsinchu, Taiwan

2CV.3.54 A Layer-by-Layer Investigation of the Sensitivity to Processing Atmosphere on Characteristics of Slot Die-Coated Perovskite Solar Cells
Tina Wahl[1], Jonas Hanisch[1], Stefanie Spiering[1], Oliver Salomon[1], Erik Ahlswede[1], Eva-Maria Hammer[1]
[1] ZSW, Stuttgart, Germany

2CV.3.55 Polymerized SAMs for Improved Charge Extraction and Improved Fabrication Process Robustness in Perovskite Single Junction and Silicon/Perovskite Tandem Solar Cells
Sandra Glocker[1], Wolfram Hempel[1], Erik Ahlswede[1], Michael Powalla[1]
[1] ZSW, Stuttgart, Germany

2CV.3.56 Hyperspectral Photoluminescence Imaging for Process Optimisation of DMF-free, Slot-die Coated, Vacuum-quenched Perovskite Solar Cells
Toshimitsu Mochizuki[1], Shota Araki[1], Hidetaka Takato[1], Katsuto Tanahashi[1]
[1] AIST, Koriyama, Japan

2CV.3.57 Near-field Effects on Cathodoluminescence Outcoupling in Perovskite Thin Films
Robin Schot[1], Imme Schuringa[2], Álvaro Rodriguez Echarri[1], Lars Sonneveld[1], Tom Veeken[1], Yang Lu[3], Samuel Stranks[3], Albert Polman[1], Bruno Ehrler[1], Saskia Fiedler[1]
[1] AMOLF, Amsterdam, The Netherlands; [2] AMOLF, Amterdam, The Netherlands; [3] University of Cambridge, Cambridge, United Kingdom

2CV.3.58 Passivation Strategies of Methylammonium Free Tin-Lead Perovskites
Michela Cecconi[1], Antonio Abate[1], Giuseppe Nasti[2], Paola Delli Veneri[3], Lucia V. Mercaldo[2]
[1] University of Naples Federico II, Naples, Italy; [2] ENEA, Portici, Italy; [3] ENEA , Portici, Italy

2CV.3.59 Experimental and DFT Studies on the Kesterite-CZTS Nanoparticles as Hole Transport Material for Perovskite Solar Cells
Mehr Un Nisa[1], Giorgio Tseberlidis [1], Simona Olga Binetti[1], Adriana Pecoraro[2], Michael Zambrano[2], Ana Belén Muñoz García[2], Michele Pavone [2]
[1] University of Milano-Bicocca, Milan, Italy; [2] University of Naples Federico II, Naples, Italy

2CV.3.60 Data-Driven Optimization of HTL-free Graded Heterojunction Solar Cells through Numerical Simulations and Machine Learning
Savita Kashyap[1], Sanjeev Kumar[1], Arun Kumar Singh[1]
[1] Punjab Engineering College, Chandigarh, India

Thursday, 17. September 2026

VISUAL PRESENTATIONS 4DV.1

08:30 - 10:00 Agri-PV | Other PV Applications (Floating, Infrastructure, etc.); CPV; PV in Space | Hybrid Systems and Storage; Direct Uses of PV Generated Electricity

4DV.1.1 Reduced-Order Models for Bifacial PV and Ground Insolation in Agrivoltaics Applications
Jennifer L. Braid[1], Isaiah H. Deane[1], Norman R. Jost[1]
[1] Sandia National Laboratories, Albuquerque, United States of America

4DV.1.2 Sustainable Agrivoltaics: Utilizing Down-Conversion Dyes to Harmonize Solar Energy and Crop Growth
Fabio Silva[1], Arthur Maufort[1], Anna Karamysheva[1], Frédéric Peilleron[1], Kristof Proost[1]
[1] IP FAB, Mechelen, Belgium

4DV.1.3 Development of a Digital Calculation Tool for Optimising the Row Spacing of Agri-Photovoltaic Systems Considering Variable Machinery Widths
Hendrik Zerkowski[1], Simon Lahr[1], Yannick Kloos[1]
[1] Next2Sun Technology, Dillingen, Germany

4DV.1.4 Image-based Phenology Monitoring to Optimize Agrivoltaic System Design and Tracker Operation in Vneyards
Dennis Kniel[1], Tamara Bretzel[1], Hannes Engler[2], Sergio Vélez Martín [3], Matthew Berwind[1]
[1] Fraunhofer ISE, Freiburg, Germany; [2] Staatliches Weinbauinstitut Freiburg, Freiburg, Germany; [3] University of Burgos, Burgos, Spain

4DV.1.5 Evaluating the Viability of Agrivoltaic Systems in Türkiye: An Analytical Examination across Three Distinct Regions
Duygu Kuzyaka[1], Ömer Yalçın[1], Atilla Polat[2], Mehmet Yüksel[2], Zeynep Demir[2], Talat Özden[1]
[1] ODTÜ-GÜNAM, Ankara, Türkiye; [2] Soil, Fertilizer, and Water Resources Central Research Institute, Ankara, Türkiye

4DV.1.6 A Simulation-Driven Multicriteria Framework for Agri-PV Configuration Optimization
Nada ElRhazouani[1], Said Elhamaoui[2], Khadija El Ainaoui[2], Paula Sanchez-Friera[3], Achraf Sounni[2], Abdellatif Ghennioui[2], Ahmed Chebak[1], Khalid Radouane[1]
[1] UM6P, Ben Guerir, Morocco; [2] Green Energy Park, Ben Guerir, Morocco; [3] Solkeys, Gijón, Spain

4DV.1.7 Voltiris Greenhouse Concentrator: Practical Concentration Ratios and Array Performance
Antonius R. (Teun) Burgers[1], Lauriane Gugnot[2], Jonas Roch[2], Seymour Lubbers[3], Bas van Aken[4]
[1] TNO Energy Transition, Petten, The Netherlands; [2] Voltiris, Epalinges, Switzerland; [3] TNO Digitial Built Environment, Delft, The Netherlands; [4] TTNO Energy Transition, Petten, The Netherlands

4DV.1.8 From Concept to Field: an Overhead Agrivoltaic System with Adaptive Tracking for Olive Groves
Iñaki Cornago[1], Aritz Legarrea[1], Gregorio Olivares[1], Ana María Gracia Amillo[1], Gillen Abrego[2], Eusebio Gainza[2], Ildefonso Muñoz[1]
[1] FUNDACION CENER, Sarriguren, Spain; [2] ALLOTARRA, Allo, Spain

4DV.1.9 Design, Implementation and Early Performance of Crop-Compatible Agri-PV Systems with Spectral Management
Ramona Davoudnezhad[1], Selin Cansu Gölboylu[1], Merve Tan[1], Ümran Dilmaç[1], Ömer Yalçın[2], Duygu Kuzyaka[2], Ali Erçin Ersundu[3], Miray Çelikbilek Ersundu[3], Colin Osborne[4], Holly Croft[4], Zeynep Dilan Deniz[5], Talat Özden [2], Selçuk Yerci[2], Meriç Çalışkan Arslan[1]
[1] Kalyon PV Solar Technology Factory, Research and Development Center, Ankara, Türkiye; [2] METU, Ankara, Türkiye; [3] Yildiz Technical University, İstanbul, Türkiye; [4] University of Sheffield, Sheffield, United Kingdom; [5] Tat Gıda Sanayi, Bursa, Türkiye

4DV.1.10 Tracing Rays from Leaves to Sky: Validation of an Irradiance Modelling Framework for Agrivoltaic Orchards
Odysseas Alexandros Katsikogiannis[1], Ebe Coomans[1], Olindo Isabella[1], Rudi Santbergen[1], Hesan Ziar[1]
[1] TU Delft, Delft, The Netherlands

4DV.1.11 A High Resolution, Forecast-Enhanced Digital Twin for Agrivoltaic Trackers: Implementation and Orchard Trials
Bilal Abdul-Qayyoom Khalid[1], Maddalena Bruno[1], Tamara Bretzel[1], Leonhard Gfüllner[1], Matthew Berwind[1]
[1] Fraunhofer ISE, Freiburg, Germany

4DV.1.12 First Parametric Studies for the Optimization of PV Electrical Performance in Crop Agrivoltaics
Corentin Coutellier[1], Ya Brigitte Assoa[1], Christophe Ménézo[2], Rémi Vézy[3], Didier Combes[4]
[1] CEA, Le Bourget du Lac, France; [2] University of Savoie Mont Blanc, Le Bourget du Lac, France; [3] CIRAD, Montpellier, France; [4] INRAE, Lusignan, France

4DV.1.13 Peatland-PV - First Research in Germany
Carl Pump[1], Hanna Martens[1], Cordula Gutekunst[1], Monika Hohlbein[1]
[1] University of Greifswald, Greifswald, Germany

4DV.1.14 Effectively Communicating of the Environmental Impacts of Agri-PV Systems: why Life Cycle Assessment and Parameterized Models are Great Tools
Alejandra Cue Gonzalez[1], Pierre Jouannais[2], Mathilde Marchand-Lasserre[1]
[1] Mines Paris, Valbonne, France; [2] University of Montpellier, Montpellier, France

4DV.1.15 From Competition to Integration: Soybean-based Agrivoltaics as a new Land-use Paradigm in Brazil
Bruno Jacomel Vieira[1], Alex Manito[1], Marcelo Pinho Almeida[1], Rafael Braghieri Menillo[2], George Lambais[2], Mauricio Cherubin[2], Roberto Zilles[1]
[1] USP, São Paulo, Brazil; [2] USP, Piracicaba, Brazil

4DV.1.16 From Roots to Rays - Holistic and Integrated Life Cycle Sustainability Assessment of Agrivoltaics
Raphaela Ari Kießer[1], Matthew Berwind[1], Daniela Thrän[2], Walther Zeug[2], Enrique A. Perdomo E.[2], Christina Zinke[2]
[1] Fraunhofer ISE, Freiburg, Germany; [2] Helmholtz Centre for Environmental Research, Leipzig, Germany

4DV.1.31 Implementation and Optimisation of Floating PV in Dutch Offshore Wind Farms
Laurens Huisman[1], Annanta Kaul[1], Sara Golroodbari[1], Wilfried van Sark[1]
[1] Utrecht University, Utrecht, The Netherlands

4DV.1.32 Systemic Barriers to Scaling Floating Photovoltaics in Europe: an Expert-based Assessment of Technical Maturity and Deployment Constraints
Sara Mirbagheri Golroodbari[1], Nabih Cherradi[2]
[1] UU, Utrecht, The Netherlands; [2] EmpowerSun, Pully , Switzerland

4DV.1.34 PV2Float: Comparative Thermal and Performance Analysis of Three Floating PV Demonstrators and a Land Reference
Monica Nicola[1], Matthew Berwind[1]
[1] Fraunhofer ISE, Freiburg, Germany

4DV.1.35 Development of a 1.12 kW Photovoltaic-Integrated Electric Vehicle Prototype and Its Evaluation as a Community Bus
Hidenori Mizuno[1], Katsuto Tanahashi[1], Takashi Oozeki[1]
[1] AIST, Koriyama, Japan

4DV.1.36 Reliability Evaluation and Accelerated Environmental Stress Testing (CASS & HF10) of Solar Inverters for Offshore and Coastal Environments
Hsiu-Ming Chang[1], San-Yu Ting[1], Syh-Homg Chen[1], Ren-Jie Guo[1], Min-An Tsai[1], Cho-Fan Hsieh[1]
[1] ITRI, Hsinchu, Taiwan

4DV.1.37 Transparent Solar Pond Prototype: Preliminary Stratification Tests Using Water and a Salt Gradient
Sedong Kim[1]
[1] Korea Institute of Industrial Technology, Chungcheongnam-do, South Korea

4DV.1.38 Optimal Design and Demonstration for Application of Bi-facial PV Modules on Floating PV
Hyunsik Jo[1], Jieun Lee[1], Sunghyun Lee[1], Donggun Yang[1], Changsub Won[2], Youngshin Lim[2]
[1] Korea Water Resources, Daejeon-Si, South Korea; [2] MIRAE, Seoul-Si, South Korea

4DV.1.39 Methodology for Small-Scale Tests on Floating Photovoltaic Systems Subjected to Waves
Jesus Florido Ortega[1], Maria Clavero Gilabert[1], Edgar Gerardo Mendoza Baldwin[2]
[1] University of Granada, Granada, Spain; [2] National Autonomous University of Mexico, Mexico City, Mexico

4DV.1.40 Performance Evaluation and Degradation Assessment of Perovskite Solar Cells for LEO Space Missions
Abdullah Alsubaihi[1], Ahmad Albakri[1], Meteb Ali[1]
[1] King Abdulaziz City for Science and Technology, Riyadh, Saudi Arabia

4DV.1.41 Floating Photovoltaic Systems Impact on the Water Quality: a Study for an Urban Area in Brazil
Vicente Diniz de Carvalho[1], Janine Brandao de Farias Mesquita[1], José Carlos de Araújo[2], Paulo C. M. Carvalho[2], Breno Bezerra Freitas[2]
[1] Federal University of Ceará, Crateús, Brazil; [2] Federal University of Ceará, Fortaleza, Brazil

4DV.1.42 Vehicle–Mounted Photovoltaic Systems: Empirical Data Acquisition in Malta
Vlad Costea[1], Brian Bartolo[1], Carmel Azzopardi[1], Austeja Mockeviciute-Azzopardi[1], Brian Azzopardi[1]
[1] FiR.mt, Birkirkara, Malta

4DV.1.43 Floating Photovoltaic Systems and Water Surface Coverage: A Simulation of Technical, Environmental, and Economic Assumptions for Bourget Lake
Hosam Mahmod[1]
[1] University Savoie Mont Blanc, Chambèry, France

4DV.1.44 Impact of Installation Site and Plant Configuration on the Energy Yield of Floating PV Systems and the Thermal Loading of Grid-connected PV Inverters
Sara Bouguerra[1], Richard De Jong[2], Jens Moschner[3], Arnaud Morlier[4], Michael Daenen[1], Patrizio Manganiello[1]
[1] UHasselt, Diepenbeek, Belgium; [2] imec, Leuven, Belgium; [3] KU Leuven, Leuven, Belgium; [4] imec, Diepenbeek, Belgium

4DV.1.45 Lithium-Gallium Co-Doped Silicon Heterojunction Solar Cells for Irradiation-Induced Defects Mitigation
Charles Seron[1], Nicolas Enjalbert[1], Samuel Harrison[1], Hélène Lignier[1], Sébastien Dubois[1]
[1] CEA / INES, Le Bourget-du-Lac, France

4DV.1.60 Enhancing Stability in Photovoltaic Direct-Coupled Green Hydrogen Systems
Jieun Lee[1], Hyunsik Jo[1], Sung Hyun Lee[1], Donggeon Yang[1]
[1] K-water, Yuseong-gu, South Korea

4DV.1.61 Titanium Based HIPIMS Films for CdTe Photovoltaic–Photoelectrochemical Integration
Daniel A. L. Loch[1], Anna Kindvall[2], Ivan Rimmaudo[2], Anna Oniszczuk[3], Robert Arndt[2], Tim Gehring[1], Uwe Heydenreich[1]
[1] TRUMPF Hüttinger, Freiburg, Germany; [2] CTF Solar, Dresden, Germany; [3] TRUMPF Huettinger, Warsaw, Poland

4DV.1.62 Performance Assessment of a Grid-Connected Bifacial PV–Flywheel Hybrid System for Level 3 Electric Vehicle Fast Charging
Yosoon Choi[1], Shubhashish Bhakta[1]
[1] Sejong University, Seoul, South Korea

4DV.1.63 Impact of PV Power Profiles on Lithium-Ion Battery Aging in Hybrid PV–Battery Systems
Nassima Ait Said ouhammou[1]
[1] Cadi Ayyad University, Marrakech, Morocco

4DV.1.64 System Design Change in Grid-Connected PV Plants with Battery Energy Storage
Djaber Berrian[1], Gaurang Chhapia[1], Johannes Linder[1]
[1] BELECTRIC Holding, Kolitzheim, Germany

4DV.1.65 Storage Solutions for PV Curtailment: A Life-Cycle Costing Approach
Elvan Burcu Kosma[1], Olga Kanz[1], Oleksandr Astakhov[1], Tsvetelina Merdzhanova[1], Sergey Shcherbachenko[1], Gerhard Mütter[2], Petra Zapp[1]
[1] FZJ, Jülich, Germany; [2] Gerhard Mütter e.U., Waldneukirchen, Austria

4DV.1.66 Beyond Grid Constraints: Integrating Energy Storage Directly into Photovoltaic Modules
Oleksandr Astakhov[1], Uwe Rau[1], Egbert Figgemeier[1], Peter Strasser[2], Christoph Brabec[1], Tsvetelina Merdzhanova[1]
[1] FZJ, Jülich, Germany; [2] Technical University of Berlin, Berlin, Germany

VISUAL PRESENTATIONS 5DV.2

10:30 - 12:00 Sustainability of PV

5DV.2.1 Design-Resolved Cabling Material Demand, Copper-Aluminium Substitution, and Criticality Impacts in Utility-Scale Photovoltaic Systems
Nithin Vakeri Perunthottathil[1], Mohammad Abdelbaky[1], David Peck[1], Olindo Isabella[1], Malte Ruben Vogt[1]
[1] TU Delft, Delft, The Netherlands

5DV.2.2 A Single-Step Silver Recovery Process from Photovoltaic Waste via Direct Electrodeposition
Alejandra Vázquez-Adán[1], Eduardo Diez[1], Salvador Cotillas[1], Luis Jaime Caballero[2], Nerea Dasilva-Villanueva[2], David Fuertes Marrón[2], Carlos del Cañizo[2], Araceli Rodriguez[1]
[1] Complutense University of Madrid, Madrid, Spain; [2] UPM, Madrid, Spain

5DV.2.3 Efficient Recycling of Solar PV: Multi-faceted Strategy
Romain Duwald[1], Agathe Vaché[1], Youcef Karar[1], Joshua Vauloup[1], Lison Marthey[2], Fabrice Coustier[3], Emmanuel Billy[1]
[1] CEA, Grenoble, France; [2] CSEM, Neuchâtel, Switzerland; [3] CEA / INES, Le Bourget-du-Lac, France

5DV.2.4 Closing the Loop of Module Recycling, Integration of Recovered Glass and Backsheet into new Modules
Xavier Mackré-Delannoy[1], Fabrice Coustier[1], Roland Riva[1], Philippe Thony[1], Jérémie Aimé[1]
[1] CEA / INES, Le Bourget du Lac, France

5DV.2.5 Improving Particle Separation and Recovery of Valuable Materials from End-of-life Solar Panels
Chengsun He[1], Yuting Zhuo[1], Yansong Shen[1]
[1] UNSW, Sydney, Australia

5DV.2.6 From Rapid Growth to Preparedness: Charting PV End-of-life Flows in the Nordics
Atse Louwen[1], Mattias Lindh[1], Michiel van Noord[2], Cecilia Wästerlid[2]
[1] RISE, Umeå, Sweden; [2] RISE, Stockholm, Sweden

5DV.2.7 Upcycling of Silicon Recovered from End-of-Life Photovoltaic Modules into Functional Energy Materials
Katsumichi Hanzawa[1], Shinya Kato[2], Kengo Yamanaka[2], Tomoharu Tokunaga[1], Taisuke Doi[3], Ryoji Katsube[1], Yasuyoshi Kurokawa[1], Takashi Itoh[1], Noritaka Usami[1]
[1] Nagoya University, Nagoya, Japan; [2] Nagoya Institute of Technology, Nagoya, Japan; [3] NPC, Matsuyama, Japan

5DV.2.8 Evaluating the Possible Utilization Strategies for End-of-Life PV-modules Regarding the Increasing demand for Cullet in the European Glass Industry
Lukas Spindler[1], Dominic Walter[2], Petra Boehm[2], Andreas Rosin[3], Harald Zmmermann[1]
[1] TAZ Spiegelau, Spiegelau, Germany; [2] HVG, Offenbach, Germany; [3] University of Bayreuth, Bayreuth, Germany

5DV.2.9 Choosing the Right Encapsulant for the Environment, LCA based Comparison of Perovskite Solar Cell Encapsulation
Simon Jech[1], Li Shen[2], Sara Golroodbari[3], Annukka Santasalo-Aarnio[1]
[1] Aalto University, Espoo, Finland; [2] Utrecht University, Utrecht , The Netherlands; [3] Utrecht University, Utrecht, The Netherlands

5DV.2.10 Operationalizing the Digital Product Passport for Photovoltaics: Platform Development and Early Industry Validation
Ässia Boukhatmi[1], Rafael Burkhalter[1], Stefan Groesser[1]
[1] Bern University of Applied Sciences, Biel/Bienne, Switzerland

5DV.2.11 AI & Robotics for the Reuse of Used PV Modules
Rita Ebner[1], Bernhard Kubicek[1], Nicole Brosch[1], Laurin Ginner[1], Simon Prüller[2], Simon Schauppenlehner[2], Markus Ikeda[3], Johann Mitteramskogler[3], Daniel Forstner[4], Thomas Nigl[5], Ferozan Azizi[5], Therese Bouvier-Schwarz[5], Barbara Brune[6], Polina Malyhina[6], Xaver Paul Stadlbauer[6]
[1] AIT, Vienna, Austria; [2] 2ndCycle, Amstetten, Austria; [3] Profactor, Steyr-Gleink, Austria; [4] METRAN Rohstoff-Handel, Amstetten, Austria; [5] Montanuniversität Leoben, Leoben, Austria; [6] TÜV Austria Data Intelligence, Vienna, Austria

5DV.2.12 Understanding the Current State and Needs of PV Modules EOL: Survey for PV Recyclers and Repair/Reuse Companies
Alberto Pico[1], Cara Libby[2], Nicolás Marx[3], Martin Wilke[4]
[1] EPRI, Santiago de Compostela, Spain; [2] EPRI, Charlotte, United States of America; [3] EPRI, Barcelona, Spain; [4] Buhck Re.Energy, Hamburg, Germany

5DV.2.13 Utilising Continuous Wave Lasers to Separate Solar Panels for Recycling
Olivia Bowen[1], Matthew Murphy[1], Zibo Zhou[1], Rong Deng[1], Michael Nielsen[1]
[1] University of New South Wales, Sydney, Australia

5DV.2.14 Recyclability and Circular Design Assessment of Mass-Customized Building-Integrated Photovoltaic Modules
Gernot Oreski[1], Petra Christoefl[2], Cristina Polacchi[3]
[1] Polymer Competence Center Leoben, Leoben, Austria; [2] Polymer Competence Center Leoben , Leoben, Austria; [3] EURAC Research, Bolzano, Italy

5DV.2.15 Responsible Procurement in Solar
Stacey McKinney[1], Sarah Albert[2]
[1] Nextpower, Fremont, United States of America; [2] Nextpower, Madrid, Spain

5DV.2.16 Verification of Carbon Reduction and Economic Effects via On-site Processing of End-of-Life PV Panels using a Mobile Recycling System
Sang-Hun Lee[1], Cheong-Min Noh[1], Kwang-Min Seo[1], Yeon-Ju Kim[1]
[1] Won Kwang S&T , Seo-gu, South Korea

5DV.2.17 Demonstration of High Purity and Scaling-free Reclamation of TOPCon Solar Cell Production Rinse Water
Jascha Reich[1], Kaya Schlössler[1], Peter Brailovsky[2], Tobias Dannenberg[3], Martin Zimmer[2], Sebastian Nold[2], Sven-Uwe Geißen[1]
[1] TU Berlin, Berlin, Germany; [2] Fraunhofer ISE, Freiburg, Germany; [3] RENA Technologies, Gütenbach, Germany

5DV.2.18 Life Cycle Assessment: Perovskite-TOPCon vs. All-Perovskite Tandems
Sohel Abbas Chungikar[1], Olga Kanz[1], Christina Wulf[1], Kaining Ding[1], Karsten Bittkau[1]
[1] FZJ, Institute of Climate & Energy Systems, Jülich, Germany

5DV.2.19 Scalable Nanosecond-pulsed Laser Ablation for Solar Panels Recycling
Remi Aninat[1], Maarten van der Vleuten[1], Quentin Mottet[1], Quan Keijsers[1], Mirjam Theelen[1]
[1] TNO, Eindhoven, The Netherlands

5DV.2.20 PV Waste: the Urban Silver Mine
Mirjam Theelen[1], Maarten van der Vleuten[1], Bart Geerligs[2], Kahya Engler[3], Joris de Riet[1], Busra Kucuk[2], Remi Aninat[1]
[1] TNO, Eindhoven, The Netherlands; [2] TNO, Petten, The Netherlands; [3] TNO, Rijswijk, The Netherlands

5DV.2.21 Multidimensional Aspects of Photovoltaic Module Repair with a Focus on Backsheet Failures
Sonja Feldbacher[1], Anika Gassner[2], Gabriele Eder[2], Yuliya Voronko[2], Simon Prüller[3], Gernot Becker[4], Markus Feichtner[5], Gernot Oreski[1]
[1] PCCL, Leoben, Austria; [2] OFI, Vienna, Austria; [3] 2nd cycle, Amstetten, Austria; [4] ATB-Becker, Absam, Austria; [5] Sonnenkraft, St. Veit/Glan, Austria

5DV.2.22 Net-Zero Assessment of Diverse Building Types Powered with PV System under Time-Varying Emissions
Mohamad Koubar[1], Sin-Yi Li[1], Santiago Valencia Gonzalez[2], Xingxing Zhang[2], Farshid Shadram[1], Joakim Munkhammar[1]
[1] Uppsala University, Uppsala, Sweden; [2] Dalarna University, Falun, Sweden

5DV.2.23 Creation of a Reuse-oriented Testing and Repair Protocol for End-of-life Photovoltaic Modules within FORESi, an EU-funded Horizon Project
Marie Mignot[1], Jérémy Sarantou[1], Marielle Perrin[1], Sébastien Mawet[2], Albert Aliu[2], Sophie Deprez[2], Ints Viksna[3], Juris Launznis[3], Agnese Kore[3], Martins Viksna[3], Thomas Peccavet[4]
[1] Hespul, Lyon, France; [2] Recma, Seraing, Belgium; [3] LTC, Riga, Latvia; [4] Mondragon Assembly, Orange, France

5DV.2.24 BIMPV Project – Retrospective BIM Approach to the Life Cycle-oriented Integration of BIPV Systems in the Building Envelope
Rene Peche[1], Thorsten Pitschke[1], Victor Aigbeghian[1]
[1] bifa Umweltinstitut, Augsburg, Germany

5DV.2.25 Scalable Recycling of Fully Encapsulated Perovskite Mini-modules
Balazs Imre[1], Mykhailo Sytnyk[1], Zhenni Wu[1], Yanxue Wang[1], Christian Göllner[1], Maria Hadjipanayi[2], Vasiliki Paraskeva[2], Sumeet Santosh Mujumdar[2], Stéphanie Narbey[3], Cécile Kalk[3], Ian Marius Peters[1]
[1] FZJ, Jülich, Germany; [2] University of Cyprus, Nicosia, Cyprus; [3] Solaronix, Aubonne, Switzerland

5DV.2.26 Failure Rate of PV Modules and their Collection Numbers for Recycling
E. Busra Kucuk[1], Remi Aninat[2], Kahya Engler[3], Mirjam J. Theelen[2], Jan M. Kroon[1], Martin Späth[1]
[1] TNO, Petten, The Netherlands; [2] TNO, Eindhoven, The Netherlands; [3] TNO, Rijswijk, The Netherlands

5DV.2.27 Bottom-up Ecodesign and Circularity for Photovoltaic Modules: Solidarity-based Supply-chain Mapping and a Lightweight Multi-Criteria Framework from the GFF Reindustrialisation Case
Daniele Bricca[1], Pietro Rista[2]
[1] Sapienza University of Rome, Rome, Italy; [2] Free University of Bolzano, Bolzano, Italy

5DV.2.28 Characterization of Photovoltaic Module Waste to Optimize the Recycling Processes of Polymer Components
Robert Heidrich[1], Michael Wendt[1], Stefanie Wahl[1], Susanne Richter[1]
[1] Fraunhofer CSP, Halle (Saale), Germany

5DV.2.29 Ecodesign Guidelines for Tin-based Perovskite PV Modules
Matthias Hämmer[1], Kerstin Baumann[1], Victor Aigbeghian[1], Béatrice Drevet[2], Markus Schönheits[1]
[1] bifa Umweltinstitut, Augsburg, Germany; [2] CEA LITEN, Le Bourget du Lac, France

5DV.2.30 From Disposal to Circularity: A Comparative Framework for PV Module End-of-Life Management Including Testing-Based Second Life and Final Recycling
Javier Ramírez-Cantero[1], Marinna Pivatto[2], Guillermo Garcia[1], Lais Vidotto[2], Sabrina Elbert[2], Mónica Calero[1], Ricardo Ruther[2]
[1] University of Granada, Granada, Spain; [2] UFSC, Florianopolis, Brazil

5DV.2.31 Environmental Risk Assessment of Hazardous Substance Release Potential and Toxicity of Flexible Lead- and Tin-Based Perovskite PV Modules
Matthias Hämmer[1], Victor Aigbeghian[1], Kerstin Baumann[1], Markus Schönheits[1]
[1] bifa Umweltinstitut, Augsburg, Germany

5DV.2.32 Life Cycle Assessment and Local Marine Impacts of an Offshore Floating Photovoltaics Concept: Is It Worth the Effort?
Maximilian Breyer[1], Heiko Keller[1], Guido Reinhardt[1]
[1] IFEU, Heidelberg, Germany

5DV.2.33 How Photovoltaic Systems Change: the Importance of the Inventory Life Cycle Data
Elisabetta Brivio[1], Andrea Danelli[1], Sofia Spagnolo[1], Pierpaolo Girardi[1]
[1] RSE, Milano, Italy

5DV.2.34 Life Cycle Assessment of Scalable R2R-Manufactured Flexible Perovskite Solar Cells
Mae Xerzel Ouano[1], Erica Magliano[2], Ilker Dogan[3], Sebastien Lizin[1]
[1] Hasselt University, Hasselt, Belgium; [2] CNR-ISM, Rome, Italy; [3] TNO, Eindhoven, The Netherlands

5DV.2.35 Barriers, Opportunities and Economic Viability of Reuse of PV Modules
Cristina Leyre Pinto[1], Ana María Gracia[1], Paola Federica Albizzati[2], Gillian Foster[2], Enrica Leccisi[3], Mattia Gianvincenzi[3], Concetta Lodato[3], Jaione Bengoechea[1]
[1] FUNDACION CENER, Sarriguren-Navarra, Spain; [2] Joint Research Centre, Directorate S, Seville, Spain; [3] Joint Research Centre, Directorate D, Ispra, Italy

5DV.2.36 SOLARIS – Building together a Roadmap for PV Resource Efficiency and Sustainability
Karl-Anders Weiß[1], Estelle Gervais[1], Sina Herceg[1], Elsen Aydin[2], Alexis Barrou[3], Yijiang Xu[4], Claire Agraffeil[5], José María Medianero Martín[6], Tayfun Hiz[2], Alessandro Virtuani[7]
[1] Fraunhofer ISE, Freiburg, Germany; [2] ODTÜ-GÜNAM, Ankara, Türkiye; [3] CSEM, Neuchatel, Switzerland; [4] SINTEF, Trondheim, Norway; [5] CEA, Le Bourget du Lac, France; [6] IDENER AI, Seville, Spain; [7] CSEM, Neuchâtel, Switzerland

5DV.2.37 Formerly Recycled Pellworm Island Modules: A 3rd Life Opportunity
Karsten Wambach[1], Tom Reiling[2], Malte Fislake[2], Radovan Kopecek[3], Rudolf Harney[3], Malte Wesenberg[4], Anna-Katharina Schnatmann[4]
[1] Wambach-Consulting, Petersdorf, Germany; [2] Reiling PV-Recycling, Münster, Germany; [3] ISC Konstanz, Konstanz, Germany; [4] ITES, Bielefeld, Germany

5DV.2.38 Spatial and Temporal Optimization of PV Recycling Facility Locations
Celine Broghammer[1]
[1] FZJ, Jülich, Germany

VISUAL PRESENTATIONS 5DV.3

13:30 - 15:00 Grid Integration and Flexibility Enablers | Scenarios for Renewables, Policy, Resilience, Global Challenges | Costs, Economics, Finance and Markets | Societal Challenges; Citizens' Participation, Awareness

5DV.3.1 Technoeconomic Analysis of Demand-side Management (DSM) Strategies for Cyprus
Demetris Marangis[1], Andreas Livera[1], Niclas Rhein[2], Rabea Sandherr[2], George E. Georghiou[1]
[1] University of Cyprus, Aglantzia, Cyprus; [2] Energynautics, Darmstadt, Germany

5DV.3.2 PV and Energy Storage Capacity needed to Replace other Electricity Sources in Finland
Evgenia Okhotnikova[1], Kari Lappalainen[1]
[1] Tampere University, Tampere, Finland

5DV.3.3 Design and Implementation of a Low-Cost Solar-Powered Smart Microgrid System for Rural Electrification in Burundi
Remy Niyibimpa[1]
[1] Independent Researcher, Bujumbura, Burundi

5DV.3.4 Charge-on-Solar: Customer Savings and Grid Impacts from EV Co-Adoption with Residential PV across the US
Emily Tansey[1], Thomas Haley[1], Marc Perez[1]
[1] Clean Power Research, Bellevue, United States of America

5DV.3.5 E-Mobility Infrastructure Planning, Observability, and Management Toolset for Smart Cities
Andreas Livera[1], Demetris Marangis[1], Georgios Tziolis[1], George E. Georghiou[1]
[1] University of Cyprus, Nicosia, Cyprus

5DV.3.7 Novel Ramp-Rate-Based Energy Storage System Power Smoothing Method for Photovoltaic Power Plants
Micke Talvi[1], Kari Lappalainen[1]
[1] Tampere University, Tampere, Finland

5DV.3.8 Ontology-based Framework for Fault Detection, Performance Assessment and Energy Management in PV Energy Communities
Laura Palomino[1], Ana Belén Cristóbal[1], Luis Miguel Carrasco[1], Luis Narvarte[1]
[1] UPM, Madrid, Spain

5DV.3.9 Renewable Energy Penetration and Flexibility Costs in European Power Systems: a Cross-Country Analysis using Imbalance Prices
Santiago Valencia Gonzalez[1], Johan Heier[1], Rehman Zafar[1]
[1] Dalarna University, Borlänge, Sweden

5DV.3.25 Risk-Oriented Spatial Suitability Modelling for Utility-Scale PV Deployment in Emerging Markets: A Case Study in Colombia
Sebastian Acosta [1], Luis Rangel[2]
[1] ICREA SAS, Bogotá , Colombia; [2] ICREA SAS, Bogotá, Colombia

5DV.3.26 How to Win the PV Race in the Perovskites- Results from an Open Survey
Philipp Kratzert[1], Balizioan Puzant[2], Christian Breyer[3], Chris Case[4], Thomas Dalibor[5], Claire Morin[6], Delfina Munoz[7], Ralf Preu[8], Pere Roca[9], Charles Roux[7]
[1] Holyvolt, München, Germany; [2] VDMA, Frankfurt, Germany; [3] LUT, Lappeenranta, Finland; [4] Oxford PV, Oxford, United Kingdom; [5] Avancis, München, Germany; [6] Solar Power Europe, Brussel, Belgium; [7] CEA, Grenoble, France; [8] Fraunhofer ISE, Freiburg, Germany; [9] IPVF, Ile de France, France

5DV.3.27 Zero Energy Buildings in the Nordics – What Is the Role of PV?
Magda Szarek[1], Sami Jouttijarvi[1], Kati Miettunen[1]
[1] University of Turku, Turku, Finland

5DV.3.28 Results of a Survey on Integrated Perovskite PV Applications
Angele Reinders[1], Antonin Faes[2], Christophe Ballif[3]
[1] Eindhoven University of Technology, Eindhoven, The Netherlands; [2] CSEM, Neuchatel, Switzerland; [3] EPFL, Neuchatel, Switzerland

5DV.3.29 Deriving a Single Reduction Factor for Large-Scale Rooftop Photovoltaic Potential Assessment
Alex Tro-Cabrera[1], Estitxu Villamor[2], Rosa Lago Aurrekoetxea[1], Leire Sainz García[1], Itziar Martínez de Alegría[1]
[1] UPV/EHU, Bilbao, Spain; [2] UPV/EHU, Vitoria-Gasteiz, Spain

5DV.3.30 Solar Employment Dynamics in Transition: Workforce Challenges and 2035 Strategies in Türkiye
Tayfun Hiz[1], Onur Bursalı[2], Esen Erkan Yıldız[2], Hande Eryılmaz[1], Pınar Derin Güre[3]
[1] ODTU-GUNAM, Ankara, Türkiye; [2] GÜNDER, Ankara, Türkiye; [3] METU, Ankara, Türkiye

5DV.3.31 Reindustrializing Europe: the Role of Industrial Policy in Reviving PV Module Manufacturing
Sandra Gallmetzer[1], Lukas Koester[1], Luis Fialho[1]
[1] EURAC Research, Bolzano, Italy

5DV.3.32 Urban Rooftop Solar PV Potential: Static and Dynamic Cadaster Approaches
Dunia Bachour[1], Daniel Perez-Astudillo[1], Abdulwahab Ziaullah[1]
[1] QEERI, Doha, Qatar

5DV.3.33 Informing Policy to Achieve Reductions in Air Conditioning Loads Through Energy Efficiency and Onsite PV Supply in Middle-Income Households in KSA
Abeer Alshehri[1], AbuBakr Bahaj[1], Patrick James[1]
[1] University of Southampton, Southampton, United Kingdom

5DV.3.34 Historical and Future Development of the PV Specific Yield Indicator and the Contribution of PV to Renewable Energy Production in the Netherlands
Wilfried G.J.H.M. van Sark[1], Anton Driesse[2], Pierre Gerrissen[3], Lex Schiebaan[4], Anton Boonstra[5]
[1] Utrecht University, Utrecht, The Netherlands; [2] PV Performance Labs, Freiburg, Germany; [3] SolarCare, Breda, The Netherlands; [4] Sundata, Utrecht, The Netherlands; [5] Boonstra, Groningen, The Netherlands

5DV.3.35 BIPV Market Status: Cross-country Analysis of Methodologies for Data Collection and Market Monitoring
Juan Ignacio Martinez[1], Philippe Macé[2], Véronique Delisle[3], Claudio Del Pero[4], Francesca Tilli[5], Nuria Martín Chivelet[6], Paolo Corti[7]
[1] Becquerel Institute, San Sebastian, Spain; [2] Becquerel Institute, Brussels, Belgium; [3] Natural Resources Canada, Montreal, Canada; [4] Polytechnic University of Milan, Milan, Italy; [5] GSE, Rome, Italy; [6] CIEMAT, Madrid, Spain; [7] SUPSI, Mendrisio, Spain

5DV.3.36 A Grid-Based Spatial Forecasting Framework for Photovoltaic Deployment Using Multi-Factor Geospatial Data
ChangYeol Yun[1], Myeongchan Oh[1], Changki Kim[1], Yongil Kim[2]
[1] KIER, Daejeon, South Korea; [2] Seoul National University, Seoul, South Korea

5DV.3.37 Beyond Potential: Hourly PV Production and Demand Matching for Building-Integrated Solar PV in Europe – a Case-Study Analysis using High-Resolution Time-Series Data
Ana Maria Gracia Amillo[1], Georgia Kakoulaki[2], Diego Pavanello[2], Robert Kenny[2]
[1] Fundacion CENER, Sarriguren, Spain; [2] European Commission JRC, Ispra, Italy

5DV.3.38 Maximising Solar PV Deployment in European Buildings: Understanding Potential and Addressing Barriers in the Implementation of the EPBD
Thomas Garabetian[1], Duygu Celik[2], Johannes Stierstorfer[2], Alexandra Michaelsen[2], Cristian Pozza[3], Francesco Babich[3], Akshit Gupta[3], Giobertti Raul Morantes Quintana[3], Laura Maturi[3], Gabriella Gonella[3], Ulrich Oberegger Filippi[3], Daniele Antonucci[3], Pawel Wargocki[4], Mariya Petrova Bivolarova[4], Andrei Vladimir Litiu[5], Nicolandrea Calabrese[6], Giovanni Murano[6], Francesca Caffari[6], Jerzy Kwiatkowski[7], Aleksandra Dudek[7], Olivier Greslou[8], Dominique Caccavell[8]
[1] SolarPower Europe, Brussels, Belgium; [2] WIP Renewable Energies, Munich, Germany; [3] EURAC, Bolzano, Italy; [4] DTU, Copenhagen, Denmark; [5] EPB Center, Rotterdam, The Netherlands; [6] ENEA, Rome, Italy; [7] NAPE, Warsaw, Poland; [8] CSTB, Marne-la-Vallée, France

5DV.3.39 New Digital Tool Linking European Solar/Storage Market and Policy Data in a Single Platform
Leah Le Pénuizic[1], Christophe Lits[1]
[1] SolarPower Europe, Brussels, Belgium

5DV.3.40 PV Policy Changes and How They Could Impact Technology Uptake: Costa Rican Case Study
Victor Vega-Garita[1], Oscar Núñez-Mata[2]
[1] University of Costa Rica, Cartago, Costa Rica; [2] University of Costa Rica, San Jose, Costa Rica

5DV.3.41 Measuring the Impact of Obstacles When Setting Up Renewable Energy Communities
Kiane Alves e Silva[1], Laura Palomino[1], Luis Miguel Carrasco[1], Ana Belen Cristóbal[1]
[1] UPM, Madrid, Spain

5DV.3.42 Photovoltaics as a Socio-Economic Transformation Pathway in Energy Transitions
Esin Yazici[1], Erkan Erdil[1], Pinar Derin Gure[1]
[1] Middle East Technical University, Ankara, Türkiye

5DV.3.56 Evaluation of Location Factors for Photovoltaic Module Factories
Max Mittag[1], Sebastian Nold[1], Christian Reichel[1], Holger Neuhaus[1]
[1] Fraunhofer ISE, Freiburg, Germany

5DV.3.57 A Sustainable Path for Solar in EU: Modeling Photovoltaic Glass Recycling Costs and Impacts
Umer Shahzad[1], Ian Marius Peters[1]
[1] FZJ, Erlangen, Germany

5DV.3.58 Current Level and Development of Solar Photovoltaic Electricity Market Value in Finland
Sami Jouttijärvi[1], Kati Miettunen[1]
[1] University of Turku, Turku, Finland

5DV.3.59 Urban Energy Resilience in the Built Environment: a Socio-Technical Framework for Hazard-Contingent PV–Storage Integration
Parisa Hosseini[1]
[1] The University of Texas at San Antonio, San Antonio, United States of America

5DV.3.60 Revenue Distribution in Hybrid Plants: Comparing Hourly and 15-minute Day-ahead Outcomes for PV+BESS
Elina Bosch[1], Philippe Macé[1], Caroline Plaza[2], Gaëtan Masson[1]
[1] Becquerel Institute, Brussels, Belgium; [2] Becquerel Institute France, Perpignan, France

5DV.3.61 Optimal Operation of Grid-Connected PV Using Multi-Energy Storage Systems
Sarvar Hussain Nengroo[1]
[1] KFUPM, Dharan, Saudi Arabia

5DV.3.75 Low-Income Native Hawaiian Energy Equity Projects With Internet Access Leads To Social Equity (3-Year Update)
John Borland[1], Takahiro Tanaka[2], Todd Yamashita[3], Liliana Napoleon[4], Bruce Yamashita[5]
[1] J.O.B. Technologies, Aiea, United States of America; [2] T&T Energy Solutions, Honolulu, United States of America; [3] Sun Farmers, Molokai, United States of America; [4] MAHA, Molokai, United States of America; [5] Computer, LLC, Molokai, United States of America

5DV.3.76 Analysis of Peatland-PV: an Insight into the Perspective of Photovoltaic Project Planning
Carl Pump[1], Carola Kiene[1], Volker Beckmann[1]
[1] University of Greifswald, Greifswald, Germany

5DV.3.77 Identifying Factors for Social Acceptance of Photovoltaic Systems on Rewetted Peatlands
Carola Kiene[1], Carl Pump[1], Volker Beckmann[1]
[1] University of Greifswald, Greifswald, Germany

5DV.3.78 Promoting Innovation Excellence in Transformation of Coal Regions to Climate-Neutral, Thriving Economies
Rita Mergner[1], Rainer Janssen[1]
[1] WIP Renewable Energies, Munich, Germany

5DV.3.79 From Nano to the Neighbourhood Scale: The Development of Colour Coated Photovoltaics from the Laboratory to Social Acceptance
Alexander N. Skinner[1], Clara E. Schreck[1], Phillip J. Dale[1], Catherine E. Jones[1]
[1] University of Luxembourg, Belval, Luxembourg

5DV.3.80 Between Panels and Pastures: Socio-Ecological Impacts of Large-Scale Solar Development on Land Use and Rural Livelihoods
Ayşe Ayda Gerçek[1]
[1] Middle East Technical University, Yenimahalle, Türkiye

5DV.3.81 Generating Equity, Nurturing Diversity, Energising Resilience for Power Against Energy Poverty
Rita Mergner[1]
[1] WIP Renewable Energy, Munich, Germany

5DV.3.82 Understanding Agrivoltaic Systems from a Cooperative Perspective: A Case Study in Türkiye
Betül Ergun[1], Bilge Senturk[2], Cisel Ekiz Gokmen[1]
[1] Mugla Sitki Kocman University, Mugla, Türkiye; [2] ODTÜ-GÜNAM, Ankara, Türkiye

5DV.3.83 Assessing the Value of Digital Feedback Tools in Energy-efficient Housing: Evidence from two ProLight Demonstrations
Elina Bosch[1], Philippe Macé[1], Caroline Plaza[2], Gaëtan Masson[1]
[1] Becquerel Institute, Brussels, Belgium; [2] Becquerel Institute France, Perpignan, France

VISUAL PRESENTATIONS 4DV.4

15:15 - 16:45 Advances in PV Performance and O&M: Bridging Research with Field Practices

4DV.4.1 Probabilistic Estimation of Unknown Tracker Angles for Sub-hourly Loss Quantification
Thore Müller[1], Franco Clandestino[1], Kostiantyn Pogorelov[1]
[1] PVRADAR Labs, Ebersberg, Germany

4DV.4.2 De-Icing-Box for Photovoltaic Systems
Adrian Jäggi[1], Matthias Burri[1], Christof Bucher[1]
[1] Bern University of Applied Science, Burgdorf, Switzerland

4DV.4.3 DC Loss Prediction for PV Systems from Measured Energy Time Series and Numerical Weather Predictions
Thomas Haley[1], Emily Tansey[1], Kyle Seymour[1]
[1] Clean Power Research, Bellevue, United States of America

4DV.4.4 The Cost of Waiting: Modelling Metocean-Driven O&M Delays in Offshore Floating Photovoltaic Systems
Manu Centeno-Telleria[1], Ane Elizetxea[1], Yerai Pena[1], Mingxin Li[2], Markel Penalba[1]
[1] Mondragon University, Arrasate, Spain; [2] Tokyo University, Tokyo, Japan

4DV.4.5 Towards Optimal Energy Production: a Hybrid Analysis of Stow Trigger
Kerman Lopez de Calle-Etxabe[1], David Olasolo[1], Diego Gonzalez[1]
[1] Fundacion TEKNIKER, Eibar, Spain

4DV.4.6 Experimental Assessment of Soiling Losses in Agrivoltaic Systems: Insights from Field Data in Denmark and Spain
Álvaro Fernández Solas[1], Nicholas Riedel-Lyngskær[2], Natalie Hanrieder[1], Stefan Wilbert[1], Carmen Alonso García[3], Rolando Cabrera Dalés[3], Estefanía Sánchez Vizcaíno[4]
[1] DLR, Almería, Spain; [2] European Energy, Søborg, Denmark; [3] CIEMAT, Madrid, Spain; [4] Cortijo El Cura Eco-Bodega, Laujar de Andarax, Spain

4DV.4.7 Robustness of the Photovoltaic Output Models with Varying Levels of Filtering
Väinö Anttalainen[1], Lauri Karttunen[1], Sami Jouttijärvi[1], Anders V. Lindfors[2], Juha A. Karhu[2], Hugo Huerta[3], Samuli Ranta[3], Kati Miettunen[1]
[1] University of Turku, Turku, Finland; [2] Finnish Meteorological Institute, Helsinki, Finland; [3] Turku University of Applied Sciences, Turku, Finland

4DV.4.8 Large-Scale Degradation Analysis of PV Modules on Operational Sites using DC Timeseries
Houria Cheikh Ahmed[1], Andreas Wabbes[1], Quentin Van Nieuwenhoven[1], Cheikhna Talebmoustaph[1]
[1] ENGIE LABORELEC, Linkebeek, Belgium

4DV.4.9 From Fault Prediction to Action: a Conversational LLM-based Tool for PV Asset Management
Yasaman Ahmdi[1], Lukas Koester[1], Sandra Gallmetzer[1], Luís Fialho[1]
[1] EURAC Research, Bolzano, Italy

4DV.4.10 Long-term Field Analysis of Fine Dust Impact on a 100 kW PV Plant with new and Reused Modules
Jeong-eun Jeon[1], Ji-Hyun Yoo[1], Gyeong-Jun Min[1], Jae-Hyeok Hur[1], Seok-Jae Lee[1], Su-Mi Yang[2]
[1] Far East University, Eumseong-gun, CB, South Korea; [2] Far East University, Eumseong-gun, South Korea

4DV.4.11 Structure-Locked Shadow Overlay GAN PV for Data Augmentation in Thermography
JungMin Moon[1], Ju-Hee Kim[1], Yonghyun Kim[1], Changheon Kim[1]
[1] Korea Photonics Technology Institute, Gwangju, South Korea

4DV.4.12 Learning Vector Quantization and K-Menas Clustering based Ensemble Model for Line-to-Line Fault Detection and Classification in PV Arrays
Peyman Ghaedi[1], Aref Eskandari[2], Mohammadreza Aghaei[3]
[1] AUT, Tehran, Norway; [2] IUST, Tehran, Norway; [3] NTNU, Ålesund, Norway

4DV.4.13 Anomaly Detection and Diagnostics for PV Systems Based on Image Segmentation of Power Residuals and on Bayesian Networks
Corentin Tissier[1], Baptiste Schubnel[1], Jelena Simeunovic[1], Pierre-Jean Alet[1]
[1] CSEM, Neuchâtel, Switzerland

4DV.4.14 Estimation of PV System Degradation using Data from Clipping Periods
Mari B. Øgaard[1], Marie Syre Wiig[1], Vilde S. Nysted[1], Nathan Roosloot[1], Josefine Selj[1]
[1] IFE, Kjeller, Norway

4DV.4.15 Physics-Informed Graph-Based Modelling to Support Performance Monitoring and Degradation Analysis of PV Systems
Srijani Mukherjee[1], Liliane Bou Nassif[2], Hervé Colin[1], Stephanie Giroux-Julien[3], Hervé Pabiou[2], Denys Dutykh[4], Laurent Vuillon[5], Ioannis (John) A. Tsanakas[1]
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4DV.4.16 The Ineffectiveness of Cooling Systems on PV Efficiency Across Climate Zones: A Climate Variability-Focused Statistical Analysis
Mohamed Elnbhani Ismail[1]
[1] Sudan University of Science and Technology, Khartoum, Sudan

4DV.4.17 Beyond the State of the Art: A Metadata Analysis and Result Comparison of Model and Lighthouse Photovoltaic Projects in Austria
Alexander Erber[1], Marcus Rennhofer[1], Christoph Mayr[1]
[1] AIT, Vienna, Austria

4DV.4.18 Unlock your hidden Solar Losses with SUPER (Solar Utilization, Performance and Reliability benchmarking tool)
Daniel Fregosi[1], Wayne Li[1], Alberto Pico[2]
[1] EPRI, Charlotte, United States of America; [2] EPRI, Santiago de Compostela, Spain

4DV.4.19 High-Resolution, Automated On-Rack Photovoltaic Module Imaging Using a Multi-Camera Array
Matthew T. Sivewright[1], E. Ernest Van Dyk[1], Frederik J. Vorster[1]
[1] Nelson Mandela University, Port Elizabeth, South Africa

4DV.4.20 Comparative Analysis for Solar Single Axis Tracker Fault Detection on DC Power Timeseries
Cheikhna Talebmoustaph[1], Andreas Wabbes[1], Aquin Magnus[1], Quentin Van Nieuwenhoven[1]
[1] Engie Laborelec, Linkebeek, Belgium

4DV.4.21 Convolutional Variational Auto-encoder-based Classifier for PV Panel-Level Anomaly Detection
Walid M'Zough[1], Yousra Sidqi[1], Benoit Delinchant[2]
[1] Lucerne University of Applied Sciences and Arts, Horw, Switzerland; [2] G2ELab, Grenoble, France

4DV.4.22 Using Large Language Models to Convert Fault Logbooks into a Labeled Dataset
Mücahid Candan[1], David Melgar[1]
[1] Fraunhofer ISE, Freiburg, Germany

4DV.4.23 Dust Impact on a 14.17 kW Rooftop PV System in Oman: Field Validation and Economic Analysis
Mazin Al Shidhani[1], Waleed Al Washahi[1]
[1] Petroleum Development Oman, Muscat, Oman

4DV.4.24 The Influence of Angle of Incidence on Soiling Losses in Photovoltaic Modules under Arid Conditions
Rolando Cabrera-Dalés[1], Aránzazu Fernández-García[2], Stefan Wilbert[3], Manuel Pérez-García[4], María del Carmen Alonso-García[5]
[1] CIEMAT, Tabernas, Spain; [2] CIEMAT, Almería, Spain; [3] DLR, Almería, Spain; [4] CIESOL-University of Almería, Almería, Spain; [5] CIEMAT, Madrid, Spain

4DV.4.25 Assessing Small-Scale Photovoltaic System Performance Using Field Irradiance Data and Utility Billing Records
Brian Bartolo[1], Brian Azzopardi[2], Carmel Azzopardi[2], Austeja Mockeviciute-Azzopardi[2]
[1] The Foundation for Innovation and Research - Malta, Birkirkara, Malta; [2] The Foundation for Innovation and Research, Birkirkara, Malta

4DV.4.26 Photovoltaic Anomaly Diagnosis using a Classification Model Based on the Maximum Power Point of I-V Curves
Woogyun Shin[1], Youngchul Ju[1], Hyemi Hwang[1], Jinseok Lee[1], Sukwhan Ko[1]
[1] KIER, Yuseong-gu, South Korea

4DV.4.27 Comparative Analysis of Cleaning Schemes for Bifacial PV Modules in a Single-axis Tracking System
Rodrigo P. Maruyama[1], Bruno J. Vieira[1], Givaldo dos Reis[1], Renzo Vargas[1], Alex Renan A. Manito[1], Marcelo P. Almeida[1], Adnei Melges de Andrade[1], Roberto Zilles[1]
[1] USP, São Paulo, Brazil

4DV.4.28 Ground-based Inspection-robot for Autonomous Daylight Photoluminescence Inspection
Lukas Koester[1], Irfan Haider[1], Luis Fialho[1]
[1] Eurac Research, Bolzano, Italy

4DV.4.29 A new Indexing Algorithm for Photovoltaic Data
Zhu Wang[1], Bo Qiu[2], Xingxing Wu[1]
[1] Sany Group, Zhuzhou, China; [2] China Mobile, Guangzhou, China

4DV.4.30 Thermal Impact of Curtailment on PV Panels: A Case Study in Brazil
Lucas T. Silva[1], Juliana C. Alencar[1], José Rhuan M. Frota[1], Rodrigo S. Queiroz[1]
[1] Delfos Energy, Barcelona, Spain

4DV.4.31 Identification of Burnout Failure Conditions in Rapid Shutdown Devices for Photovoltaic Systems
Tensei Akinaga[1], Tosiyuki Hamada[1], Ikuo Nanno[2], Norio Ishikura[3], Masayuki Fujii[4], Shinichiro Oke[5]
[1] Osaka Electro-Communication University, Neyagawa, Japan; [2] St. Andrew's University, Izumi, Japan; [3] National Institute of Technology, Yonago, Japan; [4] National Institute of Technology, Imabari, Japan; [5] National Institute of Technology, Tsuyama, Japan

4DV.4.32 Modeling and Mapping of Soiling Losses in Morocco for Different Photovoltaic System Configurations
Mounir Abraim[1], Fatima Zahra Ouchani[1], Abdellatif Ghennioui[1], Leonardo Micheli[2]
[1] Green Energy Park, BenGuerir, Morocco; [2] Sapienza University of Rome, Rome, Italy

4DV.4.33 Data-Driven Power-Loss Modelling of Photovoltaic Cells Using Physically Based Syntehtic EL-IV Data
Rodrigo del Prado Santamaría[1], Aysha Mahmood[1], Luca Oneto[2], Antonio Sgorbissa[2], Gisele Alves dos Reis Benatto[1], Thøger Kari[1], Mahmoud Dhimish[1], Peter B. Poulsen[1], Sergiu V. Spataru[1]
[1] DTU, Roskilde, Denmark; [2] University of Genoa, Genova, Italy

4DV.4.34 Intense Mid-level Wind Speeds and Flat Tracker Tilts during Rear Glass Breakages on Non-Large-Format Bifacial PV Modules on Trackers
Kee Soon (Darryl) Wang[1]
[1] DNV Singapore, Singapore, Singapore

4DV.4.35 Benchmarking PV Simulation Software Against Operational Data: A 100 MW Bifacial TOPCon Case Study in Brazil
Joel Pontes[1], Leticia Vasconcelos[1], Lucas Colares[1], Luiz Reis[1], Lucio Paiva[1], Luis Guilherme Castro[1], Rodrigo Santos[1]
[1] Casa dos Ventos, Fortaleza, Brazil

4DV.4.36 Enhancing Insurability: Preventive Strategies and Security Solutions to Combat Copper Theft
Oliver Strecke[1], Malia Cobb[1]
[1] viamon, Kaiserslautern, Germany

4DV.4.37 Benchmarking of Image Normalization Techniques in dEL and dPL Images for Field PV Module Inspections
Kabir Paul Sulca Buitrón[1], Rodrigo del Prado Santamaría[2], Julian Anaya Calvo[1], Sergiu Viorel Spataru[2], Oscar Martínez Sacristan[1]
[1] University of Valladolid, Valladolid, Spain; [2] DTU, Roskilde, Denmark

4DV.4.38 A Multiple String Current-Modulated Switching Device for Daylight Electroluminescence Imaging of Photovoltaic Modules
Kabir Paul Sulca Buitrón[1], Cristian Terrados Lopez[2], Julian Anaya Calvo[1], Victor Alonso Gomez[1], Oscar Martinez Sacristan[1]
[1] University of Valladolid, Valladolid, Spain; [2] University of Burgos, Burgos, Spain

4DV.4.39 Reliability of Ideality Factor Determination from Electroluminescence Quantification According to IEC TS 63109:2022
Gorka Torre[1], Jose Domingo Santos Rodriguez[1], Joseba Ormaetxea[1], Eneko Setien[1], Aritz Villodas[1], Alberto Del Pozo[1], Ainhoa Pereda[1], Eneko Ortega[2], Ricardo Alonso[1]
[1] TECNALIA, Derio, Spain; [2] UPV/EHU, Leioa, Spain

4DV.4.40 Predictive Maintenance: a Must use Technology
Pau Mercade Ruiz[1], Gerardo Guerra[1], Gaetana Anamiati[1], Lars Landberg[2]
[1] GreenPowerMonitor a DNV company, Barcelona, Spain; [2] DNV Denmark, Hellerup, Denmark

4DV.4.41 Open Source Hardware for Mobile String Power Acquisition of Solar Parks
Stefan Grünsteidl[1]
[1] GRN.Solar, Grafing, Germany

4DV.4.42 A Simple Statistical Modelling Approach for Evaluating Diverse PV Module Performance under Nordic Environments
Huilan Zheng[1], Maryna Waszak[2], An Ngoc Lam[2], Astrid Marthinsen[1], Alexander G. Ulyashin[1], Xiang Ma[1]
[1] SINTEF Industry, Oslo, Norway; [2] SINTEF Digital, Oslo, Norway

4DV.4.43 Performance Analysis and Design Implications of Bifacial PV Systems in an Industrial Complex
Jinho Choi[1], Wonwook Oh[2]
[1] Chungbuk Technopark Next Energy Center, Jincheon-gun, South Korea; [2] Chungbuk Technopark, Jincheon-gun, South Korea

4DV.4.44 Comparative Study of Machine Learning Algorithms for Fault Diagnosis in PV Systems Specifically under low Irradiance Conditions
Norio Ishikura[1], Kaima Yamada[1], Toshiyuki Hamada[2], Ikuo Nanno[3], Shinichiro Oke[4], Masayuki Fujii[5]
[1] National Institute of Technology, Yonago College, Yonago, Japan; [2] Osaka Electro-Communication University, Osaka, Japan; [3] Yamaguchi Gakugei University and Yamaguchi College of Arts, Osaka, Japan; [4] National Institute of Technology, Tsuyama College, Tsuyama, Japan; [5] National Institute of Technology, Oshima College, Suo-osima, Japan

4DV.4.45 Effect of PV Module Azimuth Angle on Revenue of PV Systems in Different Locations in Europe
Heidi Kalliojärvi[1], Kari Lappalainen[1]
[1] Tampere University, Tampere, Finland

4DV.4.46 Development of Failure Diagnosis Algorithms for PV Plants and Analysis in Over 6GW
Jorge Solórzano del Moral[1], Monica Quiroz[2], Alberto Valcarcel[2]
[1] Qualifying PhotoVoltaics, Madrid, Spain; [2] Qualifying Photovoltaics, Madrid, Spain