

PVRW **2026** *Photovoltaics Reliability Workshop*

February 24–26, 2026

Lakewood, Colorado

Program committee:

Michael Deceglie (chair)

Jen Braid

Kris Davis

Nick de Vries

Tristan Erion-Lorico

Henry Hieslmair

Will Hobbs

Joe Karas

Cherif Kedir

Jenya Meydbray

Colleen O'Brien

Gernot Oreski

Silvana Ovaitt

Jon Previtali

Dennice Roberts

Janna Segrest

Adam Shinn

Tim Silverman

Colin Sillerud

Allan Ward

Tuesday, February 24, 2026

Morning

7:30 AM	Breakfast
8:20 AM	Opening remarks
8:30 AM	Extreme weather and resilience
	Chairs: Jen Braid, Heather Mirlletz
8:30 AM	Hail: A data-driven understanding of PV module resilience Colin Sillerud <i>GroundWork</i>
8:50 AM	Predicting module damage from hail impacts using finite element simulations^(DuraMAT) Steven DiGregorio <i>Sandia National Laboratories</i>
9:10 AM	Measuring solar PV resilience: At 6s and 7s, how to make solar PV a 10 in the face of storms James Elsworth <i>National Laboratory of the Rockies</i>
9:30 AM	Panel discussion
9:50 AM	Break
10:20 AM	Quality and reliability in module and system design
	Chairs: Derek DuBois, Jenya Meydbray
10:20 AM	Creepage, clearance and compliance in PV modules: Quality assurance lessons from domestic manufacturing Terry Jester <i>Kiwa PI Berlin</i>
10:40 AM	Accelerating structural and mechanical engineering practice: Urgent needs and a path forward Gerald Robinson <i>University of Louisiana - Energy Efficiency and Sustainable Energy Center</i>
11:00 AM	Industry-informed analysis of PV module glass breakage: Insights and perspectives from stakeholder interviews Farid Samara <i>DNV</i>
11:20 AM	Warranty litigation—Lessons learned and best practices Todd Heffner <i>Smith, Gambrell & Russell LLP</i>
11:40 AM	Panel discussion
12:00 PM	Lunch

Tuesday, February 24, 2026

Afternoon

1:00 PM	Poster session
2:30 PM	Glass
2:30 PM	Chairs: Ashley Gaulding, Jessica Rimsza Predicting glass fracture in large-format photovoltaic modules^(DuraMAT) Martin Springer <i>National Laboratory of the Rockies</i>
2:50 PM	From static loads to dynamic reliability in PV modules Miguel Garcia <i>Nextpower</i>
3:10 PM	Site data collection for asset management Janna Segrest <i>Quanta Services</i>
3:30 PM	Panel discussion
3:50 PM	Break
4:10 PM	Discussion session: Insurance
	Moderators Michael Perron, <i>FM Renewable Energy</i> Isaac McLean, <i>kWh Analytics</i>
	Panelists Heidi Aragon, <i>J.S. Held</i> Jon Harding, <i>Adjusting Services International</i> Roderick Rennison, <i>Rimkus</i>
5:20 PM	Day 1 closing and poster awards
5:30 PM	Welcome reception

Wednesday, February 25, 2026

Morning

7:30 AM	Breakfast
8:30 AM	Cell reliability
	Chairs: David Young, Todd Karin
8:30 AM	From corrosion to UV effects: Unveiling and mitigating degradation mechanisms in TOPCon solar cells and modules
	Bram Hoex <i>University of New South Wales</i>
8:50 AM	Post-PID metastability and recovery behavior in TOPCON modules
	Allan Ward <i>Heliene</i>
9:10 AM	PID observations in the field
	Hubert Seigneur <i>University of Central Florida</i>
9:30 AM	Panel discussion
9:50 AM	Break
10:20 AM	Quality and reliability in operation and asset management
	Chairs: Will Hobbs, Steve Johnston
10:20 AM	Large scale daylight photoluminescence imaging for quality assessment of utility scale solar farms
	Thorsten Trupke <i>Lab 360 Solar / University of New South Wales</i>
10:40 AM	Insights from field operations
	Greg Rossin <i>AES</i>
11:00 AM	Insights from the PV O&M Analytics Collaborative
	Marios Theristis <i>Sandia National Laboratories</i>
11:20 AM	Repowering, the other side of the reliability coin
	Silvana Ovaitt <i>National Laboratory of the Rockies</i>
11:40 AM	Panel discussion
12:00 PM	Lunch

Wednesday, February 25, 2026

Afternoon

1:00 PM	Poster session
2:30 PM	Quality and reliability in construction and procurement
	Chairs: Vignesh Ramasamy, Michael Bolen
2:30 PM	Strained connections—EBOS and trackers
	David Devir <i>VDE Americas</i>
2:50 PM	Field data review: Quality and reliability insights from >2,000 inspections covering >5 GW of U.S. PV assets
	David Penalva <i>HelioVolta</i>
3:10 PM	National Lab Center for Electrical Balance of System Reliability
	Laurie Burnham <i>Sandia National Laboratories</i>
3:30 PM	Resuscitating Icarus: Responding to PV plant performance testing challenges
	Adam Kankiewicz <i>Origis Energy</i>
3:50 PM	Panel discussion
4:10 PM	Break
4:30 PM	Discussion session: Building consensus on module reliability classification
	Moderator Teresa Barnes, <i>NLR</i>
	Panelists Henry Hieslmair, <i>DNV</i> Colleen O'Brien, <i>UL</i> Nick de Vries, <i>Silicon Ranch</i> Tristan Erion-Lorico, <i>Kiwa PVEL</i>
5:20 PM	Day 2 closing, presentation of the PowerMark Early Career Prize, poster awards

Thursday, February 26, 2026

Morning

7:30 AM	Breakfast
8:30 AM	Fleet-level observations
8:30 AM	Chairs: Dirk Jordan, Alex Berlinsky PV Fleet performance—2025 update Chris Deline <i>National Laboratory of the Rockies</i>
8:50 AM	Insights from performance and reliability benchmarking (SUPER) Danny Fregosi <i>Electric Power Research Institute (EPRI)</i>
9:10 AM	Ensuring quality and reliability: Insights from our reliability testing and inspections Max Koentopp <i>TÜV Rheinland International GmbH</i>
9:30 AM	Panel discussion
9:50 AM	Break
10:20 AM	Inverters
10:20 AM	Chairs: Silvana Ovaitt, Hunter Coleman Inverters as repairable systems Nathan Brunner <i>DNV</i>
10:40 AM	Environmental effects on inverters: An in-depth study of humidity Peter Hacke and Ramanathan Thiagarajan <i>National Laboratory of the Rockies</i>
11:00 AM	Extending component lifetime and improving inverter reliability Wayne Li <i>Electric Power Research Institute (EPRI)</i>
11:20 AM	Panel discussion
11:40 AM	Lunch

Thursday, February 26, 2026

Afternoon

1:00 PM	Poster session
2:30 PM	Thin films
	Chairs: Marco Casareto, Tim Silverman
2:30 PM	Stabilization and characterization of CdTe solar panels Dana Kern <i>National Laboratory of the Rockies</i>
2:50 PM	Light and elevated temperature testing of perovskites Michael Owen-Bellini <i>National Laboratory of the Rockies</i>
3:10 PM	Insights from long-term stability testing of numerous FACs perovskite solar cells Marko Topič <i>University of Ljubljana</i>
3:30 PM	Panel discussion
3:50 PM	Break
4:10 PM	Encapsulants
	Chairs: Mike Kempe, Stefan Mitterhofer
4:10 PM	Temperature dependence of PV encapsulant degradation for UV-ID studies^(DuraMAT) Xavier Hanna <i>National Laboratory of the Rockies</i>
4:30 PM	Let's not R-EPE-at our mistakes^(DuraMAT) Elizabeth Palmiotti <i>National Laboratory of the Rockies</i>
4:50 PM	NIR spectroscopy for evaluating cross linking Gernot Oreski <i>Polymer Competence Center Leoben</i>
5:10 PM	Panel discussion
5:30 PM	Workshop closing and poster awards

Tuesday, February 24, 2026

Poster session

- 1 Multiple Hail Impact Testing**
Jimmy Newkirk¹, Dirk Jordan¹, Martin Springer¹, James Hartley²
¹National Laboratory of the Rockies
²Sandia National Laboratories
- 2 Defining the 50-year module: Luck, Design, or Both?**
Dirk Jordan¹, Silvana Ovaitt¹, Heather Mirlletz¹, Teresa Barnes¹
¹National Laboratory of the Rockies
- 7 Dynamic tracker system modeling for use in glass fracture studies**
Tracy Becker¹
¹University of California Berkeley
- 10 Spectral Tuning and Optimized Kinetics via Energy Down-shifting in PV Packaging (STOKED!)**
David Miller¹, Dana Kern¹, Peter Hacke¹
¹National Laboratory of the Rockies
- 13 Development of Durability Tests for Photovoltaic Connectors**
Michael Kempe¹, Aidan Wesley¹, Aubrey Jackson¹, Rachael Arnold¹, Jimmy Newkirk¹
¹National Laboratory of the Rockies (NLR)
- 16 Evaluating the UV exposure and degradation of PV backsheet materials**
Aidan Wesley¹
¹National Laboratory of the Rockies (NLR)
- 19 PVDeg: Enhancing usability and AI-driven multi-mechanism degradation modeling**
Rajiv Daxini¹, Tobin Ford¹, Silvana Ovaitt¹, Michael Kempe¹, Dirk Jordan¹, Baojie Li², Anubhav Jain², Martin Springer¹
¹National Laboratory of the Rockies
²Lawrence Berkeley National Laboratory
- 22 Reflection-Based Polariscope Technology for Stress Analysis in Glass-Glass PV Modules**
Jessica Rimsza¹, Collin Wilkinson², Ashley Gaulding³, Jennifer Braid¹
¹Sandia National Laboratories
²Alfred University
³National Laboratory of the Rockies
- 25 Let's not R-EPE-at our mistakes**
Mirzoramshed Mirzokarimov¹, Dennice Roberts¹, Michael Owen-Bellini¹, Hannah Dedmon², Mark Wilson², Elizabeth Palmiotti¹
¹National Laboratory of the Rockies (NLR)
²Sandia National Laboratories
- 28 Electrical-thermal modeling of photovoltaic module connectors to enable thermo-mechanical coupling and failure mode indication**
Farhan Rahman¹, Steven DiGregorio¹, James Hartley¹, Bruce King¹
¹Sandia National Laboratories
- 31 New Cells, New Issues: Stress Tests for N-type PV Module Designs**
Archana Sinha¹, Jean-Nicolas Jaubert¹, Dana B. Kern², Todd Karin¹
¹Kiwa PVEL
²National Laboratory of the Rockies
- 34 Large Language Model – Enabled Analysis of Field PV System Degradation**
Baojie Li¹, Dirk Jordan², Martin Springer², Rajiv Daxini², Anubhav Jain¹
¹Lawrence Berkeley National Laboratory (LBNL)
²National Laboratory of the Rockies
- 37 Accelerated stress testing identifies greater UV-induced degradation under UV-fluorescent compared to full spectrum illumination**
Rebecca B. Wai¹, Xavier M. Hanna¹, David C. Miller¹, Dennice M. Roberts¹, Kent Terwilliger¹, Jimmy M. Newkirk¹, Steve Johnston¹, Dana B. Kern¹, Peter Hacke¹
¹National Laboratory of the Rockies
- 40 A fast, accurate prediction for system-wide damage due to dynamic wind loading**
Ethan Young¹, Martin Springer¹, Brooke Stanislawski¹, Andrew Glaws¹, Xin He¹, Walid Arsalane¹, Matthew Emes¹
¹National Laboratory of the Rockies

Tuesday posters

Red numbers indicate DuraMAT posters

- 43 Assessing Risks for Photovoltaic Modules: Environmental Conditions, Extreme Weather, and Regional Capacity**
Jennifer L. Braid¹, Norman R. Jost¹
¹*Sandia National Laboratories*
- 46 Advancing the DuraMAT Data Hub**
Robert White¹, Rachel Hurst¹, David Hsu¹, Nicholas Wunder¹, David Rager¹, Sagi Zisman¹
¹*National Laboratory of the Rockies*
- 49 Cell Cracks Cause Minor Performance Loss for Modern PV Modules**
Todd Karin¹
¹*Kiwa PVEL*
- 52 Root cause investigation of glass cracking in field-mounted solar modules**
Joe Karas¹
¹*EPRI*
- 55 Mapping PV degradation mechanisms and field performance by leveraging large language models**
Baojie Li¹, Dirk Jordan², Martin Springer², Anubhav Jain¹
¹*Lawrence Berkeley National Laboratory*
²*National Laboratory of the Rockies*
- 58 PV-Copilot: An Autonomous Assistant for End-to-End Degradation Analysis**
Baojie Li¹, Anubhav Jain¹
¹*Lawrence Berkeley National Laboratory*
- 61 Effect of Cell Cracks on Module Power Loss and Degradation: Modern Module Architectures**
Viral Parikh¹, **Wayne Li**¹, Martin Springer², Michael Gostein³, Will Hobbs⁴, Jim Rand⁵
¹*Electric Power Research Institute*
²*National Laboratory of the Rockies*
³*Atonometrics Inc.*
⁴*Southern Company Services*
⁵*Core Energy Works*
- 64 A decade of In-Production EL Defects data: Insights for Different Geographies and Technologies**
Juan Lopez-Garcia¹, Varun Kelkar¹, Elias Garcia-Goma¹, Hugo Leduc¹, Yann Teyssedre¹, Stefano N. Granata¹
¹*STS*
- 67 A Test-to-Failure Protocol for PV Module Hail Damage**
Tyjal DeWolf-Moura¹, Jonathan Allen¹, Jon Previtali¹, Peter Bostock¹, Michael Linn², Cherif Kedir³, Saeed Arash Far³, Adrian Hernandez³, Manpreet Kaur³, Arlexy Angulo³, Ronald Fritz⁴, Michael Pilliod⁵
¹*VDE Americas*
²*RETC / VDE*
³*Renewable Energy Test Center RETC LLC*
⁴*InSite Technologies*
⁵*CENTRAL TENSION*
- 70 Hail Response Effectiveness of Solar trackers**
Sumanth Lokanath¹, Demetre Argiro²
¹*Array technologies*
²*Novasource Power*
- 73 Implications of Thinner Glass: Low Hanging Fruit Solutions**
Ashley Gaulding¹, Elizabeth Palmiotti¹, Timothy Silverman¹, Michael Deceglie¹
¹*National Laboratory of the Rockies (NLR)*
- 76 Integrated performance diagnosis of an utility-scale photovoltaic plant in Colombia using machine learning-based fault detection and updated energy generation modeling**
Rafael Avila Naranjo¹, Cesar Sierra¹, Luis Felipe Rangel¹
¹*ICREA*
- 79 Estimating PV system availability P-values using operational data**
Owen Westbrook¹
¹*Sunrise Technologies*
- 82 Analysis of UVID and Dark Degradation Recombination Mode in Fielded TOPcon Modules**
Johnson Wong¹, Karl Bedrich¹, Yong Sheng Khoo¹, Franco Lim², Jing Chai¹, Aziz Nairi³
¹*Quantified Energy*
²*Sembcorp*
³*Solar Energy Research Institute of Singapore (SERIS)*
- 85 3000 Performance Models is Greater than 1**
Kurt Rhee¹
¹*Proximal Energy, Inc.*

Tuesday posters

Red numbers indicate DuraMAT posters

- 88 Glass with inherent antireflective properties for PV applications**
Alexandra Mitchell¹
¹*Corning Incorporated*
- 91 Investigating the Oxygen Barrier Properties of Desiccated Edge Sealants for Protection of Perovskite Solar Modules**
Paul Monroe¹, Lori Postak, M.Sc.¹
¹*Quanex IG Systems*
- 94 Integrated Hail Resilience Strategy to Reduce Insurance Costs for Utility-Scale Solar Assets**
Travis Morrison¹, Mandar Khodegaokar², Ashish Kothari², Kendall Lilly²
¹*GroundWork Renewables*
²*Recurrent Energy*
- 97 Assessing Durability and Cracking Propensity of Emerging PV Backsheets under Accelerated Laboratory Weathering**
Xiaohong Gu¹, Zelin Li¹, Stefan Mitterhofer¹, Karissa Jensen¹, Ashlee Aiello¹, Hsin-Hsin Hsieh², Anabel Kadri³, Julie Aleiner⁴, Laing Ji⁵
¹*National Institute of Standards and Technology (NIST)*
²*Industrial Technology Research Institute (ITRI)*
³*Tulane University*
⁴*Columbia University*
⁵*UL Solutions*
- 100 Inferring module degradation from SCADA: a combiner-level state of health approach**
Hunter Coleman¹
¹*Proximal Energy, Inc.*
- 103 Impact of the surroundings on bifacial gain in the performance ratio**
Chris Buckland¹, Luis Rodrigues¹, Armando Solis¹, **Greg Gavazzi**¹, Tony Pananos¹
¹*Lightsources bp*
- 106 Wind Stow Performance Assessment**
Ali Cole¹, **Yarrow Fewless**¹
¹*CPP Wind Engineering*
- 109 Evaluation of Tracker Losses from Limited Data**
Peter Burgess¹, Natali Martinez¹
¹*EDF power solutions*
- 112 Identifying and applying alternative sources of inverter reliability data**
Stephen Ressler¹
¹*ICF International*
- 115 Does the 25-Year Warranty Anchor PV Innovation? A Techno-Economic Inquiry into a Mid-life Repowering Strategy**
Tim Johnson¹
¹*621 Power Partners*
- 118 Distinguishing Soiling and Degradation Losses Using In-Situ I-V**
Michael Gostein¹, Josh Horst¹
¹*OTT HydroMet*
- 121 MANTIS mid-project report: outdoor, non-contact electroluminescence of CdTe modules**
Greg Horner¹, Kyle Lu¹, Phillip Miller¹, Ethan Ignatovich¹, Eleda Fernald¹
¹*Tau Science Corp*
- 124 Characterization of Surface Coating Variability in Commercially Available Solar PV Connectors**
Tapasvi Lolla¹, **Wayne Li**¹, Laurie Burnham², David Miller³, Steven DiGregorio², Bruce King²
¹*Electric Power Research Institute (EPRI)*
²*Sandia National Laboratories*
³*National Laboratory of the Rockies*

Wednesday, February 25, 2026

Poster session

- 4 Linear machine abrasion test to emulate cleaning of solar power surfaces: results of the inter-lab precision study**
Delos Ashcraft¹, David C. Miller¹, Pavan S. Fuke², Anil Kottantharayil², Lubna Al Harthy³, Adam Law³, Charlotte Pfau⁴, Deshaboina Saikumar⁴, Ning Song⁵, Marko Turek⁴, Michael Walls³
¹National Laboratory of the Rockies (NLR)
²Indian Institute of Technology (IIT) Bombay
³Loughborough University
⁴Fraunhofer Center for Silicon Photovoltaics CSP
⁵University of New South Wales (UNSW Sydney)
- 5 Capacity test regression equation comparison**
James Willett¹
¹Renewable Energy Systems
- 8 Field performance tests of perovskite solar cells loaded with fixed resistors**
Takeshi Tayagaki¹, Sayaka Hirooka¹, Kohei Yamamoto¹, Takurou N. Murakami¹, Masahiro Yoshita¹
¹National Institute of Advanced Industrial Science and Technology (AIST)
- 11 IEC TC 82 status**
George Kelly¹
¹Sunset Technology Inc.
- 14 Modeling the System-Level Economic Impact of PV Connector Failure Modes**
Jal Desai¹, **Vignesh Ramasamy**¹
¹National Laboratory of the Rockies (NLR)
- 17 Modeling Tracker Twist and the Impact on Module Performance and Fatigue Life**
Chris Needham¹, Frank Oudheusden¹
¹Azimuth Advisory Services
- 20 Technoeconomic Exploration of Photovoltaic Recycling**
Collin Wilkinson¹
¹Alfred University
- 23 Insurance Cost Model Framework**
Adam Shinn¹, Jal Desai²
¹kWh Analytics
²National Laboratory of the Rockies
- 26 Symmetrical Hot Spots in Half-Cell PV Modules: Root Causes and Operational Risks**
Fan Zhang¹, Devon Nishimura¹, Alfredo Spagnuolo¹, Thomas Amsuess¹
¹Zeitview
- 29 Economic Analysis of Solar PV Decommissioning Cost and Industry Recommendation**
Simon Krebs¹
¹HSB / Munich RE
- 32 Cold-Weather Risk for Self-Powered PV Trackers**
Ali Dionigi¹, Haley DiGiovanni¹
¹Natural Power
- 35 Beyond Straight-Line Depreciation: Leveraging Real-Time Market Indexes to Scale Solar Circularity**
Alexander Olesen¹
¹Buckstop
- 38 Two module features that raise glass breakage risk**
Timothy J Silverman¹, Elizabeth C. Palmiotti², Martin Springer², Michael G. Deceglie², E. Ashley Gaulding²
¹Delft University of Technology
²National Laboratory of the Rockies
- 41 Thermal and Visual Precursors to Risk in Utility-Scale PV Connectors and Fuses Observed with Ground-Based Robotics**
Martin Waters¹, Jason Wheeler¹
¹nextpower
- 42 PV Module Mechanical Characterization**
Kanwal Bhatti¹, **Ketan Patel**¹
¹First Solar Inc

- 44 Edge Seal Effects on the Reliability of Modern Si PV Technologies**
Luke McClintock¹, Aidan Wesley¹, Jimmy Newark¹, Michael Kempe¹
¹National Laboratory of the Rockies (NLR)
- 47 Understanding the thermomechanical properties of polyolefin encapsulants for reliable perovskite solar module packaging**
Marco Casareto¹, Nick Bosco², Laura Schelhas², Michael Owen-Bellini², Nicholas Rolston¹
¹Arizona State University (ASU)
²National Laboratory of the Rockies
- 50 A Static Hail Mitigation Solution for Solar Power Plants**
Chad Medcroft¹, Mike Anderson¹
¹Erthos, Inc.
- 51 Mechanical vs Sensor Based Stow Mudasar Zahoor**¹
¹Array Technologies Inc
- 53 Domestic content as it affects quality and reliability**
Kim Clark¹
¹Natural Power
- 54 Enhanced POE Resins for Reliable and Efficient PV Module Production**
Paul Brigandi¹
¹Dow Inc.
- 56 18 Years of investigating fires in PV systems: A synopsis of experience**
Bill Brooks¹
¹Brooks Engineering
- 59 Feel the burn: a grass fire stress test for solar panels**
Sara MacAlpine¹
¹JUWI inc
- 62 Mapping J_{0e} Across Modules: Injection Dependent EL for Advanced Diagnostics**
Adrienne L. Blum¹, Tristan de la Beaujardiere¹, Wes Dobson¹, Harrison Wilterdink¹, Ron Sinton¹
¹Sinton Instruments
- 65 One flash to rule them all: rethinking non-uniformity testing in large area solar simulators**
Weston Dobson¹, Adrienne Blum¹, Harrison Wilterdink¹, Ron Sinton¹, Tristan de la Beaujardiere¹
¹Sinton Instruments
- 68 Test to Failure of PV Modules Subject to Freezer Ice Ball Impacts at Oblique Angles**
Tyjal DeWolf-Moura¹, Jonathan Allen¹, Jon Previtali¹, Peter Bostock¹, Cherif Kedir², Saeed Arash Far², Adrian Hernandez², Manpreet Kaur², Arlexy Angulo², Ronald Fritz³, Michael Pilliod⁴
¹VDE Americas
²Renewable Energy Test Center RETC LLC
³InSite Technologies
⁴CENTRAL TENSION
- 71 UV Stress and Capacitance-Based Metastability of Silicon TOPCon Photovoltaic Modules**
Steve Johnston¹, Dana B. Kern¹, Rebecca B. Wai¹, Kent Terwilliger¹
¹National Laboratory of the Rockies
- 74 Mitigation of hail-related asset risk via hail resistant PV modules**
Mengyuan Huang¹, Daniel Inns¹
¹LONGi Solar
- 77 High-Resolution Temporal Visualization of Event Losses for Utility-Scale Solar Performance Analysis**
Rob van Haaren¹, Jasper Travers¹
¹Proximal Energy, Inc.
- 80 pvcracks: python repository for electroluminescence image processing, current-voltage curve fitting and power loss estimation**
Norman Jost¹, Brandon K. Byford¹, Rodrigo del Prado Santamaría², Clifford W. Hansen¹, Jennifer L. Braid¹
¹Sandia National Laboratories
²DTU

- 83 Solar Photovoltaics Resilient Fasteners Levelized Cost of Energy (LCOE) Tool**
Bonnie Powell¹, James Elsworth¹
¹*National Laboratory of the Rockies (NLR)*
- 86 Large-area photoluminescence imaging of thin film solar panels**
Jared D. Friedl¹, Marissa Garcia¹, Rich Landy¹, Elizabeth C. Palmiotti², Timothy J. Silverman², Andrew M. Gabor¹
¹*BrightSpot Automation, LLC*
²*National Laboratory of the Rockies*
- 89 Sparks fly: Why PV fire risk isn't just a wildfire problem**
Charity Faith Sotero¹
¹*kWh Analytics*
- 92 Extreme Weather Impacts on Utility-Scale Photovoltaic Systems: Failure Mechanisms, Root Causes, and Resilience-Oriented Design Strategies**
Juan Montiel¹
¹*Bureau Veritas Renewable Technical Advisory*
- 95 Outdoor Monitoring of CdTe PV Modules - Performance and Degradation Across Three Climatic Conditions**
Camille Bainier¹, Damien Cosme², Martin Poveda¹
¹*TotalEnergies OneTech*
²*TotalEnergies*
- 98 Data driven analysis of PV soiling loss models: A case study into HSU and Kimber using machine learning**
Maya Yu¹, Mustafa Akbari¹
¹*Onyx Renewables LLC*
- 101 Module architecture - steel frame advancement**
Tyler Hudson¹, Lauren Ahslter¹
¹*nextpower*
- 104 Quantifying system-level savings in 2000V utility-scale PV plants**
Ethan Ely¹, Bobby Naimool¹, Roque Ortiz¹
¹*Trina Solar*
- 107 Soiling Loss Optimization**
Tak Shun Au¹
¹*RWE*
- Wednesday posters
- 110 Swift Solar: Unlocking the full potential of solar energy**
Alison Breeze¹, Nancy Trejo¹, Laura Crowe¹, Dong Zhang¹, Giles Eperon¹, Tomas Leijtens¹
¹*Swift Solar*
- 113 Dynamic Mechanical Load Testing of PV Module Connections: From Qualification to Capacity Characterization**
Frank Oudheusden¹, Chris Needham¹, **Jon Ness**²
¹*Azimuth Advisory Services*
²*Matrix Engineering Consultants*
- 116 Thinner glass and flat stow led to 2.2x hail damage to solar PV modules: A side-by-side case study comparison**
James Elsworth¹
¹*National Laboratory of the Rockies*
- 119 The Fast and the Faulted: Clock Drift (Detect Tracker Time Errors in Your Data)**
Will Hobbs¹
¹*Southern Company*
- 122 Analysis of PV Fleet Performance in Western United States During August 2020 Extreme Heat Wave**
Bennet Meyers¹, **Kirsten Perry**¹, Dirk Jordan¹
¹*National Laboratory of the Rockies*
- 125 Case study comparing durability of two generations of PV technology under Brazil's tropical and subtropical climate conditions**
Denio Alves Cassini¹, Vinicius Camatta¹, Daniel Sena Braga¹, Antonia Sonia A.C. Diniz¹, **Lawrence L. Kazmerski**²
¹*Pontifícia Universidade Católica de Minas Gerais (PUC Minas)*
²*RASEI, University of Colorado Boulder*
- 127 Cattle are Coming! How “grazing mode” and purposeful tracker geometry minimize the potential for harm to animal and PV equipment**
Nick de Vries¹
¹*Silicon Ranch*

Thursday, February 26, 2026

Poster session

- 3 Degradation mode identification by photocarrier lifetime spectroscopy on devices and test structures**
Paul Stradins¹, Aditya Ratnapagol², Chirag Mule², Thien Truong¹, Peter Hacke¹
¹National Laboratory of the Rockies
²Colorado School of Mines
- 6 Understanding and Mitigating Scribe-Induced Degradation for Reliable Perovskite Solar Modules**
Tianran Liu¹, Jin Wen¹, Shuai You¹, Xinwen Zhang¹, James Brown¹, Lance M. Wheeler¹, Joseph M. Luther¹, Joseph J. Berry¹, Kai Zhu¹, Michael Owen-Bellini¹, Laura T. Schelhas¹
¹National Laboratory of the Rockies
- 9 Advancements in solar simulator technologies for perovskite tandem reliability**
Peter Pasmans¹, **Jake Veloza**¹
¹Eternal Sun BV
- 12 Understanding Hydrogen Induced Surface Passivation and De-passivation Dynamics in Tunnel Oxide Passivating Contacts for Silicon Solar Cells using a Trapping-Diffusion Model**
Aditya R. Ratnapagol¹, Zitong Zhao², Adam Goga², William Nemeth¹, Sumit Agarwal³, Gergely Zimanyi², **David L. Young**¹
¹National Laboratory of the Rockies (NLR)
²UC Davis Physics
³Colorado School of Mines
- 15 EL is Possible with Analog 35mm Film**
Will Hobbs¹, Liam Hobbs¹
¹The Hobbs Family
- 18 Durability and Performance: Assessing Long-Term Grounding Efficacy in Bare Steel vs. Galvanized Steel Piles and Structural Members**
Evan Martin¹
¹Hubbell
- 21 Full-scale seismic testing of single-axis trackers**
Nathaniel Healy¹
¹GameChange Solar
- 24 Perovskite Photovoltaic Module Curvature from Lamination Correlates to Operational Stability**
Muneeza Ahmad¹, Terrence Banks², Sean P. Dunfield², Nicholas Rolston¹
¹Arizona State University (ASU)
²Tandem PV
- 27 Modeling accuracy of bifacial gain energy estimates**
Christine Bordonaro¹, Pierre Metaut¹, Alex Berlinsky¹
¹Clearway Energy
- 30 Understanding Heating from Partial Shade of a PV Module under Varying Conditions**
Shariful Islam¹, Sarah Kurtz¹
¹University of California Merced
- 33 PV Standards Activities of IEC**
John H Wohlgemuth¹
¹PowerMark Corporation
- 36 Durability of adhesion: results from the current standardized IEC aging sequence**
Rachael L. Arnold¹, David C. Miller¹, Aubrey Jackson¹
¹National Laboratory of the Rockies (NLR)
- 39 A test platform to characterize PV module cell shading**
Rich Stromberg¹
¹Equitable Solar Solutions/Univ of Alaska
- 45 Field observations: module shipments, pallet handling, and staging**
Robert Flottesmesch¹
¹Flottesmesch LLC
- 48 Clearway fleet degradation analysis**
Alex Berlinsky¹, Taylor Romshek¹, Pierre Metaut¹, Christine Bordonaro¹
¹Clearway Energy

Thursday posters

- 57 Evaluation of Long-term Durability of Repaired Photovoltaic Backsheets**
Zelin Li¹, Stefan Mitterhofer¹, Xiaohong Gu¹, William Hobbs², Michael D. Kempe³, Liang Ji⁴
¹National Institute of Standards and Technology (NIST)
²Southern Company
³National Laboratory of the Rockies (NLR)
⁴UL Solutions
- 60 A Public Data Set of Auto-Generated Geotagged PV Site Equipment, Generated via Deep Learning**
Kirsten Perry¹, Quyen Nguyen¹, Marwan Ruby¹
¹National Laboratory of the Rockies
- 63 Root cause analysis of backsheet burning at a 60MW project in the Philippines**
Beryl Weinshenker¹
¹All Correct Solar
- 66 Performance ratio vs performance index for PV underperformance detection, classification and quantification using DUET**
Trevor J. Coathup¹, Ras-Jeevan K. Obhi¹, Mandy R. Lewis¹, Julia F. Zonneveld¹, Annie C. J. Russell¹, Nick Anderson¹, Elias Hussary¹, Kibby Pollak¹, Christopher E. Valdivia¹
¹Enurgen
- 69 Spontaneous Breakage: Edge-Pinch versus Mounting Point**
Sushma Pothana¹
¹nextpower
- 72 A comparison of PXX estimation methods using typical-year and time-series solar resource data**
Evan Westphal¹
¹Luminate LLC
- 75 Thermal modeling of PV modules based on outdoor measurements at FREA**
Kenji Kamide¹, Katsuto Tanahashi¹
¹National Institute of Advanced Industrial Science and Technology (AIST)
- 78 A Systematic Review and Integrated Approach to Techno- Economic Modeling of Aging Utility Scale PV Systems**
Hanan Wehbi¹, **Joseph Simon**¹, Heather Mirlletz¹, Silvana Ovaitt¹, Brian Mirlletz¹, Matthew Prilliman¹, Garvin Heath¹, Chris Deline¹, Jal Desai¹
¹National Laboratory of the Rockies
- 81 Impacts of Improper Cable Management at Utility PV Sites**
Baba Karthik Kalapatapu¹
¹Renewable Energy Systems
- 84 Enhancing solar tracker performance and stability via wind nowcasting and aerodynamic mitigation**
Mahmoud Elnahla¹, Pejman Fatehi¹, Zhehong Zhang², Yanlin Guo¹, Teng Wu², James Elsworth³, Scott Dana³
¹Colorado State University (CSU)
²University of Buffalo
³National Laboratory of the Rockies
- 87 Toward a Multiscale Data-Integrated Workflow for CdTe Module Reliability Analysis**
Max Liggett¹, Dana B. Kern², Steven Johnston², Collin West¹, Michael Bolen³, Dylan J. Colvin⁴, Ceclie Molto⁴, Greg Horner⁵, Kristopher O. Davis¹
¹University of Central Florida
²National Laboratory of the Rockies
³SB Energy Pvt Ltd (Soft Bank Group)
⁴University of Central Florida - Florida Solar Energy Center
⁵Tau Science Corporation
- 90 LLM: Lots and Lots of Modules**
Reilly Fagan¹, Veronica Anderson¹
¹kWh Analytics
- 93 A novel setup to measure temperature-dependent adhesion and mode mixity in PV backsheets**
Stefan Mitterhofer¹, Karissa Jensen¹, Xiaohong Gu¹
¹National Institute of Standards and Technology (NIST)

96 Introducing the PV Storms Impact Database for cataloging PV systems affected by weather

Dan Riley¹, Dr. Laurie Burnham¹, Dr. Gerald Robinson²

¹*Sandia National Laboratories*

²*Lawrence Berkeley National Laboratory (LBNL)*

99 PV resiliency design for islanded systems

Joe Mueller¹, Chinmay Morankar¹

¹*WSP*

102 Protecting PV modules with specialized solar coatings

Izzy Lloyd¹, Alejandra Aragon¹, **Aaron Dupuis**¹

¹*Phazebreak Coatings Inc*

105 Designing, validating, and operating tracker controls for extreme weather

Jos Cocquyt¹

¹*Nevados Engineering*

108 Model Continuity for Utility-Scale Solar: Transforming Performance Models into Digital Assets

Christopher E. Valdivia¹, T. J. Coathup¹, M. R. Lewis¹, N. Anderson¹, J. F. Zonneveld¹, E. Hussary¹, K. Pollak¹

¹*Enurgen Inc.*

111 Hail impact testing on tilted bifacial PV panels

Jochen Carl¹, Lakshmana Doddipatla¹

¹*FM*

114 AC Solar Module & Field Test Evaluation

Harsh Galia¹, Jinend Gosar¹, Shiv Desai¹

¹*Hanwha Qcells*

117 Beyond Rd: A Framework for Interpreting Fielded Module Degradation

Clay Helms¹, Nick de Vries¹

¹*Silicon Ranch*

120 Multi-channel I-V system for thin film stability test

Kyle Lu¹, Phillip Miller¹, Ethan Ignatovich¹, Eleda Fernald¹, Greg Horner¹

¹*Tau Science Corp*

123 EPE Encapsulants in Photovoltaics: Benefits, Trade-Offs, and Open Challenges

Nikolina Pervan^{1,2}, Gabriele Eder³, Yuliya Voronko³, Astrid Macher¹, Kamil Novotny², Katharina Resch-Fauster², **Gernot Oreski**^{1,2}

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³*Österreichisches Forschungsinstitut für Chemie und Technik (OFI)*

126 Accelerated aging of PV connectors: Modifications to chamber-based tests

David C. Miller¹, Rachael L. Arnold¹, Delos Ashcraft¹, Holly Gadpaille¹, Peter L. Hacke¹, Aubrey Jackson¹, Greg Perrin¹, Jimmy M. Newkirk¹, Kent Terwilliger, National Laboratory of the Rockies, **Laurie Burnham**²

¹*National Laboratory of the Rockies*

²*Sandia National Laboratories*

129 Mitigating Moisture-Driven Degradation in Copper-Metallized PV Mini-Modules via Edge Sealing

Mark Molinaro¹, Dustin Williams², Paul Monroe¹

¹*Quanex IG Systems*

²*Bert Thin Films*

