

## DuraMAT 2022 Fall Workshop

**Location: Beaver Run Resort, Breckenridge CO**

*Please hold questions until discussion panels at the end of each session*

**Monday August 29<sup>th</sup>**

\*Arrival\*

**Tuesday August 30<sup>th</sup>**

- 7:30 – 8:30 Breakfast
- 8:30 – 8:40 Welcome, Workshop Goals, Review Logistics – Teresa Barnes,
- 8:40 – 9:00 NREL DuraMAT Highlights– Teresa Barnes, NREL

### Session I – Central Data Resource

Session Chair – Anubhav Jain, LBL and Junki Joe, NREL

- 9:00 – 9:15 D1 highlights and CO overview  
2 min Anubhav Jain, LBL
- 9:15 – 9:30 Assessing Factors Underpinning PV Degradation through Data  
2 min Analysis PI: Anubhav Jain, LBL Speaker: Baojie Li, LBL
- 9:30 – 9:45 Panel Questions

**9:45 – 10:15 Break**

### Session II – Multi-Scale Modeling

Session Chair – Michael Owen-Bellini, NREL and Baojie Li, LBL

- 10:15 – 10:30 D1 highlights and CO overview  
2 min Michael Owen-Bellini, NREL
- 10:30 – 10:45 Analyzing Hail Impacts on PV Modules Using Computational Simulation  
2 min (Virtual) PI: James Hartley, Sandia
- 10:45 – 11:00 Mechanical Models for 50-year Lifetime - PV Modules  
2 min PIs: Nick Bosco/Michael Owen-Bellini, NREL  
Speaker: Junki Joe, NREL
- 11:00 – 11:15 Panel Questions

### Session III – Acceleration Science

Session Chair – David Miller and Martin Springer, NREL

- 11:15 – 11:30 D1 highlights and CO overview  
2 min David Miller, NREL
- 11:30 – 11:45 Rapid Reliability Prediction of Emerging Module Interconnect Technologies  
2 min with Combined-Accelerated Stress Testing  
PI: Peter Hacke, NREL Speaker: Nick Bosco, NREL
- 11:45 – 12:00 Application of Acceleration Science and Validation for Combined-Accelerated  
2 min Stress Test Development: Balance of Systems Components  
PI: Peter Hacke, NREL Speaker: Dave Miller, NREL

12:00 – 12:15 Panel Questions

**12:15 – 1:15 Lunch**

**Session IV – Module Forensics**

Session Chair – Laura Schelhas and Soňa Uličná, NREL

1:15 – 1:30 D1 highlights and CO overview  
2 min Laura Schelhas, NREL

1:30 – 1:45 Degradation Pathways in Glass/Glass Bifacial Photovoltaics with Emerging Encapsulants and Half-Cut Cells  
2 min PI: Dana Kern, NREL

1:45 – 2:00 In-situ Mapping of Deformation in Crystalline Silicon Modules: Understanding the Effects of Viscoelasticity  
2 min PI: Mariana Bertoni, ASU, Speaker: Ian Slauch, ASU

2:00 – 2:15 Fielded Module Library  
2 min PI: Bruce King, Sandia, Speaker: Elizabeth Palmiotti, Sandia

**2:15 – 3:00 Break**

3:00 – 3:15 Effect of Cell Cracks on Module Power Loss and Degradation  
2 min PI: Cara Libby, EPRI w/speaker: Xin Chen, LBL

3:15 – 3:30 BOM Squad  
2 min PI: Teresa Barnes, NREL, Presenter: Joe Karas NREL

3:30 – 4:00 Panel Questions

**Session V – Materials Solutions**

Session Chair – Bruce King (Sandia), and Elizabeth Palmiotti (Sandia)

4:00 – 4:15 D1 highlights and CO overview  
2 min Bruce King, Sandia

4:15 – 4:30 Advancing Bifacial Solar Module Reliability and Manufacturability with New Module Materials and Light-Weight Transparent Back Lamination  
2 min PI: Reinhold Dauskardt, Stanford, Presenter: Alan Liu, Stanford

4:30 – 4:45 Advanced Material Development to Support Low-LCOE 25-Year Flexible Photovoltaic Modules  
2 min PI: Hoi Ng, SunPower, Speaker: Namrata Salunke SunPower

4:45 – 5:00 Panel Questions

**5:00 – 6:30 DuraMAT poster presentations**

**Wednesday August 31<sup>st</sup>**

7:30 – 8:30 Breakfast

**Keynote Speakers:**

8:30 – 9:00 Opening the Gray Box of Predictive Modeling – Working Group Report - Elizabeth Palmiotti, Sandia, Martin Springer, NREL

9:00 – 9:30 Reliable PV for Sustainable Deployment, Silvana Ovaitt, NREL

9:30 – 10:00 Industry Panel – What can DuraMAT do to accelerate manufacturing, deployment, and decarbonization? Moderator: Teresa Barnes, NREL  
Panelists: Kevin Christy, Lightsource BP, Jenya Meydbray PVEL, Henry Hieslmair, DNV, and Namrata Salunke, SunPower

**Session VI – Getting Predictive - Going from observation to probability of failure?**

Session Chair – Teresa Barnes, NREL

10:00 – 10:15 Latent degradation from cracked cells  
Tim Silverman, NREL

10:15 – 10:30 Power loss and safety risks – recoverable vs. non-recoverable, and what else?  
Dirk Jordan, NREL

**10:30 – 10:45 Break**

**10:45 – 11:15 Breakout Sessions: Cross-Capability Materials Durability Challenges**

**Session A:** Sustainability, reliability, resilience, and waste – supply chains, design, and end of life management? Lead: Silvana Ovaitt, Henry Hieslmair

**Session B:** Moving from observable damage to safety/performance risk – what can we do now?  
What do we need to work on? Lead: Dirk Jordan, Will Hobbs

**Session C:** More modules, more problems: given the rapidly changing state of module technologies, where should fundamental research and characterization development be focused? Lead: Nancy Haegel, Brian Habersberger

11:15 – 11:45 Break out session report & group discussion  
Teresa Barnes, NREL

11:45 – 12:00 FY 23: New Awards Announcement  
Laura Schelhas, NREL

**12:00 – 1:00 Lunch & full group Adjourns**

Full DuraMAT Consortium Review

1:15 – 3:00 IAB discussion – **Invite only, DuraMAT Leadership & IAB**

**IAB Meeting Agenda**

1:15 – 1:45 General Feedback and questions from IAB based on presentations, posters, and other info

1:45 – 3:00 Opportunity Analysis of DuraMAT Research