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Reliability of Photovoltaic Cells, Modules, Components, and Systems VI

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John H. Wohlgemuth
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Editors

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Introduction

The Reliability of Photovoltaic Cells, Modules, Components and Systems Conference VI of the 2013 SPIE Optics and Photonics Symposium composed a full schedule of highly anticipated presentations from a number of regarded experts from both the photovoltaic industry and academia. The conference was well attended with a strong number of international participants from a wide range of institutes and organizations within the United States, France, Germany, Switzerland, Spain, United Kingdom, Czech Republic, Japan, Korea, and Australia. 2013 marked the sixth year of this focused conference on photovoltaic reliability. The conference started on Monday, August 26 with a joint poster session with all other Solar Energy and Technology conferences. Several posters regarding accelerated stress testing methodologies and results were presented. The second day of the conference included a joint session with the Organic Photovoltaics XIV Conference, entitled Efficient and Stable Organic Solar Cells, chaired by Dr. Bernard Kippelen from Georgia Institute of Technology. A number of compelling talks on the progress and achievements regarding the long term stability of organic photovoltaic devices were presented by speakers from Stanford University, Case Western Reserve University, Fraunhofer Institute for Solar Energy Systems (Germany), and the University of Cambridge (United Kingdom).

The third day of presentations kicked off with Session 2 on PV Module Testing chaired by Dr. Bolko von Roedern. Presentations included discussions on the goals and progress of the PV Module Quality Assurance Task Force, the use of characterization tools available for PV module testing, and the methods for analyzing module test results. Session 3 was chaired by Dr. Laure-Emmanuelle Perret-Aebi from the Swiss Federal Institute of Technology in Lausanne on the topic of Encapsulant, Backsheet, and Packaging Materials. Talks were given from a mix of industry and academic professionals from Dupont, STR Solar, National Renewable Energy Laboratory, and the Florida Solar Energy Center regarding the evaluation, use, and stability of various packaging materials used in PV modules. The final session of the day on PV module Reliability, Simulation and Modeling was chaired by Mr. Sascha Dietrich of the Fraunhofer Institute for Silicon Photovoltaics. Presentations regarding the various aspects that describe how modules respond to external stresses were given. Discussions involved equations for describing module degradation, statistical methods for degradation analysis, and finite element analysis techniques for simulating external stresses.

The final day included two full sessions of invigorating talks. Session 5 on the Reliability of PV Modules, Systems, and Components was chaired by Dr. William Gambogi of DuPont. A wide range of topics were presented including the testing and reliability of module bypass diodes, simulation of contact degradation in CIGS cells, PV polymeric material reliability, safety and performance analysis of commercial installations, and stability issues with polymer based luminescent

concentrators. The final session of this conference was chaired by Dr. David Miller of the National Renewable Energy Laboratory, entitled Simulation, Accelerated Tests, and Field Results.

The conference organizers would like to thank everyone that participated in this year's conference and applaud each presenter for their contribution to the technical program. On behalf of the SPIE Optics and Photonics Program Committee and Conference Chairs, we wish everyone the best of luck in their technical and scientific endeavors and would like to invite everyone back to next year's conference to present their latest achievements in the Reliability of Photovoltaic Cells, Modules, Components and Systems.

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