

AGENDA

22nd Space Photovoltaic Research and Technology Conference

Tuesday, September 20, 2011

- 7:30 Breakfast
- 8:00 – 9:00 Registration
- 9:00 – 9:30 Introductory Remarks

Session I

High Efficiency Solar Cell Development (Invited)

Session Chair: Eric Clark

- 9:30 **High Efficiency Lightweight and Flexible Solar Sheets based on Inverted Metamorphic Solar Cells** (Noren Pan/MicroLink Devices)
- 10:00 **Solar Cell Research and Development at Emcore** (Mark Stan/Emcore)
- 10:30 – 10:45 Break
- 10:45 **Recent Progress of Advanced Inverted Metamorphic Multijunction Space Solar Cells at Spectrolab** (Ken Edmondson/Spectrolab)

Session II

Solar Cell Measurements and Calibration

Session Chair: David Snyder

- 11:15 **Effects on Solar Cell Short Circuit Current Calibrations at High Altitude** (David Snyder/NASA GRC)
- 11:35 **Characterization of a TS Space Quad Source Simulator** (Kyle Montgomery/Purdue University)
- 11:55 – 12:55 Lunch

12:55 – 1:10 Group Photo

Session III
Thin Film Solar Cell Materials
Session Chair: Sheila Bailey

- 1:10 **Nanostructured Materials in Photovoltaics** (Xingzhong Yan/South Dakota State Univ.)
- 1:30 **Materials and Devices Design for Efficient Single and Multijunction Organic Solar Cells** (Qiquan Qiao/South Dakota State Univ.)
- 1:50 **Transparent Nanostructured Conductor Systems (TNCS) for Photovoltaics** (Alex Kawczak/StrateNexus Technologies)
- 2:10 **Fabrication of Cu₂O Thin Films and Synthesis of CuInS₂ Nanocrystals for Solar Cells** (Liangmin Zhang/Arkansas State University)

2:30 – 2:40 Break

Session IV
Space Environmental Interactions and Testing
Session Chair: Boris Vayner

- 2:40 **Analysis of Velocity of Flash Over Plasma on Solar Arrays** (Teppei Okumura/JAXA)
- 3:00 **The New AFRL Spacecraft Charging and Instrument Calibration Laboratory (SCICL) at Kirtland Air Force Base** (Dale Ferguson/AFRL)
- 3:20 **Thermal Balance Testing in the NASA GRC Plasma Interactions Facility** (Barry Hillard/NASA GRC)

Session V
Solar Powered Missions and Technology Development
Session Chair: Joel Galofaro

- 3:40 **Modular Solar Panels Incorporating Advanced Solar Cell and Coverglass Approaches** (Ted Stern/Vanguard Space Technologies)
- 4:00 **Solar Electric Propulsion Technology Demonstrations Missions** (Tom Kerslake/NASA GRC)
- 4:20 **Solar Array Design for the MAVEN Mission** (Scott Billets/Lockheed Martin Space Systems)
- 4:40 **Solar Cell Performance on Venus** (Geoffrey Landis/NASA GRC)
- 5:30 Picnic

Wednesday, September 21, 2011

7:30 Breakfast

8:30 Irving Weinberg Award Presentation

Session VI

US Government Program Overviews and Technology Needs (Invited)

Session Chair: Mike Piszczor

9:15 **Overview of NRL Development of PV for Portable and Remote Power Applications** (Rob Walters/NRL)

9:45 **Status of U.S. Space Solar Array Development** (Brad Reed/SMC Air Force)

10:15 **Air Force Research Laboratory Overview** (David Wilt/AFRL)

10:45 – 11:00 Break

Session VII

III-V Photovoltaic Materials and Cell Development

Session Chair: AnnaMaria Pal

11:00 **GaAs Substrate Misorientation and the Effect on InAs Quantum Dot Solar Cells** (Seth Hubbard/Rochester Institute of Technology)

11:20 **Investigation of Quantum Dot Enhanced Triple Junction Solar Cells** (Christopher Kerestes/Rochester Institute of Technology)

11:40 **Development and Refinement of Epitaxially-Integrated Semi-Transparent Metamorphic Buffers for III-V/Si Photovoltaics** (Tyler Grassman/Ohio State Univ.)

12:00 **Statistical Analysis of Spectroscopic Images for Characterization of Metal-Enhanced Upconversion** (S. Smith/South Dakota School of Mines and Technology)

12:30 – 1:30 Lunch

1:30 – 2:15 Student Poster Session

Session VIII

Radiation Effects on Photovoltaic Devices

Session Chair: Barry Hillard

2:15 **Determination of the Radiation Hardness and the Subcell I-V Characteristics of GaInP/GaInAs/Ge Solar Cells Using Electroluminescence Measurements**
(Raymond Hoheisel/NRL)

2:35 **Change in the Electrical Performance of GaAs Solar Cells with InGaAs Quantum Dot Layers by Electron Irradiation** (Takeshi Ohshima/JAEA)

3:00 – 4:45 **Workshops**

Solar Cell Calibration Needs Discussion

Chairs: David Snyder and David Wilt

Future of Nanostructured Photovoltaics Discussion

Chairs: Eric Clark and Seth Hubbard

Technology Needs for Future Solar Arrays

Chairs: Michael Piszczor and Thomas Kraft

6:30 – 8:30 **Banquet**

Thursday, September 22, 2011

7:30 Breakfast

Session IX Solar Arrays Technology **Session Chair: Jeremiah McNatt**

8:10 **Advanced PV Technology for Future NASA Missions** (Carolyn Mercer/NASA GRC)

8:40 **Advanced Solar Array Technology** (Dave Murphy/ATK Aerospace Systems)

9:00 **DSS Technologies for NASA's Space Science and Exploration Applications** (Brian Spence/Deployable Space Systems)

9:20 **High Power Solar Array Development at Boeing** (Azam Arastu/Boeing Space & Intelligence Systems)

Session X Technology Development for NASA-Unique Missions **Session Chair: Dave Wolford**

9:40 **High Intensity High Temperature Evaluation of Solar Probe Plus Materials and Devices** (Mark Stan/Emcore)

10:00 **Development of a 250 Watt Thermal Radioisotope Thermophotovoltaic Power System** (Richard Kaszeta/Creare, Inc.)

10:20 – 10:40 Break

10:40 – 11:10 Workshop Summaries

Session XI
Advanced Concepts for Solar Power Devices
Session Chair: Geoffrey Landis

- 11:10 **Thin-Film Quantum Well Waveguide Solar Cells** (Roger Welser/Magnolia Solar)
- 11:30 **An Approach to Down-Conversion Solar Cells** (Mark Spitzer/Photonic Glass Corp.)
- 11:50 **Guided Assembly of Nanodots Through Selective Laser Heating**
(HaeyeonYang/South Dakota School of Mines and Technology)
- 12:10 **Computational Modeling of Mechanical/Thermal/Electrical Properties of Carbon Fibers/Polymer Composites** (Zhong Hu/South Dakota State Univ.)
- 12:30 Closing Statements, Conference Ends