SESSION ES11.1: Hot Carrier Solar Cells I
Session Chairs: N.J. Ekins-Daukes and Stephen Goodnick
Tuesday Morning, April 18, 2017
PCC North, 200 Level, Room 221 AB

10:30 AM *ES11.1.01
Where is the Heat Gone? Recent Progress in Coupled Photovoltaic and Thermoelectric Conversion Using Hot Carriers Jean Francois Guillemeaux1, 2, 3; CNRS, France; 2IPVF, France; 3NextPV, Japan.

11:00 AM *ES11.1.02
Solar Rectifying Antennas—A New Distinct Paradigm for Solar Power Conversion Jeffrey Gordon1, 2, 3; Ben-Gurion University of the Negev, Israel.

11:30 AM *ES11.1.03
Generating and Exploiting Hot Carriers in a Metallic Solar Cell James Dimmock1, 2, 3; Sharp Labs of Europe, United Kingdom; 1Imperial College London, United Kingdom.

SESSION ES11.2: Hot Carrier Solar Cells II
Session Chairs: James Dimmock and Louise Hirst
Tuesday Afternoon, April 18, 2017
PCC North, 200 Level, Room 221 AB

1:30 PM *ES11.2.01
Hot Carrier Cooling Mechanisms in Multiple Quantum Wells Gavin Conibeer1; University of New South Wales, Australia.

2:00 PM *ES11.2.02
Nonequilibrium Electron and Phonon Dynamics in Advanced Concept Solar Cells Stephen M. Goodnick1; Arizona State University, United States.

2:30 PM ES11.2.03
Type-II Quantum Well Absorbers—Candidate Systems for Hot Carrier Solar Cells Hamidezade Esmailpour1; University of Oklahoma, United States.

2:45 PM ES11.2.04
Influence of Hot Carrier Effects on Electrical Performance of a Quantum Well Solar Cell Dac Trung Nguyen1, 2; 1Institut Photovoltaïque d’Ile-de-France (IPVF), France; 2Institut de Recherche et Développement sur l’Energie Photovoltaïque (IRDEP), France.

3:00 PM BREAK

SESSION ES11.3: Solar Cell Optics I
Session Chairs: Alexander Mellor and Bryce Richards
Tuesday Afternoon, April 18, 2017
PCC North, 200 Level, Room 221 AB

3:30 PM *ES11.3.01
Multi-Resonant Light-Trapping in Ultrathin Solar Cells Stephane Collin1, 2, 3; CNRS, France.

4:00 PM ES11.3.02
Durable Broadband Graded-Index Fluoropolymer Antireflection Coatings for Plastic Optics Baeomin Wang1, 2; Pennsylvania State University, United States.

4:15 PM ES11.3.03
High Concentration Planar Microtracking Photovoltaic System Exceeding 30% Power Conversion Efficiency Jared S. Price1, 2; The Pennsylvania State University, United States.

4:30 PM ES11.3.04
Measuring and Exploiting Optical Anisotropies in Nanophotonic Photovoltaics Jon A. Schuller1, 2; University of California, Santa Barbara, United States.

4:45 PM ES11.3.05
Dielectric Resonator-Based Antireflection Coatings Donghoon Ha1, 2, 3; 1National Institute of Standards and Technology, United States; 2University of Maryland, United States; 3University of Maryland, United States.

SESSION ES11.4: Poster Session I: Advanced PV Materials and Devices
Session Chairs: N.J. Ekins-Daukes and Masakazu Sugiyama
Tuesday Afternoon, April 18, 2017
8:00 PM - 10:00 PM
Sheraton, Third Level, Phoenix Ballroom

ES11.4.01
Alternative Low Cost Conductors for Photovoltaic Applications Myong Jae Yoo1; KETI, Korea (the Republic of).

ES11.4.02
Mathematical Modeling of Silicon Doping by Neutron Transmutation Doping Method for High Efficient Solar Cells Sergey M. Karabanov1, 2; Ryazan State Radio Engineering University, Russian Federation.

ES11.4.03
Silver Coated Copper Paste for Low Cost Silicon Solar Cells Sung Hyun Kim1; Korea Electronics Technology Institute, Korea (the Republic of).

ES11.4.04
Low Temperature, Combustion Reacted Al Doped ZnO Coating on Ag Nanowire Transparent Electrode for Flexible Solar Cells Min Kyu Park1, 2; KAIST, Korea (the Republic of).

ES11.4.05
Study of Electrical Properties Derived from Optical Constants for Transparent Composite Electrode Aditya Verramilli1; Arizona State University, United States.

ES11.4.06
Hydrogenated Indium Oxide without Introduction of Water during Sputtering Nathan Rodney1; Arizona State University, United States.

ES11.4.07
Reduction of Zn2+/dye Complex Formation by Controlled Soaking Time in Dye Solution Kichang Jung1; University of California, Riverside, United States.

ES11.4.08
Preventing Formation of Zn2+/dye Compound by Using CuO as a Protective Layer on ZnO Photocathode for Dye-Sensitized Solar Cells Kichang Jung1; University of California, Riverside, United States.
Three-Dimensional Compositional Analysis of III-V Alloys with Clustering Behavior for Implementation in High Efficiency Photovoltaics Nicole A. Kotulak; U.S. Naval Research Laboratory, United States.

Design and Modeling of InGaN-Based Concentrator Solar Cells under High Temperature Yi Fang; Arizona State University, United States.

The Band Gap Bowing of Thick InGaN Alloys for Photovoltaic Applications Alice M. Fischer; Arizona State University, United States.

Defect-Tolerant Bilayer Films for Photovoltaic Applications Yoon Myung; Washington University in St. Louis, United States.

Fabrication of Three-Dimensional Hybrid Nanostructure-Embedded ITO and Its Application as a Transparent Electrode for High-Efficiency Solution Processable Organic Photovoltaic Device Jeong Won Kim; National NanoFab Center (NNFC), Korea (the Republic of).

High Efficiency Small Molecular Solar Cells with New Fullerene-Free Acceptor Min Joo Song; Gyeongsang National University, Korea (the Republic of).

Enhancement of Power Conversion Efficiency for A-D-A Type NDI-Based Small Molecule as Non-Fullerene Acceptor for Solution-Processed Organic Photovoltaics Yeon Hee Ha; Gyeongsang National University, Korea (the Republic of).

Improvement of Open Circuit Voltage by Adding the Cascade Materials in Ternary Bulk Heterojunction Photovoltaic Cells Luyao Song; Huazhong University of Science and Technology, China.

Effect of Chlorination for Efficient Non-Fullerene Polymer Solar Cells Feng He; South University of Science and Technology of China, China.

Transparent Wide Bandgap Inorganic Halide Material for Hybrid Solar Cells Karunakara Moorthy Boopathi; Research Center for Applied Sciences, Academy Sinica, Taiwan.

Cation-Controlled Aggregation in Fluorene-Triarylamine Sulfonate Copolymers Meiling Li1,2, 1National University of Singapore, Singapore; 2Solar Energy Research Institute of Singapore, Singapore.

A PCBM-Assisted Perovskite Growth Process to Fabricate High Efficiency Semitransparent Solar Cells Chao Li1,2; 1University of Central Florida, United States; 2University of Central Florida, United States.

Investigation of Thermal Donors and Other Bulk Defects in n-Type CZochralski-Grown Si for High Efficiency Solar Cells Anoopra Srinivasan; Arizona State University, United States.

Silicon Heterojunction Solar Cells with MoOx Hole Selective Contact Hisham Nasser1,2; 1The Center for Solar Energy Research and Applications GUNAM, Turkey; 2Middle East Technical University METU, Turkey.

Efficiency Potential and Recent Activities of High Efficiency and Si Tandem Solar Cells Masafumi Yamaguchi; Toyota Technological Institute, Japan.

Development of High Gap Ge- and Si-Based Kesterite-Like Solar Cells for Tandem Applications Guy Brammer; imec - Division of IMOMEC, Belgium.

NIR-Transparent Perovskite Solar Cell for Flexible All-Thin-Film Tandem Devices Stefano Pisoni; EMPA, Switzerland.

Large-Area Scalable Perovskite/Silicon Multi-Junction Solar Modules Manoj Javarsankar; imec, Belgium.

Study of Polycrystalline MgCd1-xTe/MgCd1-yTe Double Heterostructures for Tandem Solar Cell Applications Calli M. Campbell1,2; 1Arizona State University, United States; 2Arizona State University, United States.

Nanostructured Transparent Electrodes Utilizing Directed Total Internal Reflection Pieter G. Kik; University of Central Florida, United States.

Nanophotonic Control of Thermal Emissivity and Its Implication for Energy Applications Shanhui Fan; Stanford University, United States.

The Radiative Emissivity of Silicon Solar Cells—What is It, Where Does It Come From and What Can We Do about It? Alexander Mellor; Imperial College London, United Kingdom.

Frequency Selective Thermal Extraction for High Efficiency Thermophotovoltaics Zoiur Jurado; California Institute of Technology, United States.

Near Perfect Transmittance Arising from Waveguide Modes in Printed Nanocone Arrays Colton R. Bukowski; California Inst of Technology, United States.

Microstructured Transparent Electrodes Utilizing Directed Total Internal Reflection Pieter G. Kik; University of Central Florida, United States.
SESSION ES11.10: Singlet Fission and IBSC
Session Chairs: N.J. Ekins-Daukes and Timothy Schmidt
Thursday Morning, April 20, 2017
PCC North, 200 Level, Room 221 AB

8:15 AM *ES11.10.01
Beyond the Shockley–Queisser Limit with Singlet Exciton Fission Akshay Rag; University of Cambridge, United Kingdom.

8:45 AM *ES11.10.02
Exploring Strategies for Charge or Energy Transfer from Molecules to Semiconductors after Singlet Fission Justin Johnson; National Renewable Energy Laboratory, United States.

9:15 AM ES11.10.03

9:30 AM BREAK

SESSION ES11.11: Multi-Junction PV
Session Chairs: Diego Alonso Alvarez and Richard King
Thursday Morning, April 20, 2017
PCC North, 200 Level, Room 221 AB

10:00 AM *ES11.11.01
Dilute Nitride Solar Cells—Technology Developments towards 50% Efficiency Mireia Guna; Tampere University of Technology, Finland.

10:30 AM *ES11.11.02
Development of Epitaxial III-V/Si Multijunction Solar Cells T. Grassman; The Ohio State University, United States.

11:00 AM ES11.11.03
1-eV GaNASb Solar Cells Lattice-Matched to GaAs Aymeric Maros; Arizona State University, United States.

11:15 AM ES11.11.04
Imaging Atomic Scale Clustering in III-V Semiconductor Alloys for Multi-Junction Photovoltaics Louise C. Hirat; U.S. Naval Research Laboratory, United States.

11:30 AM ES11.11.05
Structural Properties of Si/GaAs Interfaces Fabricated by Surface-Activated Bonding at Room Temperature Yutaka Ohno; Tohoku University, Japan.

11:45 AM ES11.11.06
The GaAs/GaAs/Si Two-Terminal Tandem Solar Cell—Current Matching for a Non-Ideal Bandgap Combination Jan Marius Peters1,2; 1Massachusetts Institute of Technology, United States; 2SMART, Singapore.

SESSION ES11.12: Intermediate Band PV
Session Chairs: Urs Auerhard and Masakazu Sugiyama
Thursday Afternoon, April 20, 2017
PCC North, 200 Level, Room 221 AB

1:30 PM *ES11.12.01
Intermediate Band Solar Cells—Status and Future Directions Jacob J. Krich; University of Ottawa, Canada.

2:00 PM *ES11.12.02
Multicolor Emission in Intermediate Band Solar Cell Materials Wladyslaw Walukiewicz1,2; 1Lawrence Berkeley National Lab, United States; 2University of California, Berkeley, United States.

2:30 PM ES11.12.03
Lead Halide Perovskite-Based Intermediate Band Absorbers Alex Martinson; Argonne National Laboratory, United States.

2:45 PM BREAK

SESSION ES11.13: Nanostructured PV
Session Chairs: James Dimmock and Louise Hirst
Friday Morning, April 21, 2017
PCC North, 200 Level, Room 222C

8:30 AM *ES11.13.01
A Quantum-Kinetic Perspective on Photovoltaic Device Operation in Nanostructure-Based Solar Cells Urs Auerhard; Forschungszentrum Juelich GmbH, Germany.

9:00 AM ES11.13.02
Carrier Transport Suppression in Quantum Wire and Quantum Well Solar Cells Diego Alonso Alvarez; Imperial College London, United Kingdom.

9:15 AM ES11.13.03
Demonstration of Non-Polar and Semipolar InGaN/GaN Multi-Quantum Well (MQW) Solar Cells Xuanqi Huang; Arizona State Univ., United States.

9:30 AM ES11.13.04
Hybrid Photoelectrochemical Systems Based on Self-Organized TiO2 Nanotubes Coated with Chalcogenides Jan M. Macak; University of Pardubice, Czech Republic.

9:45 AM ES11.13.05
Silicon Nanowire/Polymer Hybrid Solar Cell-Supercapacitor—A Self-Charging Power Unit with a Total Efficiency of 10.5% Ruixuan Liu1,2; 1Soochow Univ., China; 2Georgia Institute of Technology, United States.

10:00 AM BREAK

SESSION ES11.14: Selective and Heterojunction Contacts
Session Chairs: Diego Alonso Alvarez and James Dimmock
Friday Afternoon, April 21, 2017
PCC North, 200 Level, Room 222C

10:30 AM *ES11.14.01
Dopant Free Selective Contacts for Highly Efficient Si and III-V Solar Cells Ali Javey; University of California, Berkeley, United States.

11:00 AM ES11.14.02
Carrier-Selective Materials for High Efficiency Silicon Solar Cells James Bullock; University of California, Berkeley, United States.

11:15 AM ES11.14.03
Carrier Selective Contact GaP/Si Solar Cells Chaomin Zhang; Arizona State University, United States.

11:30 AM ES11.14.04
Silicon Heterojunction Solar Cells with Silicon Nanoparticle Enabled Microcrystalline Silicon Thin Films Joe V. Carpenter; Arizona State University, United States.

11:45 AM ES11.14.05
High Efficiency Heterojunction Si Solar Cells with Effectively Transparent Front Contacts Rebecca Saive; California Institute of Technology, United States.