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- Present to experts in the field
- Publish your results internationally
- Gain experience in scientific communication
- Connect with researchers from other disciplines
- See where your work fits into global optics and photonics research
Building Integrated Photovoltaics (BIPV), Concentrating Photovoltaics (CPV) and Concentrating Solar Power (CSP) are areas of solar energy research and development (R&D) that are rapidly evolving and attracting a high level of interest and innovation. These markets often attract nontraditional Si PV technologies such as innovated building integrated designs for BIPV and technology using lenses or mirrors to concentrate sunlight from a large area onto small high-efficiency solar cells or thermal receivers for CPV / CSP.

BIPV, compared to traditional roof mounted Si PV aims to integrate in function and form the PV elements into the building structure or envelope. This can often achieve higher levels of performance, integration with other building systems and aesthetics. The following topics on BIPV are of interest:

- Highly integrated BIPV research / technology
- BIPV product advances in engineering and design
- Optics used in BIPV research / technology
- Cutting edge BIPV projects / operations
- Integrated BIPV / energy efficiency technology
- Integrated BIPV / storage technology.

CPV, compared to non-concentrating photovoltaics, allows the area of the solar cells to be reduced by the concentration ratio, offering a significant reduction in the cost of the photovoltaic system for which the solar cell is one of the most expensive components. The system design of CPV is highly dependent on the concentration ratio. High-concentration systems usually incorporate high-efficiency multijunction solar cells and track the sun, typically on a 2-axis tracker. The use of a tracker usually makes high-concentration CPV primarily compatible with large-scale utility installations. Low-concentration systems, with concentrations less than 10 suns, usually use silicon or thin film technology that do not require trackers and thus are conducive to both roof-top and commercial applications. The following topics on CPV are of interest:

- high and low concentrating optics
- fluorescent / luminescent / daylighting optics
- holographic concentrator optics
- spectrum splitting concentrators
- optimizing integration between optics and solar cells.

CSP conventionally uses mirrors to reflect sun’s radiation to a receiver where it is converted into high-temperature heat, which generates electricity through a turbine. Transformative concepts in the area of collectors and receivers for CSP with the potential to achieve low cost and high efficiency goals may include:

- novel cost-effective materials and designs for collectors that can be rapidly assembled and installed, have high optical performance (≤ 4.0 mrad pointing accuracy and ≥ 95% weighted spectral reflectivity) while maintaining sufficient flux. Potential technologies include: high-quality optics, ultra-low-cost collectors, material-efficient structures, snap-in-place facets, lenses/membranes, GRIN, waveguides, collector pods, passive tracking, fluidics, photo-responsive materials, etc.
- novel cost-effective receiver materials and selective coatings enabling reliable high-temperature operation (heat transfer fluid exit temperature ≥ 650°C) and high thermal efficiencies ≥ 90%.
- non-imaging approaches to collection and their viable coupling with receivers that meet the optical and thermal requirements above.

To help reach these goals, this conference on “BIPV and Concentrator Systems for Solar Energy Applications” focuses on increased efficiency/performance, reduced manufacturing cost per unit area, lessons learned and analysis of real world performance data of concentrator systems and power plants.

- manufacturability of advanced optics for low and high concentration
- optical losses including illumination non-uniformity, chromatic aberrations, and reliability issues
- materials development and design of primary and secondary optics
- development, modeling, and reliability of solar cell receiver (including cell protection, mounting and interconnect bonding, heat sinking, and thermal management)
- balance of systems (BOS) development and integration.

Authors are invited to submit an original manuscript to the Journal of Photonics for Energy, which is now covered by all major indexes and Journal Citation Reports.
CALL FOR PAPERS

Solar Hydrogen and Nanotechnology XI (OP202)

Conference Chair: Chung-Li Dong, Tamkang Univ. (Taiwan)

Program Committee: Hironori Arakawa, Tokyo Univ. of Science (Japan); Jan Augustynski, Univ. of Warsaw (Poland); Michael Grätzel, Ecole Polytechnique Fédérale de Lausanne (Switzerland); Jinghua Guo, Lawrence Berkeley National Lab. (USA); Hicham Idriss, SABIC (Saudi Arabia); Yosuke Kanai, The Univ. of North Carolina at Chapel Hill (USA); Claude Levy-Clement, Ctr. National de la Recherche Scientifique (France); Sanjay Mathur, Univ. zu Köln (Germany); Frank E. Osterloh, Univ. of California, Davis (USA); David Prendergast, Lawrence Berkeley National Lab. (USA); Shaohua Shen, Xi’an Jiaotong Univ. (China); Yasuhiro Tachibana, RMIT Univ. (Australia); John A. Turner, National Renewable Energy Lab. (USA); Heli Wang, SABIC (USA); Gunnar Westin, Uppsala Univ. (Sweden); Upul Wijayantha, Loughborough Univ. (United Kingdom); Jin Zhang, Univ. of California, Santa Cruz (USA)

The aim of this symposium is to offer a forum of discussion for scientists, engineers, and industrials involved in photoelectrochemical systems and nanotechnology for solar generation of hydrogen (and other renewable fuels). The technical program will address the current status and prospects of R&D activities, major achievements and latest performances, technological limitations and crucial remaining challenges, latest advances in fundamental understanding and development in semiconductor nanostructures, devices fabrication, modeling, simulation and characterization techniques, as well as assessing and establishing the role and contribution of solar hydrogen. Interested individuals from academia, national laboratories, and industries are kindly invited to contribute to this conference by submitting their abstract on the following relevant topics:

• emerging photocatalysts for artificial photosynthesis and solar water splitting
• physics and chemistry of semiconductor homo/hetero-junctions
• latest advances in synthetic techniques for large scale fabrication of photocatalysts
• new approaches to bandgap profiling and engineering
• fundamentals of hydrogen generation via photo- and electrochemical water splitting
• new devices, methods, and apparatus for solar hydrogen generation and solar fuels
• modeling and simulation of oxidation/reduction reactions at semiconductor surfaces
• electronic structure and energetics of photocatalytic (hetero) nanostructures
• surface and interface properties of photocatalysts/electrolyte junctions
• optical, chemical, and physical properties of photoelectrodes
• charge generation and transfer dynamics on photocatalysts and semiconductors
• corrosion, photo-corrosion and long term stability of semiconductors
• hydrogen generation via solar thermal (chemical) and photo-biological systems
• sustainable photocatalytic production of fuels
• national and international solar hydrogen energy systems, projects, and networks
• social, educational, environmental, and economic aspects of solar hydrogen.

IMPORTANT DATES

Abstracts Due:
8 FEBRUARY 2016

Acceptance Notification:
25 APRIL 2016

The contact author will be notified of abstract acceptance by email.

Manuscript Due Date:
1 AUGUST 2016

Please Note: Submissions imply the intent of at least one author to register, attend the symposium, present the paper as scheduled, where it is an oral or poster presentation, and submit a full manuscript by the deadline.
Thin Films for Solar and Energy Technology VIII (OP203)

Conference Chair: Michael J. Heben, The Univ. of Toledo (USA)
Program Committee: Bulent Basol, EncoreSolar, Inc. (USA); Howard M. Branz, National Renewable Energy Lab. (USA); Paola Delli Veneri, ENEA (Italy); David S. Ginley, National Renewable Energy Lab. (USA); Ivan Gordon, IMEC (Belgium); William N. Shaferman, Univ. of Delaware (USA); Ayodhya N. Tiwari, EMPA (Switzerland)

Thin film photovoltaics (TF PV) are a compelling alternative to conventional crystalline silicon PV. They offer reduced costs due to lower materials usage and high volume manufacturing, and efficiencies that are on-par with conventional polycrystalline Si PV. Moreover, they have the potential for further cost improvements and efficiency gains. Furthermore, TF PV can be applied to a wide variety of rigid and flexible substrates to enable use in a variety of applications, including building-integrated PV.

THIN FILM AND ADVANCED PV ABSORBER MATERIALS
- Thin-film silicon materials (amorphous, micro-, nano-, poly- and single crystal)
- cadmium telluride
- copper indium gallium sulfide/selenide
- perovskites
- dye-sensitized solar cells
- organic PV
- gallium arsenide
- novel/earth abundant materials (e.g., CZTS, Zn,P,).
- flexible organic/inorganic solar films

THIN FILM DEPOSITION
- large area deposition
- crystal growth
- linear sources
- non-vacuum techniques
- monitoring and control.

WINDOW AND CONTACT MATERIALS AND RELATED FORMATION
- conventional and alternative buffer layers
- transparent conductive oxides (incl. doping)
- high-performance doped layers
- metal contacts.

ADVANCED THIN FILM PV MATERIALS
- micro- and nanostructured PV materials
- nanomaterial suspension PV precursors
- metalorganic solution TF precursors
- nanotubes in PV.

LIGHT MANAGEMENT
- texturing and characterization
- light trapping
- antireflection layers (external and internal)
- optical modeling.

DEVICES AND PROPERTIES OF TF PV (EXPERIMENT AND/OR THEORY)
- novel device structures
- tandem cells
- theory and analysis of structures (e.g., influence of grain boundaries).

THIN FILM PV CIRCUITS
- circuit design, modeling, and simulation
- scribing (laser, mechanical)
- interconnects and grids
- PV integrated circuits.

THIN FILM PV TEST AND CHARACTERIZATION
- microstructure characterization
- electrically active defects and impurities
- light soaking
- novel characterization techniques.

ASSEMBLY AND PACKAGING OF TF PV MODULES
- edge deletion
- encapsulation/ sealing
- junction box attachment
- novel packaging techniques.

DEPLOYMENT/PERFORMANCE OF TF PV CELLS, MODULES, AND SYSTEMS
- module/system design, modeling, and simulation
- advanced manufacturing processes
- qualification and reliability testing
- standardization of PV modules
- array issues (mismatch, BOS cost, monitoring)
- energy delivery, rating, and payback time
- system performance and lifetime.

THIN FILM PV APPLICATIONS AND RELATED REQUIREMENTS
- utility scale
- industrial
- residential
- consumer electronics
- automotive
- building-integrated
- space applications.

Refinement of existing schemes as well as new approaches and techniques are within the scope of this call.

Authors are invited to submit an original manuscript to the Journal of Photonics for Energy, which is now covered by all major indexes and Journal Citation Reports.
Next Generation Technologies for Solar Energy Conversion VII (OP205)

Conference Chairs: Oleg V. Sulima, GE Global Research (USA); Gavin Conibeer, The Univ. of New South Wales (Australia)

Program Committee: Amanda J. Chatten, Imperial College London (United Kingdom); Andrew J. Ferguson, National Renewable Energy Lab. (USA); Alberto Salleo, Stanford Univ. (USA); Sean E. Shaheen, Univ. of Colorado at Boulder (USA); Wilfried G. J. H. M. van Sark, Utrecht Univ. (Netherlands); Xianfan Xu, Purdue Univ. (USA)

This conference centers on the science and application of advanced (nano) photonic structures for light management in solar energy conversion, as well as advanced/nanostructured solar cell concepts employing novel device architectures, new physical properties, and/or advanced light-to-energy conversion mechanisms that are enabled by nanostructures and other novel materials systems. While the focus is on photovoltaic (PV) cell-related technologies, research that impacts other parts of a solar energy system is also of interest. The aim of this meeting is to bring together scientists, engineers, and technologists to discuss and review the state-of-the-art in research and application of novel concepts to next generation PV devices and subsystems.

The scope of the conference will cover the following areas:

- bulk nanostructured and nanocomposite solar cells (organic, inorganic and hybrid)
- quantum well solar cells
- nanowire and nanotube-based solar cells
- quantum dot solar cells
- nanoplasmonic structures for solar cells
- nanostructures for light management and subwavelength optical phenomena
- advanced conversion mechanisms employed in the above structures, such as tandem structures, intermediate bands, hot carrier effects, and multi-exciton generation
- spectrum conversion mechanisms such as up- and down conversion
- concentrators employing advanced photonics and nanostructures
- novel materials and concepts for solar energy conversion.

Authors are invited to submit an original manuscript to the Journal of Photonics for Energy, which is now covered by all major indexes and Journal Citation Reports.

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This conference is building on previous successful annual conferences. It centers on the science and technology of reliability of photovoltaic (PV) cells, modules, components, and systems with emphasis on attaining a long service lifetime and providing a basis for product warranties. The aim of this meeting is to bring together material scientists, chemists, physicists, engineers, and technologists to discuss and review PV module and system reliability. This year, the scope includes fuel cells, batteries, and other storage options. Papers are also being solicited in the area of smart grids as they relate to PV.

The scope of the conference will cover the reliability of photovoltaic cells and modules, encapsulants, front and back sheets, transparent conductive oxides, non-destructive analytical tools such as optical spectroscopy (reflectance/transmittance, Raman, FTIR, fluorescence, microscopy), electrical testing (I-V, impedance spectroscopy), destructive analysis for assessment of thermal properties, chemical composition, permeation and diffusion, mechanical properties, modern imaging methods (like electroluminescence, photoluminescence and thermography), accelerated stress testing, degradation modes and mechanisms, global distribution of degradation factors based on satellite weather data and other sources, quality assurance, standards, lifetime predictions, concentrator optics and receivers, smart grids, and BOS components such as inverters, connectors and fuses.

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Nonimaging Optics: Efficient Design for Illumination and Solar Concentration XIII—Commemorating the 50th Anniversary of Nonimaging Optics (OP221)

Conference Chairs: Roland Winston, Univ. of California, Merced (USA); Jeffrey M. Gordon, Ben-Gurion Univ. of the Negev (Israel)

Program Committee: Pablo Benítez, CeDInt-UPM (Spain), Light Prescriptions Innovators LLC (United States); William J. Cassarly, Synopsys, Inc. (USA); Daniel Feuermann, Ben-Gurion Univ. of the Negev (Israel); Juan Carlos Miñano, Univ. Politécnica de Madrid (Spain), Light Prescriptions Innovators LLC (USA); Narkis E. Shatz, SureFire, LLC (USA)

The 2016 Nonimaging Optics symposium will celebrate the 50th anniversary of the field, including presentations that provide perspective and depth to the major advances over half a century.

Many important optical subsystems are concerned with power transfer and brightness rather than with image fidelity. Nonimaging optics is a design approach that departs from the methods of traditional optical design to develop techniques for maximizing the collecting power of concentrator and illuminator systems.

Nonimaging devices substantially outperform conventional imaging lenses and mirrors in these applications, approaching the theoretical (thermodynamic) limit. Nonimaging design methods usually involve solving ordinary or partial differential equations, calculating the flow lines of the ray bundles, coupling the edge rays of extended sources and targets or optimizing a multi-parameter merit function computed by ray-tracing techniques. While geometrically based, the design fundamentals have been extended to the diffraction limited and even sub-wavelength domain. Therefore applicability exists in near-field optical microscopy and nanometer scale optics.

This conference will address the theory of nonimaging optics and its application to the design and experimental realization of illumination and concentration systems, tailored freeform optics, display backlighting, condenser optics, high-flux solar and infrared concentration, daylighting, LED optical systems, laser pumping, and luminaires.

The revival of considerable work in solar energy concentration for both photovoltaic and thermal applications, much of which includes nonimaging optics, prompts reincorporating these fields into this conference.

The use of nonimaging optics promises higher efficiency, relaxed physical tolerances, improved optical uniformity, and reduced manufacturing costs. We encourage submissions ranging from fundamentals to critical design issues and practical applications.

Paper submissions are also solicited in the following and related areas:
- radiative transfer near the étendue limit
- concentrator optics
- illumination and irradiation optics
- solar photovoltaic and solar thermal concentration
- fiber-optic and light-pipe optical systems
- radiometry
- daylighting
- characterization of light-transfer devices
- freeform optics
- optical furnaces and radiative heating
- infrared detection
- LED applications
- laser pumping
- condenser optics.

Authors are invited to submit an original manuscript to the *Journal of Photonics for Energy*, which is now covered by all major indexes and Journal Citation Reports.

**Important Dates**

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The contact author will be notified of abstract acceptance by email.

Manuscript Due Date: **1 AUGUST 2016**

Please Note: Submissions imply the intent of at least one author to register, attend the symposium, present the paper as scheduled, where it is an oral or poster presentation, and submit a full manuscript by the deadline.
General Information

VENUE
SPIE Optics+Photonics 2016 will be held at the San Diego Convention Center, 111 West Harbor Dr., San Diego, CA 92101 and at the San Diego Marriott Hotel & Marina located adjacent to the Convention Center at 333 West Harbor Dr.

REGISTRATION
SPIE Optics + Photonics registration will be available April 2016.

All participants, including invited speakers, contributed speakers, session chairs, co-chairs, and committee members, must pay a registration fee. Authors, coauthors, program committee members, and session chairs are accorded a reduced symposium registration fee.

Fee information for conferences, courses, a registration form, and technical and general information will be available on the SPIE website in April 2016.

HOTEL INFORMATION
Opening of the hotel reservation process for SPIE Optics + Photonics is scheduled for April 2016. SPIE will arrange special discounted hotel rates for SPIE conference attendees.

The website will be kept current with any updates.

STUDENT TRAVEL GRANTS
A limited amount of contingency student travel grants will be awarded based on need. Grant applications can be found in the Resources for Students area of www.SPIE.org, under the Student Travel Grants section. Applications will be accepted from 25 April 2016 to 20 June 2016. Eligible applicants must present an accepted paper at this meeting. Offer applies to undergraduate/graduate students who are enrolled full time and have not yet received their PhD.

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• Abstracts should contain enough detail to clearly convey the approach and the results of the research.
• Commercial papers, papers with no new research/development content, and papers where supporting data or a technical description cannot be given for proprietary reasons will not be accepted for presentation in this conference.
• Please do not submit the same, or similar, abstracts to multiple conferences.

REVIEW, NOTIFICATION, AND PROGRAM PLACEMENT INFORMATION

• To ensure a high-quality conference, all submissions will be assessed by the Conference Chair/Editor for technical merit and suitability of content.
• Conference Chair/Editors reserve the right to reject for presentation any paper that does not meet content or presentation expectations.
• The contact author will receive notification of acceptance and presentation details by e-mail the week of 25 April 2016.
• Final placement in an oral or poster session is subject to the Chairs’ discretion.

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—Brock Koren,
Business Development Manager, Zygo Corporation

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