Physics, Simulation, and Photonic Engineering of Photovoltaic Devices XI (OE102)

Conference Chairs: Alexandre Freundlich, Univ. of Houston (United States); Stéphane Collin, Ctr. de Nanosciences et de Nanotechnologies (France); Karin Hinzer, Univ. of Ottawa (Canada)

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This conference attempts to capture basic research and breakthroughs in the application of photonic/novel device architectures and the development of advanced modeling and simulation techniques to feed the innovation pipeline leading to revolutionary and practically viable high-efficiency photovoltaic (PV) technologies. The conference also aims at providing an interdisciplinary forum to enhance interactions between physicists, photonic engineers, and photovoltaic device specialists at both the experimental and theoretical levels.

Theoretical or experimental papers are sought to address recent advances in basic material/device physics, simulation, demonstration, and optimization of:

- advanced light management concepts and architectures, including new approaches to spectral engineering (i.e. luminescent concentrators, up-down converters), light concentration, surface texturing and light trapping (i.e. ordered and disordered patterning, micro/nano-engineered ARs), as well as synergistic hybrid/multifunctional designs
- non-conventional PV converters, in particular application of advanced photonics to enable unique conversion mechanisms. Examples include application of photonics to enable the demonstration of advanced quantum confined or nanostructured concepts, intermediate band concepts, multiple exciton generation, thermophotonics or hot-carrier effects
- advanced single and multi-junction devices leveraging on innovative materials or/and photonic architectures. In particular the simulation or/and demonstration of cross-cutting photonic engineering approaches for enhancing the performance, reliability and functionality of these devices
- advanced optical characterization techniques, including photoluminescence, electroluminescence, cathodoluminescence, ellipsometry, reflectometry, and time-resolved measurements. Correlative and multi-scale characterization techniques are also welcome
- quantum- and nano-structured devices with a particular focus on deciphering the science at play in photogeneration, recombination, and carrier transport in quantum well/quantum dot and wire devices
- novel materials for PV absorbers (perovskites, and related materials), polycrystalline semiconductors (CdTe, CIGS, CZTS), hybrid organic/inorganic heterostructure devices, and advances in transparent conducting oxides
- defect-tolerant PV designs and application of photonics to enhance defect tolerance (dislocations, radiation defects, grain- boundaries, points defects) of solar cells
- contributions dealing with advanced, scalable micro/nano-fabrication techniques, the development of low-cost fabrication of material and devices, are also of relevance.

Finally, the conference also welcomes new and emerging methods in simulation of PV and hybrid photonic/PV devices, including but not limited to 3D-drift diffusion and RCWA models, integrated ab-initio, multi-scale simulation techniques including AI and machine learning approaches.

www.spie.org/oe102call
#PhotonicsWest
Present your research at SPIE Photonics West

Below are abstract submission instructions, the accompanying submission agreement, conference presentation guidelines, and guidelines for publishing in the Proceedings of SPIE on the SPIE Digital Library. Submissions subject to chair approval.

### Important dates

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<td>Abstract submission deadline</td>
<td>11 August 2021</td>
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<td>Author notification</td>
<td>11 October 2021</td>
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<td>Manuscript due date</td>
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*Authors must register prior to uploading.

### What you will need to submit

- Title
- Author(s) information
- 250-word abstract for technical review
- 100-word summary for the program
- Keywords used in search for your paper (optional)
- Check the individual conference Call for Papers for additional requirements (for example, some conferences require 2- to 3-page extended summary for technical review, or have instructions for award competitions)

Note: Only original material should be submitted. Commercial papers, papers with no new research/development content, and papers with proprietary restrictions will not be accepted for presentation.

### How to submit your abstract

- Visit the conference page: [www.spie.org/be102call](http://www.spie.org/be102call)
- You may submit more than one abstract but submit each abstract only once.
- Click the “Submit An Abstract” button on the conference page.
- Sign in to your SPIE account or create an account if you do not already have one.
- Follow the steps in the submission wizard until the submission process is completed.
- If your submission is related to an application track below, indicate the appropriate track when prompted during the submission process.

### Application track

- **Brain**: Papers that describe the development of innovative technologies that will increase our understanding of brain function.
- **Translational Research**: Papers that showcase the latest photonics technologies, tools, and techniques with high potential to impact healthcare.
- **3D Printing**: Papers that show innovative ways to apply this multidimensional/multidisciplinary technology.
- **COVID-19 Research**: Papers that illustrate the creativity and breadth of the optics and photonics community’s response to the COVID-19 pandemic.

### Submission agreement

All presenting authors, including keynote, invited, oral, and poster presenters, agree to the following conditions by submitting an abstract:

- Register and pay the author registration fee.
- Oral Presenters: Submit a presentation video by the advertised due date, or agree to the presentation capture of your presentation on site, for online conference viewing during the event and publication in the Proceedings of SPIE on the SPIE Digital Library.
- Poster Presenters: Submit a Poster PDF and optional preview video by the advertised due date, for online conference viewing during the event and publication in the Proceedings of SPIE on the SPIE Digital Library.
- Submit a 4-page-minimum manuscript by the advertised due date, for online conference viewing during the event and publication in the Proceedings of SPIE on the SPIE Digital Library.
- Obtain funding for registration fees, travel, and accommodations, independent of SPIE, through their sponsoring organizations. Ensure that all clearances, including government and company clearance, have been obtained to present and publish. If you are a DoD contractor in the USA, allow at least 60 days for clearance.
- Attend the meeting.
- Present at the scheduled time.

### Review and program placement

- To ensure a high-quality conference, all submissions will be assessed by the Conference Chair/Editor for technical merit and suitability of content.
- Conference Chairs/Editors reserve the right to reject any paper that does not meet content or presentation expectations.
- Final placement in an oral or poster session is subject to Chair discretion.

### Publication of Proceedings in the SPIE Digital Library

- SPIE will publish all presentations for viewing during the conference, as well as permanently archive all presentations in the conference proceedings on the SPIE Digital Library.
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- Only papers, presentations, and posters presented at the conference and received according to publication guidelines and due dates will be published in the conference Proceedings of SPIE on the SPIE Digital Library.
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