PROCEEDINGS OF SPIE

New Concepts in Solar and Thermal Radiation Conversion IV

Peter Bermel Jeremy N. Munday Editors

1–5 August 2021 San Diego, California, United States

Sponsored and Published by SPIE

Volume 11824

The papers in this volume were part of the technical conference cited on the cover and title page. Papers were selected and subject to review by the editors and conference program committee. Some conference presentations may not be available for publication. Additional papers and presentation recordings may be available online in the SPIE Digital Library at SPIEDigitalLibrary.org.

The papers reflect the work and thoughts of the authors and are published herein as submitted. The publisher is not responsible for the validity of the information or for any outcomes resulting from reliance thereon.

Please use the following format to cite material from these proceedings: Author(s), "Title of Paper," in New Concepts in Solar and Thermal Radiation Conversion IV, edited by Peter Bermel, Jeremy N. Munday, Proc. of SPIE 11824, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

ISSN: 0277-786X

ISSN: 1996-756X (electronic)

ISBN: 9781510644861

ISBN: 9781510644878 (electronic)

Published by

SPIE

P.O. Box 10, Bellingham, Washington 98227-0010 USA Telephone +1 360 676 3290 (Pacific Time)

SPIE.org

Copyright © 2021 Society of Photo-Optical Instrumentation Engineers (SPIE).

Copying of material in this book for internal or personal use, or for the internal or personal use of specific clients, beyond the fair use provisions granted by the U.S. Copyright Law is authorized by SPIE subject to payment of fees. To obtain permission to use and share articles in this volume, visit Copyright Clearance Center at copyright.com. Other copying for republication, resale, advertising or promotion, or any form of systematic or multiple reproduction of any material in this book is prohibited except with permission in writing from the publisher.

Printed in the United States of America by Curran Associates, Inc., under license from SPIE.

Publication of record for individual papers is online in the SPIE Digital Library.



Paper Numbering: A unique citation identifier (CID) number is assigned to each article in the Proceedings of SPIE at the time of publication. Utilization of CIDs allows articles to be fully citable as soon as they are published online, and connects the same identifier to all online and print versions of the publication. SPIE uses a seven-digit CID article numbering system structured as follows:

- The first five digits correspond to the SPIE volume number.
- The last two digits indicate publication order within the volume using a Base 36 numbering system employing both numerals and letters. These two-number sets start with 00, 01, 02, 03, 04, 05, 06, 07, 08, 09, 0A, 0B ... 0Z, followed by 10-1Z, 20-2Z, etc. The CID Number appears on each page of the manuscript.

Contents

NOVEL PHOTONIC MATERIALS AND STRUCTURES FOR ENHANCING PHOTOVOLTAICS 11824 03 Conducting polymer based hybrid cells for concurrent solar energy harvesting and charge **storage** [11824-4] 11824 04 Performance enhancement of ultra-thin TMDC-based photovoltaic systems for space applications [11824-5] 11824 05 N719 and D149 dyes: appropriate sensitizers for bare \$nO2 and MgO coated \$nO2 based dyesensitized solar cells [11824-1] 11824 07 Hybrid photovoltaic-supercapacitors: effect of the counter electrode on the device performance [11824-6] **NOVEL PHOTONIC DESIGNS FOR THERMAL MANAGEMENT** 11824 0A Rugate filters for evacuated thermal collectors: IR mirror for improvement of energy conversion **efficiency** [11824-11] 11824 0C Ultra-efficient and ultra-rapid solar cell de-icing and de-snowing (Invited Paper) [11824-19]