

# PROCEEDINGS OF SPIE

## ***Nanophotonic Materials XV***

**Stefano Cabrini**  
**Gilles L rondel**  
**Adam M. Schwartzberg**  
**Taleb Mokari**  
*Editors*

**22–23 August 2018**  
**San Diego, California, United States**

*Sponsored and Published by*  
SPIE

**Volume 10720**

Proceedings of SPIE 0277-786X, V. 10720

SPIE is an international society advancing an interdisciplinary approach to the science and application of light.

Nanophotonic Materials XV, edited by Stefano Cabrini, Gilles L rondel, Adam M. Schwartzberg,  
Taleb Mokari, Proc. of SPIE Vol. 10720, 1072001 ·   2018 SPIE  
CCC code: 0277-786X/18/\$18 · doi: 10.1117/12.2516817

Proc. of SPIE Vol. 10720 1072001-1

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 [SPIDigitalLibrary.org](http://SPIDigitalLibrary.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 *Nanophotonic Materials XV*, edited by Stefano Cabrini, Gilles LérondeL, Adam M. Schwartzberg, Taleb Mokari, Proceedings of SPIE Vol. 10720 (SPIE, Bellingham, WA, 2018) Seven-digit Article CID Number.

ISSN: 0277-786X  
ISSN: 1996-756X (electronic)

ISBN: 9781510620117  
ISBN: 9781510620124 (electronic)

Published by

**SPIE**

P.O. Box 10, Bellingham, Washington 98227-0010 USA  
Telephone +1 360 676 3290 (Pacific Time) · Fax +1 360 647 1445

[SPIE.org](http://SPIE.org)

Copyright © 2018, Society of Photo-Optical Instrumentation Engineers.

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 copying fees. The Transactional Reporting Service base fee for this volume is \$18.00 per article (or portion thereof), which should be paid directly to the Copyright Clearance Center (CCC), 222 Rosewood Drive, Danvers, MA 01923. Payment may also be made electronically through CCC Online at [copyright.com](http://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. The CCC fee code is 0277-786X/18/\$18.00.

Printed in the United States of America.

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

**SPIE. DIGITAL  
LIBRARY**

[SPIDigitalLibrary.org](http://SPIDigitalLibrary.org)

---

**Paper Numbering:** *Proceedings of SPIE* follow an e-First publication model. A unique citation identifier (CID) number is assigned to each article 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

v	<i>Authors</i>
vii	<i>Conference Committee</i>

---

## NEW MATERIAL PROPERTIES FOR APPLICATIONS

---

10720 03	<b>Optimal annealing of cubic NaYF<sub>4</sub>:Er nanomaterials for biomedical sensing applications</b> [10720-2]
10720 04	<b>Parametric study of wavelength demultiplexers designed via objective-first algorithm</b> [10720-3]

---

## METAL OXIDES PROPERTIES

---

10720 08	<b>Ultrafast dynamics of the ultraviolet and visible photoluminescence in the aluminum-doped zinc oxide metamaterial</b> [10720-7]
----------	--

---

## NANO-PARTICLES PROPERTIES

---

10720 0C	<b>Optical properties of white CdSe:Zn quantum dots</b> [10720-11]
----------	--

---

## NANOSCALE STRUCTURES

---

10720 0J	<b>Optical second harmonic generation from silicon with embedded silver nanostructures</b> [10720-18]
10720 0K	<b>Directed assembly of bimetallic nanoarchitectures by interfacial photocatalysis with plasmonic hot electrons</b> [10720-19]

---

## THIN FILMS AND 2D MATERIALS

---

10720 0N	<b>Enhanced photoelectrochemical water splitting by plasmonic Au nanostructures/reduced graphene oxide (Best Paper Award)</b> [10720-22]
10720 0O	<b>A DFT study on the structures, energy, and optical properties of copper (titanium or zirconium) doped graphenes</b> [10720-23]

**POSTER SESSION**

---

10720 0U     **Anomalous light absorption by a monolayer graphene-water complex** [10720-28]

10720 0W     **Enhancement of Purcell factor in all-dielectric dimer** [10720-30]

10720 0Z     **Combined effect of plasmonic interaction of nano-particles** [10720-34]

## Authors

Numbers in the index correspond to the last two digits of the seven-digit citation identifier (CID) article numbering system used in Proceedings of SPIE. The first five digits reflect the volume number. Base 36 numbering is employed for the last two digits and indicates the order of articles within the volume. Numbers start with 00, 01, 02, 03, 04, 05, 06, 07, 08, 09, 0A, 0B...0Z, followed by 10-1Z, 20-2Z, etc.

Alpkılıç, Ahmet M., 04  
An, Yong Q., 0J  
Angelsky, O. V., 0U  
Baker, David R., 0K  
Bhowmik, Gourav, 0J  
Boltersdorf, Jonathan, 0K  
Brus, V. V., 0U  
Campbell, Bethany, 08  
Chen, Kai, 0N  
Chung, Shu Ru, 0C  
Dalal, Reena, 0W  
Das, Naresh C., 0Z  
Diebold, Alain C., 0J  
Dua, Nidhi, 03  
Forcherio, Gregory T., 0K  
Gu, Weifeng, 0O  
Guo, Yanrui, 0O  
Ho, Hsin-Chia, 0N  
Hsueh, Chun-Hway, 0N  
Huang, Chun-Ru, 0C  
Huang, Mengbing, 0J  
Ivashko, V. V., 0U  
Kalra, Yogita, 0W  
Kelly, Priscilla, 08  
Kumar, Ajeet, 0W  
Kurt, Hamza, 04  
Kuznetsova, Lyuba, 08  
Leff, Asher C., 0K  
Liu, Hongpeng, 0O  
Lundgren, Cynthia A, 0K  
Maksimyak, A. P., 0U  
Maksimyak, P. P., 0U  
McClure, Joshua P., 0K  
Mehra, Meenal, 03  
Nagao, Tadaaki, 0N  
Saha, Soumen, 03  
Singh, Madhusudan, 03  
Song, Qinggong, 0O  
Tutgun, Mediha, 04  
Wang, Lijie, 0O  
Yeltik, Aydan, 04  
Yılmaz, Döne, 04  
Yılmaz, Yusuf A., 04  
Zhen, Dandan, 0O  
Zhu, Yanxia, 0O



# Conference Committee

## *Symposium Chairs*

**Halina Rubinsztein-Dunlop**, The University of Queensland (Australia)  
**Mark L. Brongersma**, Geballe Laboratory for Advanced Materials (GLAM), Stanford University (United States)  
**Harry A. Atwater Jr.**, California Institute of Technology (United States)  
**Nikolay I. Zheludev**, Optoelectronics Research Centre (United Kingdom) and Nanyang Technological University (Singapore)

## *Conference Chairs*

**Stefano Cabrini**, Lawrence Berkeley National Laboratory (United States)  
**Gilles Léron del**, Université de Technologie Troyes (France)  
**Adam M. Schwartzberg**, Lawrence Berkeley National Laboratory (United States)  
**Taleb Mokari**, Ben-Gurion University of the Negev (Israel)

## *Conference Program Committee*

**David L. Andrews**, University of East Anglia (United Kingdom)  
**Angus J. Bain**, University College London (United Kingdom)  
**Mireille H. Blanchard-Desce**, Université de Rennes 1 (France)  
**Robert W. Boyd**, University of Rochester (United States)  
**Zeno Gaburro**, Università degli Studi di Trento (Italy)  
**Aaron W. Harper**, The University of Southern California (United States)  
**Ghassan E. Jabbour**, Arizona State University (United States)  
**François Kajzar**, University Politehnica of Bucharest (Romania)  
**Dmitri I. Kovalev**, University of Bath (United Kingdom)  
**Paras N. Prasad**, University at Buffalo (United States)  
**Dmitri Talapin**, The University of Chicago (United States)  
**Younan Xia**, Georgia Institute of Technology (United States)

## *Session Chairs*

- 1 New Material Properties for Applications  
**Taleb Mokari**, Ben-Gurion University of the Negev (Israel)
- 2 Metal Oxides Properties  
**Tito L. Busani**, The University of New Mexico (United States)

- 3 Nano-Particles Properties  
**Stefano Cabrini**, Lawrence Berkeley National Laboratory  
(United States)
- 4 Nanoscale Structures  
**Gilles Léronnel**, Université de Technologie Troyes (France)
- 5 Thin Films and 2D Materials  
**Gilles Léronnel**, Université de Technologie Troyes (France)
- 6 Hybrid Materials  
**Taleb Mokari**, Ben-Gurion University of the Negev (Israel)