Integrated Photonics Platforms II

Roel G. Baets
Peter O’Brien
Laurent Vivien
Editors

3—7 April 2022
Strasbourg, France

9—20 May 2022
ONLINE

Sponsored by
SPIE

Cosponsored by
City of Strasbourg (France)
IdEx University of Strasbourg (France)
CNRS (France)
iCube (France)
Université de Strasbourg (France)

Cooperating Organisations
Photonics 21 (Germany)
EOS—European Optical Society (Germany)
Photonics Public Private Partnership (Belgium)
Photonics France (France)

Published by
SPIE

Volume 12148
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:

ISSN: 0277-786X
ISSN: 1996-756X (electronic)
ISBN: 9781510651722

Published by
SPIE
P.O. Box 10, Bellingham, Washington 98227-0010 USA
Telephone +1 360 676 3290 (Pacific Time)
SPIE.org
Copyright © 2022 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.

SPIEDigitalLibrary.org

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

v  Conference Committee

LIGHT EMITTERS

12148 02  Mid-IR emission from integrated rare earth (Dy$^{3+}$, Pr$^{3+}$)-doped chalcogenides waveguides for sensing applications [12148-1]

12148 03  Erbium-doped sol-gel derived silica-titania films [12148-2]

PASSIVE AND ACTIVE PHOTONIC DEVICES I

12148 04  Highly efficient silicon nitride grating couplers with metal back-reflector enabled by cryogenic deep silicon etching [12148-4]

12148 05  Highlight of polarization filtering effect in passive porous silicon ridge waveguides [12148-5]

12148 06  Low-loss all-optical ns-switching for single-photon routing in scalable integrated quantum photonics [12148-6]

12148 07  Development of a SiON-based integrated platform for the blue/near-UV wavelength range [12148-7]

SIMULATION AND MODELLING

12148 08  Dimensionality reduction for efficiency human and computer codesign in integrated photonics [12148-8]

12148 09  Mask synthesis for silicon photonics devices [12148-9]

12148 0A  Reducing loss and crosstalk in two-mode ridge waveguide bend by step-like thickness structuring [12148-10]

12148 0B  Optimization study of all-dielectric metamaterial cladding for increased integration density of PIC [12148-12]

12148 0C  A fiber-to-waveguide, 1D grating coupler design using genetic algorithm for 1550 nm applications [12148-11]
PASSIVE AND ACTIVE PHOTONIC DEVICES II

12148 0D  Silicon photonic free-space beam steered optical switch using wavelength tuned nanoantennas [12148-16]

12148 0E  Self-heating analysis of monolithically integrated hybrid III-V/Si PIN diode [12148-18]

SPECIAL SESSION ON EU-FUNDED INTEGRATED PHOTONICS PROJECTS II

12148 0F  INSPIRE: InP on SiN photonic integrated circuits realized through wafer-scale micro-transfer printing (Invited Paper) [12148-25]

SPECIAL SESSION ON EU-FUNDED INTEGRATED PHOTONICS PROJECTS III

12148 0G  Photonics integrated circuits from innovations to commercial solutions: MedPhab pilot line for accelerated industrial uptake (Invited Paper) [12148-26]

12148 0H  MORPHIC: MEMS enhanced silicon photonics for programmable photonics (Invited Paper) [12148-28]

POSTER SESSION

12148 0I  Design, simulation and performance comparison of SoI rectangular waveguide and SMF for methane detection [12148-32]

12148 0J  Genetic algorithm based, on-chip, fishbone grating waveguide and transition design for time-domain operation [12148-35]

12148 0K  Waveguide-to-substrate, vertical bend coupler design for 3D photonic integrated circuits [12148-36]
Conference Committee

Symposium Chairs

Francis Berghmans, Vrije Universiteit Brussel (Belgium)
Thierry Georges, Oxxius SA (France)
Paul C. Montgomery, Université de Strasbourg (France)

Programme Track Chairs

John T. Sheridan, University College Dublin (Ireland)
Laurent Vivien, Centre de Nanosciences et de Nanotechnologies (France)

Conference Chairs

Roel G. Baets, Universiteit Gent (Belgium)
Peter O’Brien, Tyndall National Institute (Ireland)
Laurent Vivien, Centre de Nanosciences et de Nanotechnologies (France)

Conference Programme Committee

Frédéric Boeuf, STMicroelectronics (France)
José Capmany Francoy, Universidad Politécnica de Valencia (Spain)
Frederic Y. Gardes, University of Southampton (United Kingdom)
Jin Guo, CUMEC (China)
Martijn J. R. Heck, Aarhus Universitet (Denmark)
Takaaki Ishigure, Keio University (Japan)
Robert E. Mallard, Canadian Microelectronics Corporation (Canada)
Lorenzo Pavesi, Università degli Studi di Trento (Italy)
Stefan F. Preble, Rochester Institute of Technology (United States)
Pol Van Dorpe, IMEC (Belgium)
Kevin A. Williams, Technische Universiteit Eindhoven (Netherlands)
Jeremy Witzens, RWTH Aachen Universität (Germany)
Dan-Xia Xu, National Research Council Canada (Canada)
Koji Yamada, National Institute of Advanced Industrial Science and Technology (Japan)
Zhiping Zhou, Peking University (China)