

PROCEEDINGS OF SPIE

Next-Generation Optical Communication: Components, Sub-Systems, and Systems XIII

Guifang Li
Kazuhide Nakajima
Atul K. Srivastava
Editors

29–31 January 2024
San Francisco, California, United States

Sponsored by
SPIE

Co-sponsored by
Corning Inc. (United States)
NTT Electronics Corporation (Japan)

Published by
SPIE

Volume 12894

Proceedings of SPIE 0277-786X, V. 12894

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

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.

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 *Next-Generation Optical Communication: Components, Sub-Systems, and Systems XIII*, edited by Guifang Li, Kazuhide Nakajima, Atul K. Srivastava, Proc. of SPIE 12894, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

ISSN: 0277-786X

ISSN: 1996-756X (electronic)

ISBN: 9781510670488

ISBN: 9781510670495 (electronic)

Published by

SPIE

P.O. Box 10, Bellingham, Washington 98227-0010 USA

Telephone +1 360 676 3290 (Pacific Time)

SPIE.org

Copyright © 2024 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.

**SPIE. DIGITAL
LIBRARY**

SPIDigitalLibrary.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

vii *Conference Committee*

HIGH SPEED SHORT REACH TRANSMISSION I

- 12894 02 **Surface normal electro-absorption modulators in short-reach high-capacity transmission (Invited Paper)** [12894-3]
- 12894 03 **Robustness of digital subcarrier multiplexing systems to laser phase noise and chromatic dispersion (Optical Communications Best Student Paper Award)** [12894-4]
- 12894 04 **112 GBaud PAM-8 operation of 2-ch EML array on high-performance sub-mount** [12894-5]

HIGH SPEED SHORT REACH TRANSMISSION II

- 12894 05 **Design considerations and trade-offs for 1.6 Tb/s IM/DD- and coherent transmission over O-Band (Invited Paper)** [12894-7]
- 12894 06 **Optical transceiver discussions and perspective toward 3.2T transmission from a standardization viewpoint** [12894-8]

SILICON PHOTONICS

- 12894 07 **Meeting high speed transmission targets with silicon photonics (Invited Paper)** [12894-10]
- 12894 08 **Improvement of one-chip Si photonics-based wavelength locker for light source modules** [12894-11]

SUBMARINE TRANSMISSION

- 12894 09 **SDM technologies for submarine cable system (Invited Paper)** [12894-15]

SDM AND CONNECTIVITY

- 12894 0A **Multi-core fiber switch technology for SDM network** [12894-16]

- 12894 0B **Measurements of optical fibers using frequency-domain method: from single mode fiber, polarization maintaining fiber to few-mode, multi-core, and multimode fiber (Invited Paper)** [12894-18]
- 12894 0C **Resolving the DMD-crosstalk trade-off in SDM through graded-index FMF** [12894-17]

NETWORK SENSING AND MONITORING

- 12894 0D **Photonics tomography for enhancing monitoring capability of optical networks (Invited Paper)** [12894-21]

WIDEBAND TRANSMISSION I

- 12894 0E **On the application of semiconductor optical amplifier towards Terabit/s short-reach IM/DD transmission systems (Invited Paper)** [12894-22]
- 12894 0F **Enabling capacity scaling in metro networks with multi band sliceable transceiver architectures** [12894-23]

WIDEBAND TRANSMISSION II

- 12894 0G **Chromatic dispersion compensation via an all-optical perceptron** [12894-26]

MICROWAVE PHOTONICS AND OPTICAL WIRELESS COMMUNICATION

- 12894 0H **Microwave photonics for space (Invited Paper)** [12894-28]
- 12894 0I **Novel Li-Fi transceiver design based on perovskite photodiode devices (PeLiFi)** [12894-29]
- 12894 0J **Demonstration of gigabits-per-second two-user NOMA using laser-based indoor optical wireless communication (Optical Communications Best Student Paper Award)** [12894-30]

NETWORKING AND SECURITY

- 12894 0K **Physical layer security based on scrambling of the telecommunication system parameters driven by a quantum key distribution system** [12894-31]
- 12894 0L **SDN-enabled CV-QKD for quantum secure communication in open and disaggregated 6G networks** [12894-32]

12894 0M **On the challenges of optical disaggregated data center networking for ML/AI applications (Invited Paper)** [12894-33]

POSTER SESSION

12894 0N **High performance heat spreader for thermal management of high heat flux optical and electronics systems** [12894-35]