

PROCEEDINGS OF SPIE

3D Printed Optics and Additive Photonic Manufacturing II

**Alois M. Herkommer
Georg von Freymann
Manuel Flury**
Editors

**6–10 April 2020
Online Only, France**

Sponsored by
SPIE

Cosponsored by
City of Strasbourg (France)
Eurometropole (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 11349

Proceedings of SPIE 0277-786X, V. 11349

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 *3D Printed Optics and Additive Photonic Manufacturing II*, edited by Alois M. Herkommer, Georg von Freymann, Manuel Flury, Proceedings of SPIE Vol. 11349 (SPIE, Bellingham, WA, 2020) Seven-digit Article CID Number.

ISSN: 0277-786X

ISSN: 1996-756X (electronic)

ISBN: 9781510634701

ISBN: 9781510634718 (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

Copyright © 2020, 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 \$21.00 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. 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/20/\$21.00.

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: 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	Authors
vii	Conference Committee

FIBRES AND INTERCONNECTS

11349 07	Mode-field matching design, 3D fabrication and characterization of down-tapers on single-mode optical fiber tips for coupling to photonic integrated circuits [11349-9]
11349 09	Generation of functional curved waveguides by CO ₂ -laser based deposition of coreless fused silica fibers [11349-11]
11349 0A	Stereolithographic printed polymers on ceramic for 3D-opto-MID [11349-12]

3D PRINTED METALS AND CERAMICS

11349 0C	Additive manufacturing of copper-molybdenum pseudoalloys [11349-14]
----------	---

3D PRINTING OF MACRO-OPTICS

11349 0G	Mode-locked diode lasers as sources for two-photon polymerization [11349-18]
----------	--

POSTER SESSION

11349 0M	Design and prototyping of beam shapers to generate circular or square top-hat beams of different size for additive manufacturing applications [11349-24]
11349 0N	Manufacturing and analyzing of cost-efficient fresnel lenses using stereolithography [11349-25]
11349 0O	Proximity effect in parallelized microfabrication using two-photon polymerization [11349-26]
11349 0P	Laser forming of tissue-engineering structures with nanocarbon scaffolds in the bioorganic matter [11349-27]
11349 0T	Additive manufacturing of magnetic materials using selective laser melting [11349-31]
11349 0U	Laser formation of electrically conductive nanocomposites for bioelectronic applications [11349-32]