PROCEEDINGS OF SPIE

SPIDigitalLibrary.org/conference-proceedings-of-spie

Front Matter: Volume 11589

, "Front Matter: Volume 11589," Proc. SPIE 11589, Behavior and Mechanics of Multifunctional Materials XV, 1158901 (29 April 2021); doi: 10.1117/12.2597379

Event: SPIE Smart Structures + Nondestructive Evaluation, 2021, Online Only

PROCEEDINGS OF SPIE

Behavior and Mechanics of Multifunctional Materials XV

Ryan L. Harne
Editor

22–26 March 2021
Online Only, United States

Sponsored and Published by
SPIE

Volume 11589

Proceedings of SPIE 0277-786X, V. 11589

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

Behavior and Mechanics of Multifunctional Materials XV, edited by
Ryan L. Harne, Proc. of SPIE Vol. 11589, 1158901 · © 2021 SPIE
CCC code: 0277-786X/21/\$21 · doi: 10.1117/12.2597379

Proc. of SPIE Vol. 11589 1158901-1

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.

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 *Behavior and Mechanics of Multifunctional Materials XV*, edited by Ryan L. Harne, Proc. of SPIE 11589, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

ISSN: 0277-786X

ISSN: 1996-756X (electronic)

ISBN: 9781510640078

ISBN: 9781510640085 (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.

**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

NEW FRONTIERS IN MULTIFUNCTIONAL MATERIALS

- 11589 03 **Physical reservoir computing with origami: a feasibility study** [11589-2]
- 11589 04 **Printability characterization of graphene-reinforced cementitious composites** [11589-3]
- 11589 05 **Entropy dynamics approach to fractional order mechanics with applications to elastomers**
[11589-4]
- 11589 06 **Controlling 3D deformations of bio-inspired active skins through designed geometrical imperfections** [11589-5]

MULTIFUNCTIONAL MECHANICAL METAMATERIALS

- 11589 07 **Multifunctional metamaterial sensor and nanogenerator** [11589-6]

MULTISCALE AND MULTIMATERIAL COMPOSITES

- 11589 0B **A novel multi-mode magnetic triboelectric nanogenerator energy harvesting system**
[11589-10]
- 11589 0D **Liquid metal composites for flexible thermoelectric energy harvesting** [11589-12]
- 11589 0E **Mechanical properties and durability of cementitious composites reinforced by graphene nanoplatelets with different particle size and surface area** [11589-13]
- 11589 0F **Rheological and buildability characterization of PVA fiber-reinforced cementitious composites for additive construction** [11589-23]
- 11589 0G **Postbuckling of multi-direction anisotropic constrained functionally graded material beams**
[11589-24]

SHAPE RECOVERY AND MEMORY

- 11589 0J **Material model for simulating domain reorientation and phase transformation in triaxial loaded PZT95/5** [11589-16]

METAL ADDITIVE MANUFACTURING

11589 OL	Spatial microstructural analysis for selective laser melted components [11589-18]
11589 OM	Development of ANN model for surface roughness prediction of parts produced by varying fabrication parameters [11589-19]
11589 ON	A framework for the optimization of powder-bed fusion process [11589-20]
11589 OO	Study on the microstructural and hardness variations of unsupported overhangs fabricated using selective laser melting [11589-21]
11589 OP	Toward mitigating microcracks using nanopowders in laser powder bed fusion [11589-22]