

PROCEEDINGS OF SPIE

Laser-based Micro- and Nanopackaging and Assembly III

**Wilhelm Pfleging
Yongfeng Lu
Kunihiko Washio
Willem Hoving
Jun Amako**
Editors

**28–29 January 2009
San Jose, California, United States**

Sponsored and Published by
SPIE

Volume 7202

Proceedings of SPIE, 0277-786X, v. 7202

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

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Author(s), "Title of Paper," in *Laser-based Micro- and Nanopackaging and Assembly III*, edited by Wilhelm Pfleging, Yongfeng Lu, Kunihiro Washio, Willem Hoving, Jun Amako, Proceedings of SPIE Vol. 7202 (SPIE, Bellingham, WA, 2009) Article CID Number.

ISSN 0277-786X

ISBN 9780819474483

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

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Printed in the United States of America.

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



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Introduction

At the present time, high-tech industries have increasingly stronger demands for advanced laser-based micro- and nano-packaging and assembly technologies which enable specialized prototypes and high-throughput devices with micro and nanostructures to realize fluidic, biological, electronic, mechanical, and photonic functionalities. Cutting-edge designs and applications are increasingly based on micro- and nano-system technologies. However, the realization of such devices or functional prototypes imposes new challenges for patterning, packaging, and assembly.

Functional systems are continuously becoming more miniaturized and complicated during the course of performance improvement. Nano-materials and nano-patterning technologies become more closely associated with micro-materials and micro-structuring technologies, leading to new applications and research fields, but at the same time imposing new challenges for appropriate assembly and packaging technologies. Due to the ever-increasing complexity of device structures, processing needs for wide varieties of materials and their combinations have been increasing in areas such as MEMS and optofluidics. Furthermore, in certain application fields such as large-area flexible displays and photovoltaics, aspect ratios between horizontal and vertical device features are rapidly increasing. Novel processing technologies with high efficiency and throughput are strongly demanded.

The “Laser-based micro packaging” conference series was established in 2002. In 2007, the conference was renamed “Laser-Based Micro- and Nano- Packaging and Assembly (LBMP)” to reflect the relevance of nanometer-scaled structures. The aim of this conference is to bring together scientists and engineers working on application oriented aspects of laser-based micro- and nano-packaging for mechanical, electronic, photonic, chemical, biological, bio-active, or bio-compatible devices including MEMS/bio-MEMS, MOEMS and OLED. Because of the great economical demand, material processing is playing an increasingly important role in current and future LBMP conferences, along with new “green technologies” such as photovoltaics and advanced battery systems.

The conference LBMP-III was held on 28–29 January as part of LASE 2009, at Photonics West in San Jose, California. LBMP-III comprised 6 oral sessions with 29 papers, which were presented by speakers from the USA, Japan, China, Singapore, Spain, Italy, and Germany. Papers represented a number of topics including: modeling and characterization of laser-matter interaction, direct-write processing and surface modification, micro- and nanomachining, processes for optical components and devices, MEMS, and photovoltaics. The photovoltaics session was jointly organized with Conference 7201: Laser Applications in Microelectronic and Optoelectronic Manufacturing XIV (LAMOM-XIV).

We would like to thank the program committee members and the SPIE technical staff for their great efforts during the planning and organization of LBMP-III. We would also like to thank the invited speakers and presenters of the contributed papers for their contribution to the success of the conference. All the manuscripts were peer reviewed in order to publish high-quality conference proceedings.

Yongfeng Lu
Wilhelm Pfleging
Kunihiko Washio