PROCEEDINGS OF SPIE

Optical Manipulation and Structured Materials Conference 2020

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Yokohama, Japan
20–24 April 2020

Sponsored and Published by
SPIE

Volume 11522

Proceedings of SPIE 0277-786X, V. 11522

Optical Manipulation and Structured Materials Conference 2020, edited by T. Omatsu, K. Dholakia, H. Ishihara, K. Sasaki,
Proc. of SPIE Vol. 11522, 1152201 · © 2020 SPIE · CCC code: 0277-786X/20/$21 · doi: 10.1117/12.2574114

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Please use the following format to cite material from these proceedings:
Author(s), "Title of Paper," in *Optical Manipulation and Structured Materials Conference 2020*, edited by T. Omatsu, K. Dholakia, H. Ishihara, K. Sasaki, Proceedings of SPIE Vol. 11522 (SPIE, Bellingham, WA, 2020) Seven-digit Article CID Number.

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

ISBN: 9781510638518
ISBN: 9781510638525 (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

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Introduction

Since the first demonstration of an optical tweezer based on optical radiation forces (scattering and gradient forces) created by a tightly focused laser beam, optical tweezers have been widely investigated in a variety of research fields, including biology, physics, and chemistry. In fact, Dr. A. Ashkin was awarded Nobel Prize in Physics, for contributing to a pioneering work of optical manipulation, 2018.

Conventional optical tweezers have been mostly adopted to dielectric particles with a dimension range from hundreds of nanometers to tens of micrometers. However, they do not always enable us to efficiently trap nanosacle-sized dielectric particles as well as metallic particles.

In recent years, plasmonic tweezers based on enhanced radiation forces owing to surface plasmon polaritons in metallic nanostructures have been successfully demonstrated to efficiently trap and manipulate both nanosacle-sized dielectric and metallic particles.

Also, structured lights, such as higher order Laguerre-Gaussian and Bessel beams carry optical angular momenta, and they provide unique tweezing abilities, for instance, for inducing an orbital motion of the trapped particles without employing mechanical systems.

Since 2014, the OMC has been successfully collecting more than 80 participants from home and abroad. The OMC 2020 conference aims to present and discuss up-to-date scientific subjects, new technologies, and applications related to the fields of optical and plasmonic tweezers, the manipulation of nanostructures, structured optical fields and their satellite topics.

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