# The latest Light Robotics breakthroughs - Postdeadline.

**Glückstad, Jesper; Palima, Darwin; Bañas, Andrew**

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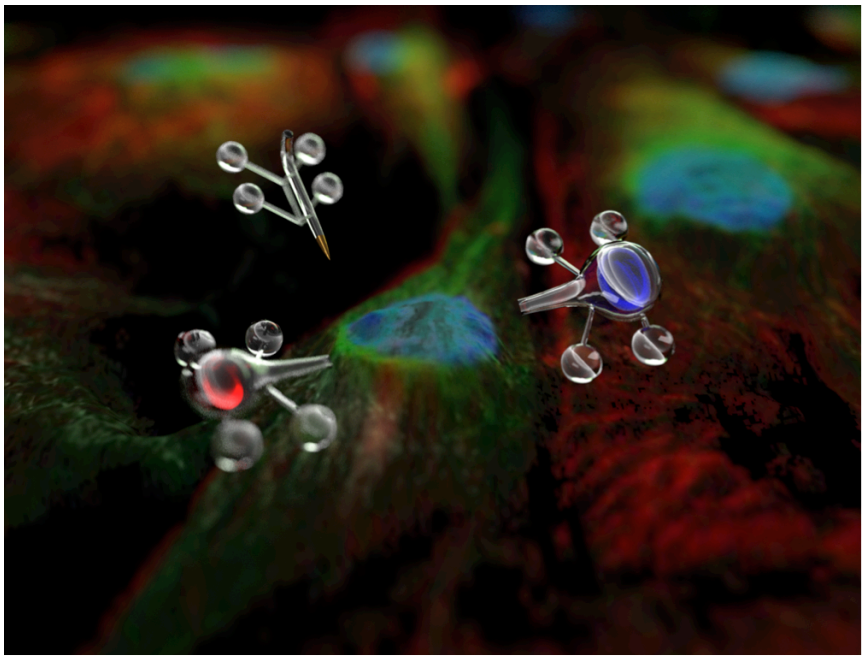
# The latest Light Robotics breakthroughs

**J. Glückstad, D. Palima, A. Banas**
DTU Fotonik, Dept. of Photonics Engineering,
Programmable Phase Optics
Technical University of Denmark,
DK-2800 Kgs. Lyngby, Denmark

*jesper.gluckstad@fotonik.dtu.dk*
*www.ppo.dk* *www.OptoRobotix.com* *www.GPCphotonics.com*

**SUMMARY**

Contemporary nanoscopy provides functionalities, not only for observing life science on the smallest scales but also for actively reaching into and manipulating at subcellular levels. This post-deadline contribution describes the latest generation of 3D-printed micro-tools for enabling light-activated robotics on sub-diffraction scales: Light Robotics.



## Introduction

Scientific disciplines constantly evolve and create new offspring or subdisciplines that combine the favorable characteristics from its forerunners. The merger of biology and photonics has within the last decade produced one such off-spring, Biophotonics, which harnesses light to study biological materials. More recently we have seen the exciting merger of biophotonics with contemporary nanophotonics into so-called NanoBiophotonics culminating with the Chemistry Nobel Prize for super-resolution microscopy – now simply coined nanoscopy. After years of working on light-driven trapping and manipulation, we can see that a confluence of developments is now ripe for the emergence of a new area that can contribute to nanobiophotonics – Light Robotics –

which combines the latest advances in microfabrication and optical micromanipulation together with intelligent control ideas from macro-robotics. This Summer we are publishing a 482 pages edited Elsevier book volume covering the fundamental aspects needed for Light Robotics including optical trapping systems, microfabrication and microassembly as well as underlying theoretical principles and experimental illustrations for optimizing optical forces and torques for full-scale Light Robotics. The Elsevier volume is also presenting an array of various new functionalities that are enabled by these new designed light-driven micro-robots in addition to various nano-biophotonics applications demonstrating the unique use of biophysical tools based on light robotic concepts. We have endeavored to make this new discipline accessible to a broad audience from advanced undergraduates and graduate students to practioners and researchers not only in nanobiophotonics and micro- and nanotechnology but also to other areas in optics and photonics, mechanical engineering, control and instrumentation engineering and related fields.

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