

Special Issue on
**Optical Force Engineering and Optical Manipulation
Applications in Micro/Nanosystems**

CALL FOR PAPERS

Since the pioneering work of Arthur Ashkin, optical trapping and related technologies have attracted much attention in various disciplines, including classical and quantum optics, condensed matter physics, and biology. Each year, more and more exciting applications emerge, including the nano-optical tweezers, optical manipulation with structured light, optical lifts, optical excitation of mechanical vibrations, and laser-controlled microrobots. With the assistance of nanophotonic structures, especially the plasmonic ones, optical trapping has been successfully scaled down to the dimensions of 10 nm or even smaller. The structured light opens new avenues for the interesting and unexpected phenomena, including the angular momentum transfer, pulling and transverse optical forces, and negative optical torque. Beyond trapping, long distance optical manipulation also rapidly develops. Now, all the degrees of freedom (forward pushing, backward pulling, transverse shifting, spinning, and rotating) can be controlled using a single beam only. Also, optical manipulation in microfluidic environment with the assistance of photophoresis effect is also becoming a hot topic. These new results provide both opportunities and challenges to all the researchers devoted to this rapidly progressing field.

This current special issue aims to publish high-quality original research from a variety of topics related to the science, technology, and applications of optical forces and optical manipulation. High-quality reviews are also welcome to address the challenges, opportunities, prospects, and the cutting edge of progress in this domain.

Potential topics include but are not limited to the following:

- ▶ Optical force and torque: classical and quantum theory
- ▶ Optical binding and assembly of multiple particles with optical force (optical matter)
- ▶ Optical force enhancement, self-induced back-action optical trapping
- ▶ Mechanical action of structured light beam
- ▶ Optical trapping and manipulating of molecules and biological specimens
- ▶ Shape induced optical torque and force, optical motors, swimmers, and spanners
- ▶ Light momentum, optical force density, stress tensor, and new optical force calculation methods
- ▶ Effect of optical force on nanostructures in both classical and quantum limit
- ▶ Angular momentum of light
- ▶ Single nanoparticle and molecule manipulating and sensing
- ▶ Optical pulling force and transverse force
- ▶ Combining of optical force with optical microscopy technologies
- ▶ Optical force and manipulation in microfluidic background, indirect optical forces, and photophoresis
- ▶ Optical manipulation techniques for bioengineering systems and medical treatment applications

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