

# Micro-optical elements fabricated by multiphoton lithography on various substrates

Vasileia Melissinaki<sup>1,\*</sup>, Dimitra Ladika<sup>1</sup>, Gordon Zyla<sup>1</sup>, Elmina Kabouraki<sup>1</sup>, Jan Marx<sup>1</sup>, Maria Farsari<sup>1</sup>

<sup>1</sup>*Institute of Electronic Structure and Laser, Foundation for Research and Technology-Hellas, 70013 Heraklion, Greece*

<sup>3</sup>*Applied Laser Technologies, Ruhr University Bochum, Bochum, Germany*

\*Corresponding author email: [melvas@iesl.forth.gr](mailto:melvas@iesl.forth.gr)

Multi-photon lithography (MPL) is a powerful 3D printing technique which enables the direct writing of computer-designed structures within the volume of a photosensitive material[1]. Over the last decade, MPL has been a leading technique for rapid prototyping of 3D micro-optical elements (MOEs).

Here, we present different designs of micro-optical elements fabricated either on glass substrates or directly onto the end-face of optical fibers. Moreover, we propose the development of optical fiber adaptors through MPL technique, where micro-optical elements will be fabricated onto the adaptor, to achieve laser beam guidance. These devices hold their novelty to the fact that can be easily handled in order to take measurements for a variety of optical fibers by using the same sample.

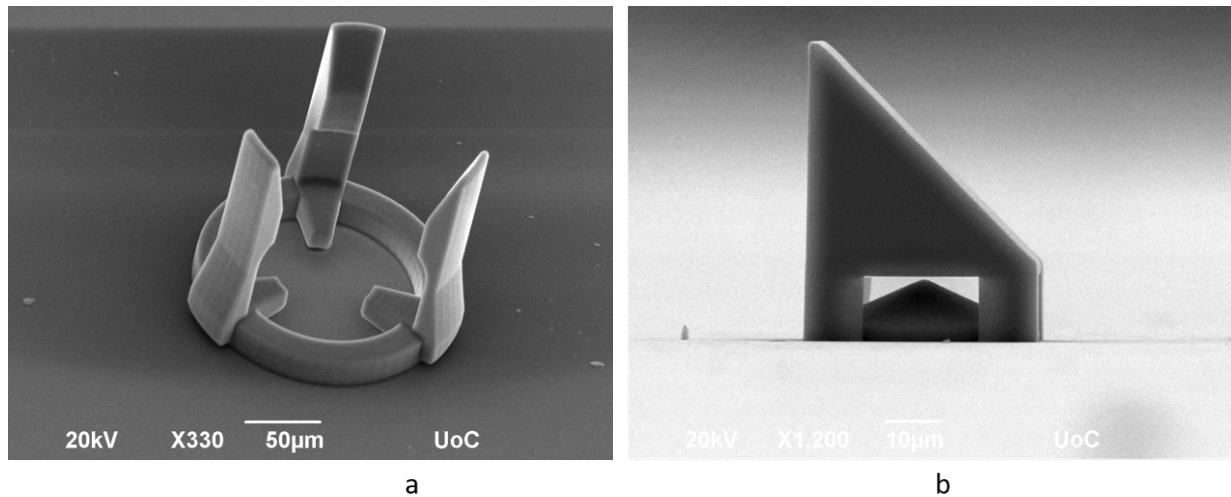


Figure 1: SEM images of (a) the optical fiber adaptor, and (b) micro-optical elements.

**References:** [1] M. Farsari, M. Vamvakaki, and B. N. Chichkov, *J. Opt.* **12**, (2010).