Ausschreibung für studentische Arbeiten im IMT

Art der Arbeit: ☒ Masterarbeit
☐ Bachelorarbeit
☐ Praktikum

Ansprechpartner:
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Thema der Arbeit:

Design, Fabrication and Characterization of Fresnel structures on fiber facet to investigate phototaxis in cyanobacteria.

Vertragsdauer: 6-9 months **Eintrittstermin:** by appointment

Persönliche Qualifikation:

- good academic record (marks); curious about various aspects of science;
- enthusiastic to work in a multidisciplinary environment;
- independent thinker and team player;
- in particular: strong interest in Optical Engineering, simulation and optical characterization techniques.

Studienrichtung:

Mechanical/electrical/Informatik engineering

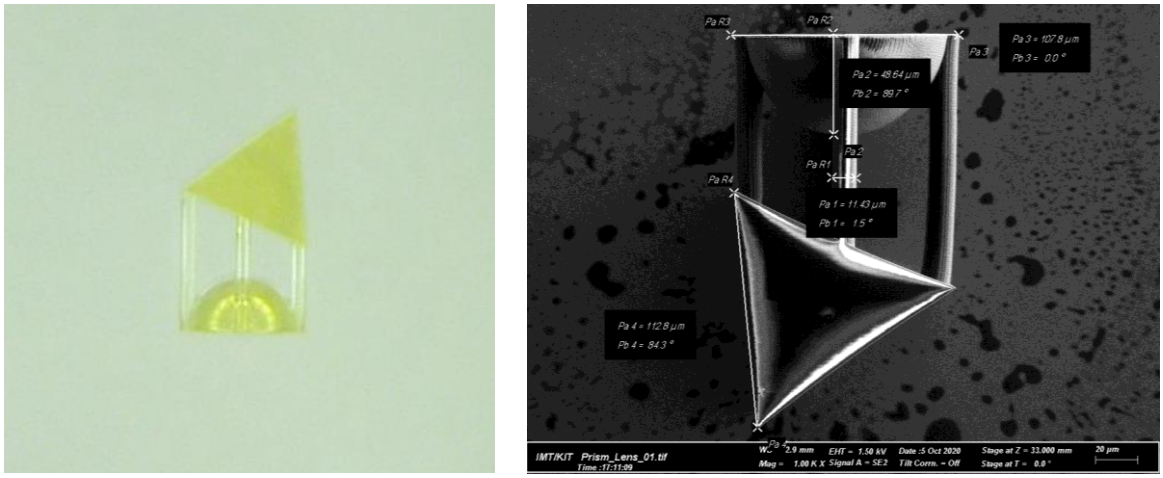
Zusätzliche Veröffentlichung: ☒ Aushang im IMT-Schaukasten am Dekanat der Fakultät für Maschinenbau

Beschreibung der Arbeit:

Cyanobacteria have the ability to migrate in response to light and more interestingly the movement pattern is wavelength dependent. These 3 micron cells act as spherical lenses focusing light to form nanojets and this inactivates their movement appendages causing the cells to move in directed fashion. The goal of this project is to use Fresnel prisms and lens to excite photo-sensitive bacteria and study their motility bias. The nano optical structures will be fabricated using two photon lithography on multi-mode fiber (MMF) facets with 50-micron core diameter.

The specific tasks within the project will be: (i) Optical Design of Fresnel structures; (ii) simulation using zemax and COMSOL; (iii) Building optical setups to characterize the fabricated structures on fiber facets; (iv) Design and fabrication of 3D models.

You will be integrated in a larger team within the SPA-Lab. This is a complete project, offering the possibility to handle embedded system and optics and test the measurement setup, giving you the opportunity to co-author conference and/or journal publications.



<u>Figure 1:</u> a) 100 micron lens-prism structures fabricated using two photon lithography process (Nanoscribe) and b) SEM image of the fabricated structure.