# Laser induced damage thresholds

# of 3D printed functional micro-optics (MSc/BSc/HiWi)

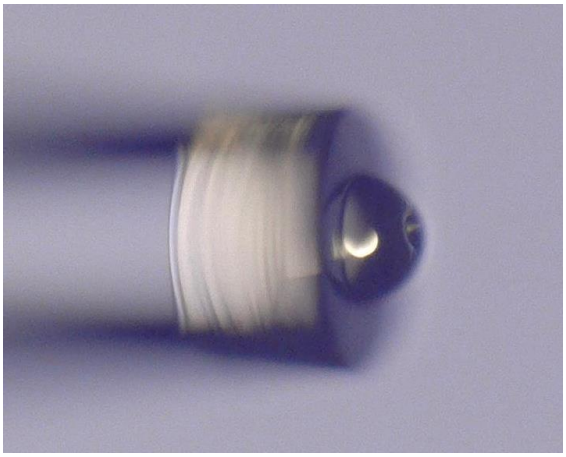
4th Physics Institute

3D printing of micro-optics using two-photon polymerization has been established in the recent years and proven to be a useful tool in many applications, such as fiber optics, optical trapping, coupling elements and general applied optics.

However, it is also possible to use such 3D printed micro-optics for laser applications. The first tests in our group promise wide possibilities of using the 3D printed optics for high-power laser applications and/or with ultra-short pulses.

**Your tasks:**

To prove the usability of 3D-printed optics for laser applications, you need to develop and conduct a series of experiments, measure the key characteristics of polymer materials for printing and study the behavior of the functional micro-optics under high-power laser radiation.



Damaged optics after test

**Required skills:**

- Interest in optics, lasers, and manufacturing
- Interest in the experimental work
- Practical thinking

**You gain:**

- IR setup alignment skills
- Experience with high-power lasers
- Insights in 3D-printing of micro-optics
- Interdisciplinary topic with broad possibilities for your creativity
- Work in a friendly team-oriented group

Contact:
M.Sc. Paul Ruchka (p.ruchka@pi4.uni-stuttgart.de)
Prof. Dr. Harald Giessen (h.giessen@pi4.uni-stuttgart.de)