LASER MICROMACHINING

- Modern workstations with pulsed lasers with:
  - UV to NIR wavelengths
  - µs to fs pulse length
- Different processing strategies implemented.
- Applicable laser machining processes are laser ablation, laser etching, laser-chemical surface modification
- Functionality range: local surface wetting, thin film scribing and surface texturing
- Applications: optics, electronics, and fine mechanics

THE INSTITUTE

The Leibniz Institute of Surface Engineering (IOM) is well known for its competence and excellence in engineering surfaces and thin films by ion beam, electron, laser and plasma techniques. The institute performs application-oriented basic research by aiming for scientific knowledge gain related to the physical and chemical mechanisms in the preparation, synthesis and modification of insulating, metallic, semiconducting and polymeric surfaces and thin films with the goal to transfer the scientific knowledge into high-tech applications.

The laser micromachining technology (LaMa-Tech) group focus on technologies for machining, texturing and scribing of surfaces and thin films for high vertical/lateral precision, low laser-induced damage, high selectivity or 3D topographies.

Leibniz Institute of Surface Engineering (IOM)
Leibniz-Institut für Oberflächenmodifizierung e.V.
Permoserstr. 15 / 04318 Leipzig / Germany

Phone: +49(0)341 235 2308
FAX: +49(0)341 235 2313

www.iom-leipzig.de

CONTACT PERSON

Dr. Klaus Zimmer
Group Leader / Laser Micromachining and Applications

klaus.zimmer@iom-leipzig.de
Phone: +49(0)341 235 3287

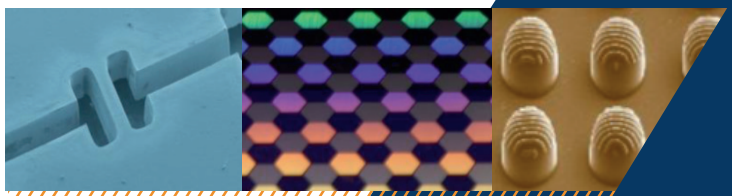
Leibniz Association

Zertifikat seit 2011
audit berufundfamilie

IOM
Leibniz Institute of Surface Engineering

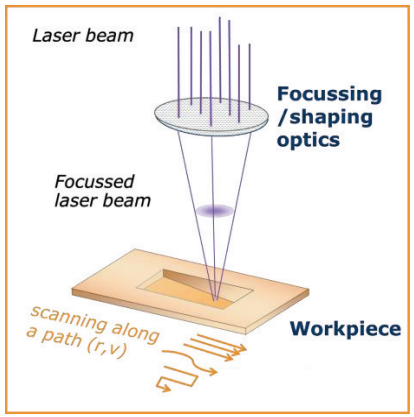
LASER BEAM TECHNOLOGIES

- SPANNING NANO TO MACRO -



TAILORED SURFACES

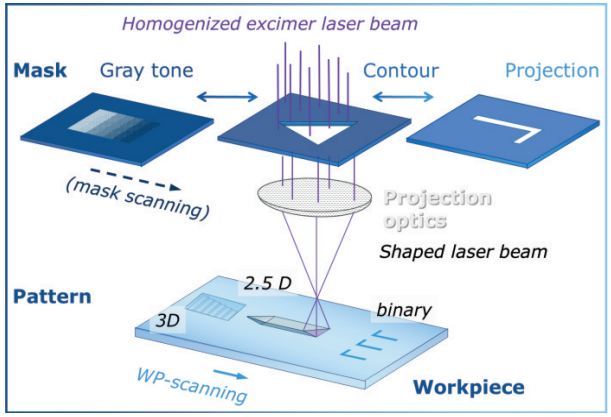
DIRECT WRITING



- UV-ns laser irradiation (λ: 248, 351 nm; tp: 20 ns; max.100Hz)
- Direct machining of pattern from CAD files
- High precision stages for sample handling and mask scanning
- Gray scale and scanning mask technology

➔ **High speed direct writing processes**

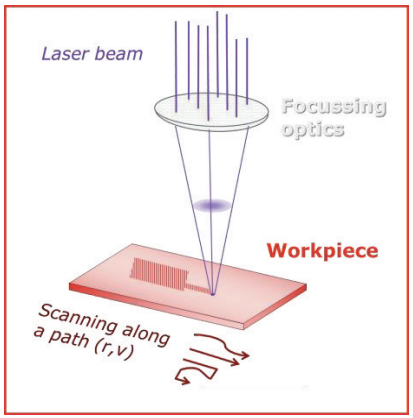
MASK PROJECTION



- Mask projection enables the printing of full size patterns; infinity view capabilities for large masks
- Gray scale and scanning mask technology
- Limited processing flexibility (mask required)
- Enabling high precision, smooth patterning

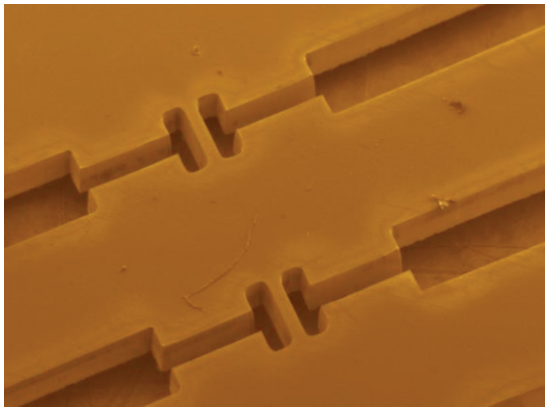
➔ **Full 3D patterning capabilities**

SELF ORGANIZATION

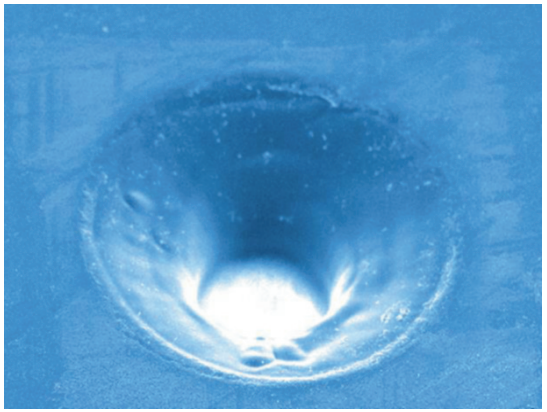


- Laser beam induced self-organization processes for submicron / nano-patterning of surfaces
- Simple and cost efficient method applicable for large areas
- Limited long range order
- Wide range of materials applicable

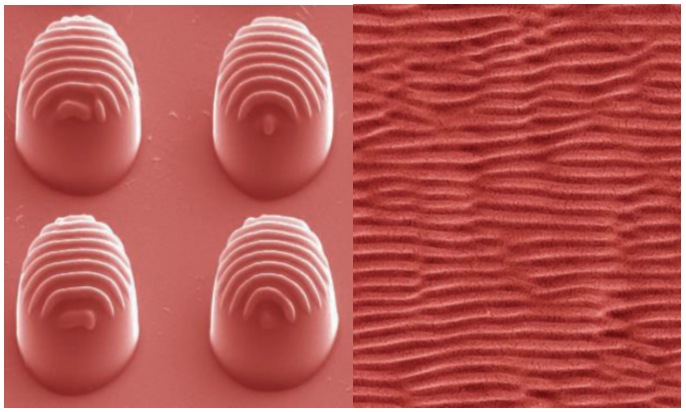
➔ **Sub-wavelength patterning abilities**



Laser – cut polymer foil



3D structure by gray scale mask projection



Self-organized ripples