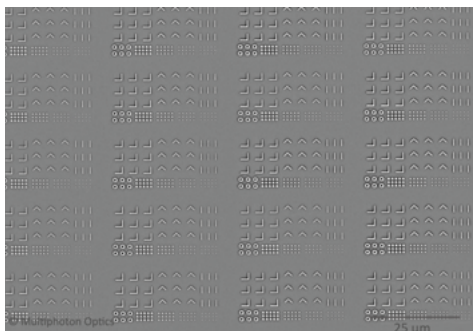
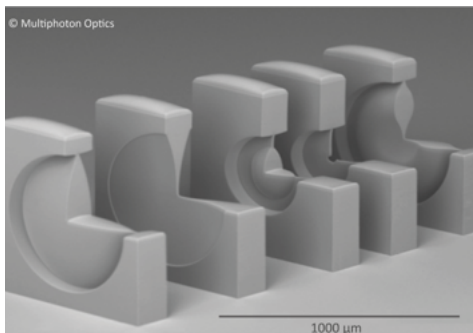
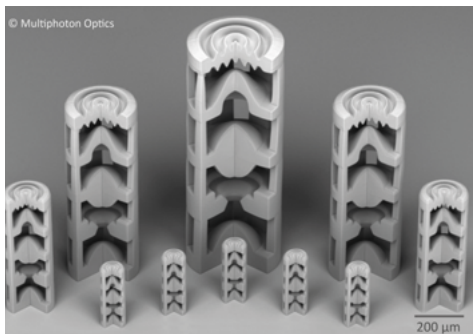
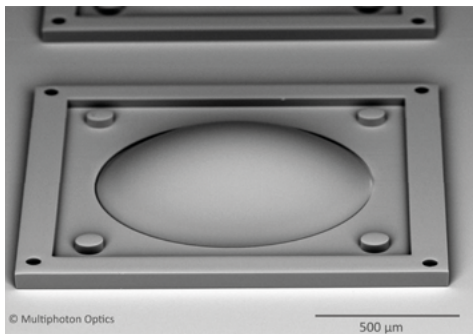


# Microoptics

## High Precision 3D Printing of Optical Elements

Micro — Meso — Macro



## Features

- Additive fabrication of optics in photosensitive and particle-filled photosensitive materials
- Direct printing on any surface (polymers, metals, glass, paper, leather, silicon, ...), on active devices (LEDs, VCSELs, InP, ...), assemblies (pre-configured substrates, PCB, ...) and wafers
- Scaling from sub- $\mu\text{m}$  to several mm in diameter, working precision adaptable within the same structure as needed
- Fabrication without stitching
- Refractive indices from 1.49 to 1.6 (VIS) for unfilled systems, lower and higher for filled systems
- Optical surface quality  $R_a \approx 5 \dots 30 \text{ nm}$
- Transparency > 95 %
- Spherical, aspherical, free-form designs, and arbitrary combinations in modular fabrication strategies
- Horizontal and vertical lens stacks without assembly steps (inherent optical alignment)
- Direct integration of frames and features for alignment and assembly
- Powerful software package LithoSoft3D® with various editors specifically designed for industrial applications

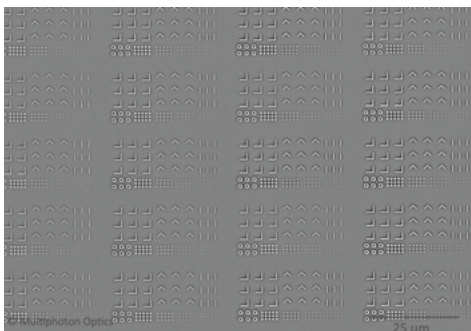
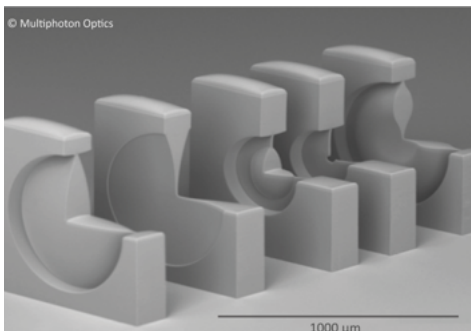
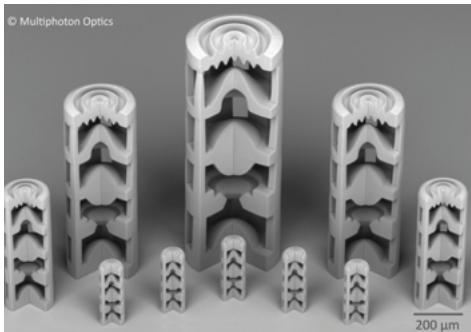
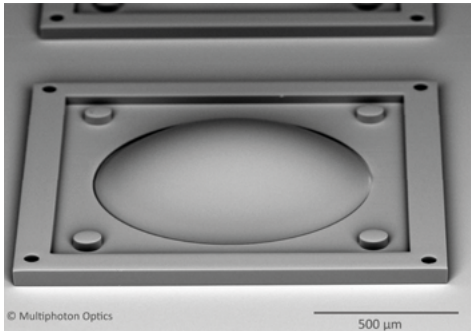
## Benefits

- Rapid prototyping, faster time-to-market
- Faster production speed, higher output volume
- No assembly, lower production cost
- Improved and novel designs

## マイクロ光学

### 光学素子に適した高精度3D印刷

Micro — Meso — Macro



## 特徴

- 感光材、あるいは粒子充填感光材での光学積層造形
- 様々な素材表面への直接描画 (ポリマー、金属、ガラス、紙、革、シリコンなど)、稼働中の機器への描画 (LED、VCSEL, InP など)、組立部品 (設置済み基盤、PCBなど) ウエハへの描画
- 直径sub- $\mu\text{m}$  ~数ミリのサイズ、同じ構造内で精度の調整も可能
- ステッチ跡のない複製が可能
- 非充填システムでの屈折率1.49~1.6 (VIS)
- 光学表面粗さ  $R_a \approx 5 \dots 30 \text{ nm}$
- 透過性 > 95%
- 球体、非球体、自由なデザイン性、パーツの製造工程にこだわらない製作が可能
- 組立工程のいらぬ縦横積層レンズの製作 (個別光学アライメント)
- フレームと一体化した構造と、アライメントと製造工程の一貫化
- 製造工程に必要な様々な編集機能をもつ、強力な業務用ソフトウェア LithoSoft3D®

## 利点

- 迅速な試作品製作。製品化への第一歩をいち早く。
- 生産時間の短縮、生産量の増幅
- 組立工程の省略による生産コストの削減
- 革新的な設計性