



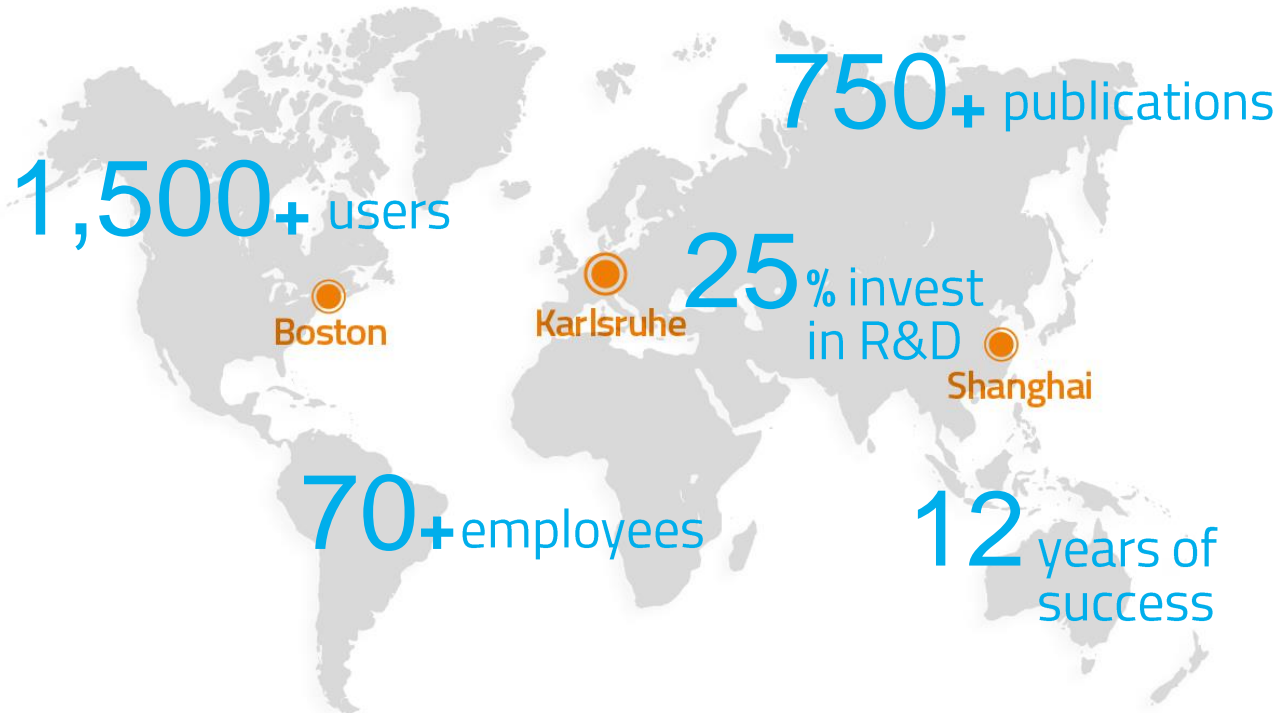
3D Microfabrication by Two-Photon Polymerization as Key Enabling Technology

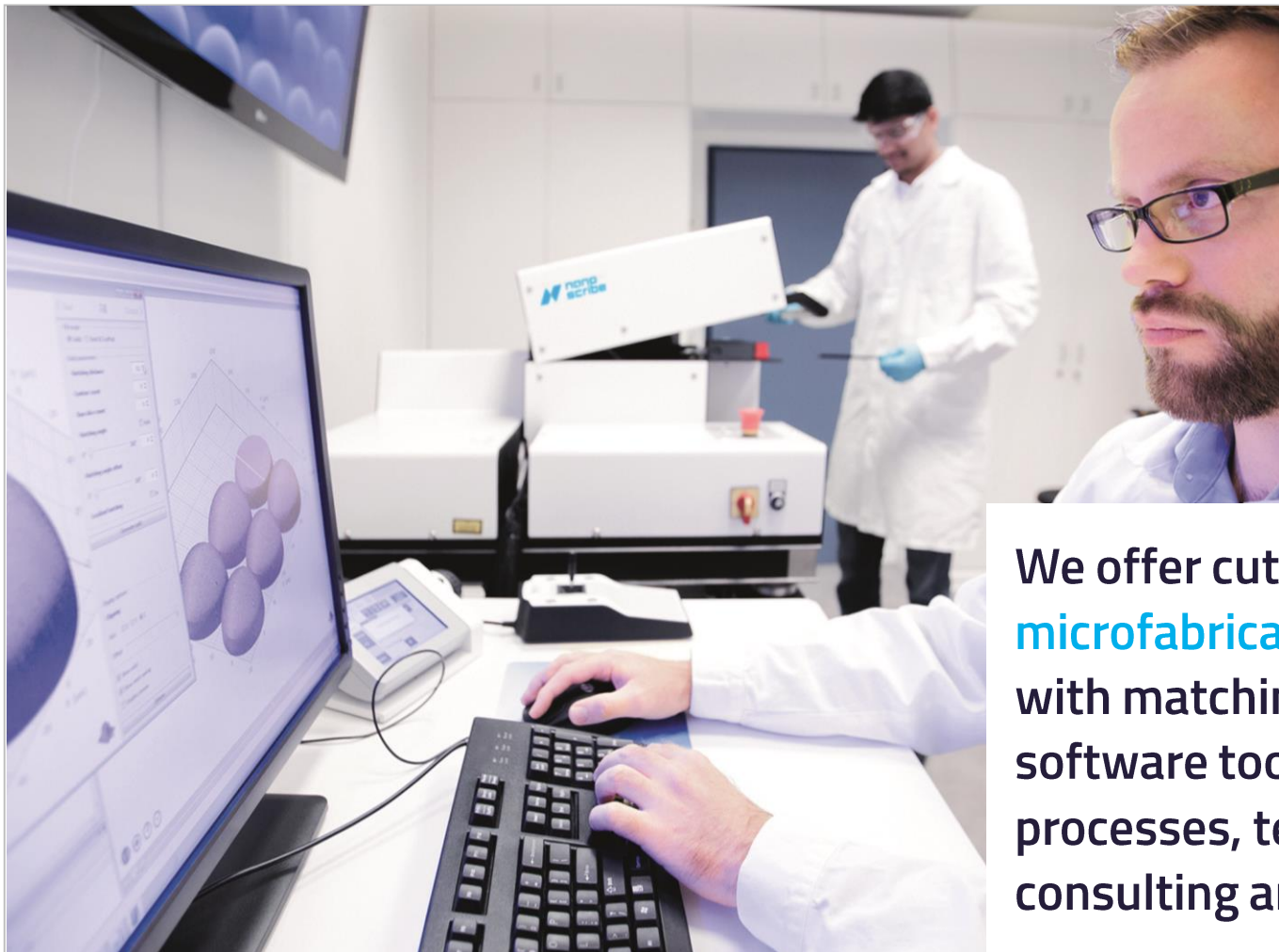
Henrik Akesson, Executive Sales Manager

EPIC Online Technology Meeting on Micro-optics Manufacturing

April 22nd, 2020

Nanoscribe worldwide in figures





We offer cutting-edge **microfabrication systems** with matching resins, software tools, optimized processes, technical consulting and services.

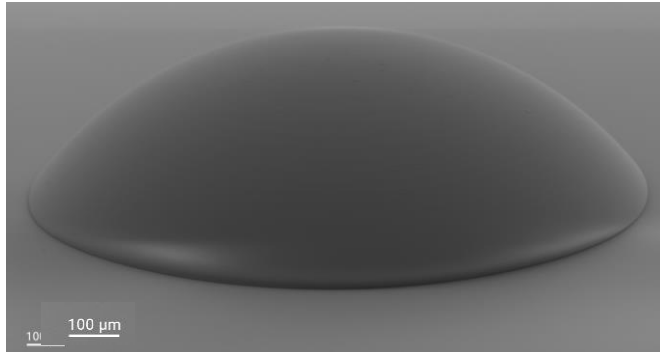
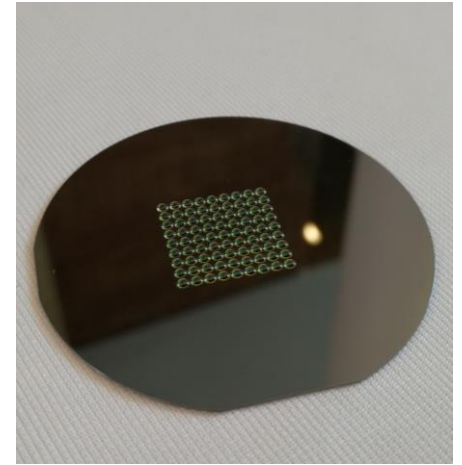
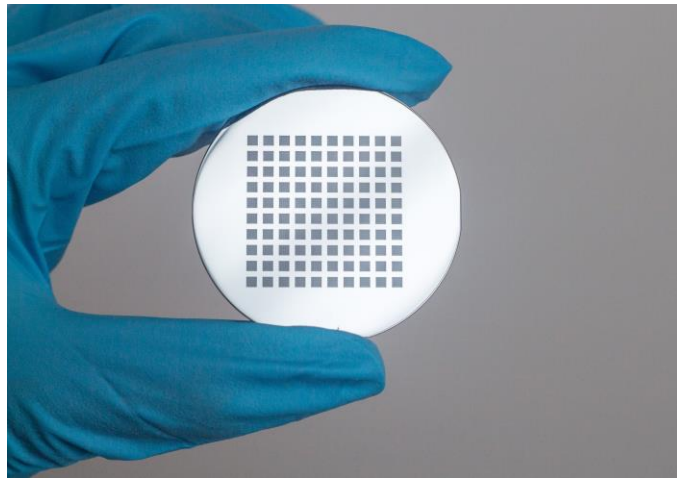
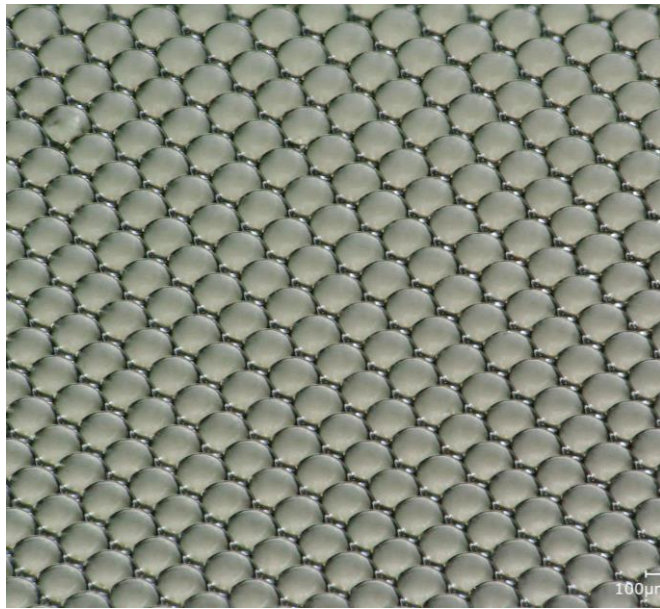
Direct printing of microoptics

- ▶ Lens shapes with smooth surfaces in optical quality
- ▶ Refractive lenses with diffractive elements
- ▶ Spherical, aspherical and even freeform microoptics
- ▶ Prototyping of single elements or arrays
- ▶ Surface roughness better than 10 nm R_a
- ▶ Prototyping of smartphone lens assemblies in days, compared to the standard two months.



200 μm





Mastering for mass production.

- ▶ Polymer master instead of tool steel
- ▶ Concave for Nano Imprint Lithography.
- ▶ Convex for Injection Molding
- ▶ Surface roughness better than 10 nm R_a

New platform for industrial microfabrication: Nanoscribe Quantum X



Market trends for the coming 2 years

- ▶ TOF-LIDAR and other non-image sensors in Smartphones
- ▶ Refractive lenses with diffractive elements
- ▶ Non-rotational symmetric, aspherical and freeform microoptics
- ▶ DOE with 256 levels, 200nm pixel and 10-30um high
- ▶ 2" x 2" MLA and another NIL comeback



In January 2020 we moved our headquarters to the brand-new **ZEISS Innovation Hub @ KIT** with modern facilities and $>4,200 \text{ m}^2$ of space to take microfabrication to the next level.