Spectrum of applications of world's highest resolution micro 3D printer: from research to industry

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Abstract:

The achievements of the two-photon polymeri-zation based world's highest resolution micro 3D printer "Photonic Professional GT" will be presented. The device offers a defined control on the feature sizes and resolutions ranging from nanometer to micrometer scale and acces-sible print area of ~ cm^2. This versatility has opened new frontiers in the field of photonics, optics, plasmonics, microfluidics, life sciences, bio-medical, microrobotics and many others. All this is made possible by the advancements in the software and hardware design of the printer as well as high level of materials research that enables the realization of ideas only with few mouse clicks.

The talk will focus on customer's applications in various fields. Prominent examples include photonic particle-accelerator [1], plasmonic color display [2], plasmonic nanoantenna [3], microoptics/micro-lenses, metamaterial absorbers [4], photonic wire bonding [5] etc.

All these excellent achievements were possible only because of a precise control on the geometry and surface of the printed objects at sub-micron level. The decade of trusted use of this technology has found its way to several industrial applications as well. This presentation will therefore, cover the latest advances utilizing this art of 3D microprinting that has made small things matter across the globe.

References

[1] DOI: 10.1364/OE.20.005607
[2] DOI: 10.1038/ncomms8337
[3] DOI: 10.1021/acsphotonics.5b00141
[4] DOI: 10.1002/adma.201300223
[5] DOI: 10.1109/JLT.2014.2373051

Figures

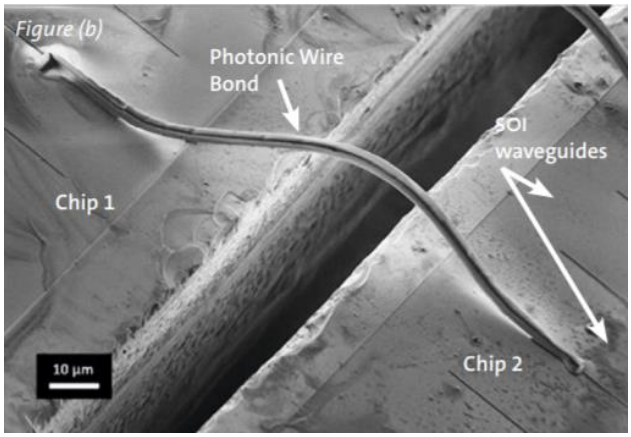

Figure 1: Photonic wire bonding: a novel concept for chip-scale interconnects. [5]

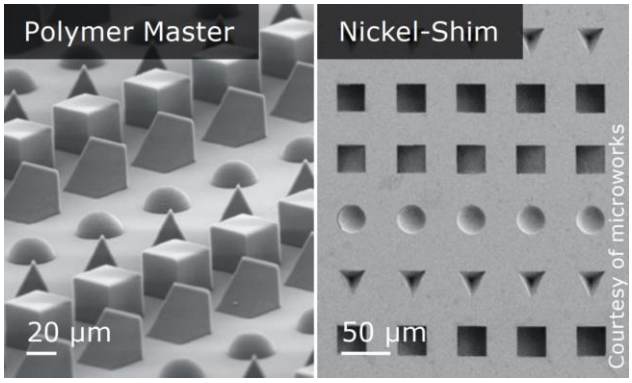

Figure 2: Example of mass replication via Ni-shim

Figure 3: Plasmonic color display [2]