Novel micro-3D printed photonic devices via two-photon lithography

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Micro-3D printing utilizing two-photon lithography (TPL) is an enabling technology for developing novel miniaturized optical systems [1]. It offers unprecedented design freedom, flexibility, and high resolution, making it possible to fabricate complex miniaturized optical systems with unmatched accuracy.
Remarkably, this fabrication technique uniquely allows for the direct *in-situ* manufacturing of miniaturized hybrid optical systems. These systems are produced in a single step and incorporate various types of photonic components, including micro-lenses, micro-reflectors, phase retarders, and waveguides with photonic crystal fiber (PCF) designs. The seamless integration of these components within compact systems highlights the versatility and potential of micro-3D printing in advancing optical technologies.
This presentation shows the use of TPL to develop novel complex micro-photonic devices for a range of applications, including fiber-based structured beams, polarization control, micro-endoscopy, and optical tweezers.

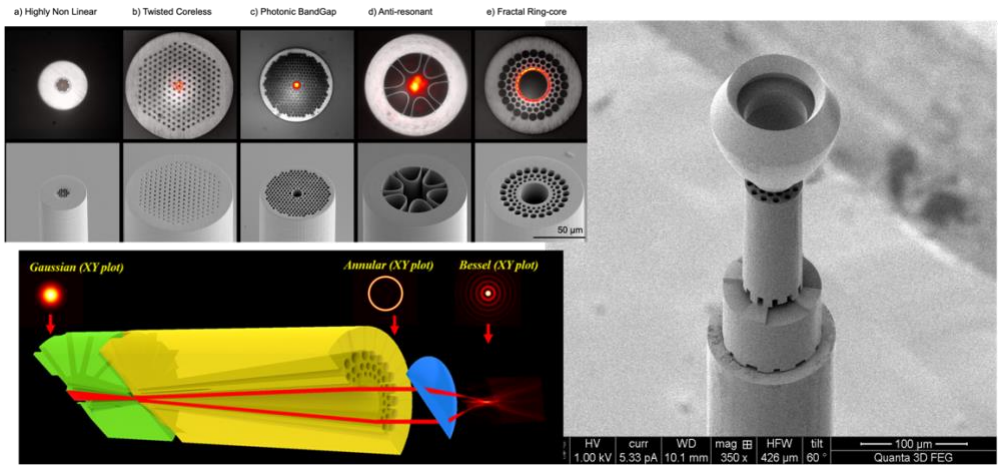

Figure: Micro-3D printed fiber structures, including PCF waveguides, vortex Bessel beam generators, and fiber optical tweezers

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