

## **Femtosecond laser-based 3D micro- and nanomanufacturing**

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A high-speed (up to cm/s translation velocity) high-precision (tens of nm) manufacturing of functional 3D microstructures using hybrid additive-subtractive femtosecond laser fabrication is presented. We unveil the potential of this approach by creating example structures such as micromechanical structures [Fig. 1], microlenses, photonic devices and similar. Objects created out of multiple materials, including functionalized polymers, and/or combining several different additive-subtractive fabrication methods are shown. Ways to increase structuring throughput sufficiently to push hybrid femtosecond laser processing from scientific laboratories to wide spread solutions are also discussed, their effectiveness assessed. Overall, it is shown that hybrid laser 3D manufacturing is a powerful tool for advanced medical structure fabrication with far-reaching implications in the field.