Near infrared femtosecond-laser material interactions such as two-photon photochemical reactions, multiphoton ionization, and plasma formation provide the possibility to perform 3D nanoprocessing in a variety of organic and non-organic materials. Sub-100 nm structures that are 10x smaller than the laser wavelength and therefore far below Abbes diffraction limit can be generated on the surface and inside the bulk. Compared to conventional UV lithography, multiphoton technology enables the production of 3D nanofeatures simpler, less expensive, and even inside transparent bulk material. Rapid prototyping and low power nanosurgery are two examples of this novel nonlinear nanotechnology tool.

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