



nanomaterials



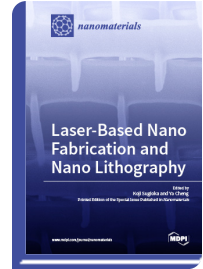
Special Issue Reprint

Laser-Based Nano Fabrication and Nano Lithography

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The improvement of fabrication resolutions is an eternal challenge for miniaturizing and enhancing the integration degrees of devices. Laser processing is one of the most widely used techniques in manufacturing due to its high flexibility, high speed, and environmental friendliness. The fabrication resolution of laser processing is, however, limited by the diffraction limit. Recently, much effort has been made to overcome the diffraction limit in nano fabrication. Specifically, combinations of multiphoton absorption by ultrafast lasers and the threshold effect associated with a Gaussian beam profile provide fabrication resolutions far beyond the diffraction limit. The use of the optical near-field achieves nano ablation with feature sizes below 100 nm. Multiple pulse irradiation from the linearly polarized ultrafast laser produces periodic nanostructures with a spatial period much smaller than the wavelength. Unlimited diffraction resolutions can also be achieved with shaped laser beams. In the meanwhile, lasers are also widely used for the synthesis of nano materials including fullerenes and nano particles. In view of the rapid advancement of this field in recent years, this Special Issue aims to introduce the state-of-the-art in nano fabrication and nano lithography, based on laser technologies, by leading groups in the field.



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