

All the Places Nanoimprinting Can Go: Patterning Carbons, Ceramics and Metals for Advanced Devices

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Nanoimprint Lithography (NIL) is a cost-effective, large-area, high-throughput patterning technique with nm-scale resolution that is typically associated with polymer materials. Recently, we have extended NIL for the full-wafer production of high-efficiency, all-inorganic metalenses and waveguides using nanoparticle dispersion inks as well as for the fabrication of patterned ceramics, metal log piles, plasmonic structures and porous carbons. Often times NIL patterning is combined with rapid photothermal processing of appropriate precursors to achieve the desired functional materials. This talk will introduce these approaches and their applications in advanced optics, energy storage, mechanical metamaterials and durable, structured surfaces.