Using Laser-induced Forward Transfer (LIFT) for Additive Manufacturing

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Additive manufacturing or AM promises the fabrication of 3D objects of complex shape and tailored functionality by adding materials in a layer-by-layer fashion. These technologies encompass a wide range of processes involving complex materials science phenomena and represent a truly new model for bottom up manufacturing. The application of lasers in AM has been very successful and offers many opportunities not only in 3D fabrication but also for printing functional structures. This talk will describe various AM processes in use at NRL and the application of laser-induced forward transfer (LIFT) for laser printing of electronics. With LIFT, a wide range of materials from silver nano-inks to entire devices, such as semiconductor chips, can be printed to fabricate a wide range of patterns, devices and even functional circuits. LIFT techniques are being investigated at NRL to print 3D structures that function as interconnects for hybrid electronics. Examples of these laser printed hybrid circuits and their role in the development of next generation electronics by additive manufacturing will be presented.

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