

NanoFrazor Lithography for advanced 2D&3D nanodevices

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The NanoFrazor uses thermal scanning probe lithography (t-SPL) for the simultaneous patterning and inspection of nanoscale structures, as well as direct laser sublimation (DLS) for mix & match lithography on a surface, namely on thermal resists. The NanoFrazor technology has proven its value as an enabler of novel ultra-high resolution nanodevices, as well as an asset for improving the performance of existing device concepts. In doing so, the NanoFrazor is establishing itself as a mature direct-write nanolithography tool, as well as a complementary extension to other mask-less nanolithography methods such as electron beam lithography (EBL). The range of applications for t-SPL is very broad, spanning from ultra-high resolution 2D and 3D patterning to chemical and physical modification of matter at the nanoscale. Nanometer-precise markerless overlay and the non-invasive patterning of sensitive materials are among the key strengths of this technology. The overlay is shown to work with sub-5nm precision even for nanowires and 2D material flakes that are buried under resist layers, thanks to the highly sensitive in-situ reading capability of the NanoFrazor tool. These unique capabilities allow for the realization of novel nanodevices with emerging 1D and 2D materials and for nanometer-precise 3D (grayscale) surfaces in nanophotonics. This talk will explain the working principle of NanoFrazor lithography, and highlight a few application examples in the fields of nanoelectronics and nanophotonics.