

Direct Printing of 2-D and 3-D Crystalline Metal Oxide Device Layers

Crystalline metal oxide films patterned at the nanoscale are essential for optical and electronic devices, but their manufacturing over large areas at acceptable cost is a significant challenge. The CHM has developed a low cost method for direct printing of 2-D crystalline metal oxide films using a variant of nanoimprint lithography. Subsequent stacking of device layers can yield 3-D nanostructures. Applications include transistors and 3-D optical band gap structures. The latter are being developed in collaboration with Phillips Electronics. The images below show ITO nanostructures (left and middle) produced by direct printing and titania nanostructures produced by printing and stacking (right). No etching is required.

