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Nanoscale Pattern Generation Using Laser Interference Lithography[1] TOM ODER, ANDREW SMITH, JOSHUA PETRUS, Youngstown State University — Nanotechnology, which encompasses research and development of devices at the atomic, molecular or macromolecular level in the length scale of 1-100 nanometers, has recently sparked a huge interest due to the exciting and novel potentials envisaged. At the nanometer regime, fascinating changes in the properties and functionalities of materials occur. Effective methods to fabricate these structures and to carefully and systematically study their properties in order to harness them into practical devices are required. We present here our investigation of laser interference lithography to fabricate nanometer size device patterns. The technique is a relatively simple way of fabricating nanometer structures. A 325 nm He-Cd laser source was used to expose thin photoresist coated on polymers and silicon substrates. Scanning electron microscopy and atomic force microscopy were used to characterize the resulting patterns. Waveguide patterns with widths as small as 120 nm, and 300 nm square array patterns were fabricated. We will discuss the possibilities this work opens in fabricating three dimensional photonic crystals on layered polymeric systems.

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Tom Oder
Youngstown State University

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