

Abstract Submitted  
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**Talbot nano-patterning with a table-top soft X-ray laser**<sup>1</sup> LUKASZ URBANSKI, PRZEMYSŁAW WACHULAK, Colorado State University, ARTAK ISOYAN, FAN JIAN, YANG-CHUN CHENG, University of Wisconsin, JORGE ROCCA, CARMEN MENONI, Colorado State University, FRANCO CERRINA, University of Wisconsin, MARIO MARCONI, Colorado State University, COLORADO STATE UNIVERSITY COLLABORATION, UNIVERSITY OF WISCONSIN COLLABORATION — We demonstrate a novel high resolution soft X-ray (SXR) patterning approach based on the generalization of the Talbot effect. This effect was used to print periodic structures of arbitrary patterns with nanometer resolution over a large area. The coherent illumination of a tiled mask produced self images of arbitrary motifs allowing for a non-contact replication technique that opens a new avenue for nanofabrication. Compact soft X-ray laser sources recently developed enable this new nanopatterning technique demonstrated with a table-top SXR laser at  $\lambda = 46.9$  nm. Shorter wavelength SXR lasers emitting in the 13 nm region would allow printing of millimeter square areas with sub-10 nm resolution.

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