A36

EUV and soft x-ray transmission microscope

R. N. Watts, T. B. Lucatorto, and S. T. Liang
National Institute of Standards and Technology, Physics Building (221), Room A253, Gaithersburg, MD 20899

F. Polack
IOTA/LURE, BAt 503, BP 147, 91403, Orsay, Cedex, France

M. R. Scheinfein
Dept. of Physics & Astronomy, Arizona State University, Tempe, AZ 85287

We present preliminary performance results for a new type of imaging microscope operating in the EUV and soft x-ray regions. This microscope is a true transmission microscope in which an unmagnified image of the sample is formed by differential absorption of the x-ray beam as it passes through the sample. The unmagnified photon image is converted into low energy secondary electrons at a thin CsI photocathode and the subsequent electron pattern is magnified and imaged using a simple 3-lens system. Conversion of the magnified electron pattern into visible photons occurs at a fine grain phosphor viewed by a CCD detector/computer combination that allows parallel detection of the original photon image in near real time with approximately 1000X magnification. The microscope has a theoretical resolution of 20 nm and a potentially wide range of uses including biology, materials science studies, and investigations into magnetic dichroism effects. The design and preliminary imaging results of the microscope will be presented and future directions discussed.