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Lithography from the "Ground Up"

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Poster Presentation P28

LITHOGRAPHY FROM THE "GROUND UP"

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Micro-fabrication techniques are used to construct miniaturized circuitry, diffractive optical elements, and 3-D micro-mechanical systems, which find application in a wide range of scientific and engineering projects. We have begun the work of setting up a laboratory for micro-lithographic preparations, which has included establishing a low-level clean room environment. We will use a variety of photo-lithographic and electron-beam lithographic techniques to machine various mechanical or electrical systems. Already, we have begun work with a computer interface (put in place by Brian Simonds, IWU Class of 2005, working with engineers from the Japanese Electro-Optics Corporation) that is designed to take over control the Illinois Wesleyan electron microscope, allowing us to steer the electron beam so as to draw desired patterns/circuits. We are currently establishing/calibrating basic protocols for the associated chemical processing that is required, and so our first samples consist of low-resolution micro-fluidic channels and test patterns aimed at refining our resolution limits. Our goal is to create a laboratory for instruction and student research, not only for micro-machine fabrication, but also for basic materials preparation and processing. And we hope to gain the knowledge that comes with the reality of lab work and the union of several disciplines, computer science, chemistry, and material physics.