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## *Planar Cameras: Experiments with Flat Optics*

It has been shown that by using a diffraction grating on the surface of a waveguide, one can make a large aperture and thus high resolution optical imaging system while effectively eliminating the distance required behind the aperture that is present in conventional imaging systems. The foundational concept which makes this approach useful is the property of the waveguide only letting certain angles of light to persist, creating a discrete optical signal which can be processed with small aperture optics; this allows for a thin, high resolution optical imaging system. Using interference lithography, a gallium nitride laser is used to expose photoresist, a light sensitive material, in a sinusoidal pattern which is developed on a waveguide material. This project will result in the fabrication of a functional diffraction grating. If this technology becomes practical, it could lead to cameras the thickness of poster-board or high resolution cameras on cell phones.



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