



# LIQUID CRYSTAL MATERIALS RESEARCH CENTER

## *PHYSICS DEPARTMENT COLLOQUIUM*

### Diffraction Liquid Crystal Lenses for Vision Correction

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#### Abstract

Many people have difficulty in focusing close objects onto the retina because of a decrease in accommodation with age, a condition called presbyopia. Conventional bifocal or trifocal lenses for this correction have been around for about 200 years, but they have limited field of view. An electro-optic lens allows voltage controlled change of the focusing power across the entire aperture. Such a lens must have high light efficiency, relatively large aperture, fast switching time, low driving voltage, and power-failure-safe configuration. These requirements have not been met simultaneously in the past. New switchable, flat, thin liquid crystal diffractive lenses that satisfy the above requirements will be discussed. The effects of the gaps between the ring electrodes and the fringing field on the lens performance have been analyzed. Design, fabrication, and characterization of three lenses will be presented. They provide the capability of corrections for near-, intermediate-, and distance-vision. Such a lens will have big potential impact on the field of vision care.

**Wednesday April 25, 4:00pm**  
**Duane Physics G1B20**

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