Fourier Optics - Lab Outline **Adam Schonewille - 31590136**
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Week 1	**Work Accomplished in Lab**	**Work Accomplished at Home**
Aligning Optical Setup	Alignment of the spatial filters and the lens is critical to collecting good data. Thus we want to make sure we know the exact alignment of all optical apparatus before making any measurements	Think through best practices for alignment, take stock of important apparatus for getting good images.
Mesh Filtering Experiment	Insert wire mesh aperture and translate off-axis to check that its image is correctly focussed on the screen. Measure magnification in comparison to the wire mesh dimensions. Next place the white screen on the transform plane and view what happens when the wire aperture is moved in the object plane.	Compare the magnification with the thin lens formula (Equation 1.1).
Week 2		
Character Recognition	Place NOZON at object point. Place rotatable spatial filter in transform plane. Align to only transmit N's. Optimized the FT pattern hitting the back side of the filter and adjusting the filter position to make the pattern as sharp as possible. Take a picture. No work need outside of lab for this one.	
Dark Field Image	Generate dark field image by blocking the central spot in transform. Shows dark spots as brighter	Develop a comparison between the dark field and a phase-contrast
Phase Contrast	Set up a phase contrast imaging system. Place the transform lens on rail, and place a transparent phase gratin.Ensure that the image is properly in focus. Insert the vertical razor blade with a wedge of clear plastic. Adjust until the wedge covers just the central diffraction spot. Measure the grating spacing in the image. No work need outside of lab for this one.	
Week 3		
Diffraction	Look at the diffraction pattern for a very small slit width and a very large slit width. Describe and explain the pattern seen at these two different slit widths. Take pictures of each. Repeat with 3 other slit sizes.	Plot the theoretical Fraunhofer and Fresnel patterns and compare to data.
Continue any Incomplete Lab Tasks		Answer final lab questions. Write-up lab report.

What part of the lab will take the longest to complete?
Optical alignment for the initial setup. This setup is sensitive to perturbations and ill-alignment.

What part of the lab take the least amount of time to complete?
Creating a dark-field image.This primarily involves changing an aperture on a system that is already setup and qualitatively measuring the results. If we have aligned the system well than this should not take very long.