

Caleb Cook

Final Analysis

Wednesday Lab

One thing that I struggled with in this lab was definitely the nodal slide, but more specifically finding the nodal points. I can wrap my head around the concept of the nodal slide, but putting it into practice and having to look for when the object does not rotate with the slide is for some reason really hard for me, maybe I don't have the patience required for that type of activity. I am glad, however, that I do understand what exactly we are doing because for one of the labs where we had to calculate the  $d'$  value before the lab, we were able to use that value to get a rough estimate as to where the nodal point was because it is colocated with the principle plane, so using the value of  $d'$  and the edge of the lens we were able to find it relatively easy. The harder labs were the ones where you weren't sure where the nodal point was so you just had to do a lot of trial and error, and I will be honest I went fast through these and went over the nodal points so many times and had to go back and forth a ton, patience is definitely key with the nodal slide. I did find them really fun to do when you finally did find the nodal points, it was really interesting seeing the whole scene behind the object move while the object itself remained still, it really helped my understanding with nodal points and the relative locations of the principal planes of an optical system.

Another thing that I struggled with is part of gaussian reduction and ray tracing mirrors. It is where you have a telescope problem, where the primary mirror is on the right and the secondary mirror is on the left, so the light goes left to right then right to left then back to left to right, and the part I struggled with on the exam/ the homework was getting the indices of

refraction correct. I now know that whatever the initial direction of light is, whether it is right to left or left to right is always the positive index, and then when it switches directions is also when it switches sign of index, and then when it switches direction again it goes back to positive. This confused me on the test and I wish I did a practice problem like the one on the test so that I could have a better understanding of it, but now I know. Another confusing part of these problems is whether the image was real or virtual after the first reflection, I initially thought of it as is it real or virtual with respect to the first mirror, where it doesn't matter that there is a second mirror there, so I thought it was a real image, but the second mirror actually does have an effect on this answer because the image is formed behind the second mirror which is virtual image space of the second mirror but real image space of the first mirror, which is still a little confusing but I think I can figure that out on a test.

One last thing that I still don't understand completely is some of the little specific concepts that we have learned throughout the semester. One that comes to mind is how in the powerpoint slides the author talks about infinity, and how there is no positive or negative infinity, but I find it a lot easier to think about it as if there is a negative and positive infinity when showing light coming from one direction or another. Another thing, a little bigger, is the last thing we learned in class about stops and pupils, mainly pupils because they aren't physical objects but they can be in real object space. That still hasn't completely clicked with me, thinking about binoculars and if you have them farther away from your eyes and you can see the ring of light, but you can't touch it, I'm not sure, it is still a bit confusing to me on how to measure it and think about it. It is definitely something I still need to review for the Final. I have stopped down, and good thing they are closely related with the pupils once you scale the YNU

raytrace table. I need to review that problem a few more times to be able to do it correctly on the test.