Update 6/18

Hi Dr. Horn,

I wanted to send you some of the possible index of refraction set up equipment that I found on the thorlabs website, as well as some possible software options that I saw yesterday. Sorry this is so long.

Rotating Stage: (Would be helpful for taking measurements at given angles and not having to move the aerogel)
This is a stage that may be rotated freely by hand and then locked for more precise rotation: https://www.thorlabs.com/newgrouppage9.cfm?objectgroup_id=2464 It has a vernier scale on the side for measuring angle up to 2.4 arcmin (.04 degrees). I would proabably also want one of the clamping arms or maybe some different kind of pegs from the website to hold the aerogel in position.
This is another rotating stage that would allow for less precision but might also be helpful if the precise stage is too expensive: https://www.thorlabs.com/newgrouppage9.cfm?objectgroup_ID=992&pn=RP01 I could probably make do with the Ø1.4" Manual Rotation Stage.
Either of these stages would be a bit small. The solid adapter plate from the first link might help make the stage bigger, or else I could just attach some other material from a hardware store (plastic or wood or something) to make a larger platform on top of the stage.
They sell a larger rotating stage which might work, but I don't think it is worth the extra cost because of a loss in precision.
The table circle you gave me might work. The problem is that it is not quite horizontal and also a bit wobbly. This would mess up the measurements of the distances inside the prism (when taking a picture from above) and the measurement of the distance from the prism to the target. I'm going to add some washers to the pin to see if that stabilizes it a bit. I also want to draw some reference lines so that I could reposition the prism at a given angle without having to move it around.

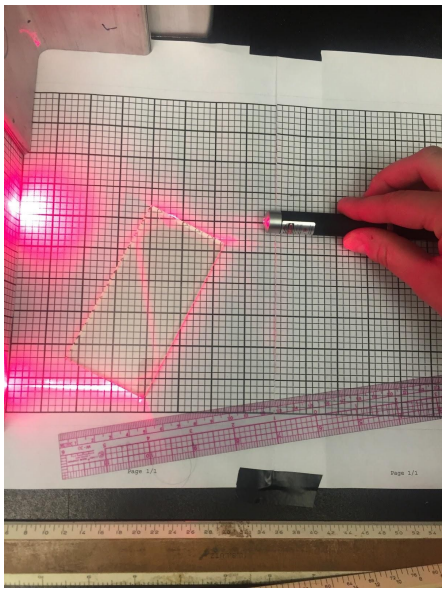
Mounting Surface: (Would be helpful for ensuring the laser, camera, prism and target all maintain the same angles and distances with respect to each other)
This is a surface to mount the rotation stage and other equipment on: https://www.thorlabs.com/newgrouppage9.cfm?objectgroup_ID=6327. I could also probably mount it on plywood instead.
This is an extra clamp to hold things down. It would be useful to have a couple of these if I ended up getting the thorlabs breadboard: https://www.thorlabs.com/newgrouppage9.cfm?objectgroup_id=6325

Laser Stand/Holder:
These would be to hold the laser in the right position at the right height: https://www.thorlabs.com/newgrouppage9.cfm?objectgroup_ID=6322,

https://www.thorlabs.com/newgrouppage9.cfm?objectgroup_ID=6322,
https://www.thorlabs.com/newgrouppage9.cfm?objectgroup_ID=6323,
https://www.thorlabs.com/newgrouppage9.cfm?objectgroup_ID=11827,
https://www.thorlabs.com/newgrouppage9.cfm?objectgroup_ID=219. I didn't see just a fixed mount for cylindrical components.
I found an adjustable platform in the office that I might be able to attach the laser to instead. I'm planning to go to the hardware store sometime later this week.

Alignment:
I am going to try to find options for how to make sure the laser is set up exactly perpendicularly to the stage, but would appreciate any suggestions for techniques you might have. I was thinking maybe something like these might help, or I could use the larger one as the target for the aerogel measurement:
https://www.thorlabs.com/newgrouppage9.cfm?objectgroup_id=7298. I found a laser in the lab that appears to be for alignment and I'm hoping to figure out how to use that.

Camera:
I also was wondering if you had a camera around the lab that I could use to take pictures of the refraction with. I don't think my phone camera will work very well because it catches the laser's reflections as well as the beam itself:



There are a few small cameras that can be mounted on cages and whatnot sold on the thor labs, but they are over $1,000, which I am guessing is out of the budget for this.

Camera Mount:
I would probably want to build a cage on top of the rotating platform for the plastic scintillator and above the target and rotating table for the aerogel. I could either find stuff for that on thorlabs or just make a stand out of wood from the hardware store.

Laser:
Here are some possibilities for a new laser, but it looks like we would have to buy several other pieces to get these to work:
https://www.thorlabs.com/newgrouppage9.cfm?objectgroup_id=1487 CPS450 or CPS635R
They sell equipment for mounting their lasers on a stand, so I wouldn't have to figure out how to mount the laser. These only lower the size of the beam by a couple of mm. There are other more expensive options for lasers on thorlabs, but I'm going to see if I can find a more precise laser pointer somewhere else, as that might be simpler.

Image Analysis Software:
The link to the software you sent (digimizer) doesn't appear to be free, although it looks like it would work well for what I want to do. (https://www.digimizer.com).
I found a free image analysis software called imagej that might work (https://imagej.nih.gov/ij/). I think I may have seen someone here use it before, but I might be wrong. It looks like it would be complicated to learn how to use, because it is a simple javascript program that you can add plugins too, and I am not familiar with javascript. There is a bundled version of it (also free) called fiji that is supposed to have several plugins that make it simpler to learn (fiji.sc). I'm going to try to look further into it to make sure that it is a good option.
I also found out that adobe photoshop allows you to measure distances within photos. I don't think it would be a good option because it looks like I would have to manually select the distances in the images anyway, which would be tedious and allow for error. I'm guessing that the imagej software has a way to set up a measurement to repeat on several images, although it might be hard to figure out how to do that.
The software you sent has a feature to automatically repeat a task and also lets you perform simple analysis of data and export data. The MedCalc program that is linked to Digimizer allows you to analyze data in more detail, although I could look into other programs for this also, as it is also not free.
Anyway, I'll keep looking to see if there are other options.

Let me know what you think. I am planning to work in the office tomorrow since Mireille is letting me use her computer, so I'll look through the lab next door to see if there are any stages or laser pointers or anything that seems like it could be helpful.

Thanks,
Helen