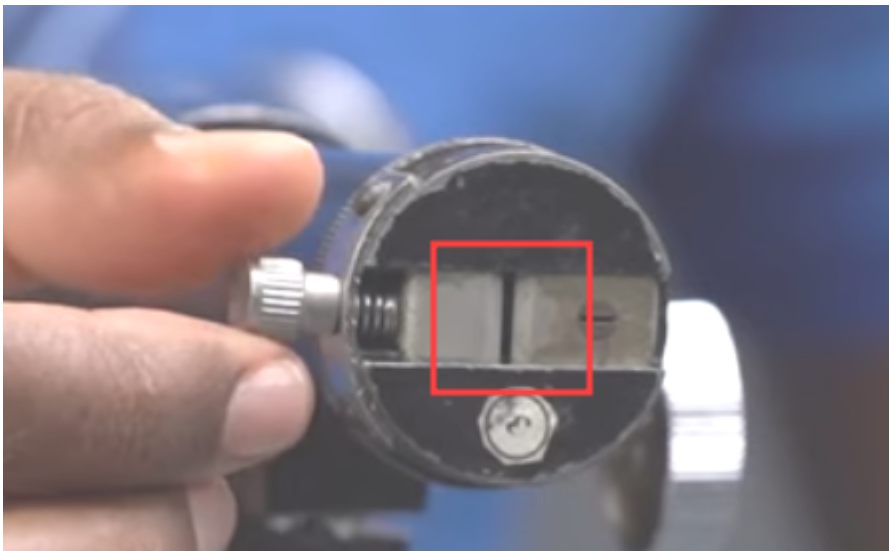
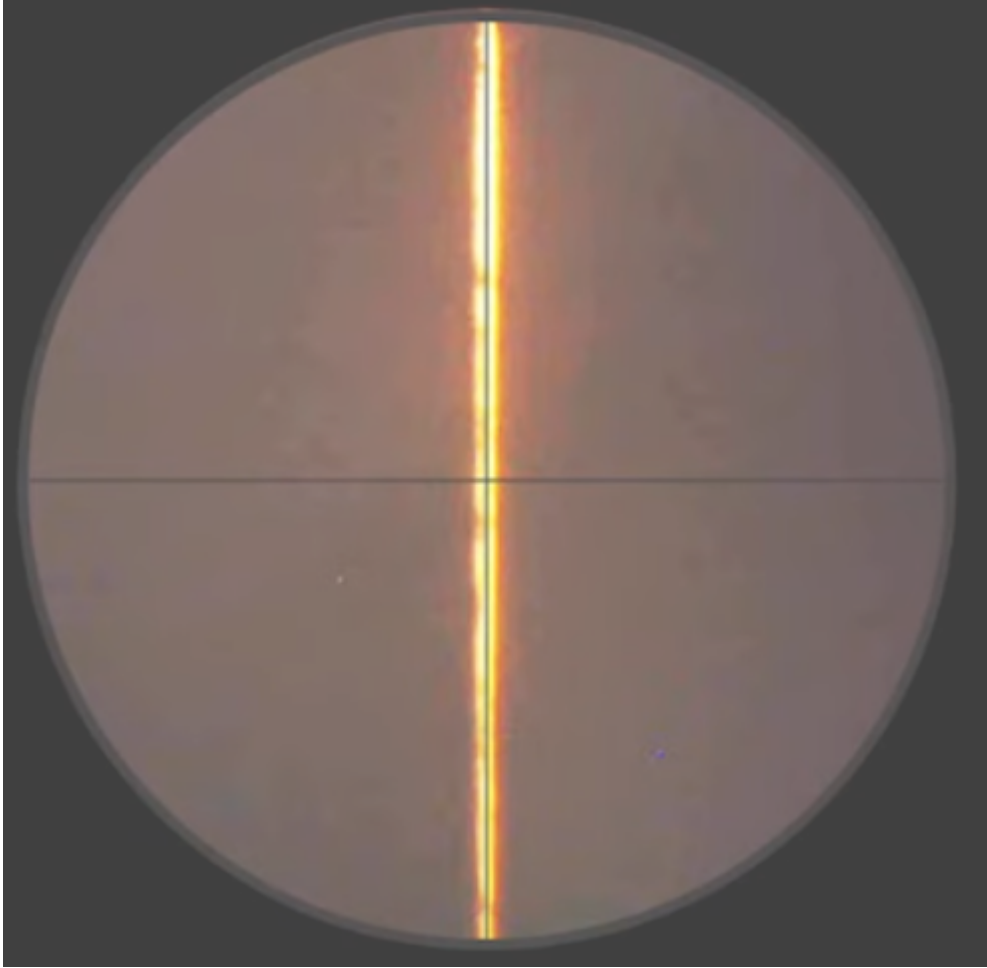


# Setup

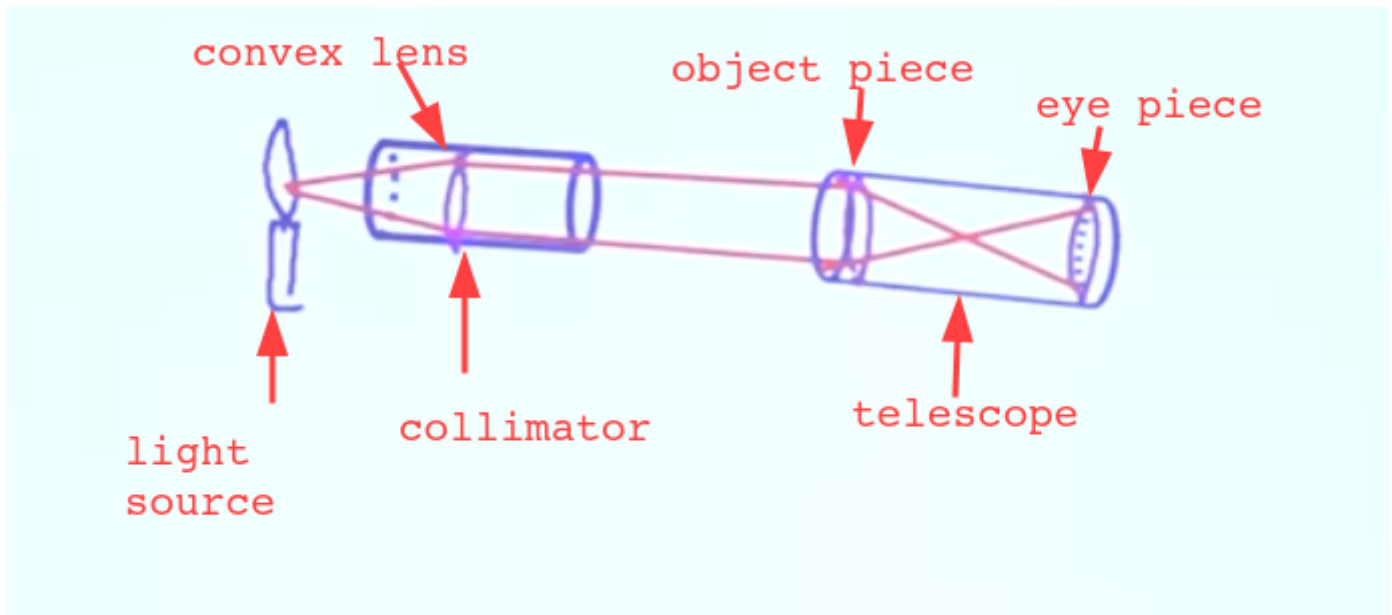
1. Levelling the microscope
    1. Adjust the eye piece to get a clear image of cross wires horizontally and vertically
    2. Adjust the object piece to get a clear image of a distant object (using the focusing knob)
  2. Levelling the collimator
    1. Open the slit (not too big, a narrow one)
    2. Adjust the focusing nob on the collimator and get a clear image of the Na lamp by looking from the telescope
  3. Levelling the prism table
    1. Keep the prism on the table such that one side of the prism is perpendicular to a line connecting 2 levelling pins, and one vertex of the prism should be exactly on the middle of the prism table.
- Adjusting the slit



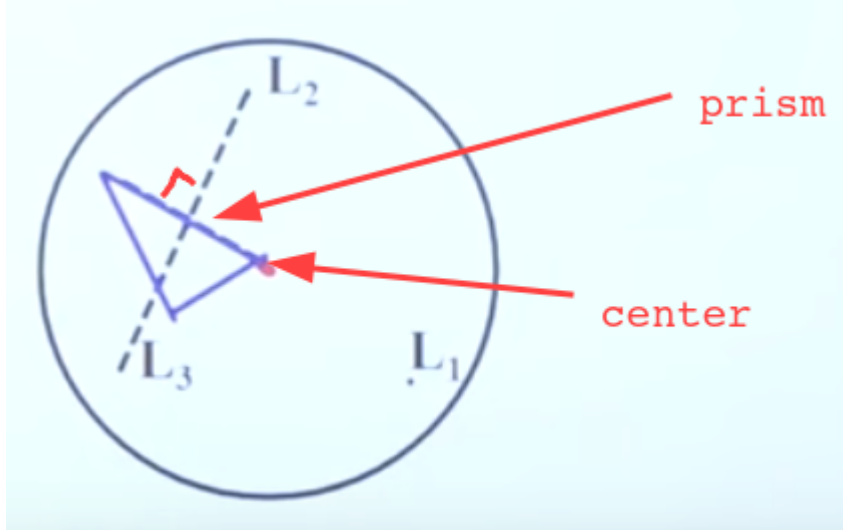
- Getting a clear image of the slit from the telescope



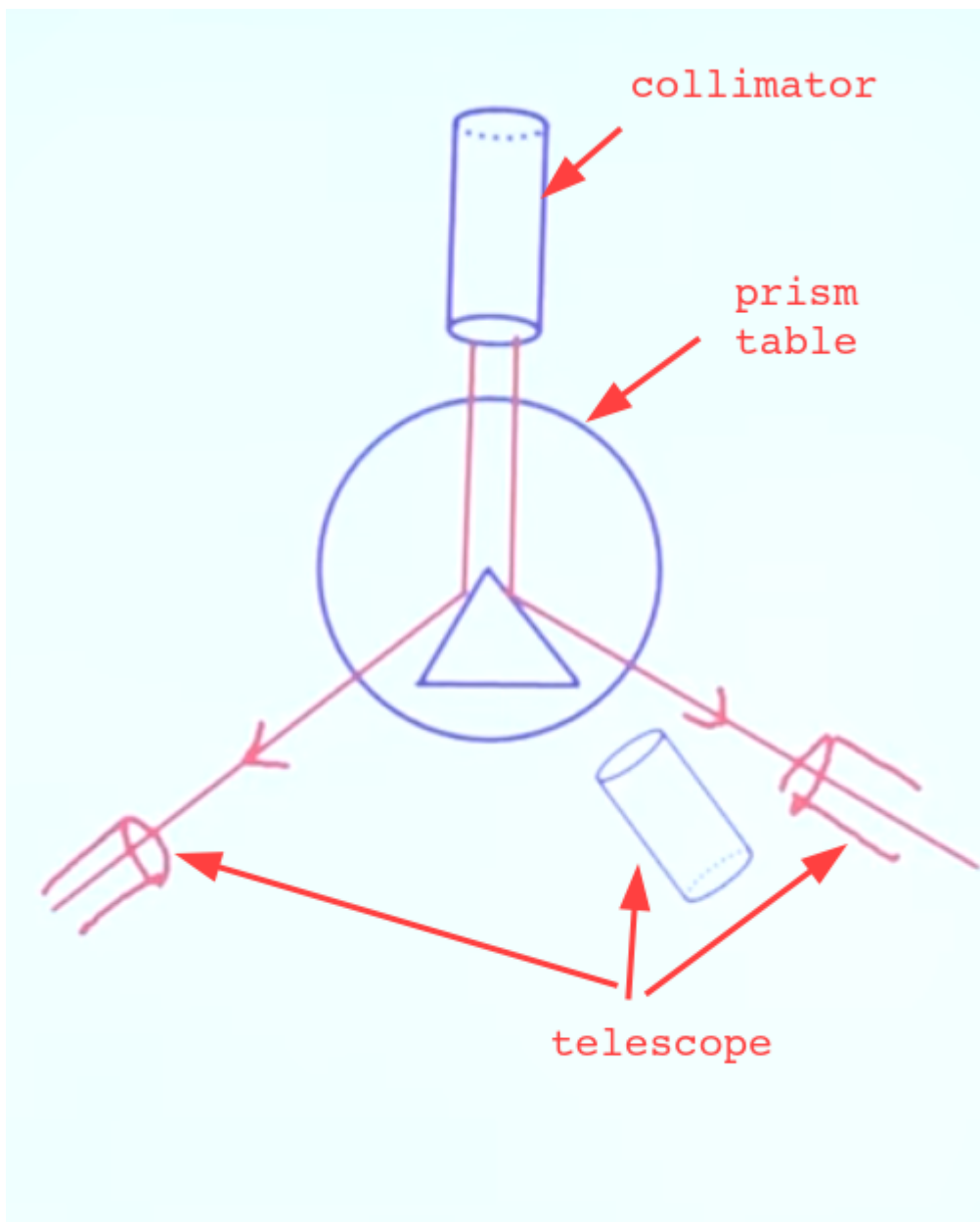
- After the levelling is done, the light rays should travel from the light source to the eye as follows.

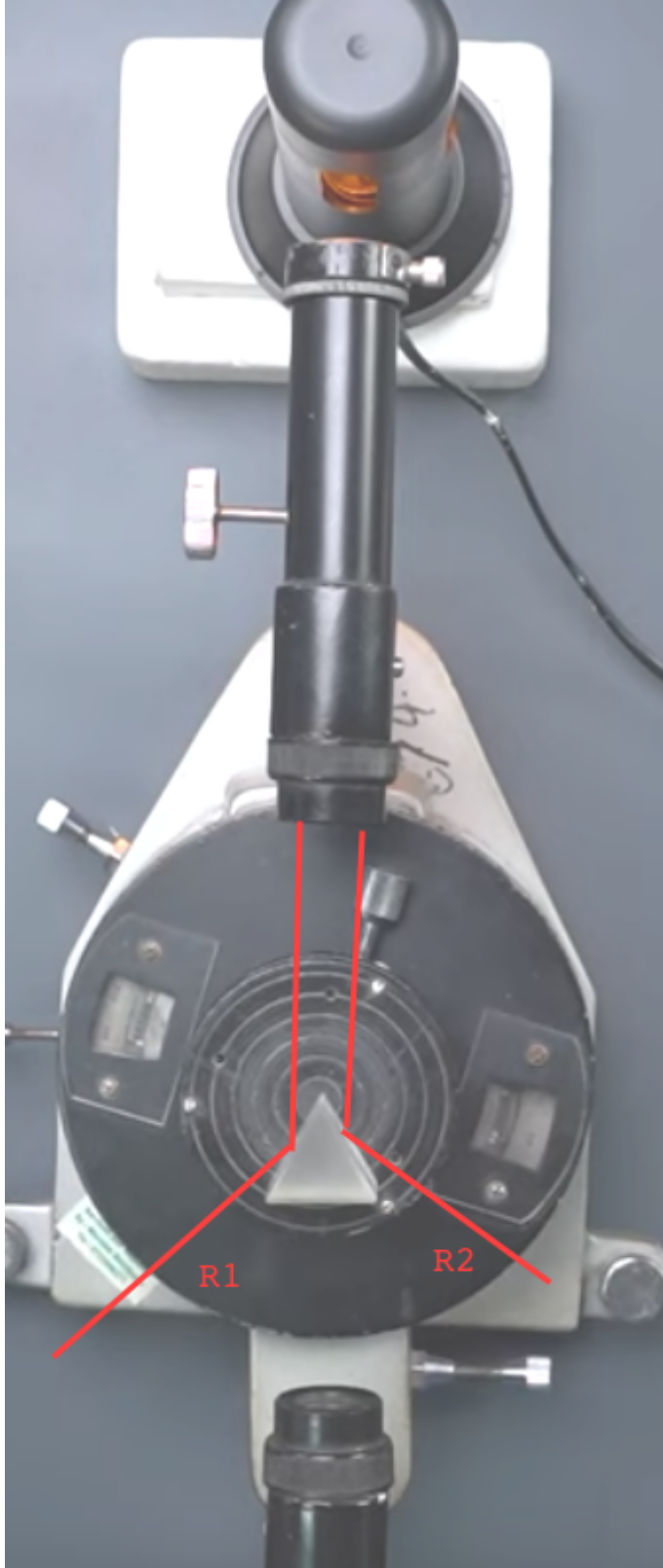


- This is how the prism should be kept (Note that L1,L2 and L3 are the levelling pins)



- This is how the telescope and the collimator should be kept with the prism table.\





If all 3 of these are in the same plane and levelled, the image of the slit should be observed as below.

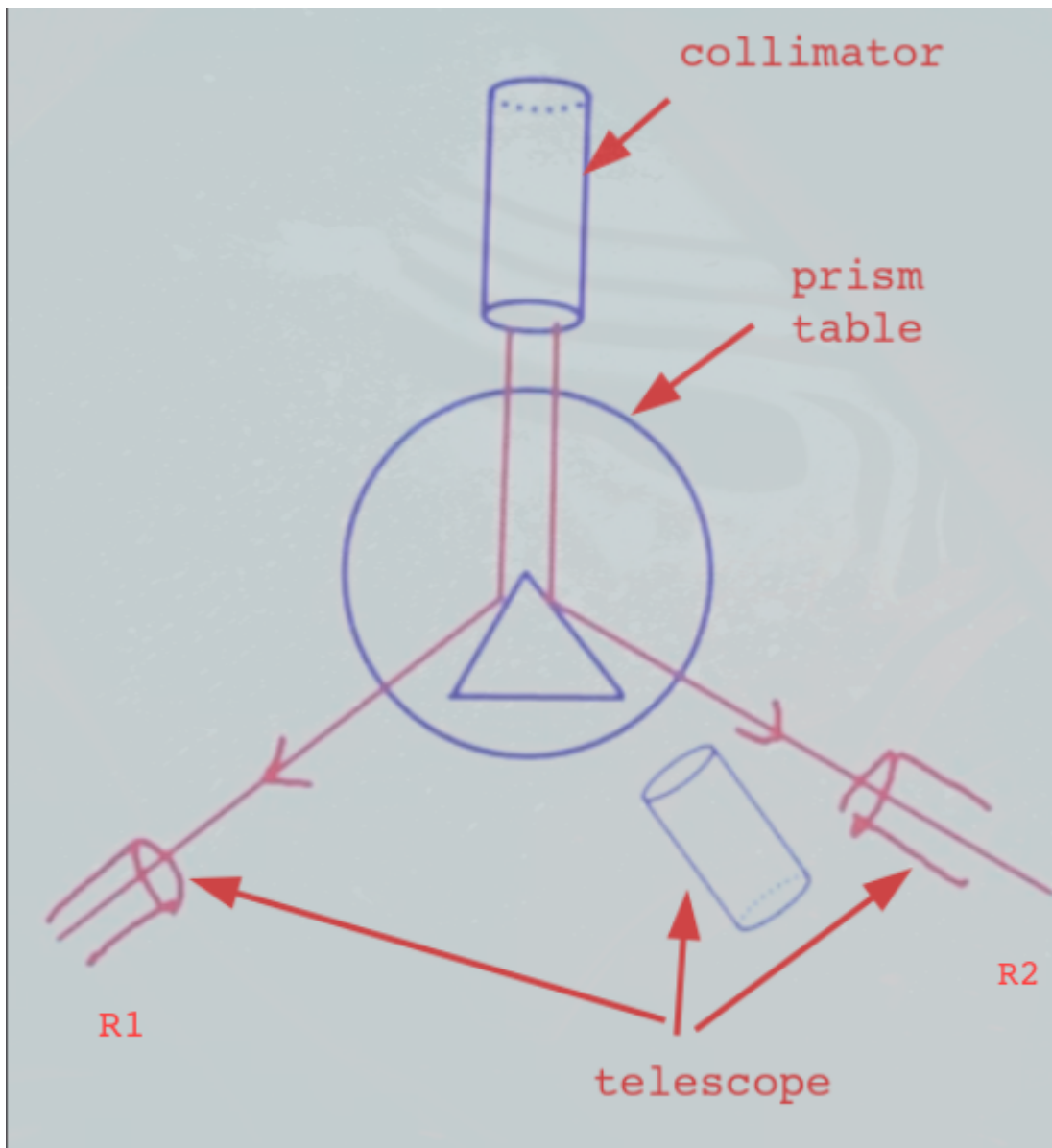


Not levelled



Levelled

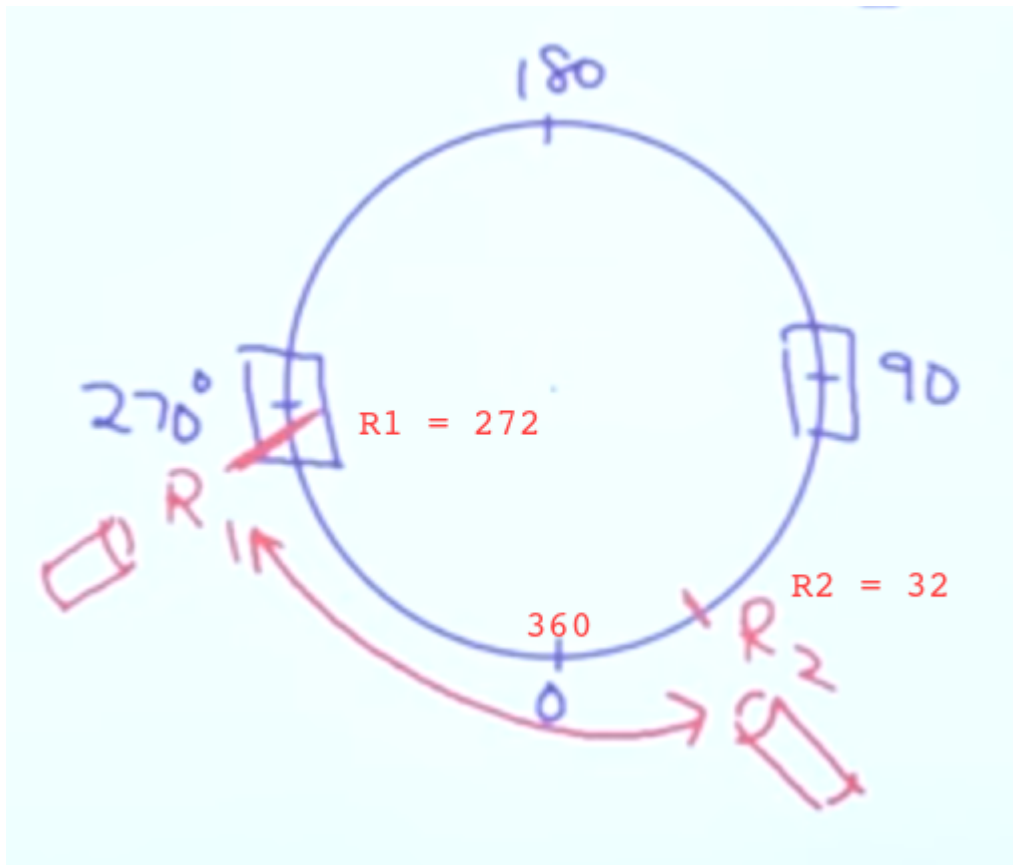
Here we can get the prism angle using the difference of the readings we get from the 2 occasions. That difference is equals to the twice of the Prism angle



$$2A = R2 - R1$$

$$\therefore A = \frac{R2 - R1}{2}$$

Note that the difference is only taken when both the readings are taken without passing the 360 degree mark. Anyhow, the objective here is to get the angle between the two reflected lines



In this case  $R_1 = 272$  degrees and  $R_2 = 32$  degrees. So the difference between 2 lines is  $(360 - 272) + 32$  which is 120. So  $120 = 2A$  therefore the prism angle is  $A = 60$

## Important points

- What is the first step of adjusting the telescope?

Adjusting the eye piece to see the cross wires clearly and be aligned with vertical and horizontal planes.



- Why do we tune the telescope by looking at a distant object?

To get parallel light rays from the objects.

The image will be inverted as well.

- What do we use to tune the telescope?

Focusing nob in the telescope



( This is how it should look like after adjusting the object and eye piece correctly.

- What is the usage of the collimator?

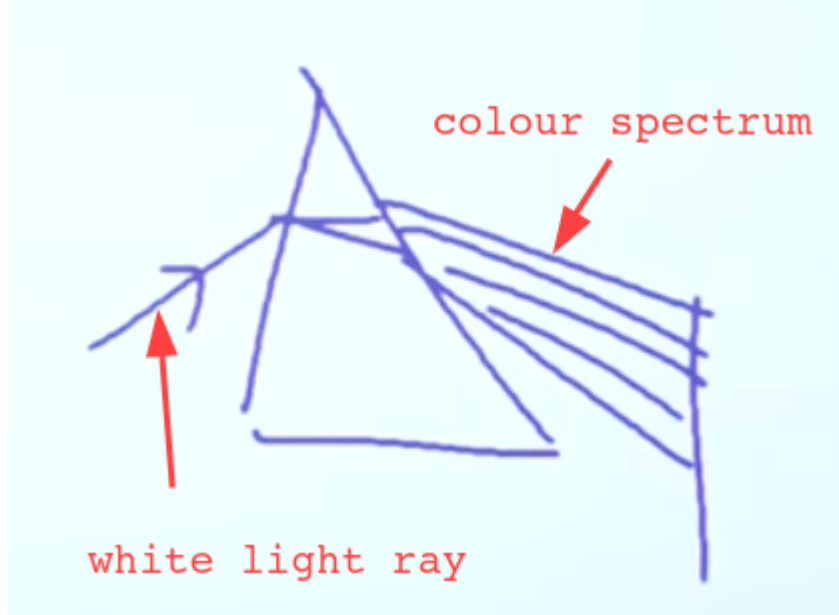
To convert the light rays coming from the light source to parallel rays.

Usually the light rays that are coming from close distance objects are not parallel, this is used to make them parallel.

- Why do we have to use a Sodium lamp?

Whenever we give a single white ray to a prism, after refracting the emergent ray could be of 7 different colours (are colour spectrum) with 7 different angles. (Because white ray is made from 7 different colours - i.e rainbow)

So to prevent this from happening we use the Na lamp which only emits yellow rays.



- If this is the case with the white light, why can we use the white light in the case of finding the prism angle?

Because in that experiment we work with reflection and not refraction. White ray can't be used only when we deal with refraction.

- After adjusting the telescope and when looking at the light source through the the collimator we still see an unclear image. What should you do?

Adjust the collimator lens from the nob in the collimator.

The reason why you dont see a clear image is because you dont get parallel rays to the telescope, so we adjust the convex lens in the collimator and make the light rays parallel

- Why can't we use the focusing nob and adjust the telescope to get a clear image in this case?

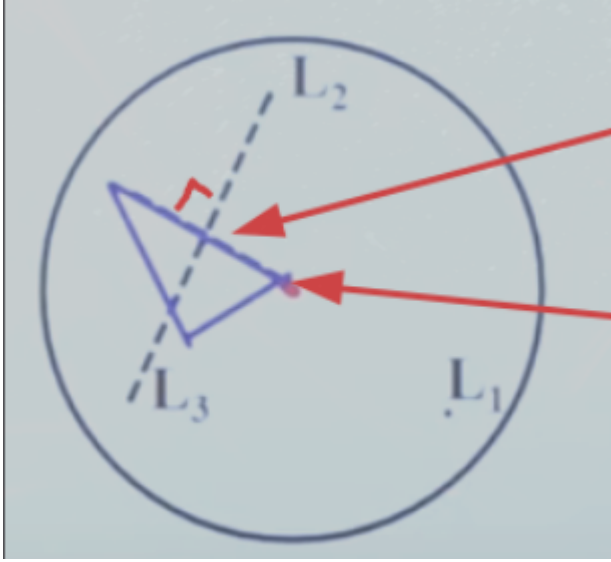
We have already adjusted the telescope to see a clear image when parallel light rays are entered. So we shouldn't change that.

- When adjusting the prism table, what the important things we need to remember about the pins?

We should choose 2 form the 3 pins and only adjust 2 of them relative to the other pin keeping that one unchanged.

And then when we move to the reading 2, then that 3rd pin should be adjusted. The previously adjusted 2 pins shouldn't be touched.



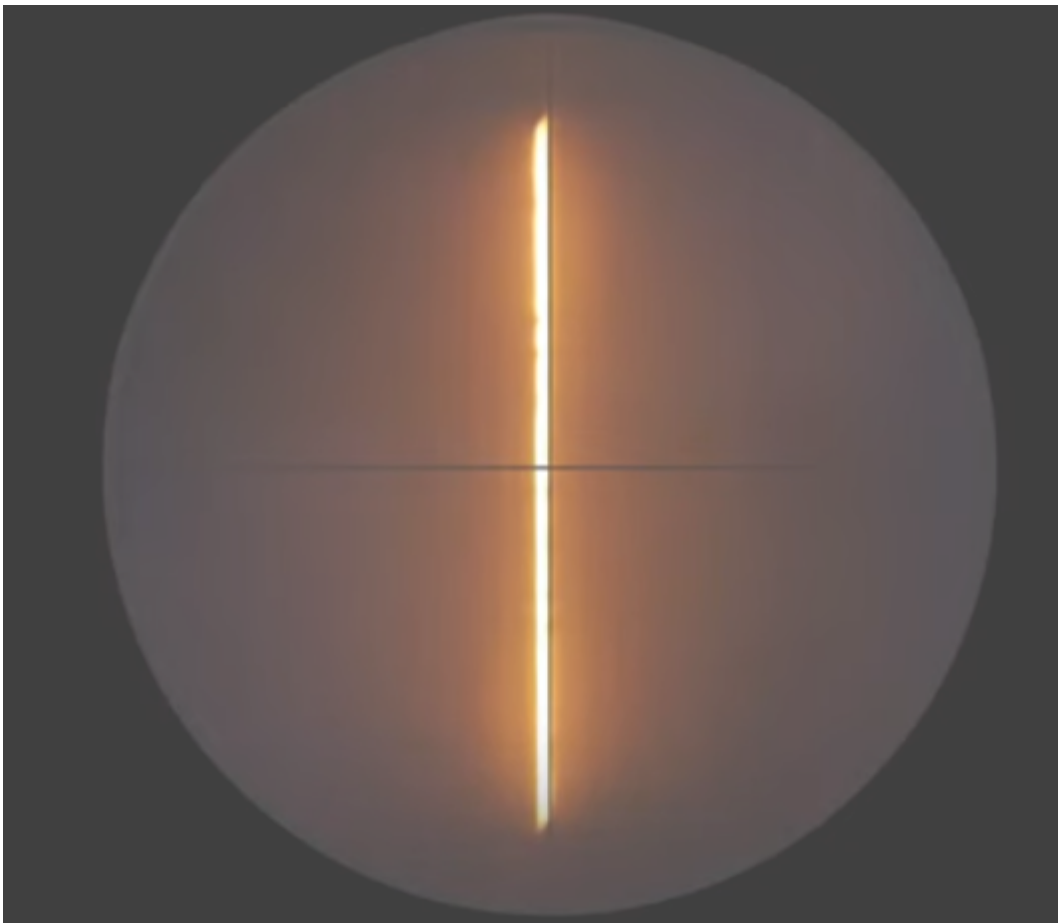


In this case the **L1** shouldn't be changed. Only the **L2** and **L3** should be changed to get the image aligned correctly. Then when we move to reading 2, then **L1** should be changed keeping **L2** and **L3** unchanged.

- What is the direction of rotating the screws when levelling the table.

We should not rotate 2 pins in the same direction at the same time. This will keep the inclination unchanged.

So we need to rotate 2 screws in opposite directions until you get an symmetric image on horizontal crosswire



Same thing needs to be done by looking from the other side (position of reading 2) as well.