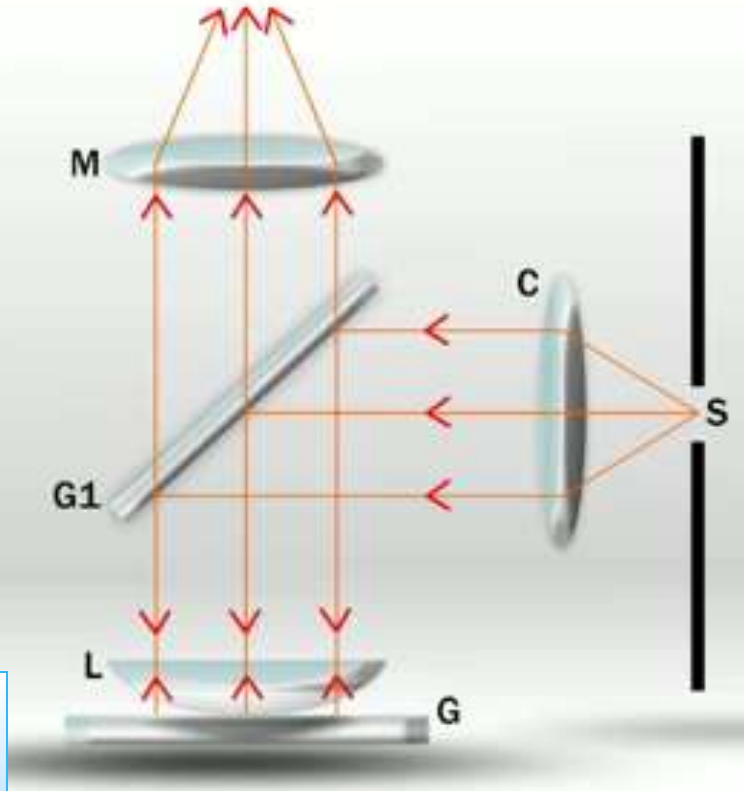
NEWTON'S RINGS

AIM OF THE EXPERIMENT

To form Newton's Rings and then find the radius of curvature of a given plano-convex lens

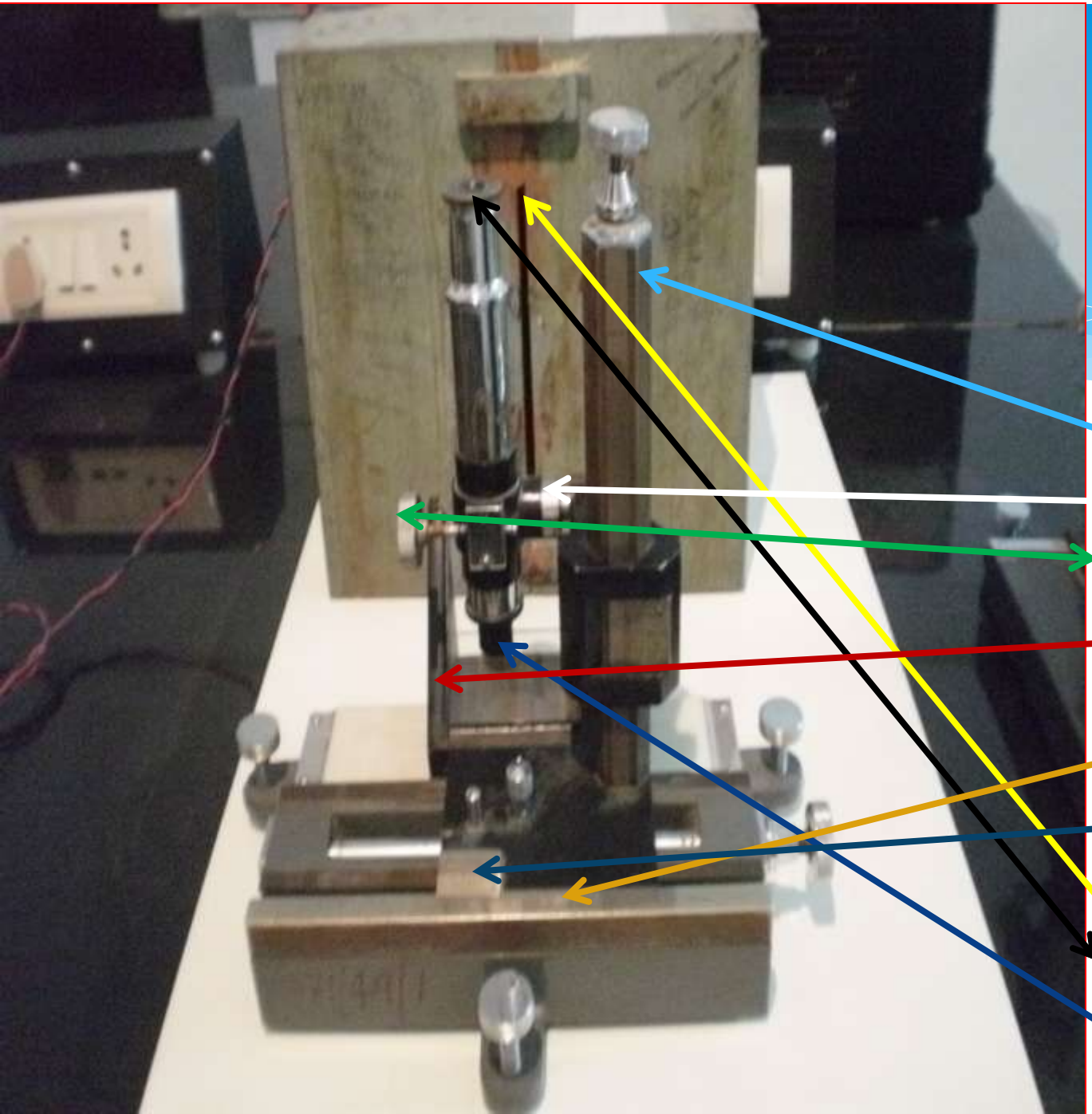
Schematic of the Experiment

Experimental Set-up to Observe Newton's Ring

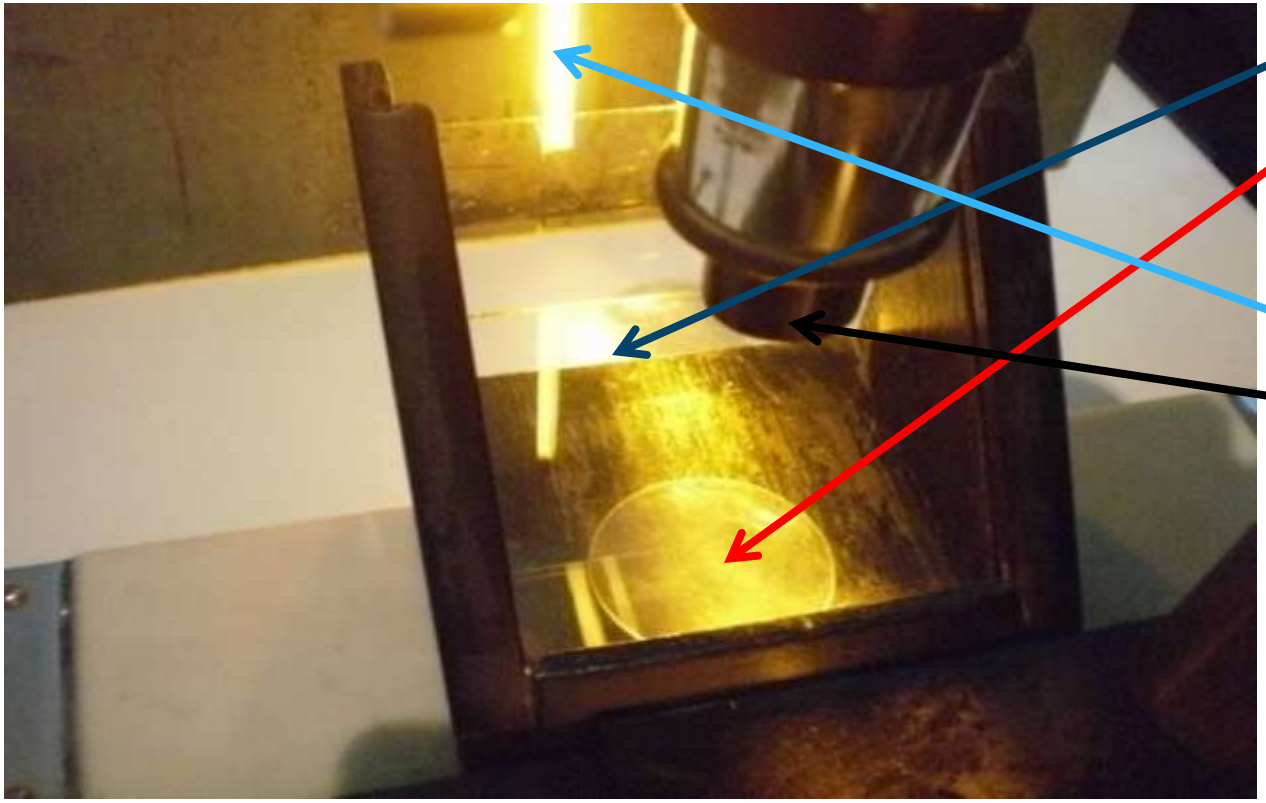


- G → Glass plate
- L → Plano convex lens
- G1 → Beam Splitter
- M → Microscope
- C → Focussing lens
- S → Source of light

EXPERIMENTAL SETUP

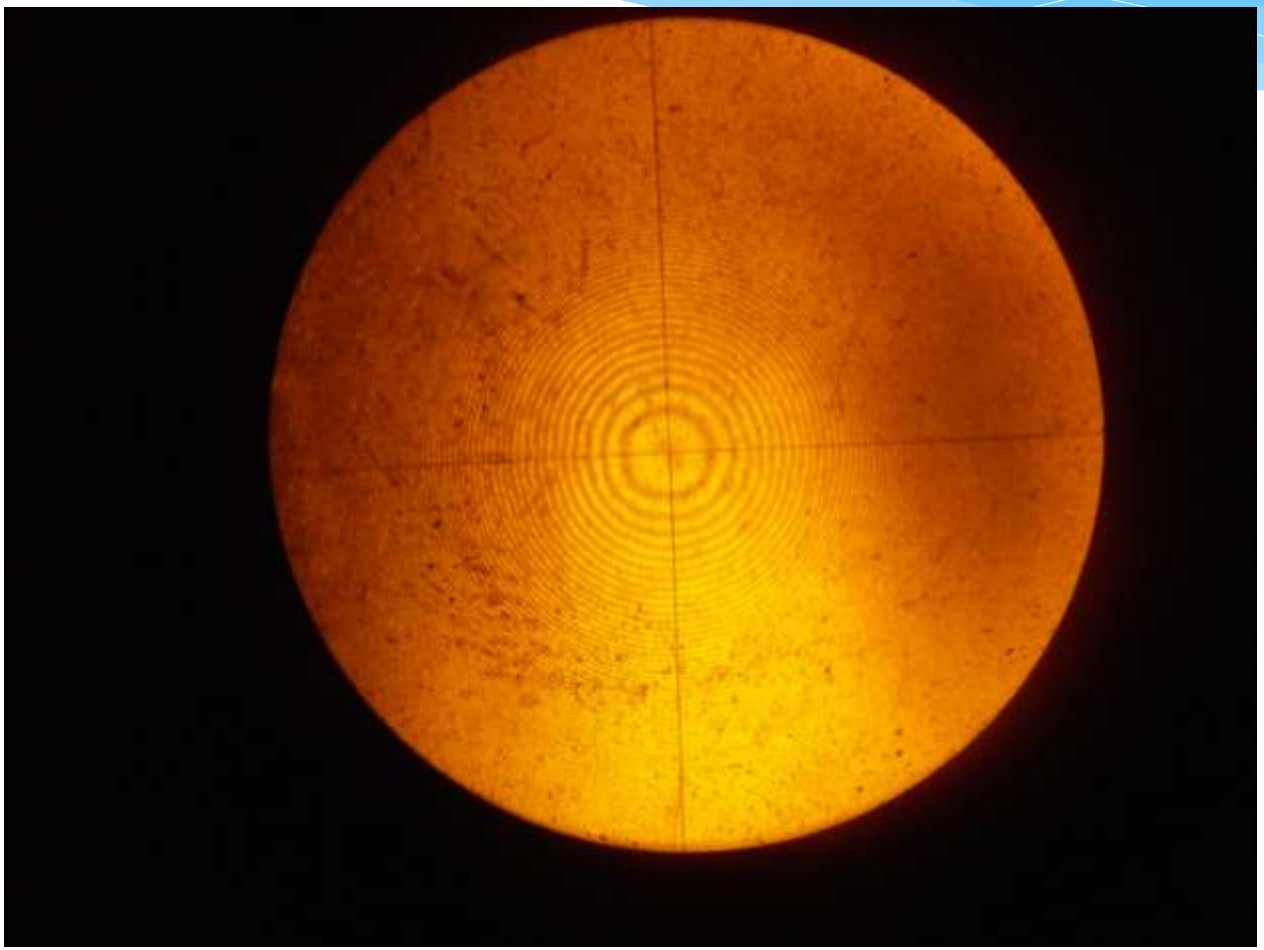


- Telescope holder
- Tilting Screw
- Focussing screw
- Beam Splitter and Lens holder
- Main Scale
- Vernier Scale
- Source of light
- Eye Piece
- Objective



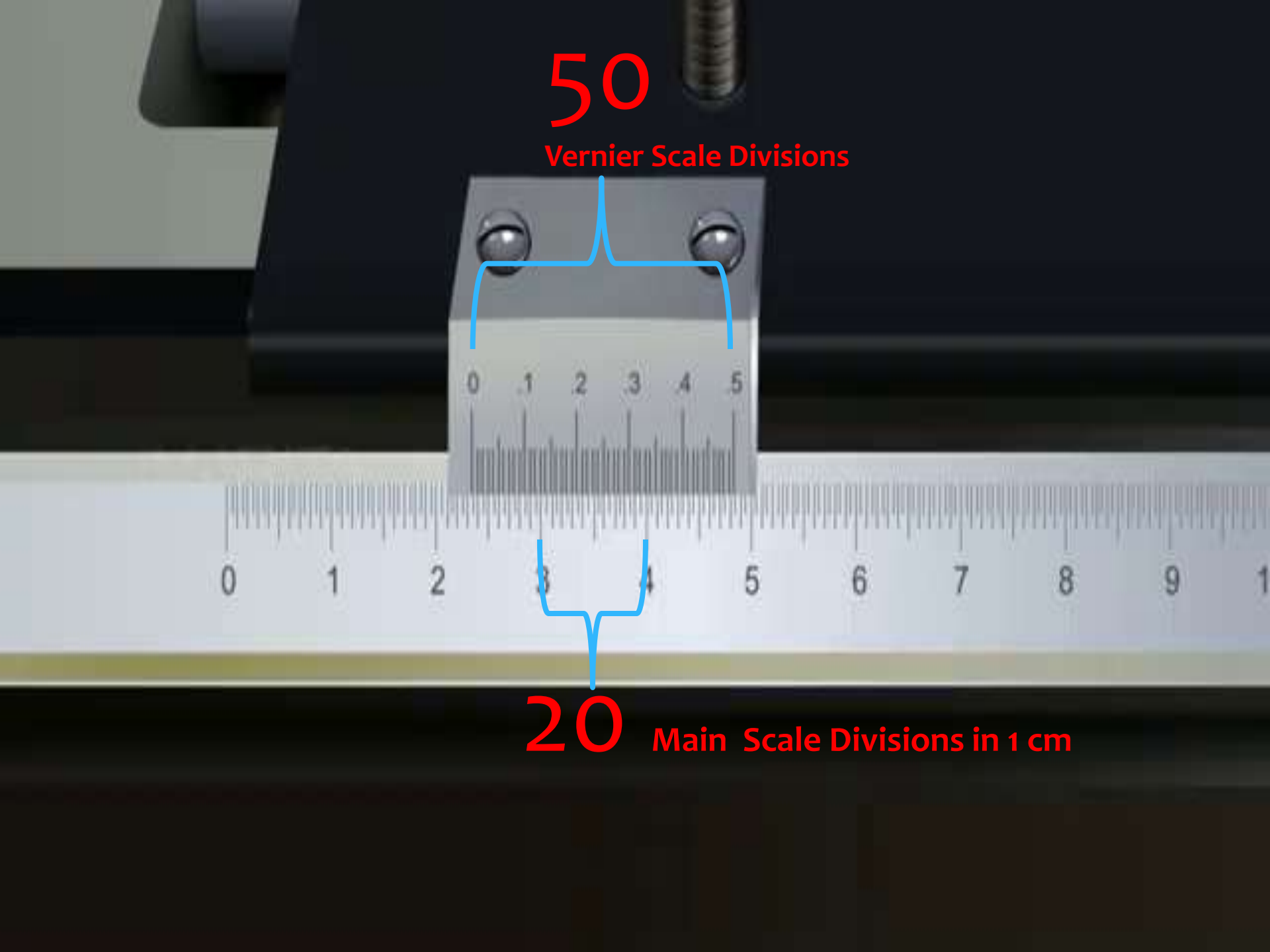
* Beam Splitter
* Plano-Convex Lens
* Source of light
* Objective

Newton’s rings as observed under the microscope



CALCULATION

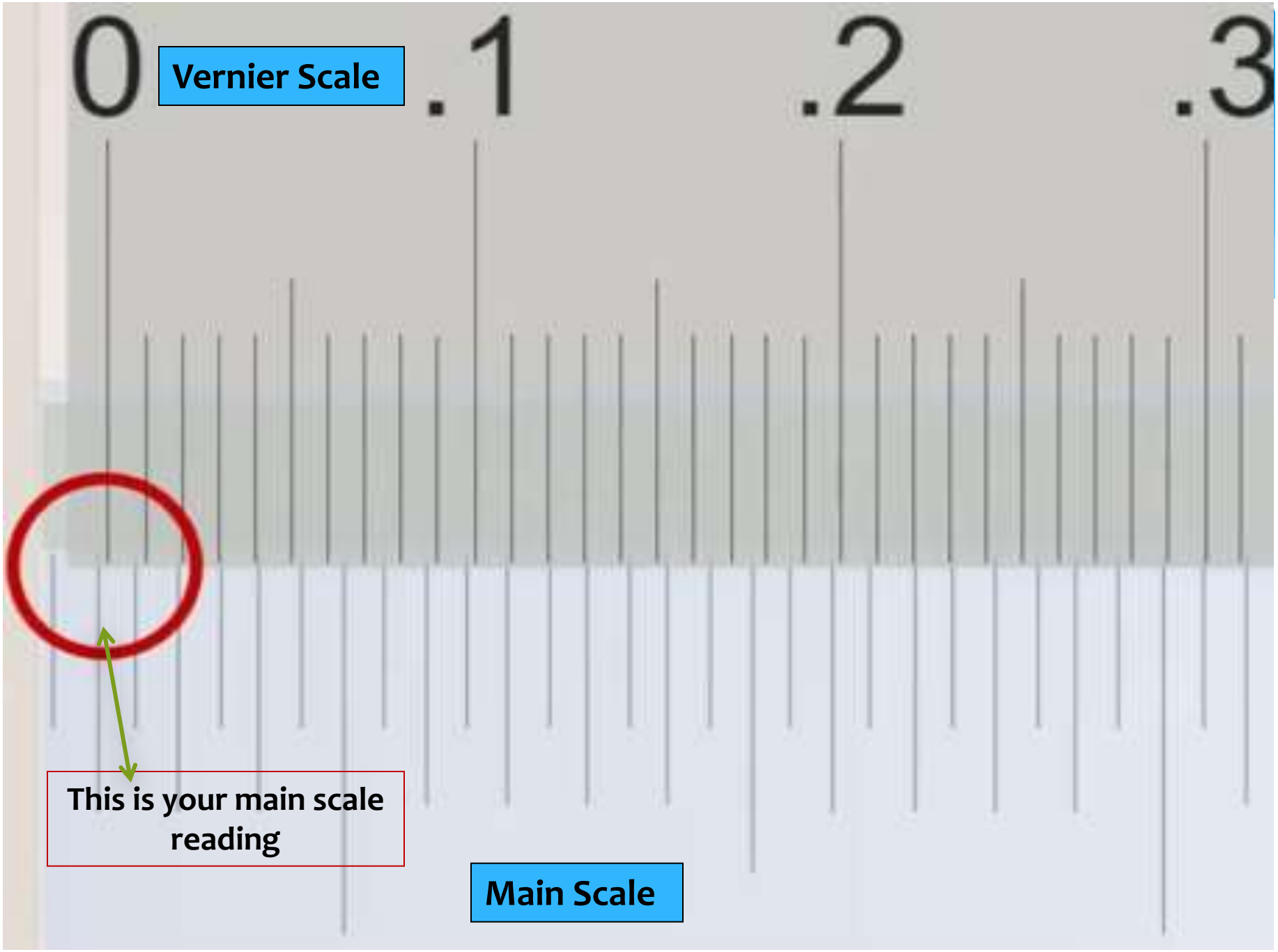
Step 1- To Find Least Count of the microscope

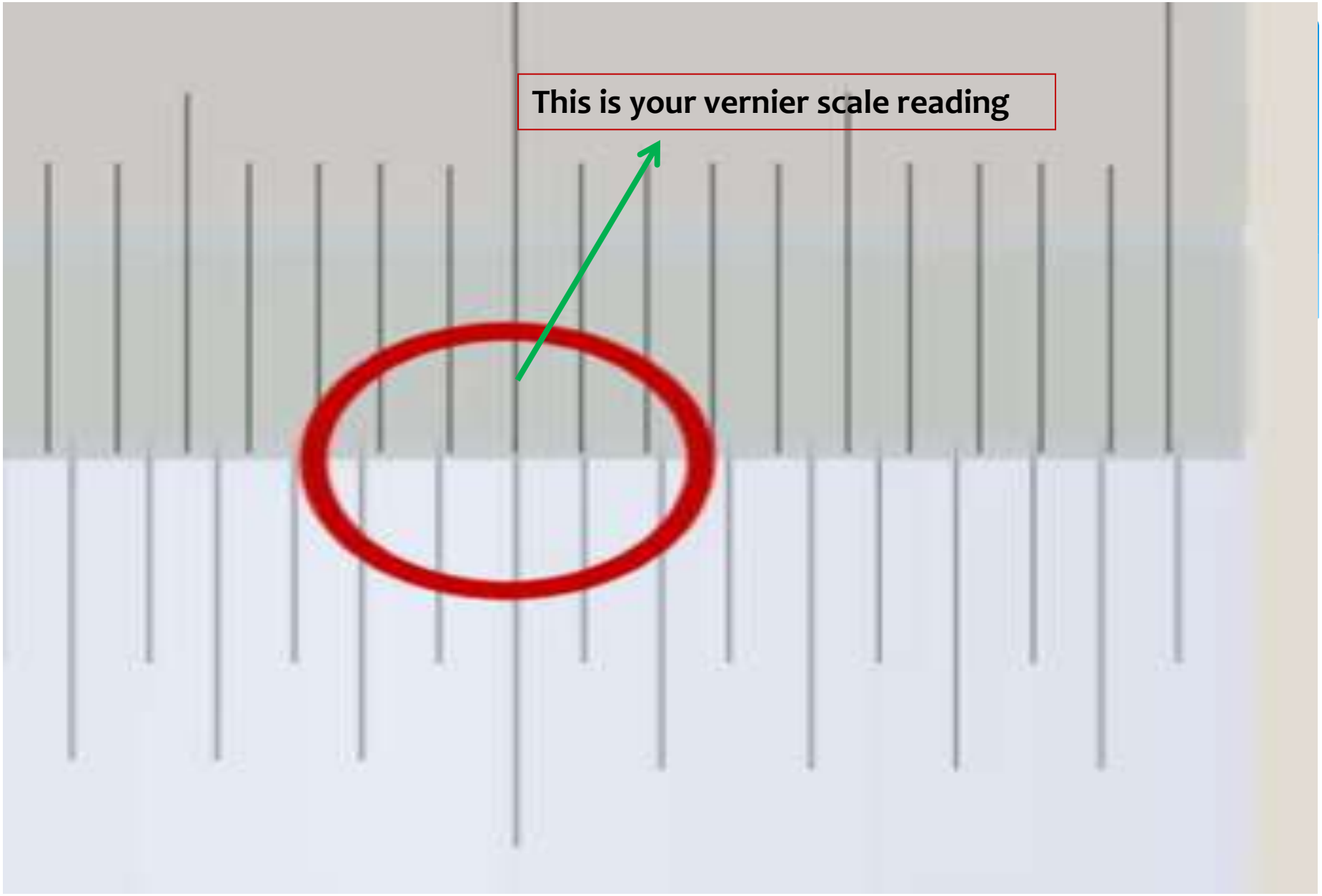

50
Vernier Scale Divisions
0 .1 .2 .3 .4 .5
0 1 2 3 4 5 6 7 8 9
20
Main Scale Divisions in 1 cm

LEAST COUNT OF THE MICROSCOPE

$$LC = \frac{Smallest\ Main\ Scale\ Reading}{Total\ no.of\ Vernier\ Divisions}$$

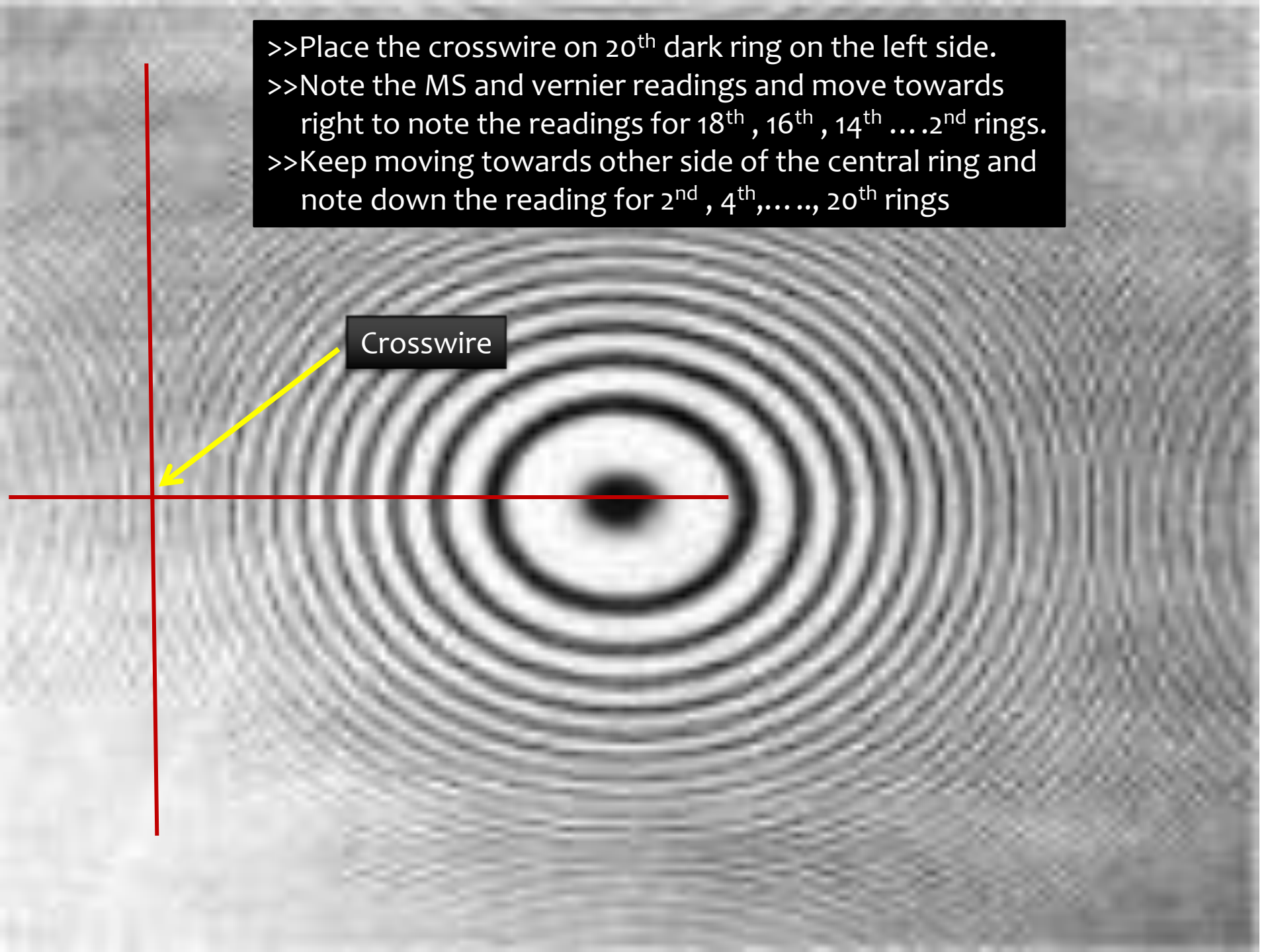
$$LC = \frac{\frac{1}{20}(cm)}{50} = .001\ cm\ (from\ previous\ slide)$$


0
Vernier Scale
.1
.2
.3
This is your main scale reading
Main Scale


This is your vernier scale reading

Final Reading of a Ring

Final Reading = Main Scale Reading +(Vernier Scale Reading * Least Count)


>>Place the crosswire on 20th dark ring on the left side.
>>Note the MS and vernier readings and move towards right to note the readings for 18th , 16th , 14th ….2nd rings.
>>Keep moving towards other side of the central ring and note down the reading for 2nd , 4th,…..., 20th rings
Crosswire

Precautions

In order to avoid the backlash error, move the crosswire only in one direction (e.g left to right) while recording the data

Data entry in the computer

- Login to the PC
- Applications→ Accessories→Terminal
- Type “ring” (without quote) in the Terminal & follow up the instructions
- Fit the graph with a straight line y=a0*x and estimate the slope a0 from the fit.
- Enter the value of slope in the terminal when it is asked for.

END