TELESCOPY LAB

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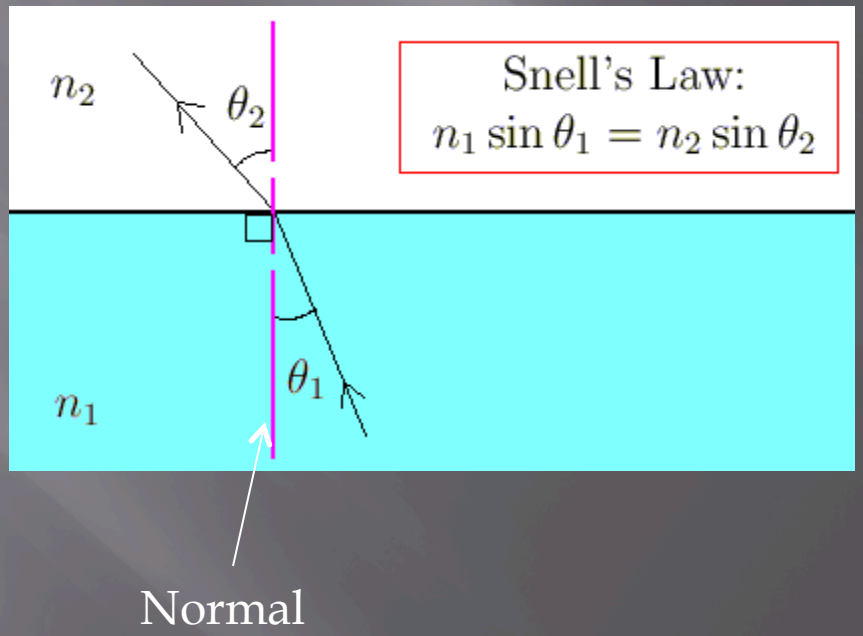
Introduction to Telescope Lab

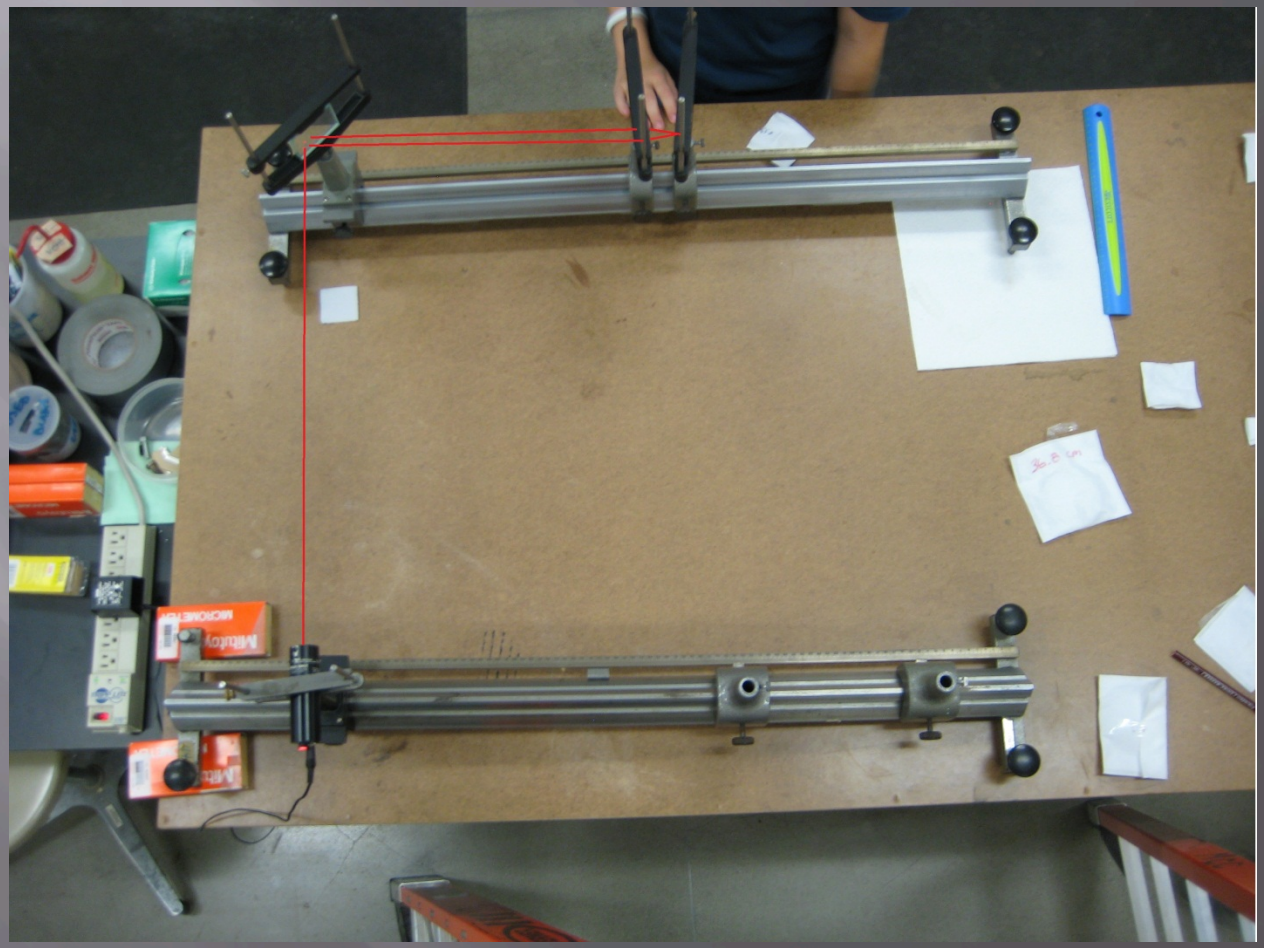
I. We measured focal lengths of various lenses
II. We selected a few different lenses to create a telescope
III. A telescope was created from a model kit
IV. Image qualities were compared from the first telescope to the model kit

Refraction

- When light goes through a medium, its speed varies depending on the index of refraction



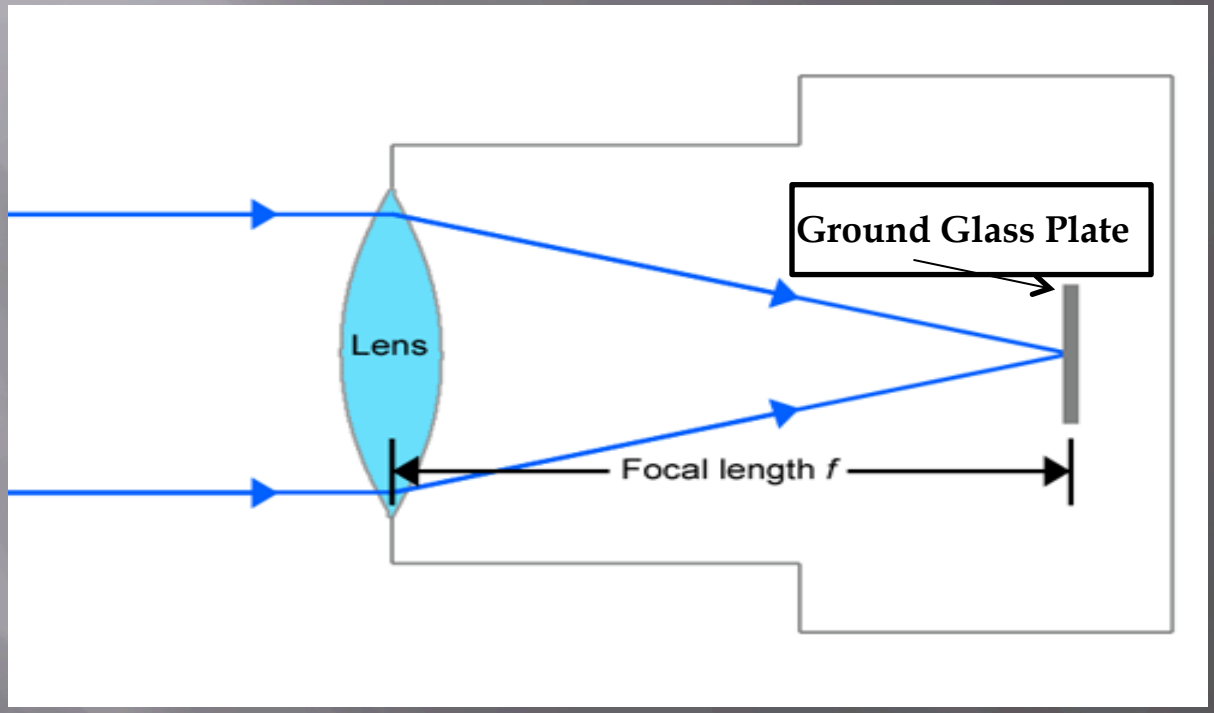
Beam Path



Collimated Light Simulation

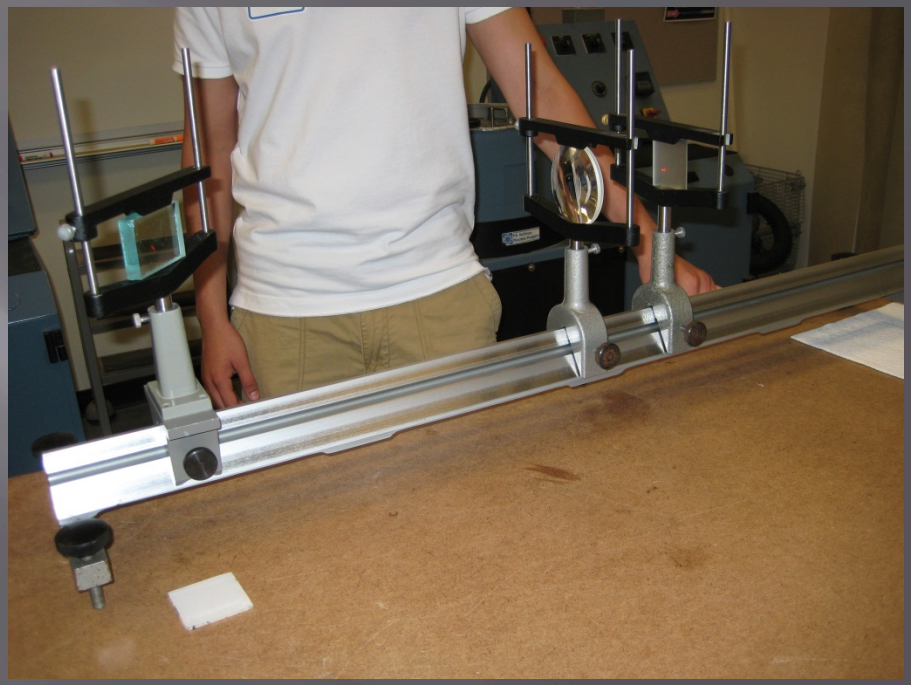
Measuring beam separation

Focal Length



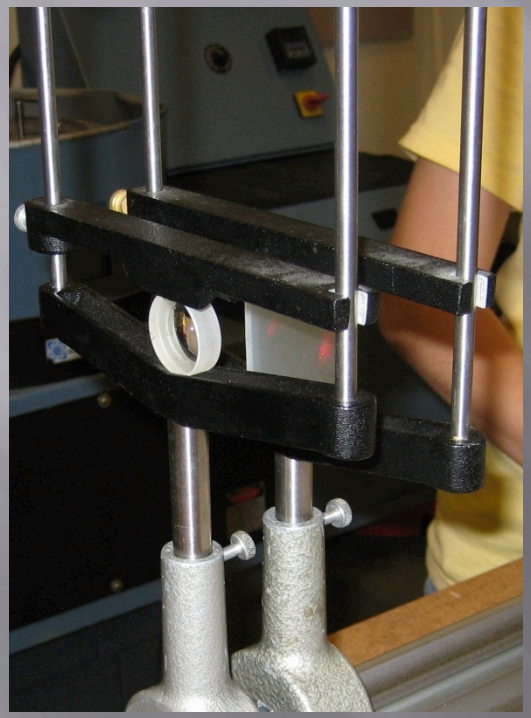
Where the two beams meet on the plate or in space

Focal Lengths

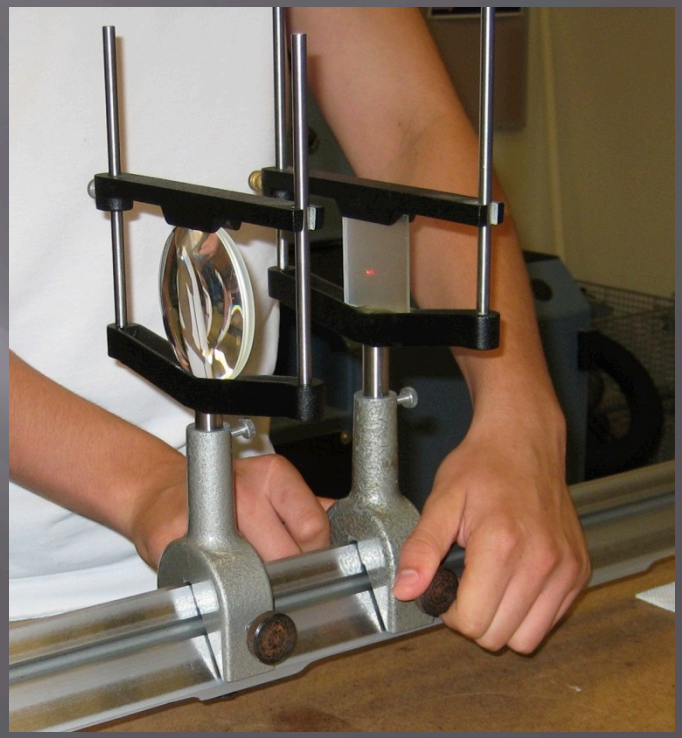


- The lens holders are positioned where the two beams meet at the focal point

Divergent vs. Convergent



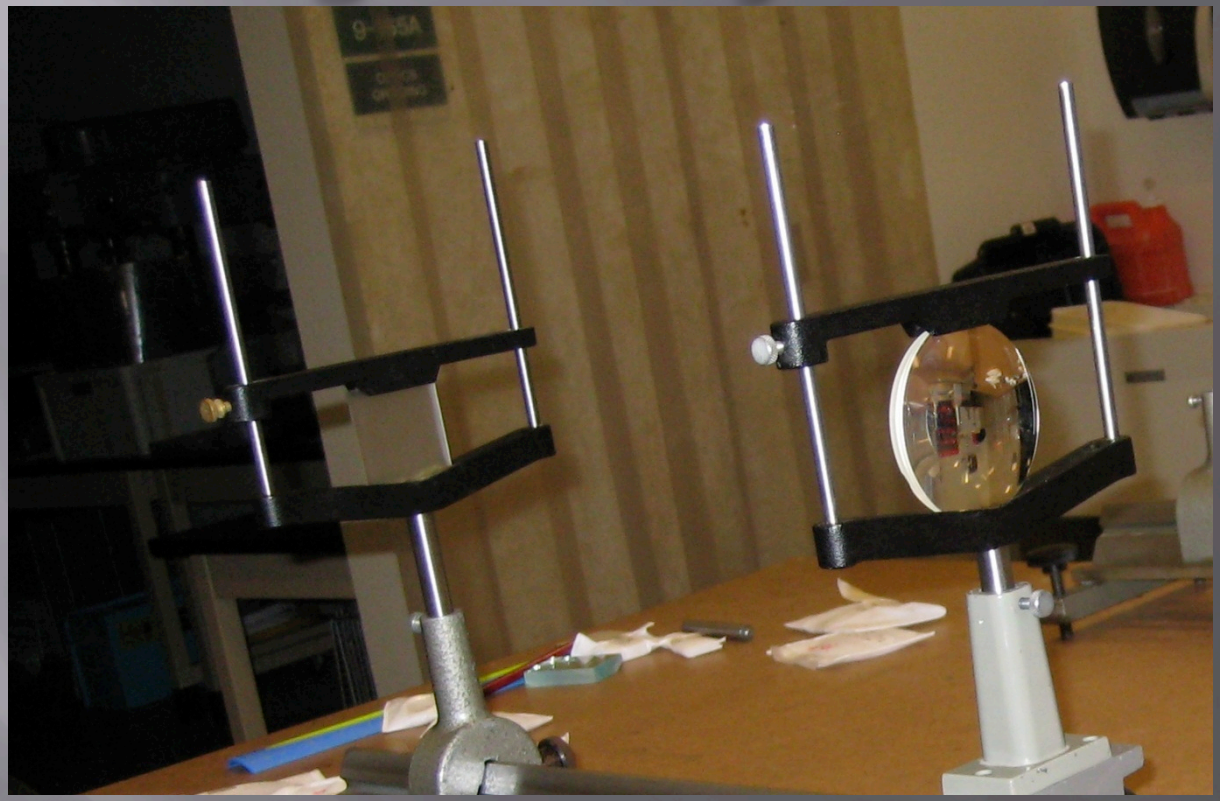
vs.



Biconcave Lens

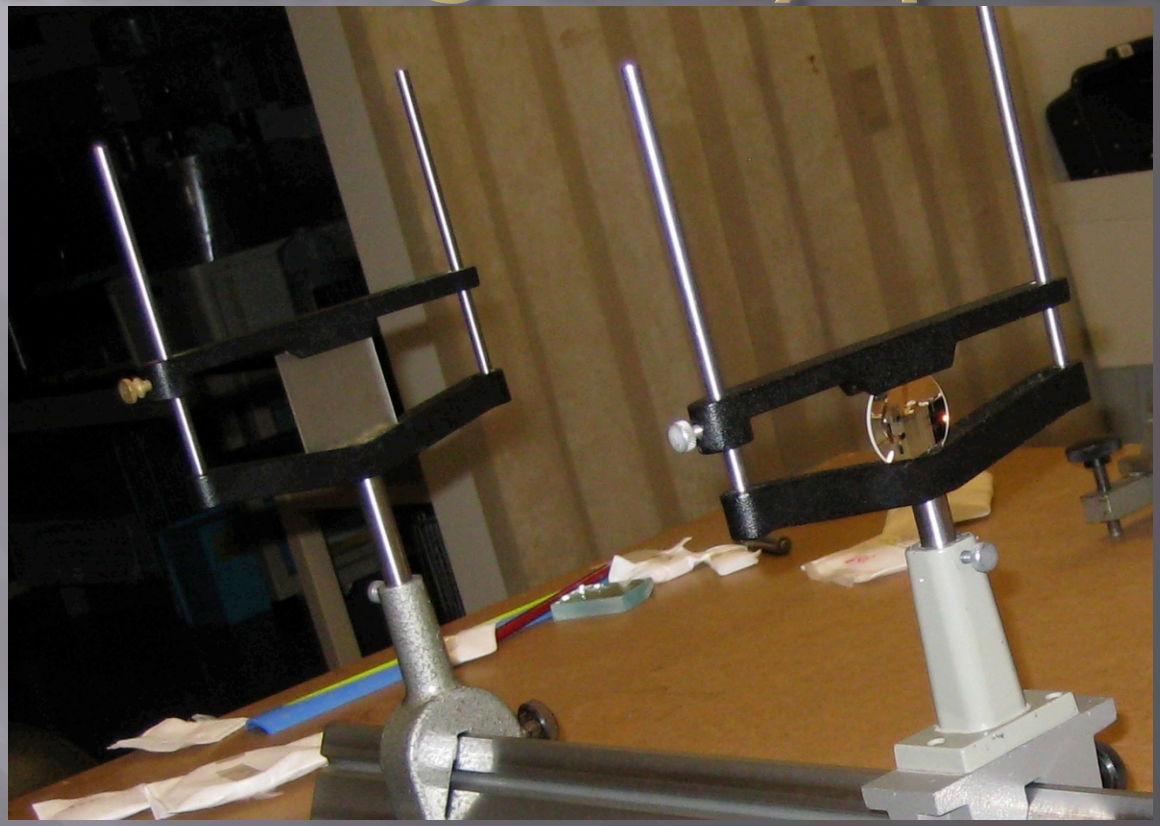
Biconvex Lens

Selecting an Objective Lens



- An objective lens is larger in diameter and has a longer focal length
- It is closer to the object
- Our lens had a focal length of 36.8 cm

Selecting an Eyepiece



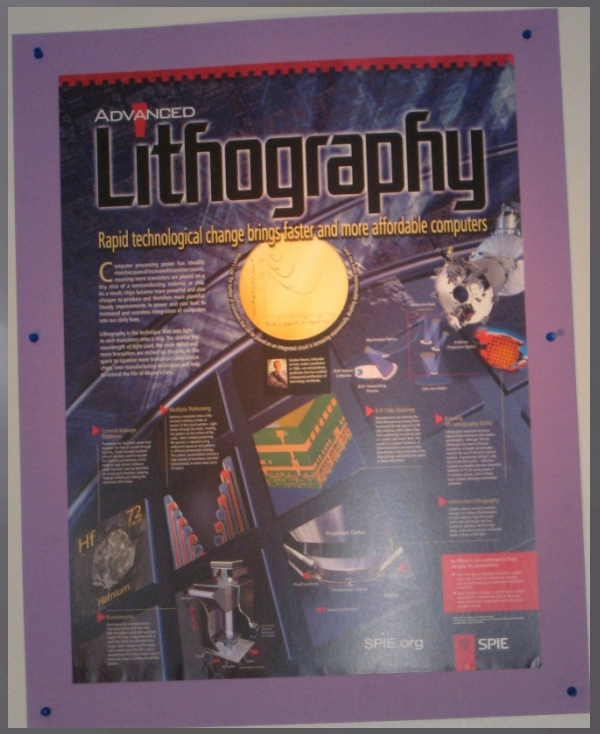
- An eyepiece is smaller in diameter and has a shorter focal length
- It is closer to your eye
- This lens had a focal length of 9.0 cm

Objective Lens in Action

Introducing the Eyepiece

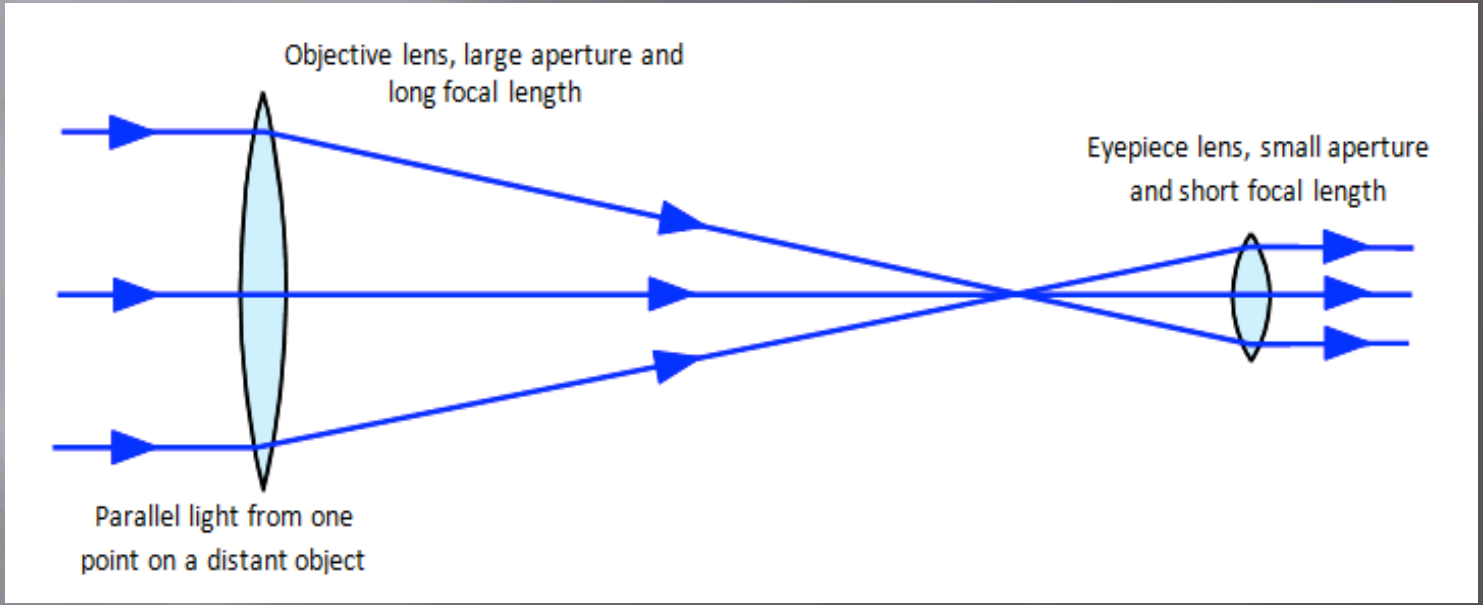
Introducing the Eyepiece

Image on Ground Glass



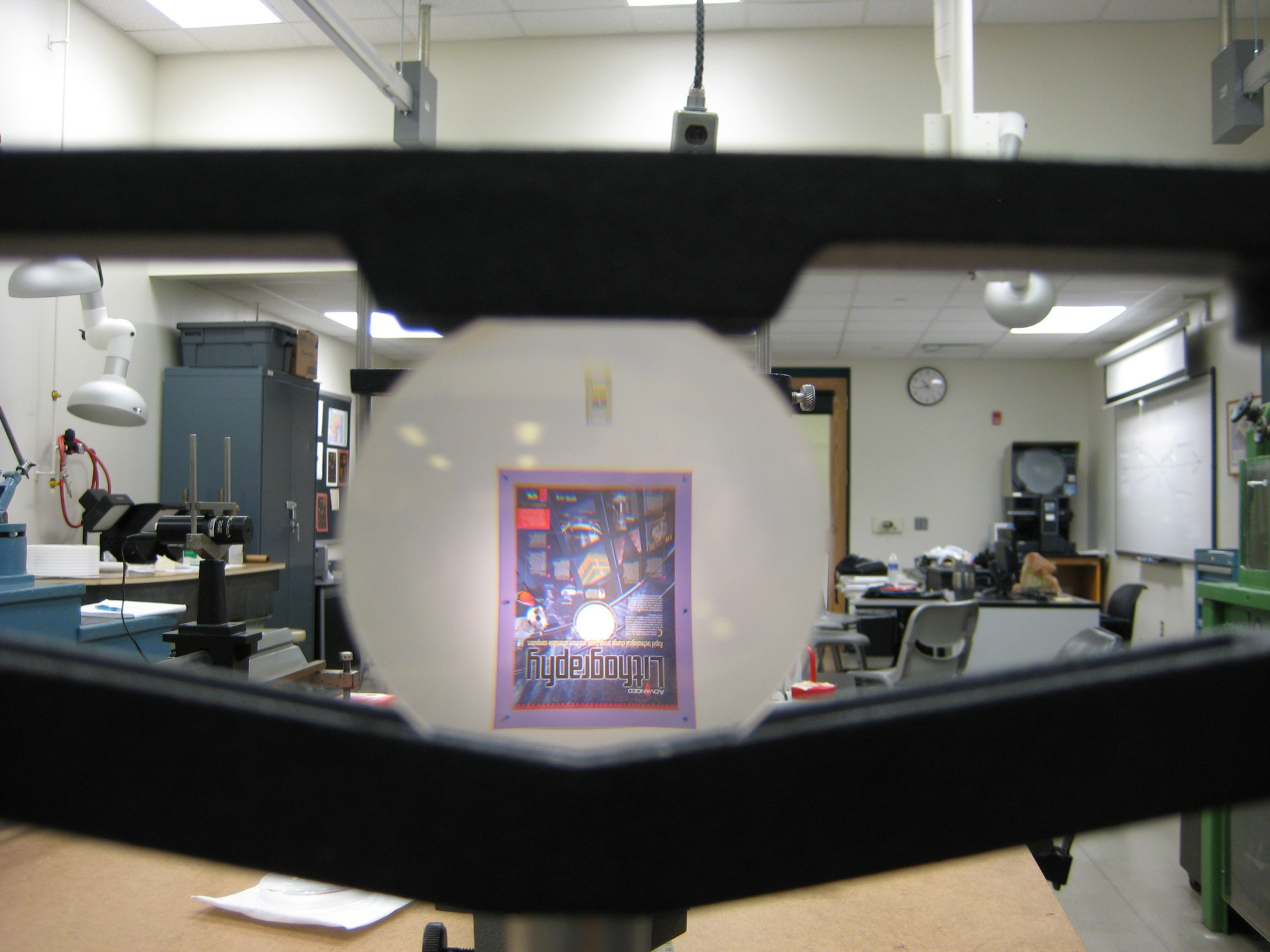
Object

Ray Diagram of Telescope



Focusing the Image

AT A COMBINED FOCAL LENGTH OF 45.8CM, THE IMAGE WAS CLEAR


ADVANCED
Lithography
Rapid technological change brings faster and more affordable computers

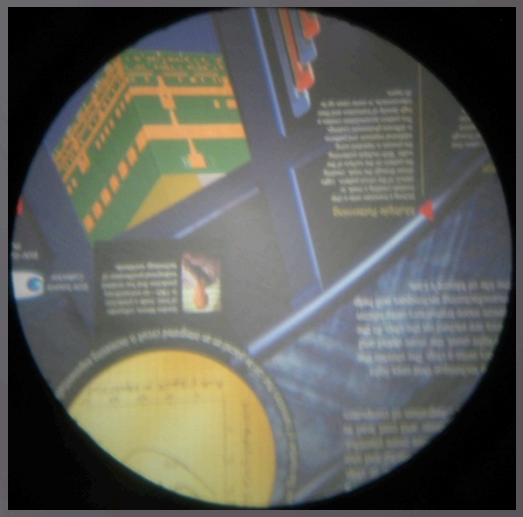
Galileoscope Kit

Galileoscope Kit

Ability of the Galileoscope

1/4 Mile

150 Meters



35 Feet

Magnification Formula

$$M = \frac{F_o}{F_e}$$

$M = 36.8cm/9.0cm$

$M = 4.09x$

Lab Apparatus vs. Galileoscope

4.09x

25x

Galileoscope in Hallway

Importance

- Lenses allow us to see:
  - Distant objects
  - Microscopic objects
  - Inner space-surgery
  - Outer space
  - At all