

Using a diaphragm

Close double stars can be trying objects. A star is imaged not as a single light spot but as an Airy disc (a spot of light at the core and many bright and dark concentric diffraction rings). In binary stars the Airy patterns impinge on each other making resolution difficult.

One answer is to use a hexagonal diaphragm over the objective--thick card or a lens cap with a hexagonal cut-out is ideal. This changes the diffraction pattern to a central spot surrounded by six very fine rays. Since the field remains dark right up to the edge of the primary, a fainter companion appears clear and distinct.

The hexagonal cut out should be such that it can be inscribed in a circle of diameter equal to the clear aperture of the object glass (i.e. its diagonal is the same length as the diameter of the object glass which it is to mask). The diaphragm should be movable, so that it can be rotated through sixty degrees in order to change the orientation of the image.

There is a small trade off in reduced light-gathering power and performance. However, when used on good seeing nights, the unsurpassed clarity more than compensates!

To construct a hexagonal diaphragm ABCDEF with diagonal 100 mm.

With compasses mark center O and draw an **outer** circle **larger** than radius 50 mm.

Using the same center draw an **inner** circle radius 50 mm.

Take one point on the circumference of **inner** circle to be A.

With compasses radius 50 mm and centre A, mark off an arc to cut the circumference at point B.

Repeat with center B to get C.

Continue this method to get points D, E and F.

Join AB, BC, CD, EF and FA to make the sides of the heagon.

Cut out the hexagon with a craft knife to make the aperture.

