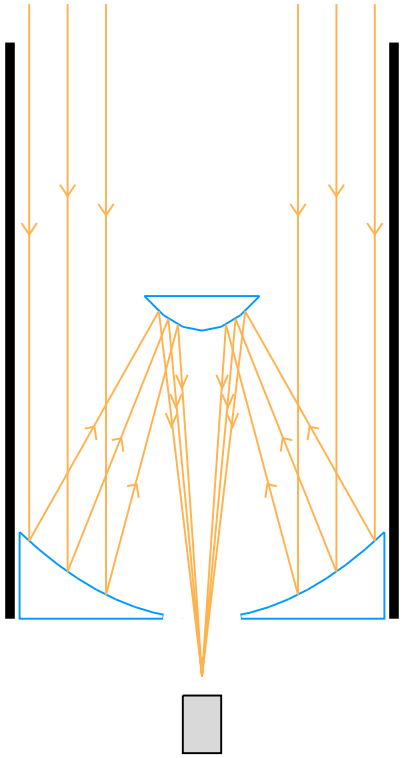
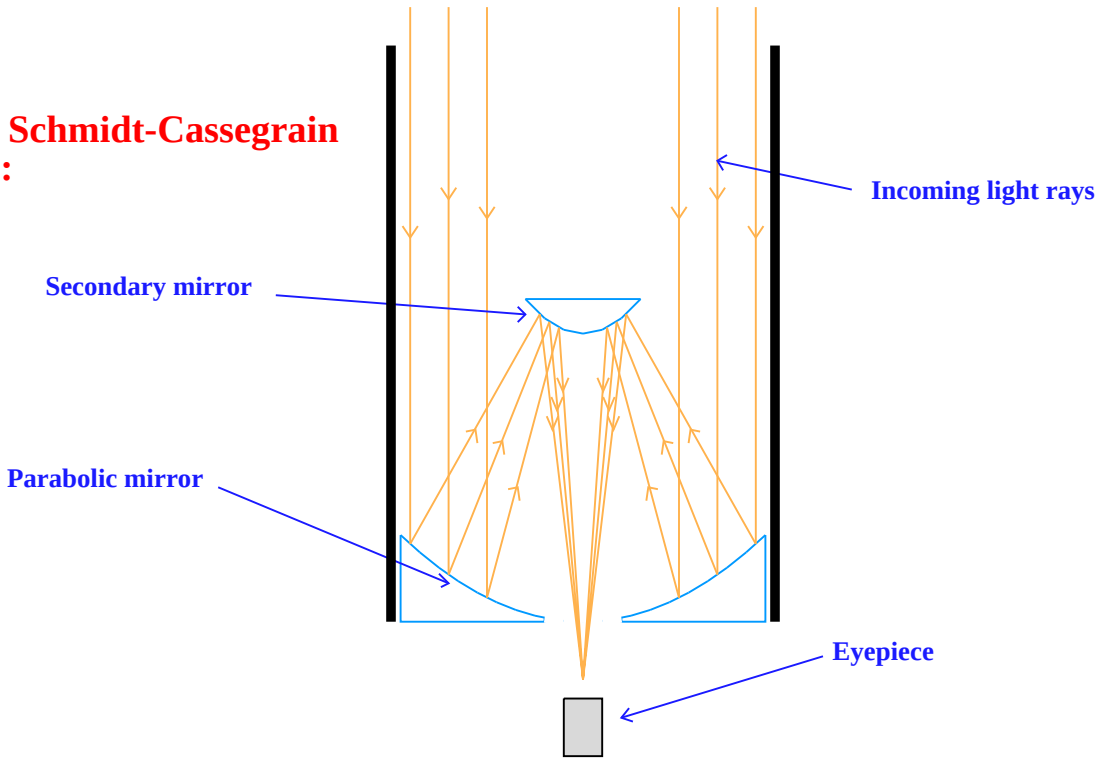
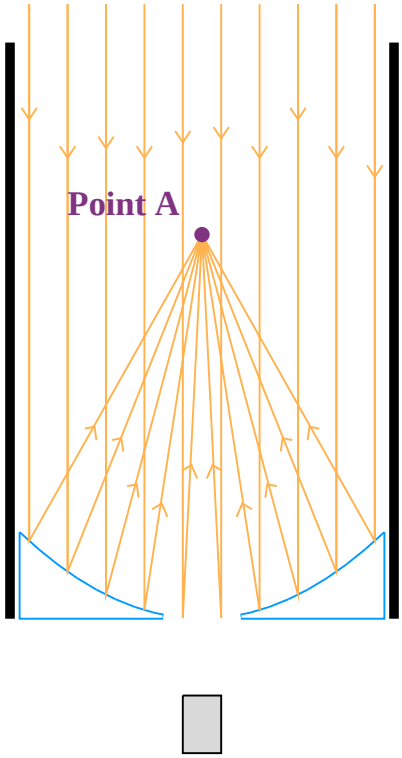
Here is a Schmidt-Cassegrain telescope:



Here is a Schmidt-Cassegrain telescope:

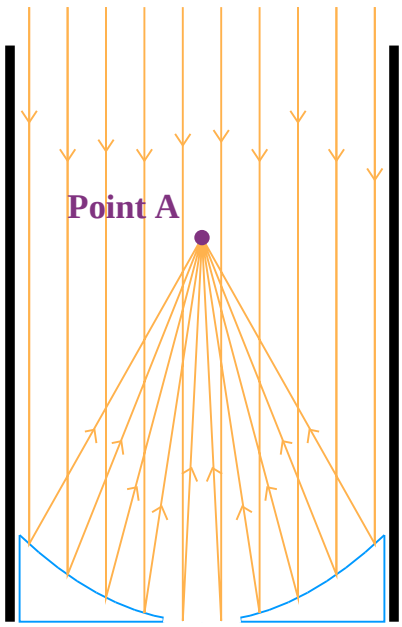


A parabolic mirror is used so that all the rays will focus at Point A if there isn't a secondary mirror.

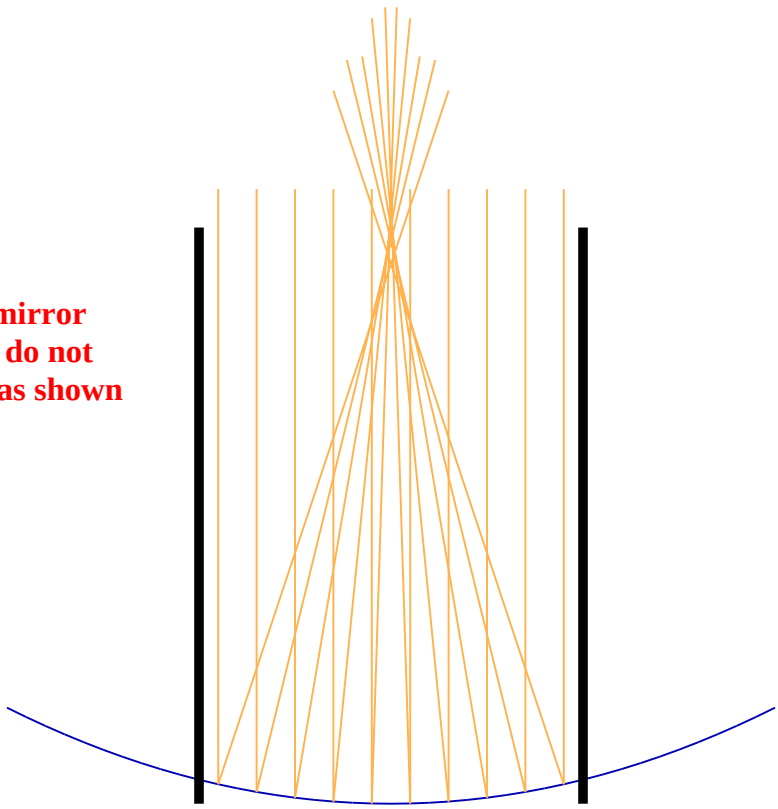


A parabolic mirror is used so that all the rays will focus at Point A if there isn't a secondary mirror.

This will produce the clearest image because the eye will be able to see all the incoming rays.

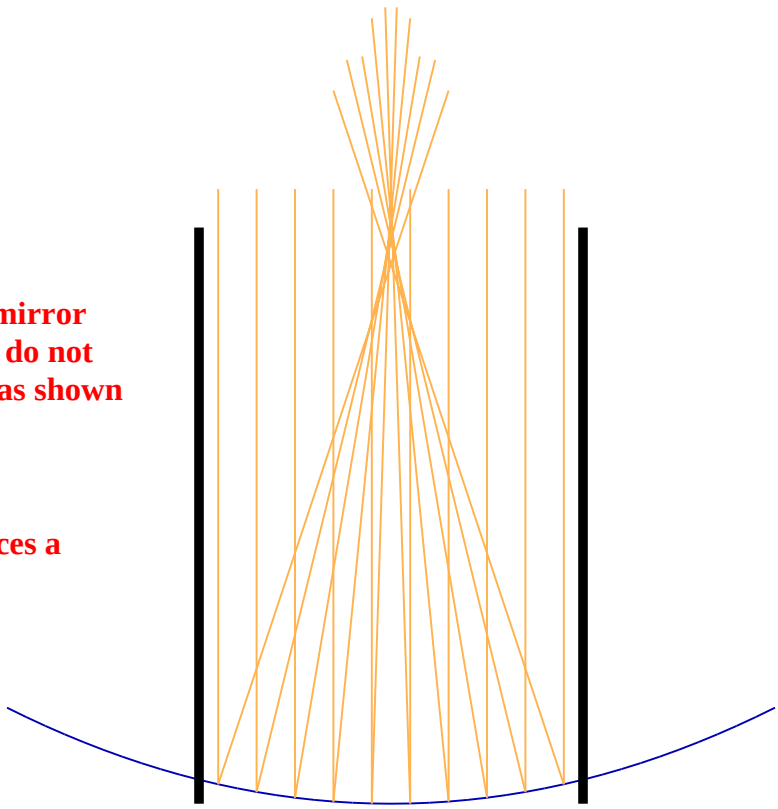


However, if a spherical mirror is used, all the light rays do not focus to a precise point, as shown in the picture.

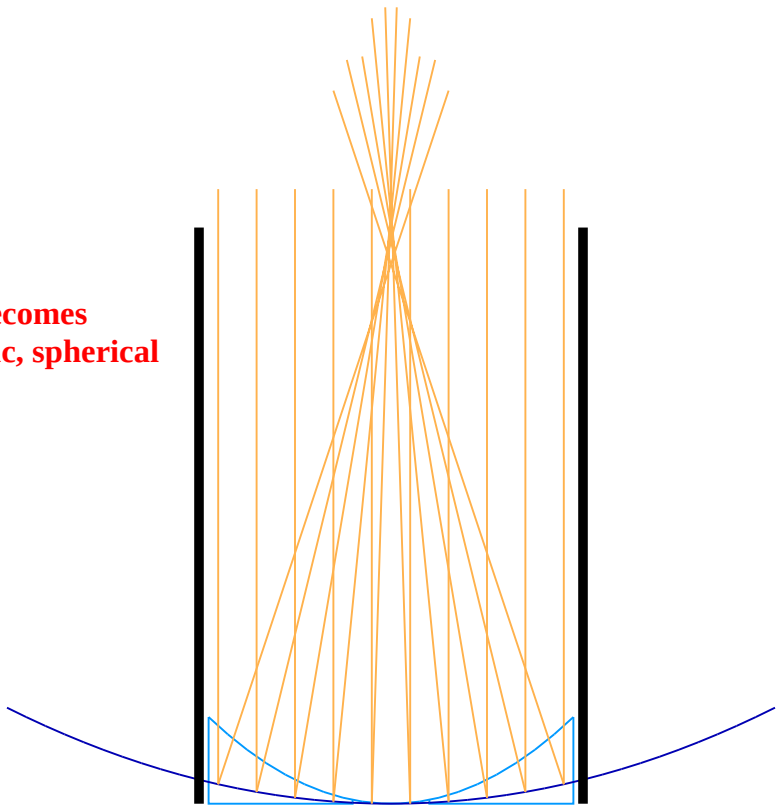


However, if a spherical mirror is used, all the light rays do not focus to a precise point, as shown in the picture.

This results in spherical aberration which produces a blurred image.

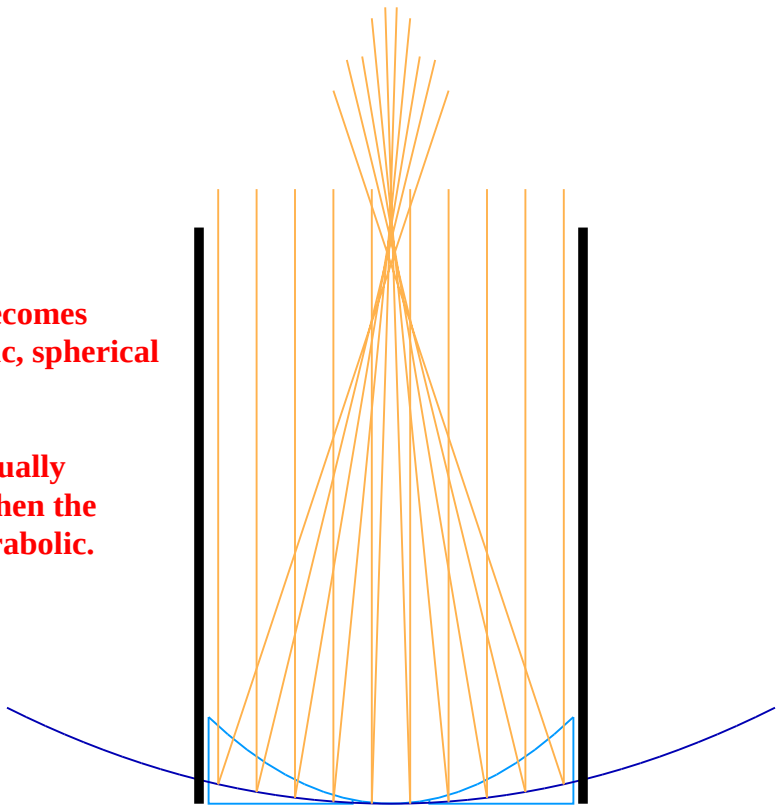


As a spherical mirror becomes more and more parabolic, spherical aberration is reduced.

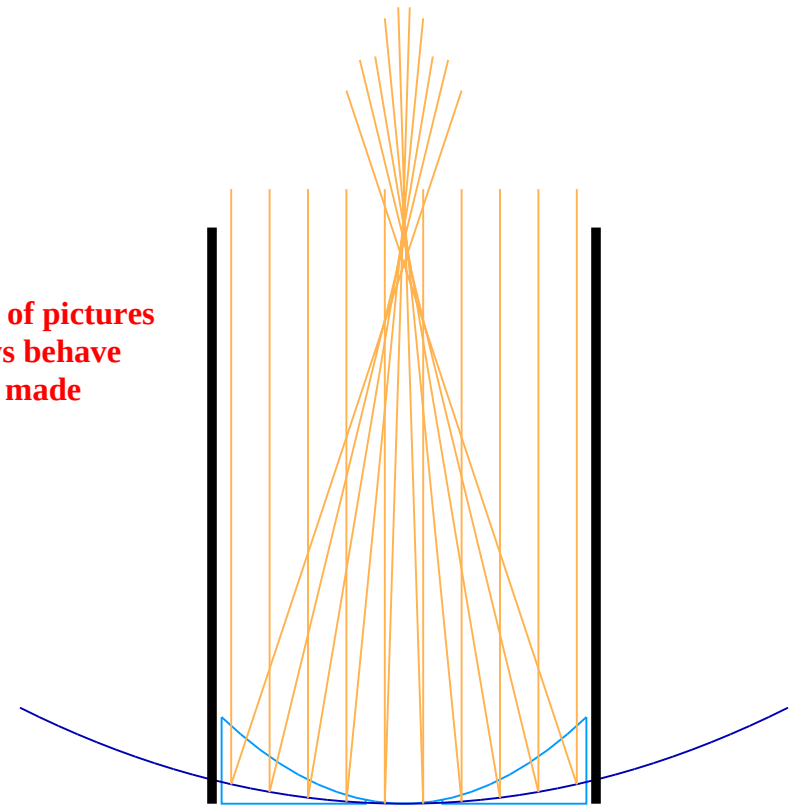


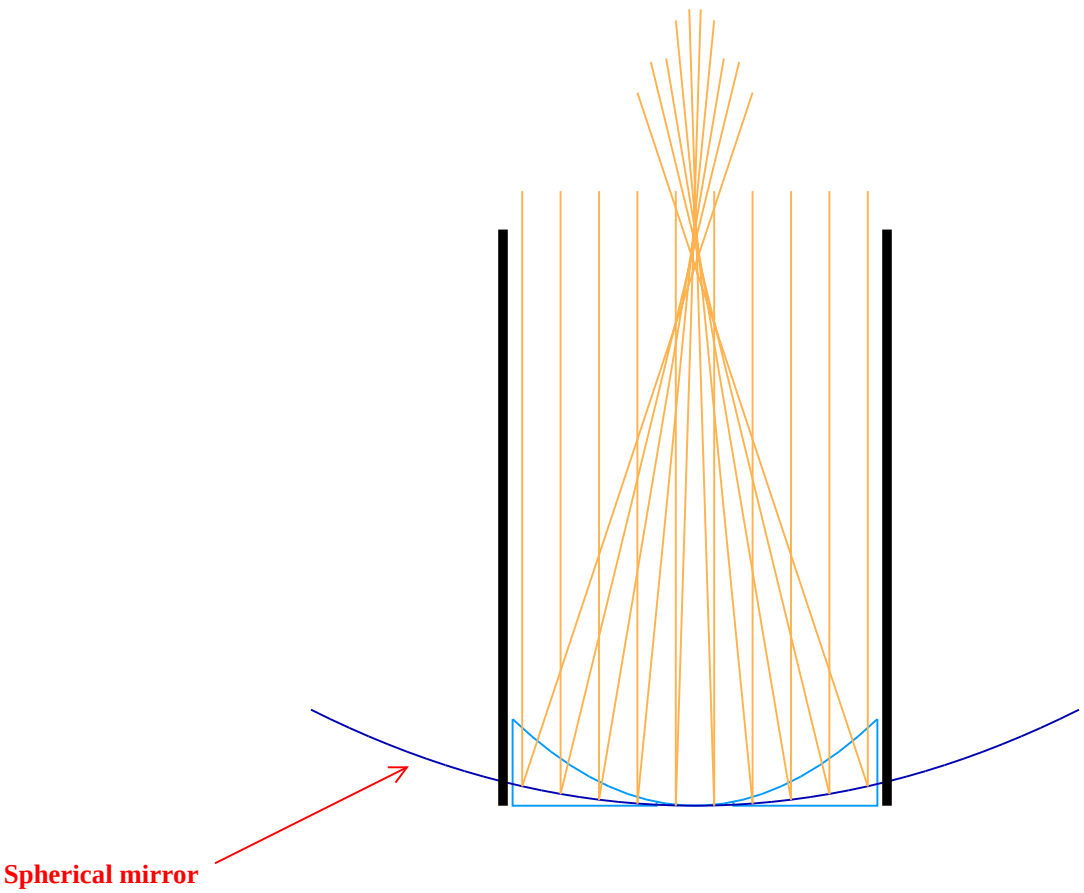
As a spherical mirror becomes more and more parabolic, spherical aberration is reduced.

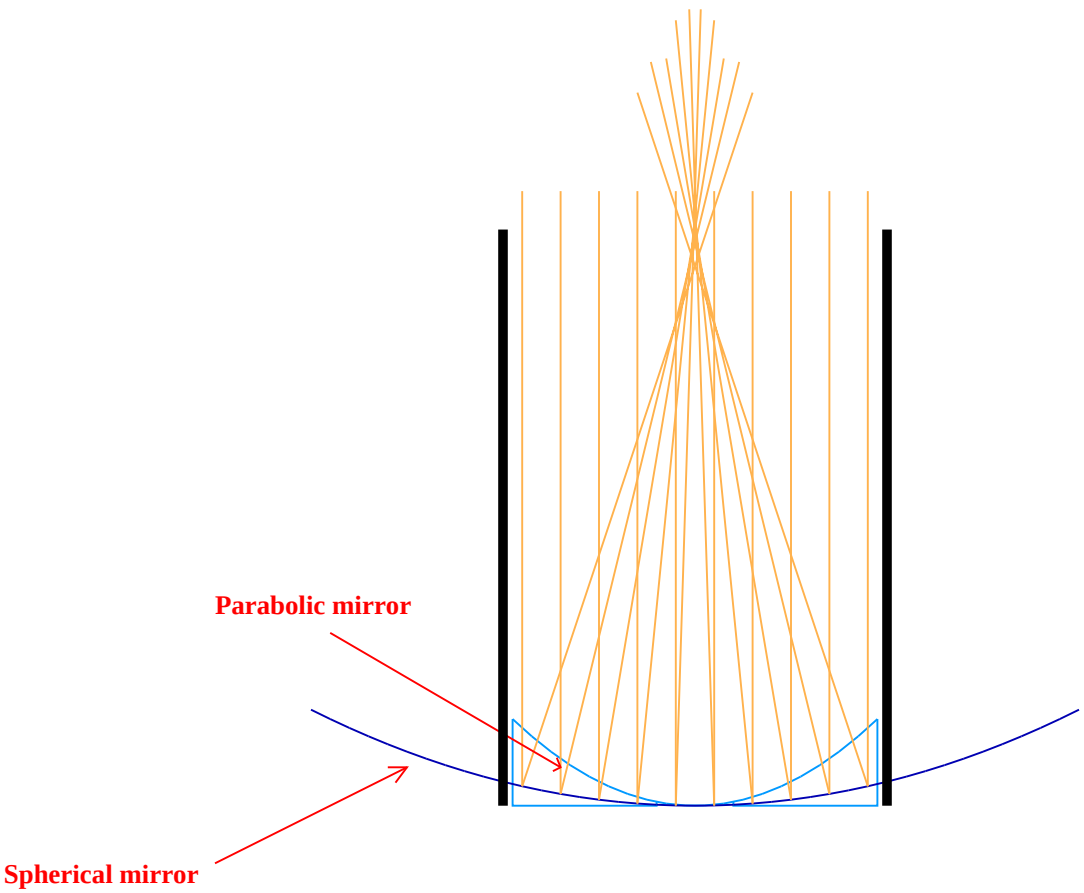
The light rays will eventually focus at a single point when the mirror is completely parabolic.



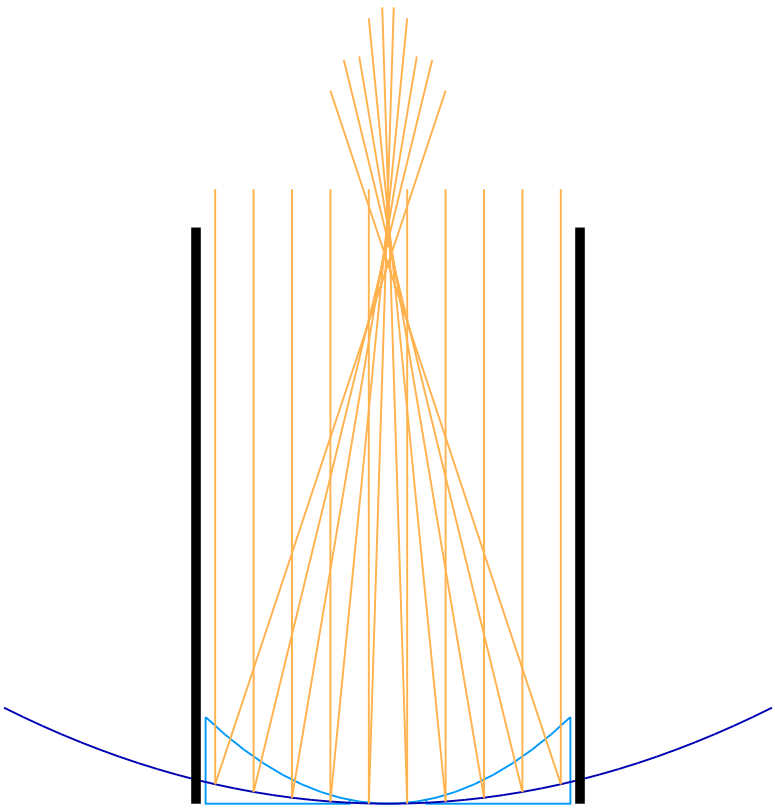
The following sequence of pictures shows how the light rays behave as a spherical mirror is made more parabolic.

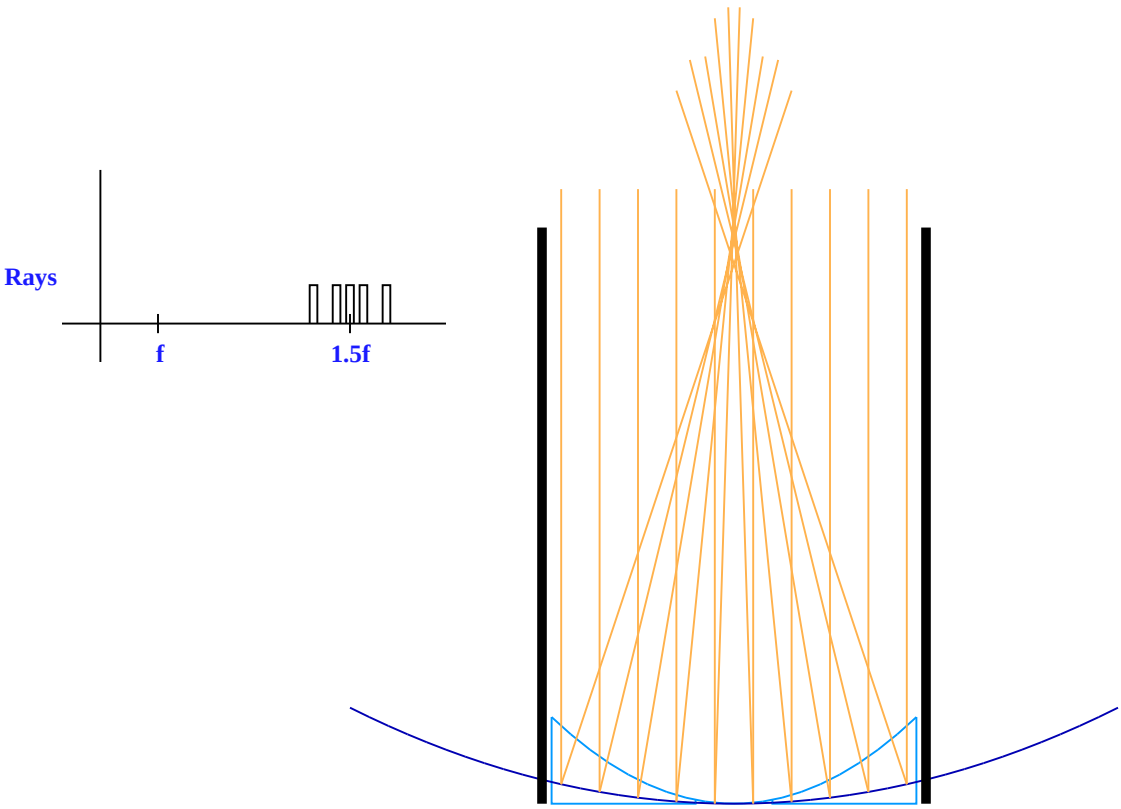


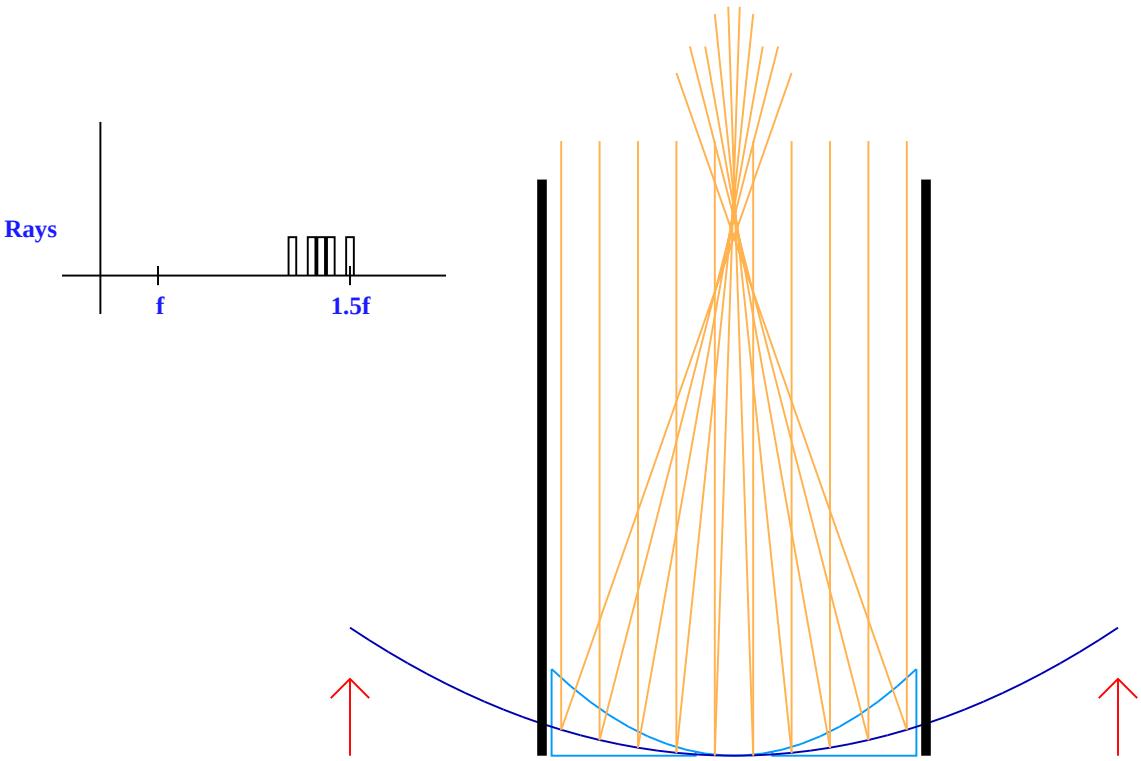

Spherical mirror

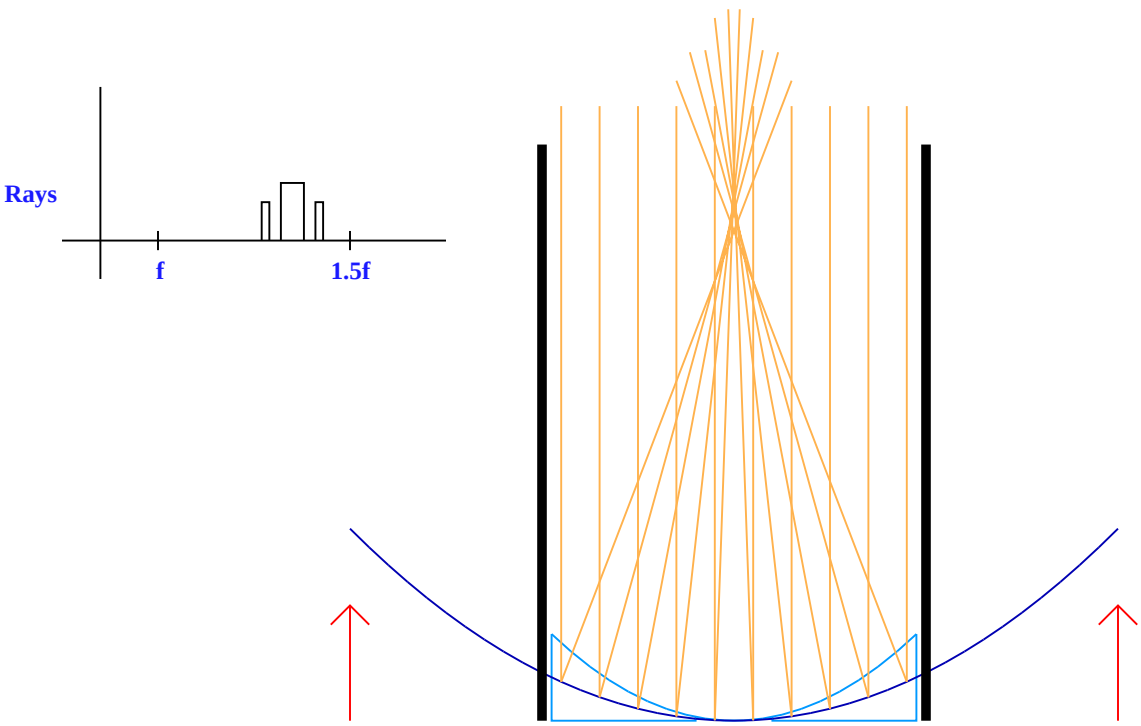

Parabolic mirror
Spherical mirror

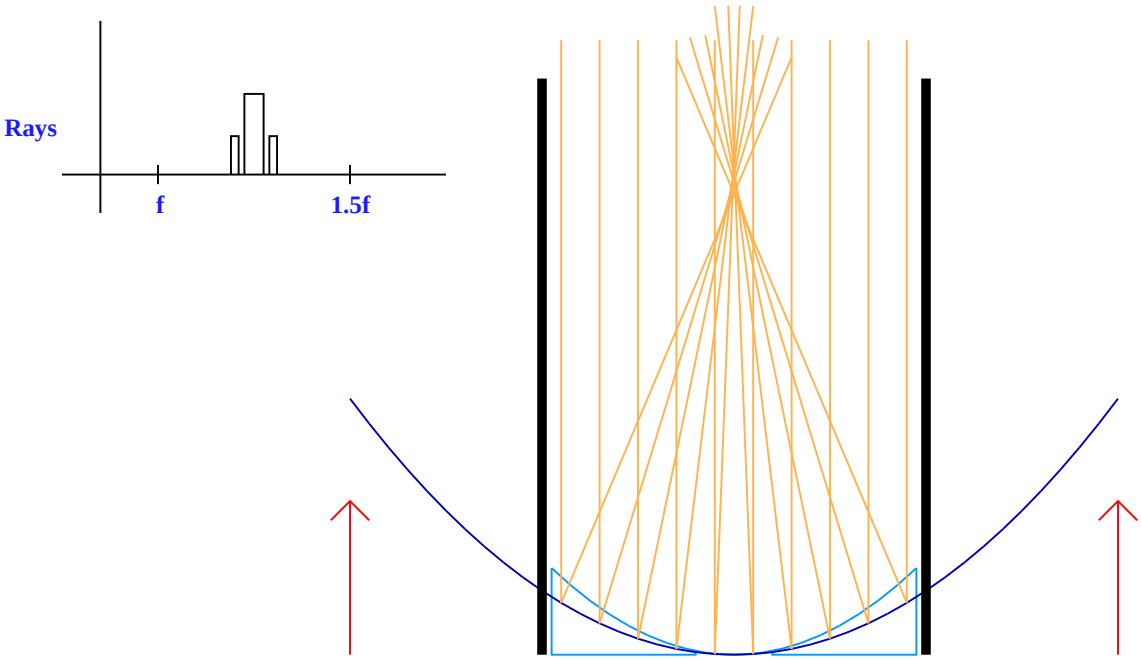
The animation begins...

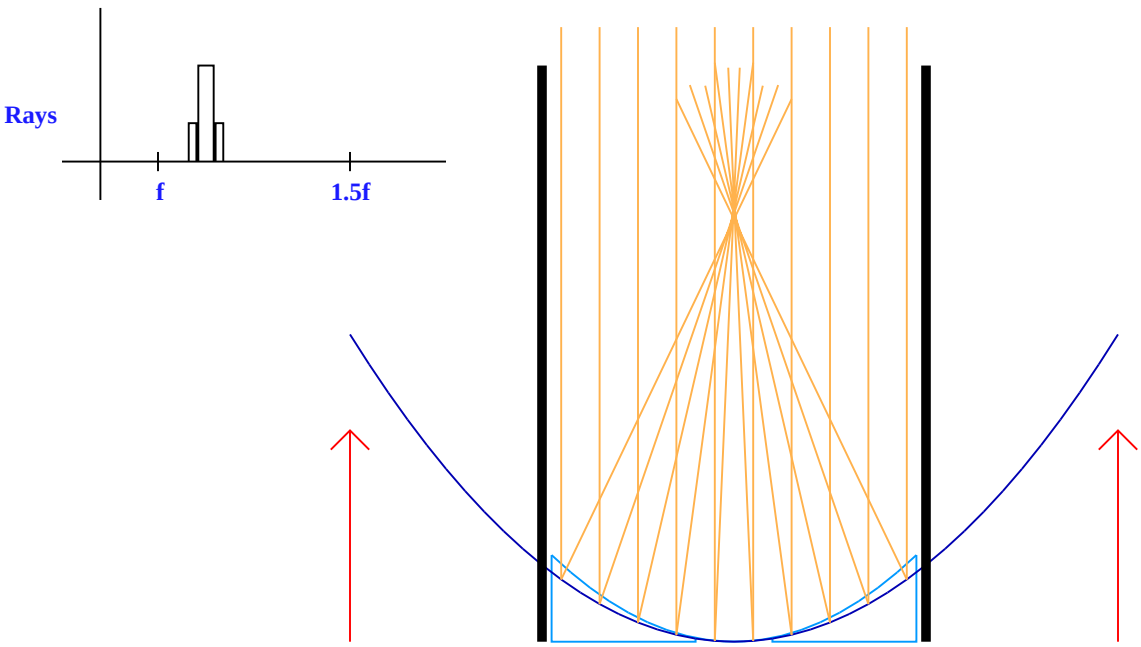


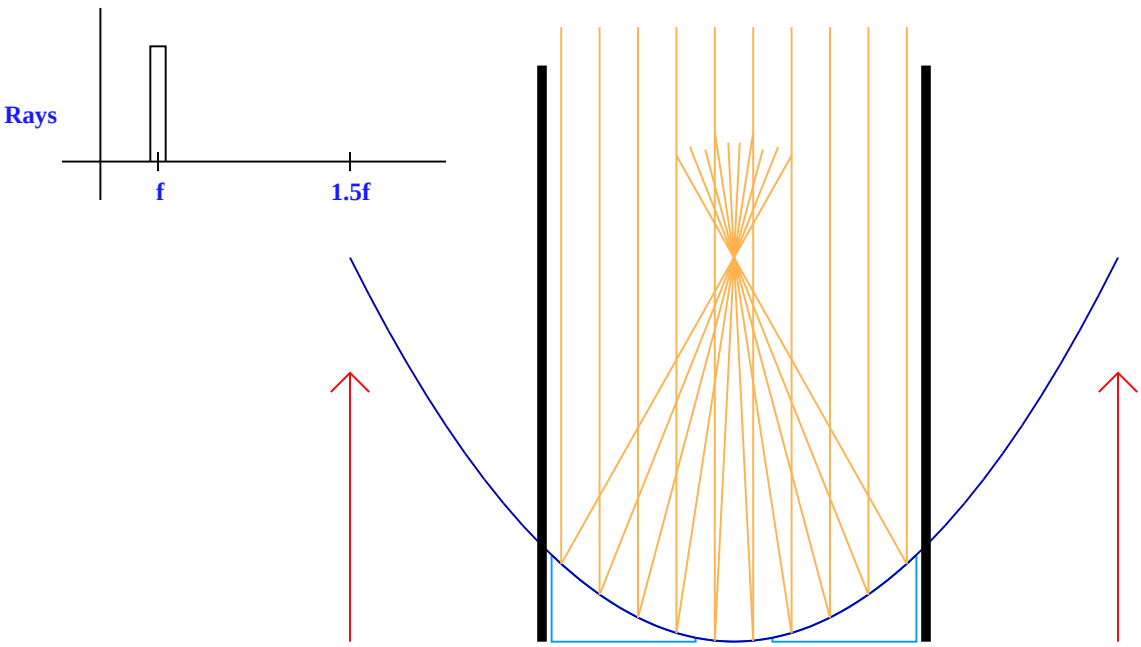

Rays
f
1.5f

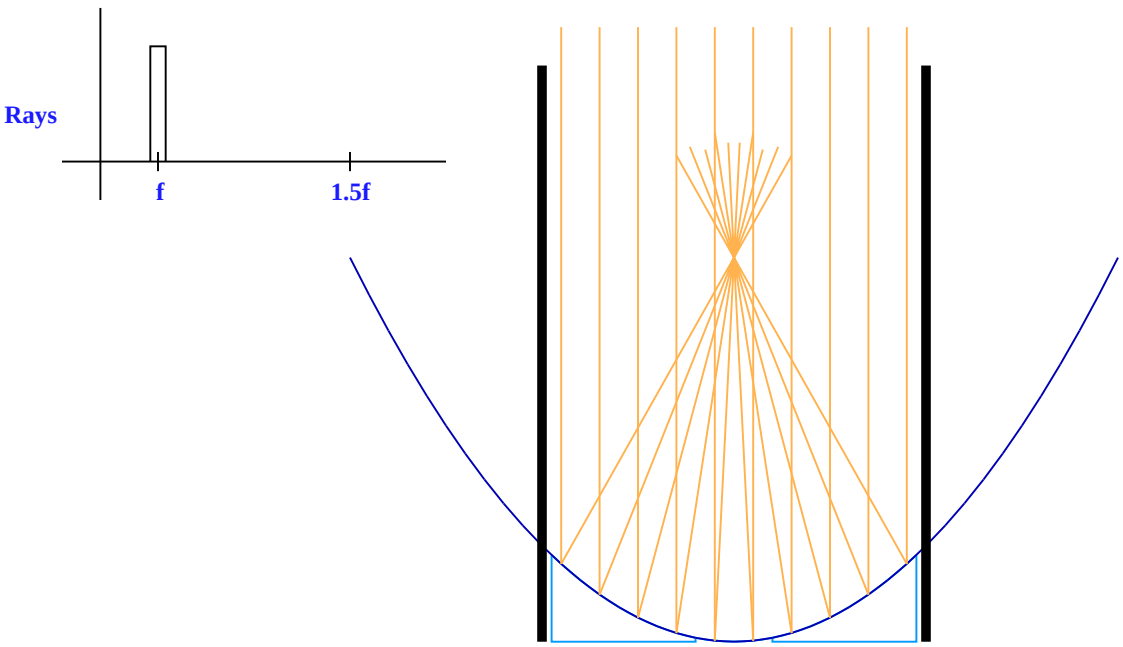

Rays
f
1.5f


Rays
f
1.5f

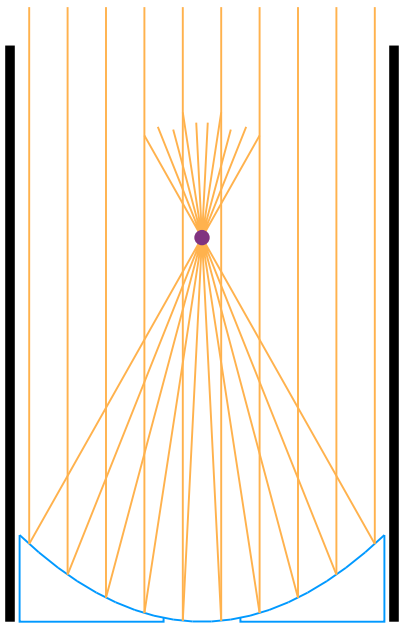

Rays
f
1.5f


Rays
f
1.5f


Rays
f
1.5f

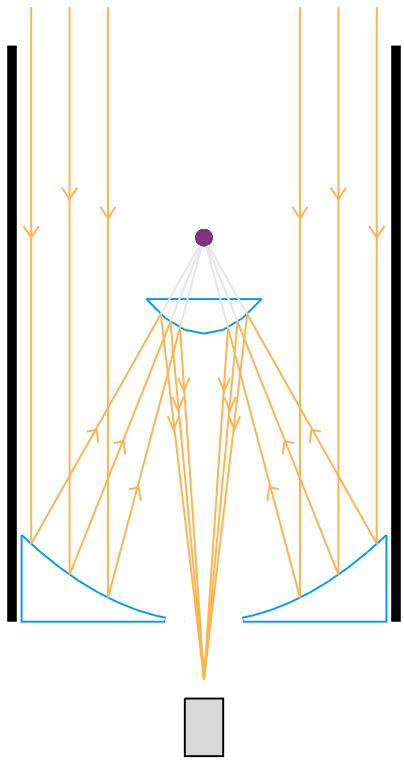

Rays
f
1.5f

As you can see, all of the rays focus at one precise point. This produces the clearest image.



As you can see, all of the rays focus at one precise point. This produces the clearest image.

Because the light rays intersect at one point behind the secondary mirror, the image seen from the eyepiece is not blurry or hazy.



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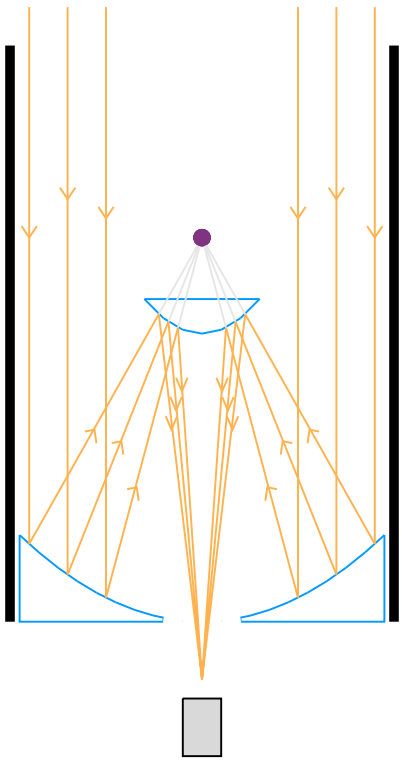
This is why a parabolic mirror is best for viewing.