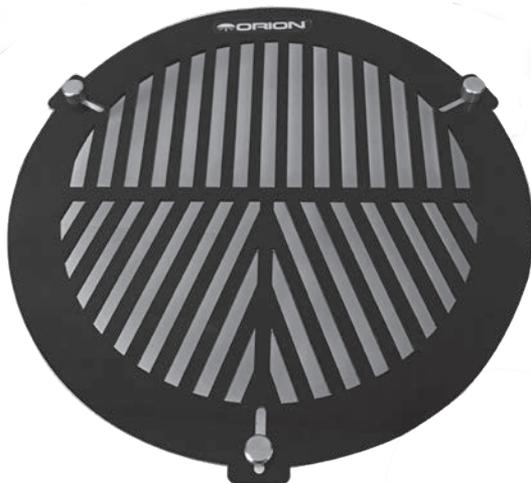


## Orion® PinPoint Telescope Focusing Masks

#40004 58-93mm; #40005 78-113mm; #40006 98-133mm; #40007 118-153mm;  
#40008 138-173mm; #40009 158-193mm; #40010 178-213mm; #40011 198-233mm;  
#40012 228-263mm; #40013 268-303mm



**Figure 1.** An Orion PinPoint Telescope Focusing Mask

Orion PinPoint Telescope Focusing Masks will ensure you achieve a precise focus for astrophotographic imaging. They take the guesswork out of finding the exact focus point, which can be difficult when looking at stars on a DSLR's small LCD screen or on a laptop's display when using a CCD camera. Whether you're doing planetary, lunar, or deep space photography, a PinPoint focusing Mask will ensure that your images are sharply focused every time.

The grid cut into the PinPoint mask, which is placed on the front of your telescope, produces three diffraction spikes when the telescope is aimed at a bright object, like a bright star. Two of the spikes form an "X", with the two lines intersecting on the star, and the third spike moves back and forth across the center of the X as the telescope's focus is adjusted. Precise focus is achieved when the center spike exactly bisects the X. It's easy to see and correct small deviations from exact focus. And the whole process takes just seconds!

Orion PinPoint focusing masks work with any type of telescope: refractor, reflector, or Cassegrain. The sizes listed above for each mask indicate the range of diameters they will fit (outer diameter of the telescope's front cell or dew shield). Make sure you carefully measure the diameter of your telescope's front cell to determine the correct mask to use.

***HANDLE WITH CARE! This mask may crack if bent too forcefully. Keep it flat when storing it and use care when handling and it will last indefinitely.***

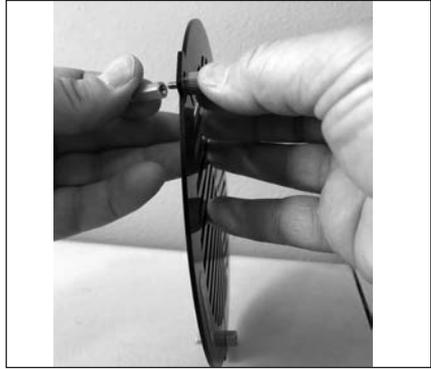
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## Removing Backing Paper

Your PinPoint mask comes with a protective adhesive backing paper on each side. To remove it just use a fingernail or knife tip to peel up a small portion at the edge, then slowly lift the rest off (**Figure 2**). Be careful not to put undue pressure on the mask when removing the backing, so as not to crack the mask.



**Figure 2.** Carefully remove the adhesive backing paper from the mask.



**Figure 3.** Attach the three grip posts to the mask with the included thumbscrews.

## Assembly

Attach the three rubber-sleeved grip posts to the mask as shown in **Figure 3**. The thumbscrew head should be on the logo side of the mask.

## Attaching the PinPoint Mask to the Telescope

Loosen the three thumbscrews a turn or two and slide the grip posts outward as far as they will go. Then place the mask over the front of your telescope. Slide each of the three grip posts inward until they contact the telescope's front cell or dew shield, then tighten the thumbscrews (**Figure 4**). To make sure the mask is centered on the front of the scope, adjust the posts so that each is at roughly the same position in its slot. To ensure a tight grip, loosen one thumbscrew slightly, then push the grip post inward while pulling the mask gently toward the loosened grip post. This will make sure that the other two grip posts are contacting the telescope when you retighten the third thumbscrew.

Now the mask should be well secured in position over the front of the telescope. You're ready to focus!



**Figure 4.** Place the mask over the front of the telescope, then slide the grip posts inward until they contact the telescope's front cell or dew shield before tightening the thumbscrews.

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## Using the PinPoint Mask to Focus

With the mask in place over the front of your telescope and your camera attached to the scope and turned on, center a bright star in the field of view. You should see the diffraction spike pattern on the camera's LCD screen (for DSLRs) or on your laptop computer running your preferred image capture software (**Figure 5**). If the scope is grossly out of focus you may see the grid pattern of the mask, in which case you should adjust the scope's focus to shrink down the grid pattern until it turns into a dot with spikes.

*NOTE: Use a bright star to focus on, not a planet. A planet is not a point source so it will not work. For planetary imaging you would focus on a star first, then move the telescope to the planet for imaging.*

A “live view” image is best if your camera or software permits it, because then you'll be able to see the results of your focus adjustments in real time, and the focusing process will be faster. If needed, though, you can take successive still exposures and review each exposure on the screen, tweaking the telescope's focus slightly after each exposure, then taking another one. In either case, you'll want to “zoom in” as needed so you can get a clear view of the spike pattern and, in particular, the center spike's position relative to the other two spikes that form the “X” (**see Figure 5**). DSLRs often have two or more magnification settings for live view focusing, and capture programs used with a laptop often allow subframe viewing, which magnifies the image.

As you turn your telescope's focus knobs to move in and out of focus, you should see that center spike move to one side and the other of the X. Make fine adjustments of the focus until the center spike lands exactly in the center of the X; that is, it bisects the X. Then you're in focus!



**Figure 5.** As the telescope's focus is adjusted, the middle spike of the diffraction pattern moves left and right of center of the “X” formed by the other two diffraction spikes. Adjust focus until the middle spike is exactly centered in the X; that's when precise focus has been achieved.

Once focus is achieved, remove the PinPoint mask. Then you're all set to photograph any object at infinity focus.

## Focusing for Visual Observation

Although a PinPoint Mask could be used to focus for visual observing, it's generally not necessary. It is intended as a tool for astrophotography.

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## One-Year Limited Warranty

This Orion product is warranted against defects in materials or workmanship for a period of one year from the date of purchase. This warranty is for the benefit of the original retail purchaser only. During this warranty period Orion Telescopes & Binoculars will repair or replace, at Orion's option, any warranted instrument that proves to be defective, provided it is returned postage paid. Proof of purchase (such as a copy of the original receipt) is required. This warranty is only valid in the country of purchase.

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