

Make a Box Mount & Solar Shield for Your Galileoscope Text & Photos by Rick Fienberg, Galileoscope, LLC



The <u>Galileoscope</u> has a standard ¼-20 nut in the base, so you can attach it to any standard photo tripod. What if you don't have such a tripod? A medium-to-large corrugated cardboard box and small ¼-20 bolt or machine screw will do! This idea was first popularized for the Galileoscope in 2010 by Shannon Murphy, who provides an alternative set of instructions on his blog.



File-storage boxes, which you can pick up at any officesupply store, are particularly convenient. They come flat, and you assemble them with a few quick folds. One advantage of these boxes is that the lids are separate, so you can use them as solar shields, as explained below. The accompanying instructions were written for a Staples economy storage box, which assembles to a final size of 15½ x 12 x 10½ inches (L x W x H). But any similar or larger cardboard box will work just as well as a mount, and any large, flat piece of cardboard or foamboard will work fine as a solar shield.

The essential function of the box mount is to hold your Galileoscope steady no matter where it's aimed in the sky.

You put the box on a small table and sit in a chair or on the ground so that you can look up at the sky through the telescope.

The solar shield is to be used only in conjunction with a special-purpose solar filter placed securely over the front of your Galileoscope so that you can safely observe our daytime star. The accompanying photos show Rainbow Symphony's 50-mm-aperture, 70-mm-diameter black-polymer solar filter, which we sell in six-packs bundled with cases of Galileoscopes (6 kits/case).

The solar shield has two purposes: to enable you to quickly and easily aim your Galileoscope at the Sun, and to cast a shadow over the eyepiece (and your head) so that you can look through the telescope without having the bright Sun in your face.

Box Mount

Supplies and tools:

- Medium to large corrugated cardboard box
- ½-inch-long ¼-20 machine screw or bolt
- Screwdriver, hex key, or wrench (whatever matches your bolt/screw)
- Assorted washers
- Sharp pencil
- Paperweight, book, or other small weight

Step 1: If you need to assemble your box, do so now — but don't assemble the lid, which you should set aside.

Step 2: Set the box on one of its small sides, i.e., so that the box stands tall. If you're right-handed, turn the box so that the bottom faces right. If you're left-handed, turn the box to that the bottom faces left.

Step 3: Use the pencil to poke a hole through the bottom of the box roughly 2 inches down from the top and 2 inches in from the side facing you.



Step 4: Put a washer on the screw/bolt and push the screw/bolt through the hole from the inside. The threaded end should stick out no more than ¼ inch from the bottom of the box. If it sticks out farther, add another washer or two.



Step 5: Attach your Galileoscope to the screw/bolt. (Depending on the size of the box and your level of manual dexterity, you may find it easier to hold the screw/bolt and turn the Galileoscope than to hold the

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Galileoscope and turn the screw/bolt.) You want it just tight enough to stay put, not tight enough to crush the cardboard. If hand-tight is tight enough, great. If not, use a tool to tighten the screw/bolt a little more.

Step 6: If the box tends to tip over once the Galileoscope is attached, put a paperweight or book or something similar inside the box to keep it upright.

You're done! To aim your Galileoscope in azimuth (left-right), just turn the box. To aim in altitude (updown), just tip the telescope tube up or down.

Solar Shield

Supplies and tools:

- Flat piece of corrugated cardboard, preferably at least 11 x 14 inches
- Pencil
- Small, sharp knife (e.g., X-Acto, box cutter, pen-knife)

Step A: Remove the lens shade (dew cap) from the front of your Galileoscope and retrieve the lid from your storage box.

Step B: Lay the cardboard flat, white side up, and place the lens shade small end down (sky end up) on the cardboard. Position it so that it's 4 to 6 inches from one short edge and centered between the long edges.

Step C: Hold the lens shade firmly and trace a circle around the outside of it on the cardboard using the pencil.



Step D: Taking care to cut slightly to the *inside* of the penciled circle (and not to damage the tabletop or other surface under the cardboard), use the knife to cut out the disk you just traced.

Step E: Insert the lens shade into the round hole — it should fit snugly.



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Step F: Attach a safe solar filter, such as a Rainbow Symphony black-polymer filter, to the front of the lens shade. The filter should fit snugly so as not to fall off or blow off in a breeze. Rainbow Symphony filters come with a strip of felt with double-stick tape on one side. If your filter is loose, cut a 1-inch piece of felt and stick it on the inside wall of the filter cell. If the filter is still too loose, add more pieces of felt as needed.

Step G: Reattach the solar-filter-capped lens shade to your Galileoscope and turn it (or turn the cardboard) so that the short edge of the solar shield nearest the hole you cut faces the ground and the opposite short edge faces the sky. Push the cardboard toward the front (sky end) of the telescope so that it sits flush against the lens shade.

You're done! Aim your Galileoscope roughly toward the Sun and observe the shadow of the lens shade on the cardboard. Adjust the aim so that the shadow is as small as possible and centered on the shadow of the solar filter. When you look through the eyepiece and focus, your head should be in the shade and you should see a safely filtered view of our daytime star!



Note: When you add the solar shield to your box-mounted Galileoscope, the telescope will be unbalanced, i.e., it'll be front-heavy. You may need to tighten the mounting screw/bolt a bit more to keep the telescope from slipping (again, take care not to crush the wall of the box). Alternatively, you can add a small counterweight to the tube near the eyepiece; for example, tape on a small beanbag or equivalent.

If it's breezy outside and you're using a solar shield, you may need to add more books or other weights to the inside of the box to keep it from blowing over or away.