

# CARE OF YOUR ASTRO-PHYSICS REFRACTOR

Astro-Physics refractors require little or no maintenance under normal use. The optics are collimated at the factory when the telescope is assembled. Due to the rugged construction of the tube assembly, the optics should remain in alignment and will not require further adjustment unless the telescope is subjected to a strong blow. Nevertheless, your refractor is a fine instrument and should be handled with care. You will be rewarded with years of observing pleasure.

## Optical performance

When using the telescope at high power, it is important that the "seeing" be taken into account. Seeing refers to the steadiness of the air, not to the transparency (darkness or clearness) of the night. When the seeing is good, out-of-focus star images will be round and steady at high powers. When seeing is not good, out-of-focus stellar disks will bend, distort and dance around, or show shearing lines characteristic of rapidly moving atmospheric air. Under those conditions, high power observations may be impaired.

All optical glass, except for zero-expansion material, has a finite coefficient of expansion. When lenses are subject to large temperature fluctuations (such as being brought out into the cold night from a warm room), the lens figure will change drastically and the initial view through the instrument may be disappointing. Until the optics are settled down, the figure will not be at optimum correction. The smaller 4 and 5 inch lenses generally settle down in 30 minutes. The 6 inch lenses may take up to an hour to fully settle down. If the temperature drops below freezing, it may take somewhat longer.

If you are transporting your scope to your favorite observing site, be aware of the possible temperature differences between your scope and observing site. For instance, if the weather at your home is 90 degrees Fahrenheit and you load your scope into your car trunk or an open truck (or other non-air-conditioned place) with the sun beating down on it, the temperatures will rise above 100 degrees F. If you drive to the cool mountains (temperatures in the 40's F.), your scope will be subjected to extreme temperature differentials and will take much longer to cool down. It would be much better in this circumstance for the scope to ride in the air-conditioned car with you.

## Cold Weather

There are steps you can take to minimize thermal shock. Leaving the scope in an unheated garage, instead of the warm indoors, is a good example. You should leave the dewcap in place (retracted/reversed) for the 1<sup>st</sup> hour. This will act as insulation around the outside of the lens cell, thus assuring a more even cool down of the glass.

We suggest that you leave your case outdoors while you are observing. This will assure that your scope and case will be about the same temperature at the end of the evening. If there is a lot of dew, you may wish to place it under an overhang, in your car or cover it to keep it dry. To prevent moisture from accumulating inside the case, keep the lid closed.

When taking the scope down, cover the lens with the dustcover while the lens is still cold. Place the tube assembly in the case while you are still outdoors. If you do this, the scope will warm up gradually in the case when you take it indoors. *Do not take the tube assembly indoors without the case. A tremendous dewing and moisture buildup will occur just as it does on eyeglasses when you step into the house on a cold day.*

## Dew

The formation of dew is slowed, but not prevented, by the dewcap of your instrument. As long as the air temperature is falling, the lens surface lags slightly behind and dew will not form. When the air temperature stabilizes, the lens eventually reaches dewpoint and will dew over.

If dewing is a problem at your location, we suggest the Kendrick Dew Remover System, which applies a slight amount of heat to the lens cell. This will prevent dew from forming. Turn it on at the beginning of your session a low or mid-level setting and you will be observing long after others have been forced to close down for the night.

*It is not advised to blast dew off with a hot hair dryer, or to wipe it with cloth. Hot blasts of air cause optical glass to rapidly expand and will ruin the lens's figure for the better part of the evening. In extreme cases, permanent damage to the glass can result. If dew must be removed by blowing air at the lens, use cool or very slightly warmed air (blow the air at the back of the hand to judge its temperature). Keep the dryer well away from the lens surface. In below zero degree conditions, it is not advisable to blow any warm air at the lens surface.*

As in cold weather, at the end of your observing session, place the scope with the dustcover into the case prior to bringing it into the house or other warm environment. This will help to prevent the formation of dew or frost since the scope will return to room temperature at a slower rate inside a closed case.

## Cleaning

Minimal cleaning of your optics is recommended. Under heavy dewing conditions, or in areas of airborne dust or pollutants, the front surface of the lens will acquire a layer of dirt. Normally, this will not degrade the image quality. Improper cleaning procedure will cause scratches in the front surface coating and, in extreme cases, in the glass itself. A little bit of dirt is preferable to damaged coatings. We recommend cleaning once a year or less if the scope is not used often.

For optimum cleaning results, we suggest that you use the [Astro-Physics Optical Cleaning System \(OPTCS\)](#) available for purchase. This kit contains Baader Optical Wonder™ Cleaning Fluid, Purosol™ Enzyme Optical Fluid and Lint-free Professional Optical Cleaning Wipes. Optical Wonder™ is especially good at removing dew spots and fatty contaminants from fingerprints, eyelashes and most pollens. It also destroys and removes bacteria and fungi that can harm optical coatings and prevents their return. Purosol™ is a unique enzyme based formula that attacks the way contaminants bond to surfaces. Purosol™ is recommended for more stubborn contaminants like tree sap and stubborn pollens. Lint-Free Professional Optical Cleaning Wipes disposable cloths are baby soft, completely sterile, and totally lint-free. Disposable wipes are preferable to reusable micro-fiber cloths because they won't harbor any damaging particles of dirt left over from previous cleanings (or earlier steps in your current cleaning). Detailed [instructions](#) for the use of all three products are provided with the Optical Cleaning System and are also available on our website.

If you do not have the Optical Cleaning System products, we recommend the following procedure: If you must clean, first blow loose dirt away with an air bulb (from a camera store) or a can of compressed air. (See precaution on canned air in Optical Cleaning System [Instructions](#)) Stubborn particles can be removed with a soft camelhair brush. Next, soak a single facial tissue in mild soap and water solution. The entire tissue is then gently pulled over the surface of the lens. A dry tissue is then used to remove excess water. This is followed by one gentle swipe with a denatured alcohol (isopropyl alcohol has high water content) wetted tissue (removes fingerprints) and a final swipe with an acetone wetted tissue (removes stains). Sometimes a faint stain or film will stay behind where the tissue has been lifted off the glass. This will cause no harm to the glass; nor will it degrade the image in any way. It is best left alone. **Excessive cleaning is to be avoided.**

07-05-06