



TRAVEL SCOPE 50

SUN OBSERVING TELESCOPE WITH BACKPACK

Instruction Manual MODEL # 22060



Conforms to and meets the
Transmission Requirements
of ISO 12312-2, Filters for
Direct Observation of the Sun

The permanently mounted glass solar filters in this product:

- Conform to and meet the Transmission Requirements of ISO 12312-2, Filters for Direct Observation of the Sun.
- Meet the Transmission Requirements of EN 1836:2005 + A1:2007 (E) for an E15 Filter for the Direct Observation of the Sun.
- Meet the Transmission Requirements of AS/NZS 1338.1:2012, Filters for Eye Protectors.

EC Type Examination by: SAI Global Assurance Services Ltd. (Notified Body No. NB2056), MK5 8HJ U.K.

WHAT'S IN THE BOX

We recommend saving your telescope box so it can be used to store the telescope when it is not in use. Unpack the box carefully as some parts are small. Use the parts list below to verify that all parts and accessories are present.

PARTS LIST



SOLAR WARNING

Even though your EclipSmart telescope is equipped with ISO certified solar filters that allow safe direct observation of the Sun, there are still some important rules you should follow when solar observing:

- Never look directly at the Sun with the naked eye or with a telescope unless you have the proper solar filter. Permanent and irreversible eye damage may result.
- Never use a telescope to project an image of the Sun onto any surface. Internal heat build-up can damage the telescope and any accessories attached to it.
- Never use an eyepiece solar filter or a Herschel wedge. Internal heat build-up inside the telescope can cause these devices to crack or break, allowing unfiltered sunlight to pass through to the eye.
- Do not leave the telescope unsupervised, especially when children or adults unfamiliar with the correct operating procedures of your telescope are present.

ASSEMBLING YOUR TELESCOPE

THE MOUNT & TRIPOD

The tripod and mount come preassembled so the setup is very easy:

1. Stand the tripod upright and pull the tripod legs outward until the tripod's center leg brace slides down to the bottom of the center column.
2. You can extend the tripod legs to the height you desire. The lowest setting of 16 inches is perfect for tabletop use, while the fully extended height is 43 inches. To change the height, pull open the three leg clamp levers on each leg. Pull the legs out to the desired length and press the clamp levers closed.
3. Your tripod also has an extendable center column, allowing you to raise the mount up to another 6 inches. Turn the center column locking knob counterclockwise until the column is unlocked. Pull the mount head upward until you are at the desired height and turn the center column lock knob clockwise to lock the column in place. With the legs fully extended the mount will now be 49 inches tall.



Tripod open in lowest position



Tripod leg clamps



Center column lock knob

THE TELESCOPE TUBE

The tripod and mount come preassembled so the setup is very easy:

1. Loosen the platform tilt knob by turning it counterclockwise. This allows you to tilt the telescope mounting platform 90° to the right to the vertical position, allowing for easy access of the mounting knob underneath the platform. Tighten the tilt knob to secure the platform in place.
2. Locate the 1/4-20 threaded hole in the plate on the bottom of the telescope tube. Place it over the threaded bolt on the mounting platform and tighten the knob by turning it clockwise until it is finger tight. **DO NOT OVERTIGHTEN.**
3. With the telescope now attached to the mount, loosen the platform tilt knob and rotate the platform to the left 90 degrees to its original horizontal position. Tighten the tilt knob to secure the platform in place.



THE STAR DIAGONAL

The star diagonal is a mirror that diverts the light at a right angle to the light path of the telescope. This allows you to observe in a position that is more comfortable than if you had to look straight through. When looking through the eyepiece, the image will appear to be correctly oriented up and down, but will be mirror reversed left to right. This is perfectly normal.

To install the diagonal:

1. Remove the cap from the focuser of the telescope by turning the silver set screws counterclockwise until they are no longer protruding into the focuser tube.
2. Remove the caps from both ends of the star diagonal.
3. Insert the silver barrel of the star diagonal into the focuser tube.



THE EYEPIECES

Your EclipSmart telescope comes with one high quality 20 mm eyepiece that will give you 18x magnification and a 2-degree field of view. This is a perfect magnification for watching the phases of a solar eclipse or just looking at sunspots at any time. You can increase the magnification by using optional eyepieces with focal lengths shorter than 20 mm. Your scope can accept any industry-standard 1.25 inches diameter eyepiece between 5 mm and 32 mm focal length.

To install an eyepiece:

1. Loosen the setscrews on the open end of the star diagonal.
2. Insert the silver barrel of the 20 mm eyepiece into the diagonal.
3. Tighten the setscrews to secure the eyepiece.



FOCUSING

When you first look through the telescope at the Sun, the image will likely be blurry. To bring the image to a sharp focus:

1. Look at the Sun through the 20 mm eyepiece.
2. Turn the focus knob located under the back and forth until the edge of the Sun is as sharp as possible.

If observing with a group of people, each person viewing through the telescope should focus the image for their own eyes. If you use additional eyepieces to increase magnification, you should readjust the focus each time you switch eyepieces.



MOVING THE TELESCOPE

The photo-style altazimuth mount is simple to use. To move the scope left and right, loosen the azimuth tension knob at the base of the mount. Hold one of the tripod with one hand and grab the panning handle with the other. Move the scope to the desired location. You can adjust the tension of the left and right motion by adjusting the tightness of the azimuth tension knob.

To move the scope up and down, loosen the altitude clutch by turning the entire panning handle counter-clockwise. Move the handle up or down as required and turn the handle clockwise to lock the scope on target.

NOTE: When observing, the Sun will appear to slowly drift in your field of view. This is perfectly normal and is caused by the Earth's rotation. You will need to re-center the Sun in your field of view every couple of minutes. If you use any optional higher magnification eyepieces, the drift will become more apparent and you will need to readjust the telescope's position more often to keep it in the field of view.



THE SOLAR FINDERSCOPE

The EclipSmart telescope comes with a 100% safe solar finderscope that allows you to align your telescope without looking directly at the Sun. The finderscope is already installed and is ready for use. To use this finder:

1. Point the telescope in the general direction of the Sun.
2. Look at the large round bulls-eye pattern on the sunlit side of the finderscope.
3. Adjust the position of the telescope until the shadow of the ball at the end of the projection arm is within the innermost circle of the bulls-eye pattern.
4. This Sun should appear somewhere in the field of view of your 20 mm eyepiece, but may not be perfectly centered. Looking through the eyepiece, adjust the position of the telescope until the Sun is centered. If the Sun is not visible in the eyepiece, put the shadow of the projection arm over the innermost ring and slowly search in a circular pattern until you see the sun in the eyepiece.



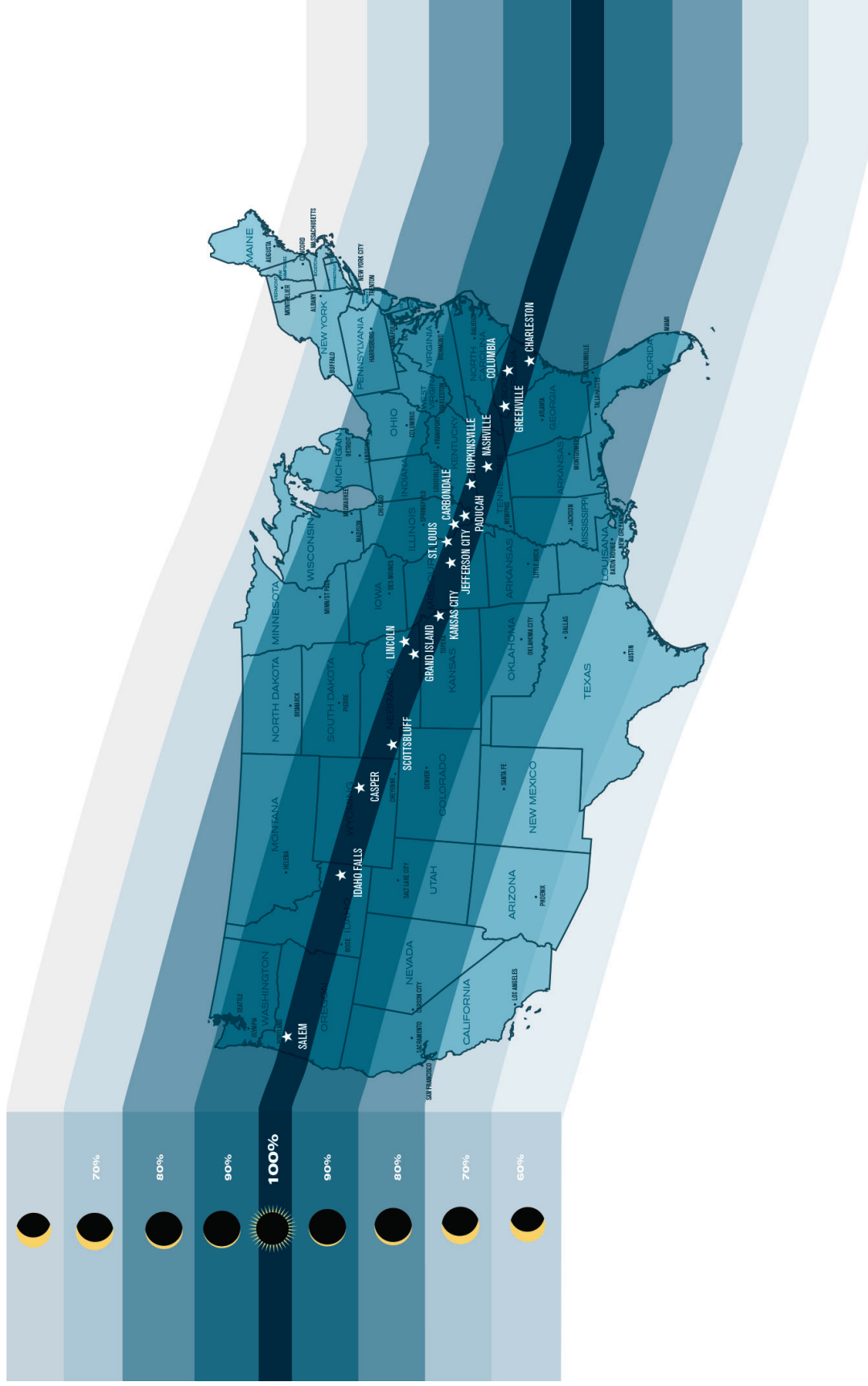
Sun shadow not perfectly centered



Sun shadow centered on bull's eye pattern

THE GREAT AMERICAN SOLAR ECLIPSE OF 2017

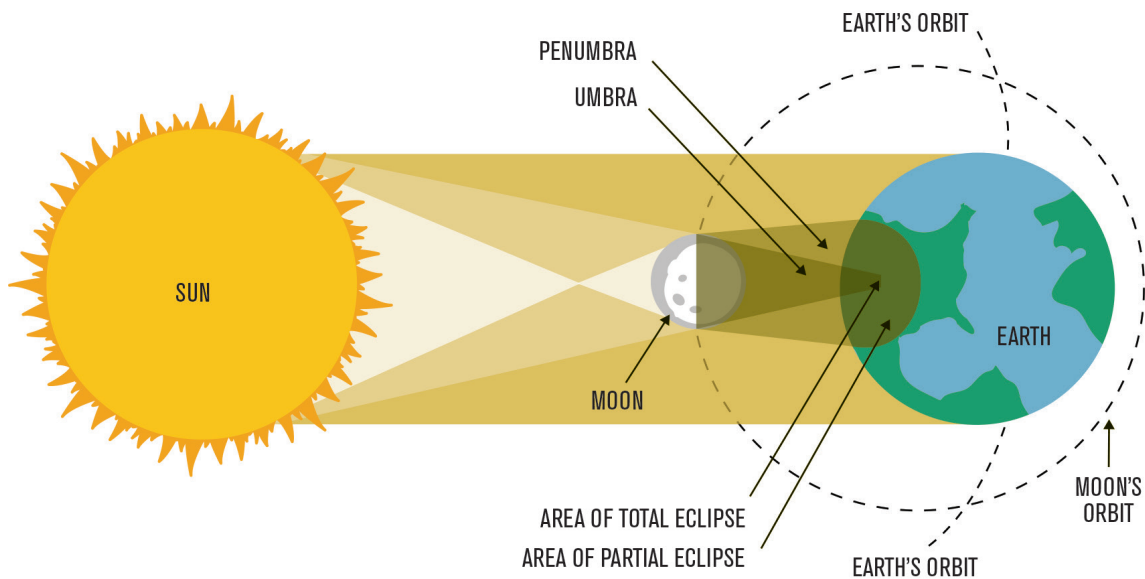
On August 21, 2017, one of the greatest spectacles of our time will take place over most of North America – a total solar eclipse. The Moon will pass between the Earth and the Sun and the Moon's shadow will trace a path directly across the United States from coast to coast.



Travel Scope 50

While solar eclipses happen somewhere on Earth at least twice a year, the last time there was a total solar eclipse over the USA was in 1979. At that time, the Sun just grazed the states of Washington, Idaho and Montana. The coast to coast August 2017 total solar eclipse is expected to be the most watched celestial event in American history.

A total solar eclipse occurs when the Moon is close enough to Earth in its orbit so that it blocks the entire disk of the Sun from view. The partial phases of a total solar eclipse leading up to totality are incredible to watch. The Moon will first appear as a small dark dent in the edge of the Sun, growing to a large bite. If you are in the path of totality, the Sun will eventually become a thin crescent and will disappear completely. For a couple of minutes, daytime turns to deep twilight and bright stars and planets are visible in the daytime sky. After totality, the process reverses itself as the Sun reemerges from behind the Moon. It is a sight that should not be missed.



How much of a given total solar eclipse you can see will depend greatly on where you are located. The closer you are to the centerline of the path of the Moon's shadow, the greater the percentage of the Sun will be blocked and the longer the solar eclipse will last. In order to experience totality, you need to be directly under the Moon's shadow. This path of totality is extremely narrow and for the 2017 total solar eclipse is only 75 miles (120km) wide. If you are too far north or south of the path of totality, you will only see a partial solar eclipse. Even if you are unable to travel to the path of totality, everyone in the continental United States and most of Canada will be treated to a partial solar eclipse with at least 60% of the Sun covered by the Moon.

With your EclipSmart telescope, you are ready to be part of history.

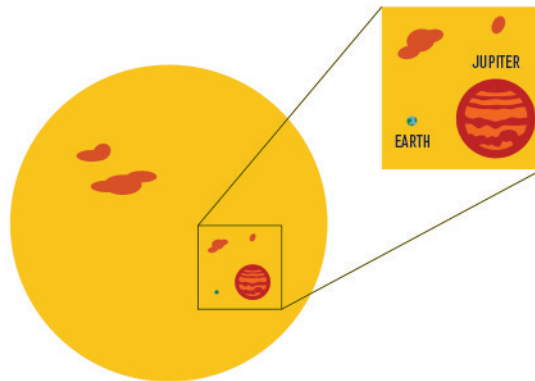
OBSERVING THE SUN

In addition to observing solar eclipses, your scope is capable of seeing other solar phenomena. Here are some suggestions to get the most out of your solar telescope.

SUNSPOTS

Sunspots are dark spots that appear on the photosphere, or visible “surface” of the Sun. They usually have a dark core, called the umbra, surrounded by a lighter border, called the penumbra. They form when large disturbances in the Sun’s magnetic field cool portions of the photosphere. Sunspots are relatively cool, being only 6000°F (3300°C) compared to the normal 10,000°F (5500°C) of the rest of the photosphere. Although these spots appear to be almost black, they are actually quite bright. If it were possible to remove a sunspot from the Sun and put it in the night sky, it would shine brighter than the full moon. They only appear to be “dark” when compared to the rest of the photosphere.

Sunspots can be big. Very big. They can range in size from 10 to 100,000 miles (16 to 160,000 km) in diameter. To put that into perspective, the Earth is only 8,000 miles (12,800 km) in diameter! Compare sunspot sizes to the relative size of the Earth in the image below in order to better grasp the immense size of the Sun and share that WOW factor with neighbors, friends, and family.



1.3 MILLION EARTHS CAN FIT INSIDE THE SUN!

Sunspots usually appear in pairs but can also appear in very large groups. They can last from a few days to several weeks and can change their shape, size and number as they slowly rotate across the face of the Sun. It will take about two weeks for a sunspot group to cross the Sun. Try looking at the Sun every day and draw a picture of what you see. At the end of the week, compare your drawings and you’ll see how sunspots evolve.

MERCURY TRANSIT

Mercury transits occur when the planet Mercury passes in between the Sun and Earth allowing observers on Earth to track Mercury's dark disk as it crosses the face of the Sun. This is an extremely rare event, occurring only four times over the next 50 years. On the morning of November 11, 2019, Mercury will transit the face of the sun. For most of North America, the event will already be underway as the sun rises, but you will still be able to view the transit for a few hours. Be sure not to miss this event as the next transit of Mercury will not occur for another 13 years in 2032.

LIMB DARKENING

When viewing the Sun's disk, look for a falloff of brightness as you look from the center of the disk to the edge, or limb. This is caused by the thick solar corona, or outer atmosphere of the Sun. As you look at the center of the solar disk, you are looking straight down through the least amount of atmosphere. As you look near the limb, you are looking through a thicker layer, which dims the amount of light shining through.

NOTES

CELESTRON TWO YEAR LIMITED WARRANTY

- A. Celestron warrants your telescope to be free from defects in materials and workmanship for two years. Celestron will repair or replace such product or part thereof which, upon inspection by Celestron, is found to be defective in materials or workmanship. As a condition to the obligation of Celestron to repair or replace such product, the product must be returned to Celestron together with proof-of-purchase satisfactory to Celestron.
- B. The Proper Return Authorization Number must be obtained from Celestron in advance of return. Call Celestron at (310) 328-9560 to receive the number to be displayed on the outside of your shipping container.

All returns must be accompanied by a written statement setting forth the name, address, and daytime telephone number of the owner, together with a brief description of any claimed defects. Parts or product for which replacement is made shall become the property of Celestron.

The customer shall be responsible for all costs of transportation and insurance, both to and from the factory of Celestron, and shall be required to prepay such costs.

Celestron shall use reasonable efforts to repair or replace any telescope covered by this warranty within thirty days of receipt. In the event repair or replacement shall require more than thirty days, Celestron shall notify the customer accordingly. Celestron reserves the right to replace any product which has been discontinued from its product line with a new product of comparable value and function.

This warranty shall be void and of no force of effect in the event a covered product has been modified in design or function, or subjected to abuse, misuse, mishandling or unauthorized repair. Further, product malfunction or deterioration due to normal wear is not covered by this warranty.

CELESTRON DISCLAIMS ANY WARRANTIES, EXPRESS OR IMPLIED, WHETHER OF MERCHANTABILITY OF FITNESS FOR A PARTICULAR USE, EXCEPT AS EXPRESSLY SET FORTH HEREIN. THE SOLE OBLIGATION OF CELESTRON UNDER THIS LIMITED WARRANTY SHALL BE TO REPAIR OR REPLACE THE COVERED PRODUCT, IN ACCORDANCE WITH THE TERMS SET FORTH HEREIN. CELESTRON EXPRESSLY DISCLAIMS ANY LOST PROFITS, GENERAL, SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES WHICH MAY RESULT FROM BREACH OF ANY WARRANTY, OR ARISING OUT OF THE USE OR INABILITY TO USE ANY CELESTRON PRODUCT. ANY WARRANTIES WHICH ARE IMPLIED AND WHICH CANNOT BE DISCLAIMED SHALL BE LIMITED IN DURATION TO A TERM OF TWO YEARS FROM THE DATE OF ORIGINAL RETAIL PURCHASE.

Some states do not allow the exclusion or limitation of incidental or consequential damages or limitation on how long an implied warranty lasts, so the above limitations and exclusions may not apply to you.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Celestron reserves the right to modify or discontinue, without prior notice to you, any model or style telescope.

If warranty problems arise, or if you need assistance in using your telescope contact:

Celestron
Customer Service Department
2835 Columbia Street
Torrance, CA 90503
Tel. (310) 328-9560
Fax. (310) 212-5835
Monday-Friday 8AM-4PM PST

NOTE: This warranty is valid to U.S.A. and Canadian customers who have purchased this product from an authorized Celestron dealer in the U.S.A. or Canada. Warranty outside the U.S.A. and Canada is valid only to customers who purchased from a Celestron's International Distributor or Authorized Celestron Dealer in the specific country. Please contact them for any warranty service.



FCC NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Product design and specifications are subject to change without prior notification.
This product is designed and intended for use by those 14 years of age and older.



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www.celestron.com
2835 Columbia Street • Torrance, CA 90503 U.S.A.
Telephone: 800.421.9649

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