



STELESCOPE 70

70 mm Altazimuth Refractor Telescope

ASSEMBLY AND OPERATING INSTRUCTIONS

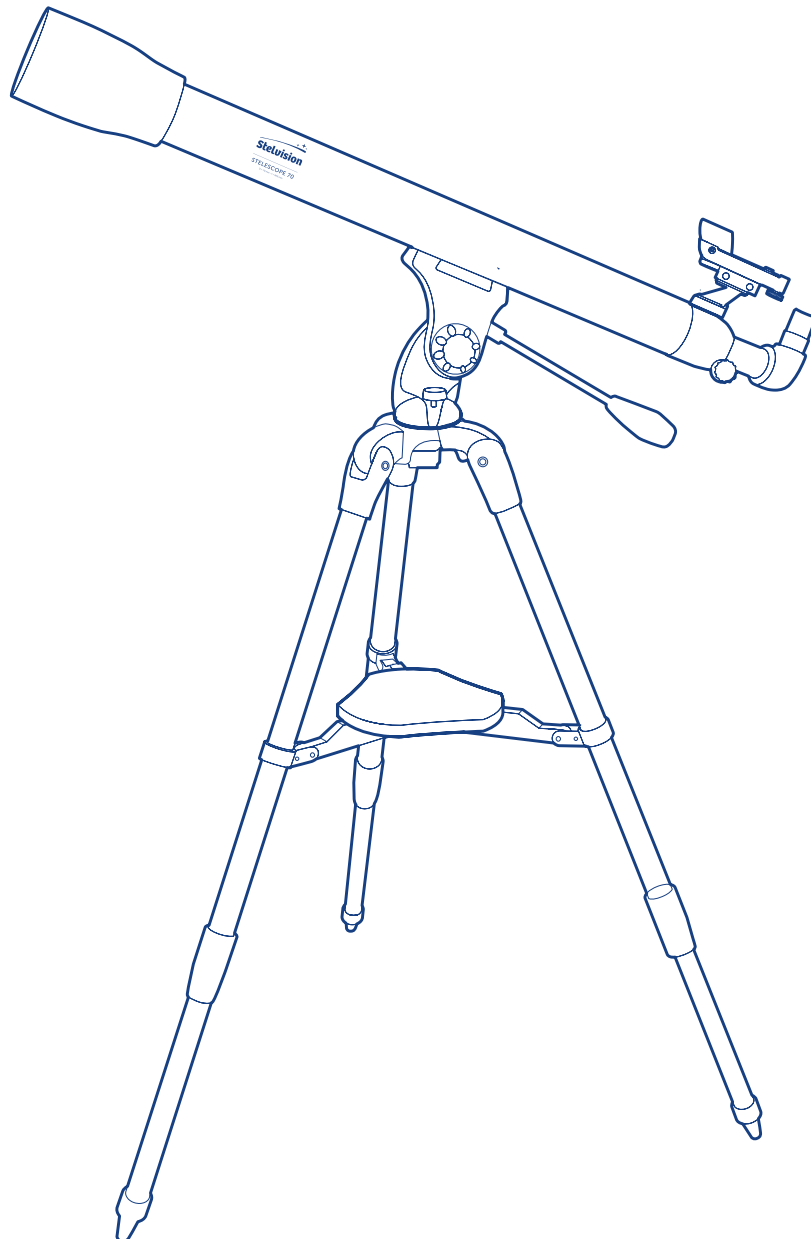


TABLE OF CONTENTS

4 Presentation of the STELESCOPE 70 in Images

6 Assembling the Telescope

6 Tripod Set Up

7 Optical Tube Assembly

7 Accessory Assembly

8 Initial Settings and Things You Need to Know

9 Motion

9 Pointing

9 Eyepiece Assembly and Focusing

10 Understanding Image Orientation

10 Aligning the Red Dot Finder

10 Understanding the Field and Magnification

12 Preparing and Beginning Observation

12 Preparations and Selecting an Observation Site

13 Pointing the Telescope at a Celestial Object

14 Focusing on a Celestial Object

14 Choice of Magnification

15 End of Observation

16 What Can Be Observed?

18 Maintenance and Adjustments

18 Storage and Routine Maintenance

18 Adjusting the Optical Tube

19 Optional Accessories

20 Waste Disposal

20 Additional Information

20 Warranty

20 Contact

20 Technical Characteristics of STELESCOPE 70



Congratulations on your purchase of this STELESCOPE 70 telescope! Stelvision's STELESCOPE range has been designed to make quality sky observations as simple as possible. This manual will give you the explanations you need to simply and easily learn about your telescope and make your first observations. Read it carefully. We are at your service for any questions that may remain after you've read these pages (see p. 20).

Happy observing,
The Stelvision Team

This instruction manual is to be considered an integral part of the telescope. Please read it carefully, making sure to understand the safety instructions before use. Keep this manual for the entire service life of the telescope and attach it to the telescope in the event of resale or transfer.



CAUTION: RISK OF PERSONAL INJURY

RISK OF BLINDNESS: Never look directly at or near the Sun through the telescope without a specific sun filter, as this may cause irreversible damage to your eyes. Children should only use the telescope under adult supervision.

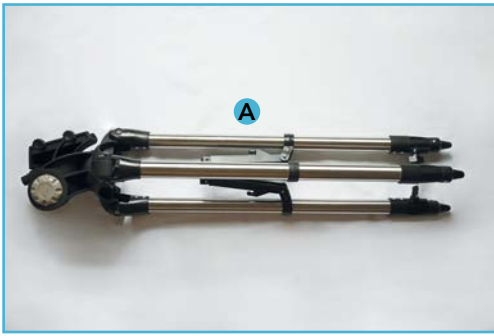
DANGER OF SUFFOCATION: Keep packaging materials (plastic bags, rubber bands, etc.) out of the reach of children.

FIRE HAZARD: Never leave the telescope, especially the lenses, exposed to direct sunlight. The magnifying glass could cause fires.

Presentation of the STELESCOPE 70



WHAT'S IN THE BOX



- A** Tripod with adjustable legs and azimuth mount



- B** Accessory tray
- C** Height adjustment clamp

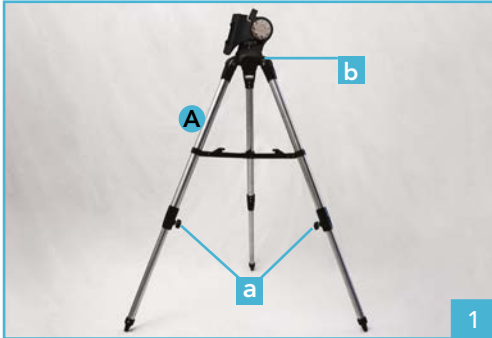


- D** Optical Tube
- E** Eyepiece holder cap
- F** Optical tube dust cap



- G** Red dot finder
- H** Amici prism star diagonal
- I** Kellner eyepiece 9 mm
- J** Kellner eyepiece 20 mm

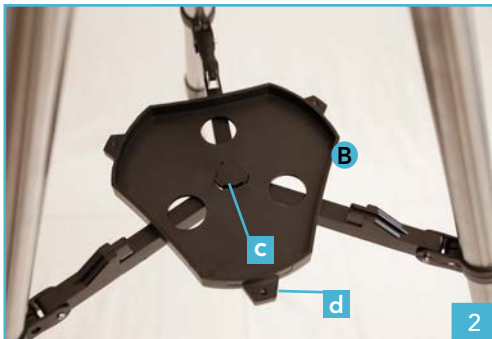
Assembling the Telescope



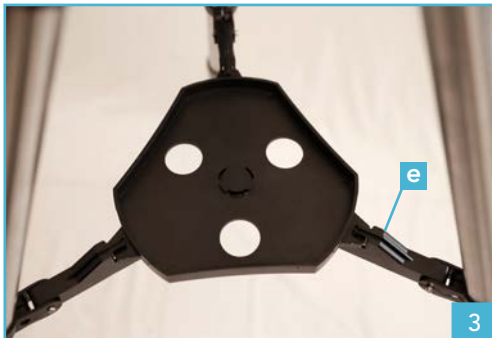
The letters refer to the indications in the images on the left of each page. The capital letters also refer to the description of the items on page 5.

TRIPOD SET UP

1. The telescope mount includes the tripod with adjustable legs, its mount **A** and accessory tray **B**. Extend the legs of the telescope and lock them in place by tightening the knobs **a**. Stand the tripod upright and gently pull the tripod legs apart until the center brace **b** snaps into place horizontally. Adjust the length of the feet if necessary.



2. Position the accessory tray so that its central hole can be inserted over item **c** at the center brace line.

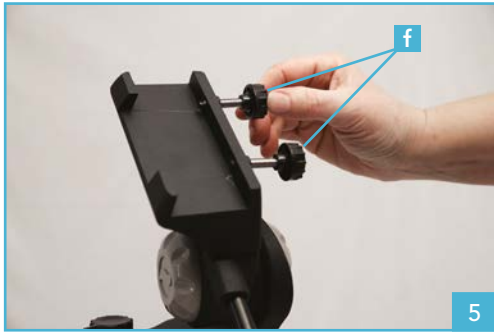


3. Rotate the tray until the tabs **d** clip into the pins **e** on the three leg braces.

PLEASE NOTE: Although not essential, the accessory tray helps reinforce the telescope and increases the stability of the images provided by the optics.



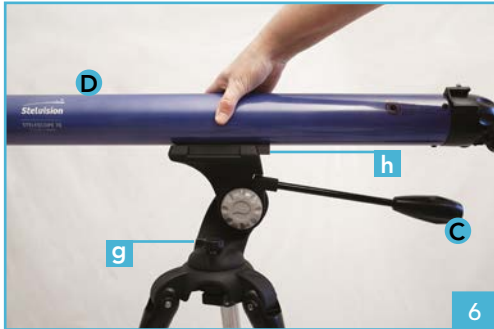
6. Screw the panning handle **C** onto the mount.



OPTICAL TUBE PLACEMENT

The optical tube is attached to the mount by means of a dovetail bar. This trapezoid-shaped metal part is inserted into the slide rail located on the telescope clamp at the top of the mount.

5. Loosen the two knobs **f** of the slide rail until the passage is completely free.



6. Position the telescope clamp horizontally and tighten the panning handle **C** and the azimuth tension knob **g**. Insert the dovetail bar **h** of the tube **D** into the slide rail and tighten the knobs **f**.

INSTALLING THE ACCESSORIES

The Red Dot Finder

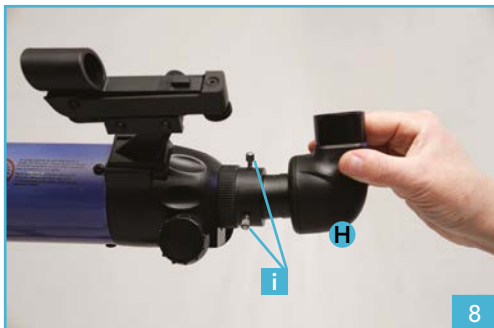
The STELESCOPE 70 is equipped with a red dot finder **G** which helps point celestial objects.



7. Set up the red dot finder lens so that it is positioned towards the front of the tube. Insert the finder on the base found at the rear of the optical tube and tighten the clamp screw. Remove the plastic tab under the battery cover before use.

The Eyepiece Holder and Star Diagonal

8. Remove the cap from the eyepiece holder and insert the Amici prism star diagonal **H**. Tighten the clamp screws **i**.



Dust Caps

9. Dust caps must always be in place when STELESCOPE 70 is not in use in order to limit dust deposits on the optics as much as possible. There are two caps: the eyepiece holder cap **E** which can also be used on the star diagonal in the absence of an eyepiece (see picture) and the optical tube cap **F** to be placed at the front of the tube.



Initial Settings and Things to Know



Before you use your STELVISION 70 for the first time, carry out the following adjustments in day light for the best results. You will be able to do this at night just before observations once you have a better understanding of your telescope.

MOTION

The azimuth tension knob **g** must be just tight enough to allow for smooth, frictionless movement from left-right. Once this tightness has been adjusted, the panning handle **c** can be used to maneuver the STELESCOPE 70. This handle, located on the altitude axis that moves up-down, makes swiveling the optics possible. The handle should be unscrewed when maneuvering the telescope. It must be tightened (without over-tightening) before release to ensure that the tube remains stationary.

POINTING

Always use the eyepiece with the lowest magnification, i.e., the one with the longest focal length (20 mm), to make pointing easy.

Pointing can be done by moving the tube via the panning handle. To do this, aim at the target by placing your eye along the tube or by using the red dot finder. (Make sure that the red dot finder is correctly aligned: see *Aligning the Red Dot Finder* paragraph on p.10).

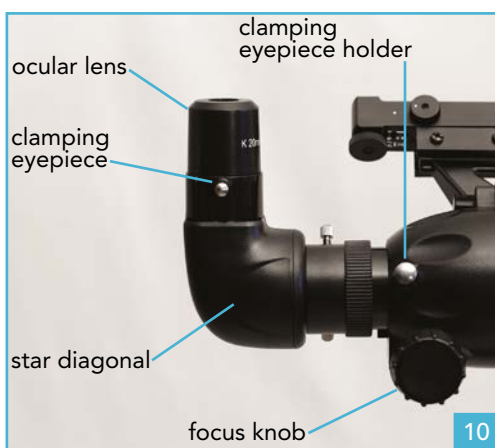
Tighten the panning handle to lock the tube in place.

Twist the knob until focus is reached (see the following section), and then center on the target in the eyepiece with more precision by operating the height adjustment lever.

EYEPIECE PLACEMENT AND FOCUSING

To guarantee the quality of the images delivered by STELESCOPE 70, the focus, i.e. the sharpness of the image, must be properly administered. This can be done by turning the knob located at the rear of the eyepiece holder. Choose a distant object and point the telescope at this object to focus your eyepiece for the first time (if the distance is too short, focusing will be impossible).

10. Insert an eyepiece and tighten the clamp screw. Place your eye on the eyepiece and turn the focus adjustment dial gently in one direction until you find the sharpness range. If this does not work, turn the dial in the other direction.

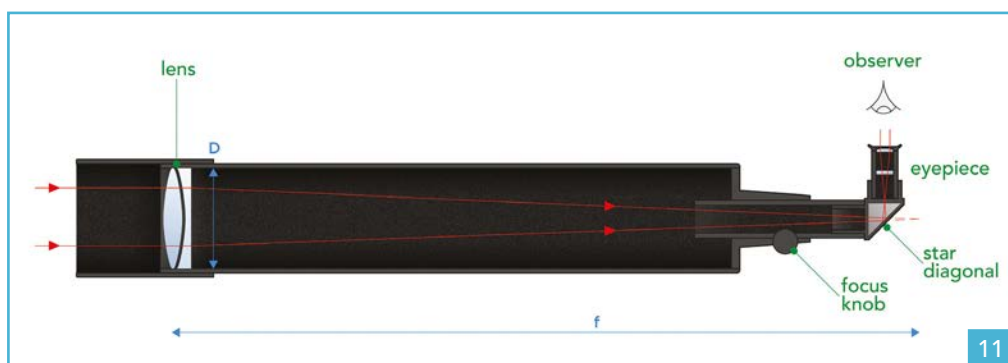


Once you find the sharpness range, you can refine the focus quality. To do this, turn the dial back and forth to "frame" the area. Each overshoot in either direction will be gradually reduced until you stop at the sharpest point. This method will prevent your eye from getting used to an otherwise blurry image. **It naturally compensates for an approximate focusing, but it makes the observation much less comfortable and leads to faster eye fatigue. The back and forth movement of the eyepiece holder's dial deceives the eye and makes it easy to find the right focus.**

Please note that the eyepiece holder is equipped with a clamp screw which must be tightened just enough to allow smooth focusing.

UNDERSTANDING IMAGE ORIENTATION

11. The STELESCOPE 70 telescope is a refractor, which means that it is made up of lenses. Light passes through these lenses and then through the eyepiece, which is also composed of lenses.



You can insert an eyepiece directly behind the optical tube. In this case, the image will appear inverted (both upside-down and left-right direction).

It is better to add a star diagonal to the telescope, which makes viewing much more comfortable. This accessory is equipped with an Amici prism optical

system which flips the image on both ends. This is particularly useful if STELESCOPE 70 is used for daytime terrestrial observing.

RED DOT FINDER ALIGNMENT



The red dot finder is necessary to center on the celestial objects in the telescope. It therefore must be perfectly aligned with the optical tube to work.

12. The red dot finder does not magnify the image. It is made up of a window which displays an illuminated red dot. Stand behind the finder while keeping both eyes open to use it.

Aim the tube at an easily recognizable object, such as the top of a pole, which should be as far away as possible (at least twenty meters).



Once the target is in the 20 mm eyepiece, center on the top of the pole via the panning handle. Then repeat this by replacing the 20 mm eyepiece with the 9 mm eyepiece.

Turn on the red dot finder and look through (set the intensity to its maximum level if you are in a lit area).

13. The red dot must be placed on your target. If this is not the case, use the two knobs **j** to adjust it.

Check that the target is still centered in the eyepiece's field of view after adjusting the finder. If not, repeat steps 12 and 13.

UNDERSTANDING THE FIELD AND MAGNIFICATION

The STELESCOPE 70 eyepieces make it possible to alter the magnification and field of vision.

Magnification

To calculate the magnification of a given telescope and eyepiece combination, take the focal length F of the telescope and divide it by the focal length f of the eyepiece. The resulting number is the magnification factor.

$$M = F/f$$

The STELESCOPE 70 comes with two Kellner eyepieces of 20 mm and 9 mm focal length. The focal length of the optical tube is 900 mm, which allow eyepiece magnifications of:

- $900/20 = 45$ times for the 20 mm eyepiece;
- $900/9 = 100$ times for the 9 mm eyepiece.

The range of eyepieces can be extended to provide a wider choice of magnifications. Any given telescope aperture has a limit magnification. Any additional detail beyond this limit magnification is not visible and the image quality will even deteriorate significantly. This maximum magnification is about twice the scope aperture. STELESCOPE 70 with a 70 mm aperture recommends a magnification that does not exceed 140 to 150 times. Such a magnification can only be used under conditions of perfect atmospheric stability (absence of turbulence), i.e. very rarely. A magnification of about 100 times (obtained with the 9 mm eyepiece) will often be the maximum.

True Field of the Eyepiece

The true field of view of the eyepiece makes it possible to know the surface area of the sky observed and therefore estimate the size of the objects. It is calculated with the apparent field of view of the eyepiece (this value is provided by the manufacturer) and the magnification M obtained with this eyepiece on a specific telescope. The true field is expressed in degrees and arc-minutes.

$$\text{True field} = \text{Apparent field} / M$$

The eyepieces supplied with the STELESCOPE 70 have an apparent field of view of 45° . Their true fields when used with STELESCOPE 70 are therefore:

- $45/45 = 1^\circ$ for the 20 mm Kellner eyepiece;
- $45/100 = 0^\circ 27'$ for the 9 mm Kellner eyepiece.

Preparing and Beginning Observation

PREPARATIONS AND SELECTING AN OBSERVATION SITE

Meteorological Conditions

Good conditions for observing are:

- clear skies;
- dry weather, for moisture quickly deposits on the optics, which makes it difficult to focus and affects the quality of the images;
- little wind, for this otherwise shakes the telescope and alters the images;
- transparency (such as after a good rainfall because the sky has been "washed" and rid of debris), especially for observing fainter deep-sky objects;
- a stable atmosphere, especially when observing the Moon and the planets at high magnification. Highly magnified images through the telescope are often blurred by atmospheric turbulence, which is caused by eddies in the atmosphere and is similar to the haziness that can be seen over a hot asphalt road.

Observation Site

Observing through a window is not recommended because the window glass will distort images considerably. Also avoid observing from an open window, for the difference in temperature between the room where you are located and outside will inevitably generate turbulence and distort the images.

The STELESCOPE 70 optical tube must be cooled down to the same temperature as outside to guarantee the best image quality. **It is therefore recommended that you take out your telescope about ½ hour before beginning observation.**

14. Move away as much as possible from any source of light pollution. Lit windows, street lighting, or private outdoor lights will prevent your eyes from properly adjusting to night vision. If you are unable to escape these light sources (if you are observing in a backyard, for example), position yourself so they are behind a wall or plants. Light pollution in the city generally only allows you to observe the Moon, the planets, and a few bright objects in the deep sky. The country sky is more appropriate for any kind of observation target.

Carefully choose the surface where you place your telescope. Avoid concrete slabs or tiles in the summer, for these surfaces accumulate heat during the day and release it at night, which generates turbulence and blurs the images. However, these types of surfaces may be suitable in winter and cooler weather. Grass and clay surfaces are ideal in all seasons.



Photo Aurélien Chapron

Milky Way and light pollution

14

Avoid observing over a roof, parking lot, or metal building when it is hot during the day, for these surfaces also release heat, which alters the images.

Basic Observer Equipment

Equip yourself appropriately to ensure observation is as pleasant as possible. Some essentials include:

- warm clothing (hat, thick-soled shoes, parka, gloves...);
- a table to place accessories and a chair;
- a flashlight with a red light, for this color appropriately illuminates while preserving night vision.

POINTING THE TELESCOPE AT A CELESTIAL OBJECT

Which eyepiece is used for pointing at objects?

To locate a target more easily, it is recommended to always use the lowest available magnification. For the STELESCOPE 70, use the 20 mm Kellner eyepiece. When the object is located and centered on at low magnification, the eyepiece can then be changed to magnify the image if necessary.

There are different methods of pointing that depend on how difficult a particular celestial object may be to locate.

Pointing by Direct Aiming (easy)

Direct pointing is the simplest and fastest method. When the object is visible to the naked eye or its position is specifically known, simply align the telescope directly on the object or star with the red dot finder.

This method is ideal for the Moon, bright planets (Mercury, Venus, Mars, Jupiter, Saturn), deep sky objects visible to the naked eye or easy to locate (Andromeda Galaxy M31, Orion Nebula M42, etc.), or any other object visible to the naked eye (bright comet, etc.).

Pointing from Star to Star (easy to difficult)

When the object is not visible to the naked eye, it can be located from the surrounding stars by using a sky map. The goal is to find a star path on the map that begins with an easy-to-spot star with the naked eye. This star is first located with the telescope by direct aiming (see previous paragraph). Then, either with the red dot finder or by directly looking through the eyepiece, move the telescope's target field to follow the starry path, which then leads to the desired target. Compare it with the star map (use an infrared flashlight to avoid too bright of a light).

FOCUSING ON A CELESTIAL OBJECT

Focusing on a celestial object is similar to focusing on an earthly object, except that it is always moving. Therefore, when focusing on an object, adjustment can not always be repeated for the next target. We recommend that you adjust focus regularly, as it can easily be modified by various factors (temperature changes of the optics, movements of the telescope, unintentional changes by the observer, etc.).

To make observation easier, adjust the focus at the very beginning by aiming at a bright object, such as the Moon, a planet, or a bright star. It can be difficult for beginners to directly find the focus range for faint objects in the deep sky and / or for those located in a field with few or faint stars.

MAGNIFICATION CHOICE



15. The choice of magnification depends on the type of object being observed and the technical specifications of the telescope. The STELESCOPE 70 comes with two eyepieces with focal lengths of 20 and 9 mm, which deliver magnifications of 45 and 100 times (see also p.11 for magnification calculations). It can withstand magnifications of up to about 150 times, provided that the appropriate eyepieces are obtained and that the quality of the sky allows it.

As a general rule:

- the lowest magnification is used when searching for a target;
- the target is well centered in the eyepiece before changing to a higher magnification;
- magnifying beyond the maximum value accepted by the telescope has no purpose;
- the highest magnification is not necessarily the best for quality observation;
- magnification tends to darken the image and reduce the field of view;
- when the atmosphere is turbulent (stars are twinkling), there is no purpose for increased magnification, as this only leads to blurred images.

In order to choose the right magnification according to the star being observed, keep in mind that:

- the Moon, the planets, and all bright targets can more easily withstand high magnifications (when the atmosphere is sufficiently stable and they are not too low on the horizon);
- deep sky objects are best viewed at low to medium magnifications, unless they are very small.

END OF OBSERVATION

In order to keep your STELESCOPE 70 in good working order, here are a few tips to follow at the end of each observation:

- turn off the red dot finder;
- remove the eyepiece from the eyepiece holder;
- place the STELESCOPE 70 in a dry and dust-free room **without putting the dust caps back on**. This will allow the moisture deposited on the optics to disappear quickly. The caps are to be put in place once the telescope is dry;
- allow the eyepieces to also air dry for a few hours before storing them in their protective boxes.

What can Be Observed?



The Moon

16. Observing **the Moon** is simple and always spectacular! This satellite is easy to locate and accessible all year round. The Moon is essentially observed along its terminator, which is the division between the daylight side and the dark night side of the planetary body. Observing this area easily reveals a surface studded with craters, rilles, and various formations. The closer you are to the terminator, the more visible the relief of these formations is due to the shadows cast by the Sun. However, the full moon is of little interest to observe, since the entire surface of this satellite is illuminated from the front and therefore does not have any shadows.



The Stars

17. With the exception of our own star, the Sun (see next page), **the stars** are too far away to see their surfaces. No matter how magnified a star is, it will always appear as a bright spot.

However, stargazing can still be quite interesting. Stars offer a whole range of colors (white, yellow, blue, red, orange, etc.), their brightness can change, they can evolve alone or in groups, and we now even know that some of them are surrounded by planets! It might be quite fun to try and understand what you observe. For example, you might want to learn why one particular star is red or why another star is part of a triple star system. You can discover a world of knowledge!



The Planets

The various planets, thanks to their ever-changing appearance, are great to observe. They should preferably be observed when they are highest in the sky, i.e. when they cross the meridian (to the south), in order to limit atmospheric disturbances. The layer of air is thicker for the stars close to the horizon. The atmosphere must be calm for quality observations.

Amongst the planets of our solar system, four planets are really worth observing.



18. **Venus** is the closest planet to the Sun. It is to be observed after sunset in the west or before sunrise in the east, since it is closer to the Sun than the Earth. With a telescope, it is fairly easy to see its phases like with the Moon. Venus' surface detail cannot be observed.



19. **Mars**, orange in color, is interesting to observe when it is closest to the Earth (about every two years). During this time, a few large formations and its white polar caps can be observed on its surface. Mars also has phases.

20. **Jupiter** is one of the most spectacular planets. Its interesting angular diameter and evolutionary cloud formations make it a fun subject to observe. It is also accompanied

Photo Stéphane Gonzales



Saturn 21

by numerous moons. The four brightest, Io, Europe, Ganymede and Callisto, regularly move in front of and behind the giant planet for remarkable observation.

21. **Saturn** is also spectacular because of its surrounding rings. They are easily visible as soon as magnification exceeds 40 times. With a magnification of more than 100 times and a stable atmosphere, Saturn's Cassini division between the two main rings can be faintly made out. The rings' tilt changes over the years.

Because of its proximity to the Sun, Mercury is difficult to observe and not of much interest. Uranus and Neptune, which are very distant, are observable but are only of interest because of their blue / green color.

Photo Bernard Tassy



The Andromeda Galaxy M31 22

The Objects of the Deep Sky

22 to 25 **Galaxies, open clusters, globular clusters** and **nebulae of gas and dust** form the bulk of what amateur astronomers call deep sky objects. All these objects are located outside our Solar System, or even outside our galaxy, the Milky Way. Some deep objects are bright and can sometimes even be visible to the naked eye, but most can only be revealed with the help of a telescope. They also vary greatly in size, and can be almost stellar in appearance or have surfaces much larger than the full moon.

Observing deep sky objects can be disappointing at first glance, for what the eye sees is very different from what can be seen in photographs. These objects often reveal few or no colors and details can be quite obscured. But it is important to persevere, because these objects can be fascinating to observe after working on your observing skills. These distant but visible objects via even a small telescope also allow us to think about our place in the Universe!

Photo Corinne Yahia



The Double Cluster of Perseus 23

Thanks to its aperture, STELESCOPE 70 gives you a chance to see the most beautiful and brilliant objects in the deep sky. The great Andromeda Galaxy, the Double Cluster in Perseus, the Hercules Globular Cluster, and the large Orion Nebula are just a few examples. If you'd like to discover more deep sky objects, pick up an observation book or consult the Internet, which is full of resources, especially stelvision.com.

Photo Gérard Bauza



The Hercules Globular Cluster M13 24

The Sun

26. **The Sun** is the closest star to the Earth and the only one whose surface can be observed. But be careful, because its observation is dangerous if adequate precautions are not taken. You must install a special filter (not provided) on the front of your telescope! Never look at the Sun directly through a telescope. It is important to only use filters that are specifically designed for this use, which are available from specialist astronomy vendors.

Photo Gérard Bauza



The Great Orion Nebula 25

Once this precaution has been taken, observing our star is in many ways exciting. Its surface, observed in visible light, regularly shows dark spots of varying size, areas where the temperature is lower and whose shape changes from day to day. These spots also change position on the surface of the Sun due to its rotation. Beginning astronomers can monitor these changes from day to day because it is very simple to do.

Photo Didier Aubergot



The Sun 26

Observing the Sun is one of the few things that can be done during the day. For better image quality, observe in the morning when the atmosphere is not too turbulent.

Maintenance and Adjustments

STORAGE AND ROUTINE MAINTENANCE

STELESCOPE 70 must be stored in a dust-free, dry room that's protected from high temperatures. In case of prolonged non-use, cover it with a cover or a sheet or take it apart and store it in its packaging.

If metal or plastic parts become soiled, clean with a soft, slightly damp cloth.

The optical surfaces (front lens, star diagonal, eyepiece lenses) are fragile and can easily be scratched. A small amount of dust on the surface will generally not affect image quality. If some dust has settled on the surface, gently remove it with a soft bristle brush working from the center outward, or use a rubber bulb to diagonally blow the dust off from the surface of the optics.

When the eyepiece lenses are dirty, use a soft cloth (such as a microfiber cloth) and possibly a photo lens cleaner.

ADJUSTING THE OPTICS

The optics of the STELESCOPE 70 are factory set before shipment. Except in the event of a severe shock, it cannot be adjusted and therefore does not require any intervention on your part.

Additional Accessories



27

Your STELESCOPE 70 is ready to use, but you can complete it with the following accessories available on the Stelvision online shop (<https://stelvision.com/astro/en/shop/>).

Super Plossl Eyepiece 32 mm

27. This very low magnification eyepiece provides a wider field of view. It makes targeting easier and produces beautiful images of large objects, such as the Pleiades Cluster.



28

UW 15 mm Wide Angle Eyepiece

28. This eyepiece provides an intermediate magnification of 60 times and offers a wider field of view (apparent field 68°). Great for deep sky observations (Orion Nebula M42, Messier 13, Andromeda Galaxy M31, etc.).



29

UW 6 mm Wide Angle Eyepiece

29. This eyepiece provides a high magnification of 150 times and offers a wider field of view (apparent field 68°). Perfect for planets and the Moon close-up.



30

Stelvision 365 Sky Map

30. Essential for learning about the sky and making your first sightings of stars, planets and deep sky objects.



31

Stelvision Map of the Moon

31. This map makes discovering the Moon easy thanks to its three maps for different observation situations. Observe with the naked eye / binoculars, with a refractor telescope, or with a reflector telescope. It also presents nine spectacular lunar formations to explore as well as the location of the Apollo mission landing sites.

WASTE REMOVAL



Electrical and electronic parts (red dot finder) must be disposed of in an authorized collection area for recycling.

ADDITIONAL INFORMATION

Observation ideas, introductory articles, news, practical information sheets:
stelvision.com/en/

Subscribe to our newsletter to learn about new online content:
stelvision.com/astro/en/shop/

Forum of amateur astronomers (advice and suggestions):
cloudynights.com (US)
stargazerslounge.com (UK)

WARRANTY

This Stelvision product is guaranteed parts and labor for two years from the date of purchase. For more information, visit our website stelvision.com.

In the event of a defect covered by the warranty, we will repair or replace the product. This warranty does not cover damage caused by mishandling. All returns must be accompanied by the following items:

- name and address of the recipient for the return of the product;
- description of the problem;
- proof of date of purchase.

The product must be properly packaged in a sturdy box to prevent damage during shipping. Before shipping, please notify us by e-mail (contact@stelvision.com) and we will confirm the mailing address to be used.

You may also have other rights that may vary from country to country.

CONTACT

Do not hesitate to contact us for any question, suggestion, or remark:

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TECHNICAL CHARACTERISTICS OF STELESCOPE 70

Aperture	70 mm
Focal	900 mm
Mount	azimuth, manual motions
Magnitude visual limit	11.2
Tube length	94.5 cm
Separating power	1.7"
Accessories included	20 mm and 9 mm Kellner eyepieces, 31.75 mm, star diagonal (Amici prism); red dot finder
Magnifications with the supplied eyepieces	45 times and 100 times
Maximum magnification possible with other eyepieces purchased separately	140-150 times (with 6 mm eyepiece)
Optical Treatments	multi-layer
Tripod	steel tube aperture 31.75 mm, height adjustable
Total weight of the equipped telescope	5 kg