



USER'S GUIDE

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rev.10b

WARNING – WARNING – WARNING – WARNING – WARNING

This product is not a toy. Never look at the sun directly. Important damage can occur to your eye.
The Solarscope correctly assembled and used as described in this manual works is an eye-safe instrument.

Any other use can generate harmful damage to your eyes, especially if the mirror is not at its place or if you screw out the lens tube and look at the sun through it. Never directly view the sun with the lens tube. LightTec and Solarscope LLC are not responsible and liable for any eye damage occurring in any case Solarscope is not used assembled, mounted and in accordance with this manual.

1. Components List of a Solarscope: Paper Edition

There are two sizes of Solarscope: a small one (Standard version) and a large one (Education version)

A Solarscope is made of 11 parts: 2 cardboard panels that make up the structure

4 plastic parts that make up the lens tube and its collar












1 glass lens* diameter 38 mm

2 metallic parts that make up the mirror mount

1 black plastic stopper

1 convex mirror* diameter 15 mm

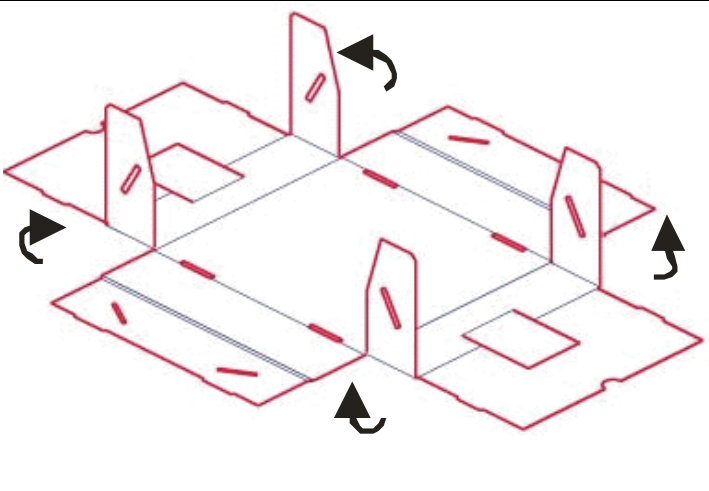
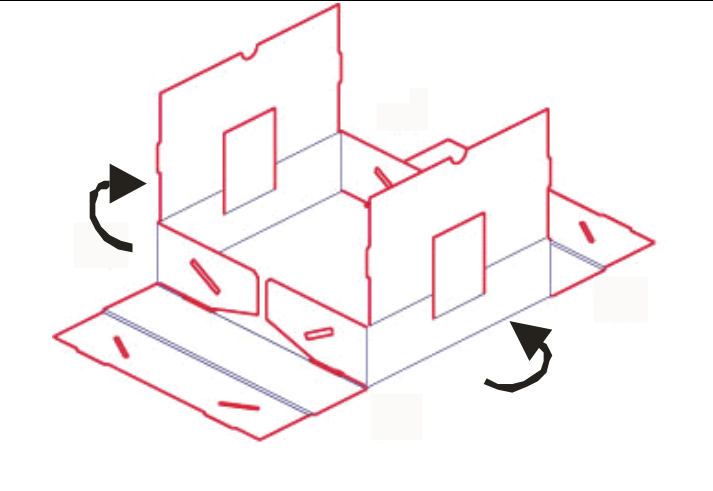
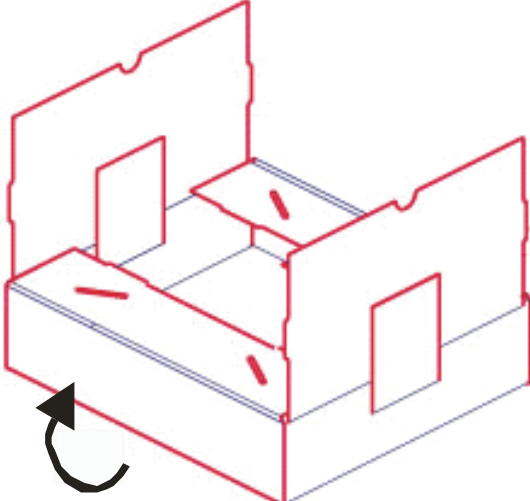
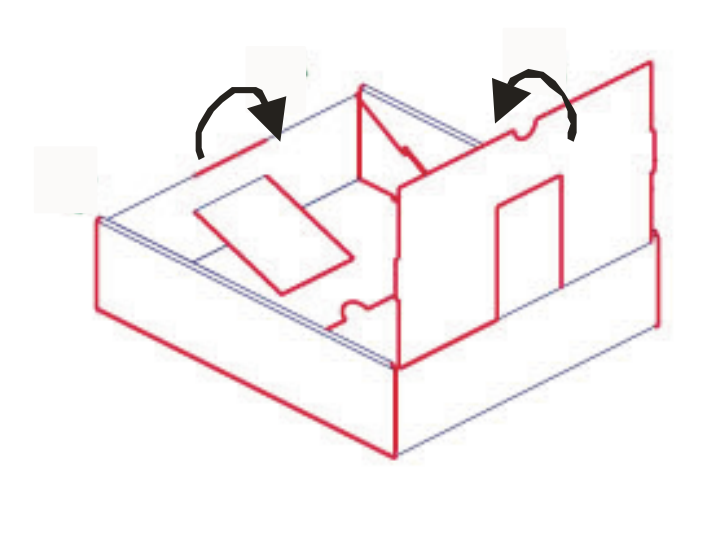
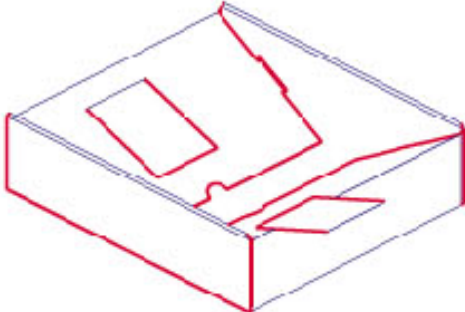

* Optical components are easily damaged, however it's possible to clean them with a soft towel to remove some dusts.

				
- 1 – Base panel		- 2 – Upper rotating panel		
				
- 3 – Collar n° 3	- 4 – Collar ring n° 4	- 5 – Lens tube	- 6 – Screw cap	- 7 – lens diameter 38 mm
				
- 8 - Support flange for the mirror mount	- 9 – Mirror mount	- 10 – Black plastic stopper	- 11 – Convex Mirror diameter 15 mm	

2. How to build the Solarscope?

Building your Solarscope will take about 10 to 15 minutes.
Please carefully follow the 18 steps described below:

Steps 1 to 5: Setting the base (base of Solarscope):

	
<u>Step 1</u>	<u>Step 2</u>
	
<u>Step 3</u>	<u>Step 4</u>
	
<u>Step 5</u>	<u>What it looks like when it's done</u>

Steps 6 to 13: How to build the Upper Rotating Housing of the Solarscope:



Step 6

Place Support Flange into position, smaller diameter end down (to be facing out).

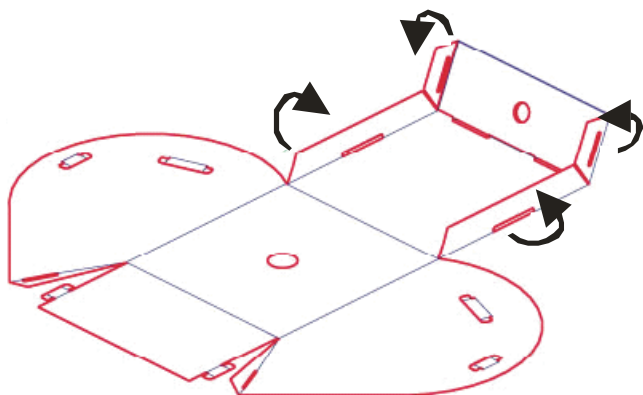


Step 7

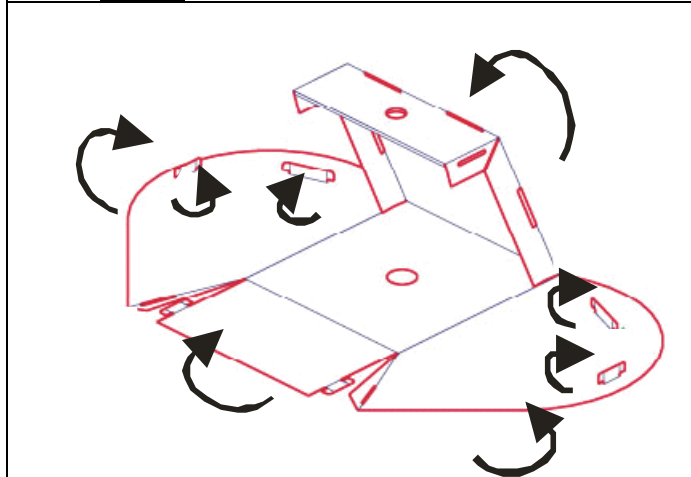
The wide circular part of the mirror mount Support Flange n°8 must be positioned inward.



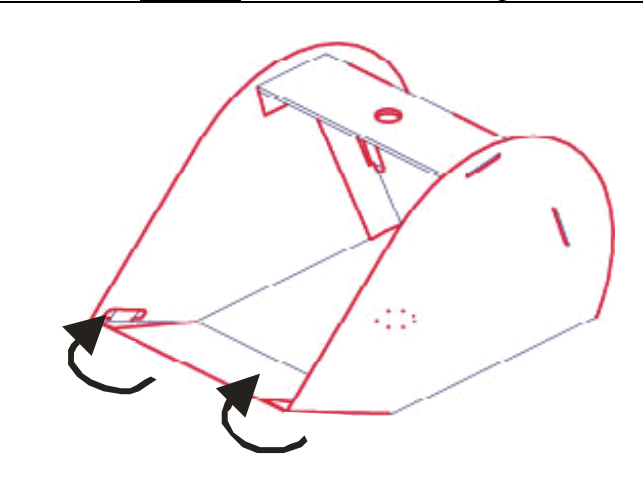
Step 8 Fold over and insert tabs into slots



Step 9 Fold bottom side flaps



Step 10 Fold wings and insert tabs

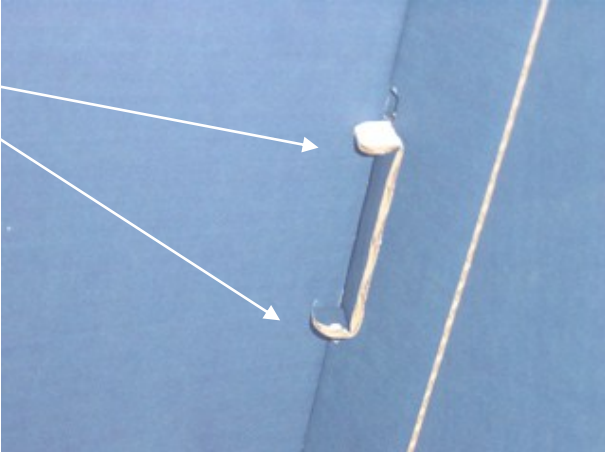


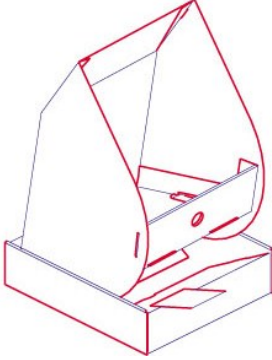

Step 11

NOTE: As indicated in the picture below, we advise you to fold the cardboard tab edges in order to assemble Solarscope firmly.



Gentle handling of tabs will provide repeated disassembly and assembly of the Solarscope.

Fold the edges



	
<p>Step 12 Position of rotating part in the base</p>	<p>Step 13: Solarscope housing fully assembled.</p>

Step 14 : How to put the mirror in its mount:

 <p>Place Mirror Mount on table</p> <p>Seat Mirror Convex side down</p>	
<p>Place the mirror n° 11 into the mirror mount n° 9, the convex* side at the bottom. Ensure it is seated flat.</p>	<p>Insert the black plastic cup n° 10 following the mirror, to secure it in the mount.</p>

<< IMPORTANT NOTE >>

By the convex side the image (your face for example) is correct in the mirror, and by the concave side the image is reversed. Do not seat plastic cup stopper if mirror is not seated level into mirror mount.

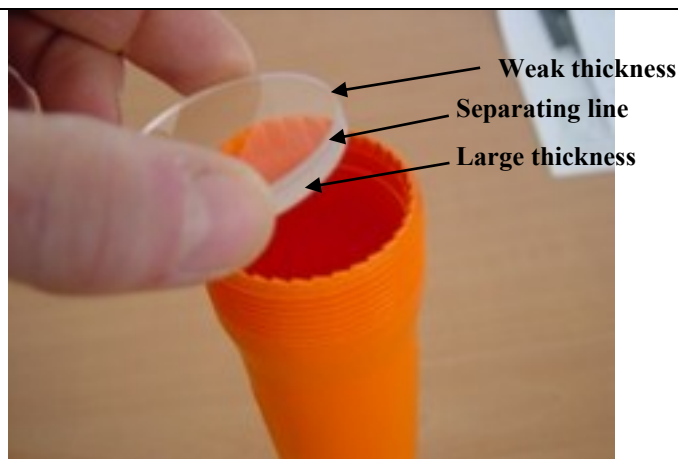
Step 15: Attach the mirror adjustment set:



The Mirror Mount n° 9 must be screwed into Support Flange n° 8 to about half distance.

Step 16 : Assemble the lens and tube (for EDU version):

!! CAUTION: Once the Screw Cap is fastened, the lens CANNOT be dismantled !!



Insert the Lens n° 7 into tube, as indicated in picture



Place the Screw Cap n° 6 onto the tube making sure it is level, and screw on. Tighten lightly.

Step 17 : Attaching Lens Collar onto Upper Housing:





Insert the Collar n° 3 inward from outside of upper housing.



From the inside of housing: screw down [over threads] the Collar Ring and LIGHTLY tighten onto Collar n° 4.

Step 18 : Mounting the lens tube assembly:

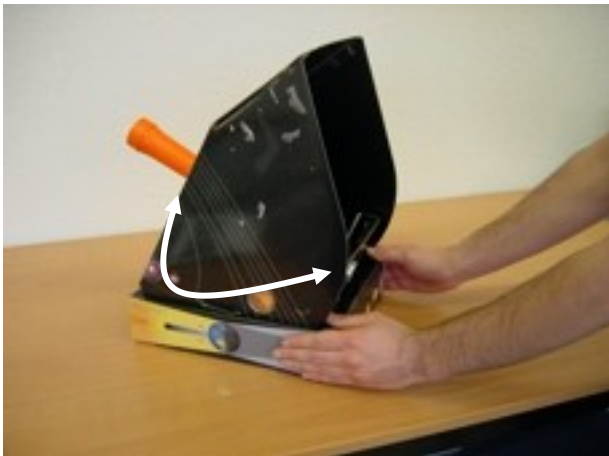

	
Insert the tube.	The tube is adjusted with a small counter clockwise rotation within grooves at different settings.

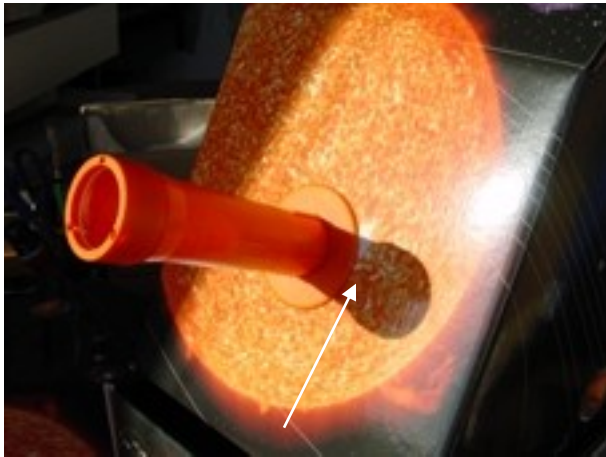
Your Solarscope is ready to work!

3. How to acquire the Solarscope image of the sun?

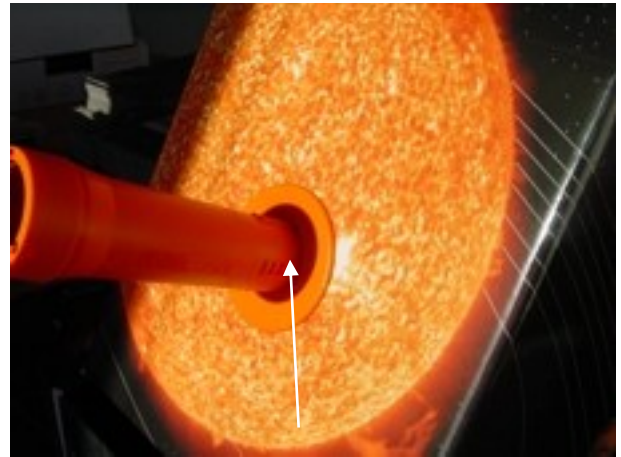
1 - Set the Solarscope facing the sun.

2 - Solarscope must be oriented so there is no shadow reflected from the lens pointing to the sun:

	
Move the base horizontally	Move the upper part vertically



Solarscope in bad position
(shadow)



Solarscope in good position
(no shadow)

3 - To focus your image of the Sun and its spots, first adjust the tube by different settings in the collar to get the best general impression.

4 - Then, fine tune focus the picture by adjusting/screwing the mirror in its mount (Mirror Mount).



5 - Now you can use Solarscope and observe the sun and its entire phenomenon such as eclipses, sun spots, occultation and transits!

4. Some useful hints to using the Solarscope:

① Never observe the sun directly through the lens alone:

For safety reasons for your eyes and others, always use Solarscope fully assembled as indicated above. No components must be missing.

② Use Solarscope in a wind proof environment:

Indeed wind can move it and modify the observation.

To avoid such a problem we advise you to use Solarscope through a window or inside a room.

Unless you purchased one of our wooden models, weather may damage your Solarscope, so keep it out of the rain!

③ Other options:

You can calculate the sun's direction thanks to the protractor on the left side of Solarscope. In order to calculate this use:

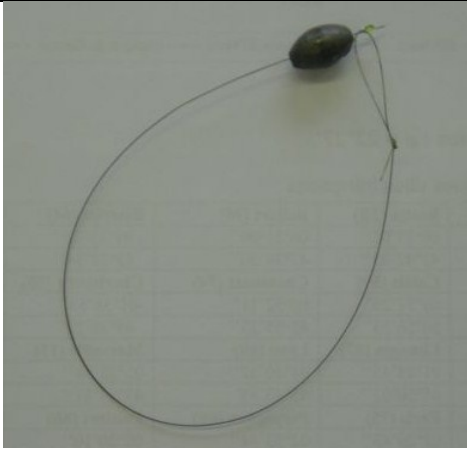


- A plumb line for instance ~2 g (e.g. fishing thread and sinker)
- Make a hole at the 90° angle point on the protractor, which is on the left side of Solarscope.
- Use a pin to clip the plumb line (e.g.: thread and sinker) on the Solarscope.

This system allows you to directly read the elevation on the protractor.

This is useful if you wish to compare your measures done throughout the season. (See N°5 for possible application of Solarscope)

5. Various accessories of educational version:

(Only available with Education versions)

		
Plumbline system	Handbook of practical works	Measurement screen

“Plumb line” system:

It is possible to locate the direction sight of the Sun thanks to the plumb line and to the protractor printed on the left side of the Solarscope.

How to affix the plumb line:

Bore or punch a hole with tack in the Solarscope as indicated on the photography, in the top corner of protractor angle.

Use a pin to clip and suspend the plumb line.

This system enables you to read directly in degree the angle of inclination of the Solarscope with the horizon (direction sight)



“Practical Works”

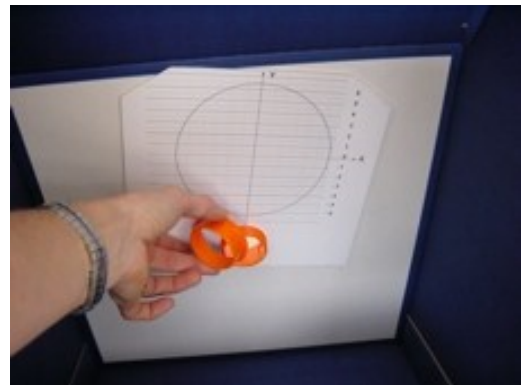
The education version includes a handbook of practical works for primary and secondary school level.

“Measurement screen”

The measurement screen is a tool that makes it possible to measure the displacement of the picture of the Sun and its sunspots with accuracy.

Its utilization is detailed in the handbook of practical works.

The measurement screen card is placed on the white zone inside the Solarscope as indicated in the photograph. The screen card is affixed within the Collar and Collar Ring used to hold the Lens Tube.



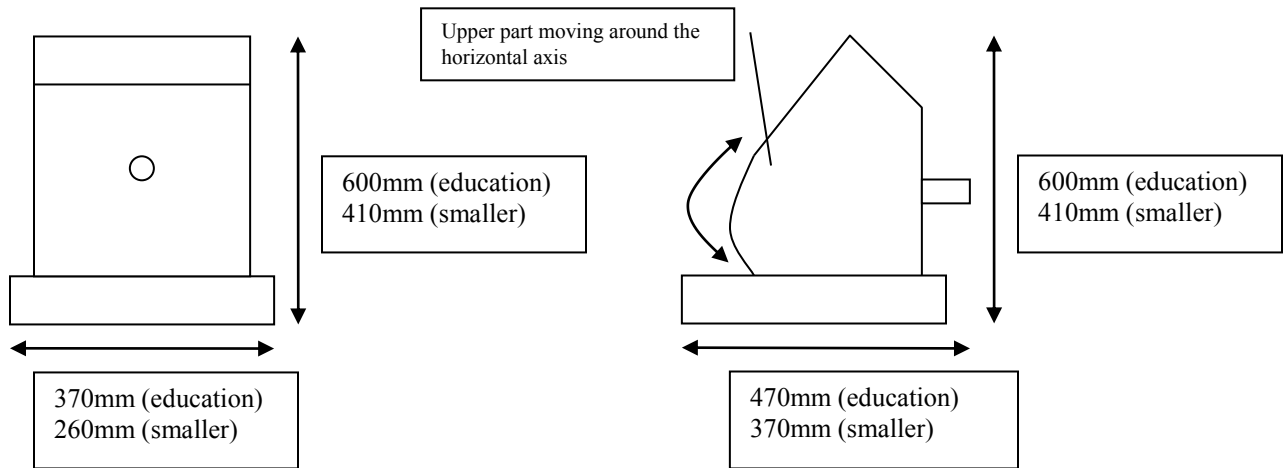
6. What can be measured with Solarscope?

Solarscope can be used to measure several characteristics of the solar system:

- Earth's rotation rate (Solar day measurement),
- Sun's rotation rate,
- Inclination angle of pole axis,
- Latitude of a place,
- Terrestrial orbit eccentricity,
- Time's equation,
- Astronomical Unit.

To find useful information to make those measurements, please visit our web site: www.solarscope.com

7. Technical Characteristics :



Materials :

- Base and Upper Housing: Color printed labelled cardboard
- Lens and mirror : glass
- Lens Tube and mirror mount: plastic (ABS) and aluminium

Dimensions (education version):

- Dimensions of size package: 640 X 460 X 60 mm³ 25-1/4 x 18-1/8 x 2-3/8 inches
- Dimensions of product assembled: 600 x 470 x 370 mm³ 23-5/8 x 18-1/2 x 14-5/8 inches
- Weight: 1000g (1300g w/package) 2.25 lbs (3 lbs. w/ packaging)

Dimensions (standard version):

- Dimensions of size package: 450 x 340 x 50 mm³ 17-3/4 x 13-1/2 x 2 inches
- Dimensions of product assembled: 410 x 370 x 260 mm³ 16-3/16 x 14-5/8 x 10-1/4 inches
- Weight: 750g (1000g w/package) 1.7 lbs (2.25 lbs w/ packaging)

Optical characteristics :

- Optical specifications: focal length 13 m for the education version and 9 m for the small version, image quality: better than 1 lambda (wave front)
- Optical aperture: 38 mm
- Sun's image size on the screen:

Diameter about 125 mm	Education version	4-7/8 inches
Diameter about 80 mm	Standard version	3-1/8 inches
- Observation screen size:

340 x 340 mm ²	13-3/8 inches ²	Education version
240 x 240 mm ²	9-7/16 inches ²	Standard version

Safety: Ocular safety: Solarscope is designed to be eye safe.

Set up Assembling: Sold with assembly instructions, folded in a clamshell game-sized briefcase. Mechanical mounting will be assembled and screwed onto the cardboard.

Patent: This instrument is protected by patents n° FR 2812951 and n° 02/08984.
SOLARSCOPE is a registered trademark.

Inventor: Jean Gay, astronomer at « l'Observatoire de la Côte d'Azur » [Côte d'Azur Observatory]

5 Simple Steps to Using Your Solarscope

