

Guidance of Pleiades watching

1. Background

Pleiades is a group of many stars which locates at constellation of Taurus. You can see 6-7 stars in the cluster with the naked eyes. From ancient times, people have noticed this tight group of stars. Various cultures have different names of Pleiades.

Galileo observed the Pleiades with his telescope. Though his telescope had a far poor performance than modern telescopes of the similar size, Galileo could confirm 36 stars in the Pleiades. The stars in the Pleiades were born at the almost same time (about 100 million years ago) in a same interstellar gas cloud. Meanwhile the Sun is 4.6 billion years old. Compared with the Sun, the stars in the Pleiades are very young.

2. Purpose

The aim of this activity is that children experience the feeling of wonder that Galileo had when he observed celestial bodies for the first time. When children observe the Pleiades with a telescope, they will notice that there are many stars in the area. Teachers make children do sketch of the Pleiades by themselves and lead them to find many stars in the field of view.

3. Observation Tips

It is not difficult to see the Pleiades with a low magnification telescope. As for the person who use telescope for the first time, it is advisable to have a practice session by using distant scenery in daytime.

4. Steps

(a) Observation and sketch with the naked eyes

The Pleiades locates at the constellation of Taurus. If you cannot find Pleiades directly, search the west of Orion.

For observation and sketch, you use the first sheet. Children count the number of stars in Pleiades with the naked eyes, and write it in the frame of the worksheet. The person who has poor eyesight see Pleiades like a cloud.

(b) Observation and sketch with the telescope

You use the second sheet for observation and sketch with the telescope. Enter the Pleiades in the field of view of the telescope, then sketch it. Children would see many stars there. For a comparison, enter a bright star such as Sirius in the constellation Canis Majoris in the field of view, children will notice fewer stars than in Pleiades area.

(c) Write any findings and/or questions

Write anything you found out and/or question from your observations in your sketch sheet under the sketch column.

(d) Think why some stars make a group, why some stars exist alone like the Sun

Children think why stars are in a group by seeing the photo or the Galileo's sketch of Pleiades on the work sheet of the post observation study.

Summarize your knowledge of the Pleiades, which you learned from observations with the telescope and through a text book or the internet. Also, write down what you want to know more and what you can do further.



5. Notes

In this activity, children notice that Pleiades is actually a star cluster and more stars can be seen there when we use telescope. In addition, children think why some stars make a group and others don't. Teacher will explain the star formation mechanism and its evolution, depends on children's levels of understanding.

If it is possible, teachers observe Pleiades with a larger telescope beforehand. If the sky condition is good, you can see a bright nebula around Merope with a 10cm (or larger aperture) telescope. On the photo, you can clearly see a pale nebula. This nebula is called IC349. It is one of the diffuse nebula, it reflects starlight from nearby stars, Merope and others. This nebula is temporally located near Merope at present time. It is not associated with the stars of Pleiades.

Caution must be given to children that "Never watch the Sun through the telescope!"

6.Memo

There are two kinds of the combination of eyepiece and object lens for a refractor: the Galileo style and Kepler style. The Galileo style uses a convex lens for the object lens and a concave lens for the eyepiece. This combination makes an erect image, however the field of view is very narrow. It has been used for opera glasses with a low magnification today. Meanwhile the Kepler style uses the convex lenses for the object lens and the eyepiece. It was made by Johannes Kepler. With this combination, an inverted image appears, but the field of view is relatively wide. It has been used for observations of celestial objects. Please try to guide the children's interest towards the history of telescope and its optical system through experience obtained with telescopes of the Kepler and Galileo styles.