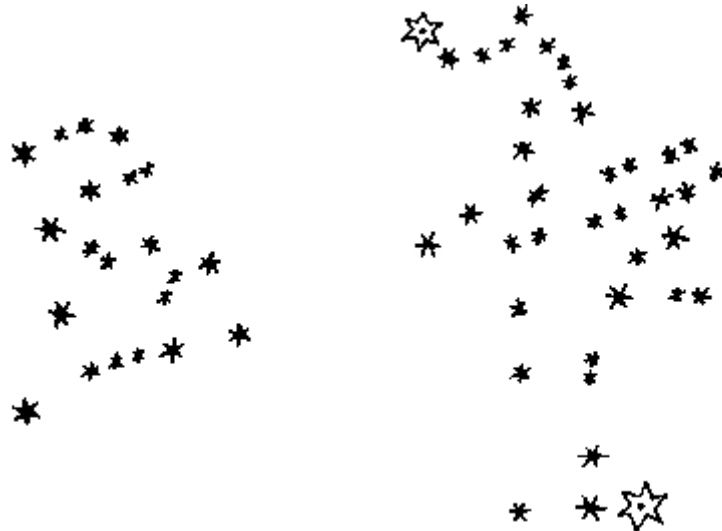


JOURNAL ENTRY FROM *STARRY MESSENGER*

... I have observed the nature and the material of the Milky Way. With the aid of the telescope this has been scrutinized so directly and with such ocular (clarity of vision) certainty that all the disputes which have vexed philosophers through so many ages have been resolved, and we are at last freed from wordy debates about it. The galaxy is, in fact, nothing but a congeries of innumerable stars grouped together in clusters. Upon whatever part of it the telescope is directed, a vast crowd of stars is immediately presented to view. Many of them are rather large and quite bright, while the number of smaller ones is quite beyond calculation.

But it is not only in the Milky Way that whitish clouds are seen; several patches of similar aspect shine with faint light here and there throughout the aether, and if the telescope is turned upon any of these it confronts us with a tight mass of stars. And what is even more remarkable, the stars which have been called 'nebulous' by every astronomer up to this time turn out to be groups of very small stars arranged in a wonderful manner. Although each star separately escapes our sight on account of its smallness or the immense distance from us, the mingling of their rays gives rise to that gleam which was formerly believed to be some denser part of the aether that was capable of reflecting rays from stars or from the sun. I have observed some of these constellations and have decided to depict two of them.



NEBULA OF ORION

NEBULA OF PRAESEPE

Sketch (after Galileo) of Nebula of Orion and Nebula of Praesepe from Galileo Galilei, *Starry Messenger* (1610), Figure Six.

JOURNAL ENTRY FROM *STARRY MESSENGER*

On the seventh day of January in this present year 1610, . . . when I was viewing the heavenly bodies with a spyglass, Jupiter presented itself to me; . . . I perceived . . . that beside the planet there were three starlets, small indeed, but very bright. . . . they aroused my curiosity somewhat by appearing to lie in an exact straight line parallel to the ecliptic, and by their being more splendid than others of their size. Their arrangement with respect to Jupiter and each other was the following:

EAST ✨ ✨ ○ ✨ **WEST**

that is, there were two stars on the eastern side and one to the west. . . . on January eighth . . . I found a very different arrangement. The three starlets were now all to the west of Jupiter. . . .

EAST ○ ✨ ✨ ✨ **WEST**

. . . I began to concern myself with the question how Jupiter could be east of all these stars when on the previous day it had been west of two of them. . . . On the tenth of January . . . the stars appeared in this position with respect to Jupiter:

EAST ✨ ✨ ○ **WEST**

that is, there were but two of them, . . . the third (as I supposed) being hidden behind Jupiter. . . . on the 11th of January, I saw the following. . . .

There were two stars, . . . [one] star was nearly double the size of the former, whereas on the night before they had appeared approximately equal.

EAST ✨ * ○ **WEST**

**FIRST LETTER FROM GALILEO GALILEI
IN REPLY TO THE ILLUSTRIOUS
MARK WELSER CONCERNING THE SOLAR SPOTS**

Most Worthy Sir:

Tardy in replying to the courteous letter Your Excellency wrote me three months ago, I have remained silent . . . until I might hope to give some satisfaction . . . about the solar spots. . . . As Your Excellency well knows, certain recent discoveries that depart from common and popular opinions have been noisily denied and impugned, obliging me to hide in silence every new idea of mine until I have more than proved it. Even the most trivial error is charged to me as a capital fault by the enemies of innovation. . . .

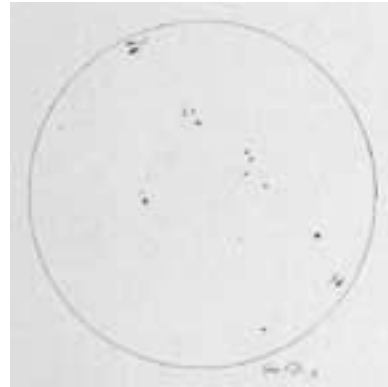
First of all, I have no doubt whatever that they [the sunspots] are real objects and not mere appearances or illusions of the eye. . . . I have observed them for about 18 months, having shown them to various friends of mine, . . . It is also true that the spots do not remain stationary upon the body of the sun, but appear to move in relation to it with regular motions. . . . The spots seen at sunset are observed to change place from one evening to the next. . . .

It proves nothing to say, . . . that it is unbelievable for dark spots to exist in the sun simply because the sun is a most lucid body. So long as men were in fact obliged to call the sun 'most pure and most lucid,' no shadows or impurities whatever had been perceived in it; but now that it shows itself to us as partly impure and spotty, why should we not call it 'spotted and not pure'?

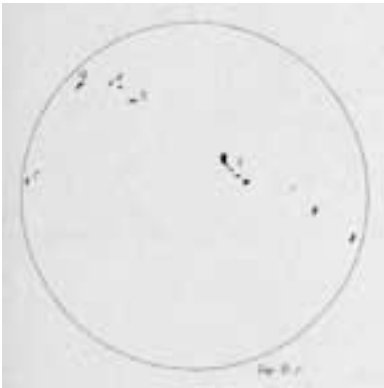
Source: Galileo Galilei, *History and Evidence Concerning Sunspots and Their Phenomena* (1613), translated by Stillman Drake, pp. 89–92.



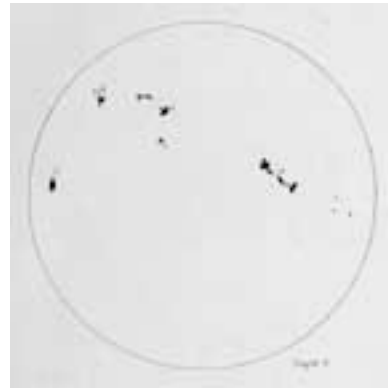
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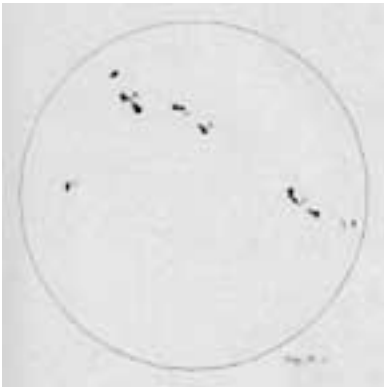
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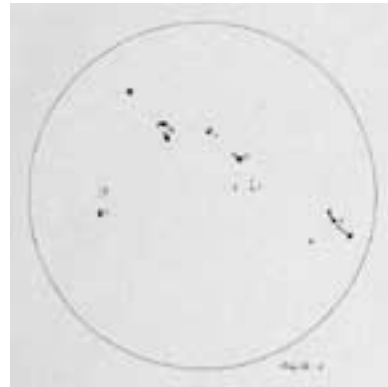
05 June 1613



06 June 1613



07 June 1613



08 June 1613

Galileo's own sketches of sunspots. The entire series of sketches can be viewed online.
Albert Van Helden and Elizabeth Burr, *The Galileo Project* (Houston, TX: Rice University, 1995)
http://es.rice.edu/ES/humsoc/Galileo/Things/g_sunspots.html