

Ancient perceptions of the Pleiades

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Abstract

The Pleiades cluster is prominent in many cultures. Curiously, many cultures call it the Seven Sisters while acknowledging that most people only see six stars. They then have stories to explain why only six are visible. Similar stories about the Pleiades are found around the world and are shared by cultures (e.g., Australian Aboriginal and Classical Greek) that have had no cultural contact, even indirect contact, for tens of thousands of years. These curious details suggest the stories may date back to the time when early humans left Africa. This paper is part of a larger study to catalogue ancient references to the Pleiades, to help trace the history and evolution of the ancient myths and artefacts that refer to the Pleiades. This paper has a particular focus on material from Armenia and its surrounding region.

Keywords: *Pleiades; history of astronomy; ~~Aboriginal astronomy~~; ~~mythology~~*

1. INTRODUCTION

The Pleiades, or Seven Sisters, is an open stellar cluster of young stars formed about 115 to 125 million years ago (Stauffer et al., 1998, Ushomirsky et al., 1998), and is shown in Fig. 1. They are surrounded by a blue reflection nebula resulting from a passing interstellar cloud of dust, moving at 18 km s^{-1} relative to the stars of the cluster (White & Bally, 1993).

The Pleiades are important in many cultures around the world, from ancient Chinese records through to the present day (e.g. Allen, 1899, Avilin, 1998, Burnham, 1978, Dempsey, 2009, Krupp, 1994, Kyselka, 1993, Sparavigna, 2008). In this paper, I use the term “Pleiades” to refer to the astronomical stellar cluster and the term “Seven Sisters” to refer to the human perception of the cluster.

The most widely-known version of the Seven Sisters story comes from classical Greek mythology (e.g. Homer, 850), in which the Seven Sisters are named after the seven Pleiades sisters, who were the daughters of

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Figure 1. The Pleiades, showing the names of the seven brightest stars.

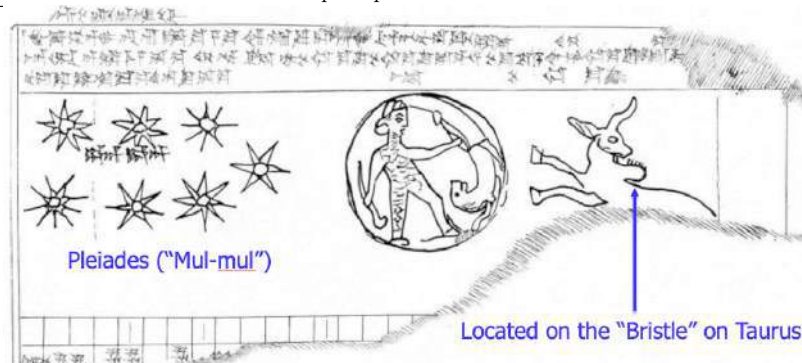


Figure 2. The Pleiades (“mulMul”) depicted in the Babylonian Seleucid tablet, VAT 7851, taken from Verderame (2016). The seven stars of the Pleiades are shown on the left, and their position is on the “bristle” of the bull, Taurus, shown on the right.

Atlas and Pleione. After being forced by Zeus to hold up the sky, Atlas was unable to protect his daughters, who were being pursued with lustful intentions by Orion the hunter. To save them, Zeus transformed them into stars.

Very similar stories about the Pleiades and Orion are found in many other cultures. For example, many Australian Aboriginal cultures associate the constellation Orion with a virile man or a group of young men, and many have stories in which the Orion-man is trying to chase and rape the Seven Sisters (e.g. Johnson, 2011, Massola, 1968, Mountford, 1976, Norris, 2016, Norris & Norris, 2009, Pascoe & Norris, 2026).

For example, the Anangu people in central Australia call Orion Nyiru and say that he is chasing the Seven Sisters (Kunkarunkara). A typical version of the story¹ is that Nyiru chased the sisters from northern Australia past Uluru (Ayers Rock) until they hid in Walinynga Cave in South Australia. Nyiru manages to capture and rape the youngest sister, but the other sisters escape from the cave, rescue the seventh sister, and fly up into the sky. This rescued sister is the “missing” star.

In some versions of the story, the bright star Aldebaran, between Orion and the Pleiades, is a dingo dog that tries to protect the girls from Orion.

These same elements are found in many other stories around the world, suggesting a common origin.

1.1. This paper

In this paper, I examine evidence for ancient representations of the Pleiades, with a particular focus, given the location of this conference at Byurakan Observatory, on the area around Armenia. This is an important area for the history of astronomy, given its proximity to Mesopotamia, where our constellations are said to have originated around 1000-3000 BCE (Rogers, 1998), and to Gobekli Tepe, which may be our oldest (~ 9000 BCE) astronomically-aligned building (e.g. Malkhasyan, 2024).

Section 2 of this paper describes the earliest images that may represent the Pleiades, and Section 3 discusses why most people only see six stars in the “Seven Sisters”. Section 4 discusses the similarity of the Seven Sisters stories from around the world, and Section 5 describes the phylogenetic analysis of the Seven Sisters stories. Section 6 discusses the evidence for early representations of the Pleiades in the region around Armenia, and Section 7 presents the Conclusions.

2. The Earliest images of the Pleiades

The oldest known reliable representation of the Pleiades (or “mulMul”) is said to be from the Babylonian Seleucid tablet, VAT 7851, dated to about 300 BCE (Verderame, 2016), shown in Fig. 2. The fact that this tablet shows the seven stars of the Pleiades in roughly the right positions, shows their position on the back of Taurus, and refers to them in the text lends credibility to this claim.

The next oldest reliable reference to the Pleiades is in Ptolemy’s *Almagest* (Ptolemy, 150), published in about 150 CE. That listed four of the stars of the Pleiades and their positions, but an image was not made until the Persian astronomer Abd al-Rahmān al-Sufi produced his book *Kitāb ṣuwar al-kawākib* (“The Book

¹<https://songlines.nma.gov.au/walinynga-rock-art/0/>

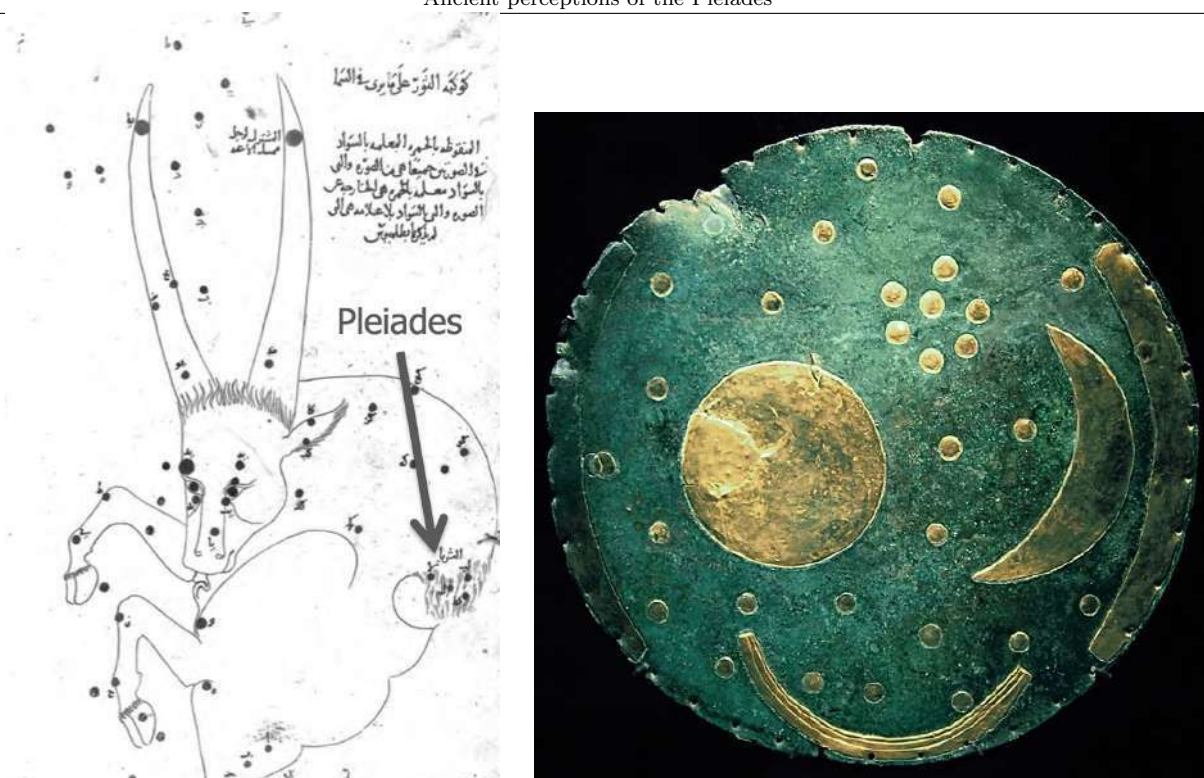


Figure 3. (left) The Pleiades depicted in Al Sufi's *Kitāb ṣuwar al-kawākib* ("The Book of Fixed Stars"). Like the Babylonian tablet, the seven stars of the Pleiades are shown on the "bristle" of Taurus. (right) The Nebrat disk, dated to ~1600 BCE, which is said to show the seven stars of the Pleiades above the sun and moon.

of Fixed Stars"), in 964 CE (Al-Sufi, 964). Like the earlier Babylonian tablet, Al Sufi shows the Pleiades on the bristles on the back of Taurus, as shown in Fig. 3(left).

A possibly older image is the Nebrat disk, shown in Fig. 3(right), which was found in Germany in 1999 and is dated to ~ 1600 BCE (Pasztor, 2015). Above a circle and a crescent which are said to represent the Sun and Moon are seven dots which are said to represent the Pleiades. However, the dots are not arranged in a shape that resembles the Pleiades, and there is no other information suggesting a connection with the Pleiades, so the identification of these dots with the Pleiades seems tenuous.

Even older, and even more controversial, is an image from the Lascaux caves in France dated to about 20,000 BCE. Six dots above an antioch (an ancient, and now extinct, member of the cow family) are suggested by Rappenglück (1997) to represent the Pleiades on the shoulders of Taurus, as shown in Fig. 4.

In defence of this suggestion, the six dots really do resemble the six obvious stars of the Pleiades, and they are shown on the shoulder of Taurus, just as the Al Sufi image shown in Figure 3. It can even be argued that there is a double dot at the position of Atlas/Pleione. On the other hand, archaeologists have pointed out that there are many other dots amongst the cave painting which do not seem to represent stars, and, most crucially, these images were painted some 17,000 years before the constellation of Taurus was thought to have been defined in Mesopotamia. Thus, if this suggestion were correct, it would necessitate a major rewrite of the early history of astronomy, and we have no other evidence of these constellations at that early date. So this suggestion must remain speculative unless more evidence is found to support it.

Another potentially older image may be found in the rock art at Marra Wonga, Australia (Taçon et al., 2022), with a probable date of about 3000 BCE. This site is perhaps unique in possessing ancient rock art combined with local traditional knowledge of the meaning of the rock art. The rock art includes a cluster of seven star-like designs (see Fig 5) said by Elders to represent the Seven Sisters. As in other Australian Aboriginal stories, the Seven Sisters are said to be chased by an evil man with a big penis. In some versions associated with Marra Wonga, the oldest sister is raped by the man. However, the engravings of the Seven Sisters unfortunately do not appear to be an accurate representation of the stars of the Pleiades, and so may be symbolic rather than literal.

A very similar story, summarised in Section 1, is associated with the painted figures in Walinynga cave



Figure 4. A cave painting from Lascaux, France, dated to about 20,000 BCE, which is controversially claimed to show the Pleiades above the shoulder of Taurus ([Rappenglück, 1997](#)). The inset shows the actual image of the Pleiades, revealing a strong similarity to the positions of the painted dots.

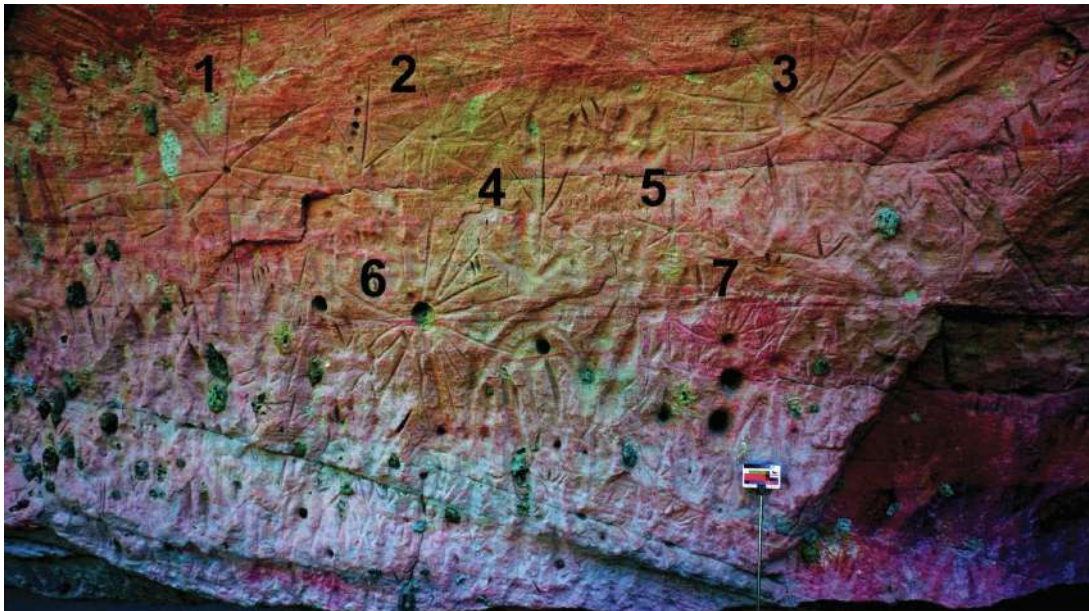


Figure 5. The engraving of the Seven Sisters from Marrawonga, Australia, reproduced with permission from [Taçon et al. \(2022\)](#).



Figure 6. Galileo's diagram of the Pleiades, from [Galilei \(1610\)](#). He shows the six naked-eye stars as large stars (encircled here for clarity), and shows fainter stars, visible only with a telescope, as smaller stars. Note that he does not include Pleione as a naked-eye star.

in South Australia. These show the Seven Sisters as part of the "Seven Sisters songline" which is focussed this cave. These paintings have been dated to before 1000 BCE (but may be much older), and, according to local oral tradition, show the Sisters from the Pleiades cluster, but they do not show any representation of the Pleiades cluster itself.

3. How many stars in the Seven Sisters?

Classical Greek mythology says that the Pleiades were the seven daughters of Atlas and Pleione, and so a purist might argue that the stars Atlas and Pleione (see Fig. 1) should not be included in the Pleiades.

However, we may be guided by Galileo, who **did** include them (see Fig. 6), and said "I have depicted the six stars of the ... Pleiades. I say six intentionally, since the seventh is scarcely ever visible." ([Galilei, 1610](#)). Like Galileo, most modern authors include Atlas and Pleione in the Pleiades (e.g. [Burnham, 1978](#)). Also like Galileo, most people with good eyesight, in a dark sky, see only six stars ([Kyselka, 1993](#)). The first documented mention of the Seven Sisters only having six stars goes back to the third century BCE, when the Greek poet Aratus of Soli named the Seven Sisters but then reported that "only six are visible to the eyes" ([Krupp, 1991](#)). It seems that many traditions regard the cluster as having seven stars, but acknowledge that only six are normally visible.

Stories from around the world explain that you can't see the seventh star, which is sometimes called "the lost Pleiad", and then have a story to explain why the seventh is invisible. For example, Greek mythology recounts how one of the sisters, Merope, fell in love with a mortal and her shame caused her to fade from sight ([Sparavigna, 2008](#)). Many Australian Aboriginal stories say that the seventh star is missing because one of the sisters has died, is hiding, or has been abducted ([Fuller et al., 2014](#), [Kyselka, 1993](#)). There are many similar stories from around the world, such as that from the Onondaga Iroquois ([Krupp, 1991](#)) in which one of the stars sang during their ascent to the sky and thus became fainter.

These stories suggest that at some time there really were seven easily visible stars, one of which is now missing. In the words of [Hertzog \(1987\)](#), "the combined testimony of numerous societies, spanning continents and millennia, [militate] for a seventh easily visible ... Pleiad which subsequently dimmed".

So what happened to the seventh star? Possible explanations include:

- Many of the Pleiades are B stars, which are often variable. The long-term variability of B stars is poorly understood, and it is possible that one of the faint stars in the Pleiades was much brighter in the past. However, there are no data to support this hypothesis.
- It is also possible that one of the stars exploded in a supernova, but there is no evidence for a supernova remnant in the Pleiades.

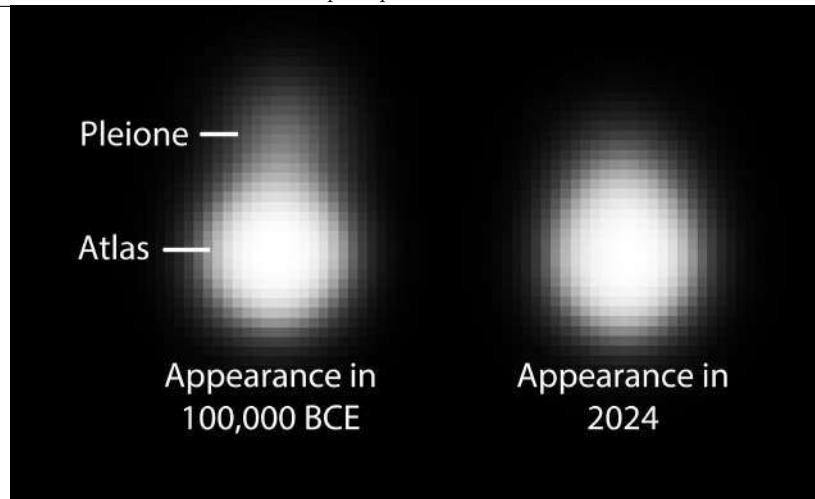


Figure 7. The appearance of Pleione and Atlas in 100,000 BCE and now, based on [Norris & Norris \(2021\)](#) but updated to use more recent astrometric data from Gaia ([Gaia Collaboration et al., 2023](#)).

- We have previously noted ([Norris & Norris, 2021](#)) that Pleione, despite being magnitude 5.1, is currently invisible to most human eyes because of its proximity to Atlas. For example, Galileo ([Galilei, 1610](#)) did not list it as a naked-eye star, although he could see it with his telescope. However, [Norris & Norris \(2021\)](#) pointed out that, because of its proper motion, Pleione was slightly further away from Atlas, and thus visible to most humans, 100,000 years ago, so may have been the lost Pleiad (see Figure 7). But this implies that this story is 100,000 years old, making it by far the oldest known story. Nevertheless, this hypothesis has some supporting evidence, discussed in Section 5.

4. Why are the Greek and Australian Stories so similar?

I have shown above that there is a strong similarity between the stories about the Seven Sisters from around the world. It is particularly instructive to consider the Greek and Australian stories because of the lack of cultural contact between these two societies since the arrival of the first humans in Australia, and so little chance of cultural diffusion. Here I consider possible reasons for the strong similarity between the Greek and Australian stories.

4.1. Cultural Diffusion

The Australian Aboriginal people arrived in Australia at least 65,000 years ago ([Clarkson et al., 2017](#)), after which there was then virtually no cultural contact with the west until (a) trading by the Yolngu (Northern Australia) people with Macassan (Indonesian) Trepang collectors from about 1750 onwards ([Wesley et al., 2014](#)), (b) the invasion of Australia by the British in 1788. Could either of these be the origin of the Aboriginal Seven Sisters stories? It seems unlikely because

- The Seven Sisters stories are found throughout Australia, with a level of uniformity that suggests an ancient origin. We may compare those with the Christianity stories introduced to Aboriginal people by the British from 1788 onwards, which are not widely diffused but are mainly found near towns and missions.
- The paintings and engravings associated with the Seven Sisters stories at Marra Wonga and Walinynga appear to be thousands of years old.
- stories about other constellations (e.g. Scorpius, Crux) vary widely from group to group. If cultural diffusion across Australia were a rapid process, then it might be expected that other stories would also be uniform.

I conclude that the Aboriginal Seven Sisters stories are very old, and probably predate both the Indonesian and the British influences.

4.2. Independent Invention

Could it be that the Greeks and Australians independently came up with the same story? It might be argued, for example, that the beauty of the Pleiades cluster triggers all humans to regard it as “feminine”, whilst the majesty of the Orion constellation triggers all humans to regard it as “masculine”. However, the details of the story are very specific, and both Greek and Australian versions contain the following elements.

- they both identify the Pleiades as a group of seven young girls, even though only six stars are normally visible
- they both identify Orion as male,
- they both say that Orion is chasing and attempting to rape one of the girls in the Pleiades,
- they both say that only six of the seven stars are normally visible, and have a story to explain the invisibility of the seventh.

It is difficult to imagine different people in different continents independently contriving stories with these same details.

I therefore conclude the stories most likely have a common origin. As the last cultural contact between the Greeks and Aboriginal Australians was when they left Africa before 65,000 BCE, that suggests that the story is at least that old, and perhaps came out of Africa with the mass migrations.

5. Phylogenetic analysis

Evolutionary biologists developed a technique called phylogenetic analysis, which traces the relationship between species by tracking changes in genes. Anthropologists have applied this technique to different versions of myths from around the world, tracing the transmission of stories from culture to culture, by tracking changes in the elements of the stories (called “motifs”).

Julien d’Huy and Yuri Berezkin published a series of papers (e.g. [D’Huy & Berzkin, 2017](#)) in which they use this technique to explore the Seven Sisters myths.

They first built a database of about 55,000 myths gathered from about 1,500 ethnic groups from around the world, from which they selected the Seven Sisters stories. They identified 21 different motifs that appear in the stories, such as the Pleiades being a group of girls or women, or the Pleiades being birds, or Orion being male, or Orion chasing the women. They then built phylogenetic trees showing which myths might share a common heritage, and the age of the divergences. This enabled them to trace the evolution of the Seven Sisters stories.

Their analysis showed several of the most common motifs (e.g. the story includes both the Pleiades and Orion, the Seven Sisters are a group of girls or women, and Orion has the opposite gender) probably originated in Africa and were spread across the world through human migration. Using this technique (and unaware of our work), d’Huy and Berezkin had independently reached a similar conclusion to that of Section 4, using a completely independent technique. However, their database is necessarily incomplete, and so further work is planned to extend their analysis.

6. Relationship to the region around Armenia

To test the hypothesis that the Seven Sisters story dates back to the early human migrations, it is important to search for evidence of early traces of the story in other cultures, and also search for other versions of the myth to extend the phylogenetic analysis.

The region surrounding Armenia is extremely important in the study of ancient astronomy, as it lies immediately to the north of Mesopotamia, where our modern constellations are thought to have originated around 3000 BCE (e.g. [Horowitz, 2015a,b](#), and references therein), from where they spread to Europe and elsewhere ([Jones, 2015](#)). By 1200 BCE the Pleiades (or “mulMUL”) are referred to as the “seven gods”. But Armenia is also connected to Europe and the much later astronomical traditions associated with Greek and Roman mythology, and so is an important bridge for understanding the evolution of these stories.

Orion (or *Hayk* in Armenian) is an extremely important constellation in Armenia, and was once the defining point of the Armenian calendar ([Broutian, 2017](#)). Similarly, the Pleiades (known as “Bazmats’tegh”



Figure 8. The seven carved birds at the base of Pillar 18 at Göbekli Tepe, dated to about 8000 - 9500 BCE and interpreted by [Malkhasyan \(2025\)](#) as representing the Pleiades, which are traditionally associated with the winter months in Armenia. The shadow is the noon shadow of Pillar 19 at the winter solstice. Reproduced with permission from [Malkhasyan \(2025\)](#).

in mediaeval Aremian, or “Boylke” in modern Armenian) were also important. There are many (perhaps hundreds) of Armenian folk tales about Orion and the Pleiades, in some of which the Pleiades are the seven daughters, or wives, of Orion, and are chased by him, similar to the Greek and Australian stories (H. Malkhasyan, personal communication). In some cases, the seven stars are associated with seven birds that transform into girls. However, details of these are not yet available and will not be discussed further here.

In the rest of this section, I discuss sites in and around Armenia for which evidence has been claimed of ancient astronomical observations of the Pleiades.

6.1. Göbekli Tepe

Göbekli Tepe, also known as Portasar, in southeastern Turkey, is the oldest known monumental structure in the world, with dates from 9500 to 8000 BCE ([Steadman & McMahon, 2011](#)). It features large T-shaped limestone megaliths decorated with intricate animal reliefs. Several authors have argued that some of the megaliths at Göbekli Tepe are aligned with stars or the Sun (e.g. [Coombs, 2023](#), [De Lorenzis & Orofino, 2015](#), [Malkhasyan, 2024](#)). Controversially, [Collins \(2015\)](#), [Sweatman & Tsikritsis \(2017\)](#), [Vahradyan & Vahradyan \(2010\)](#) have claimed that some of the carved figures are depictions of constellations, significantly predating the much later Mesopotamian representations of the constellations.

Pillar 18 at Göbekli Tepe shows seven carved figures of birds and [Malkhasyan \(2025\)](#) argues that these represent the seven stars of the Pleiades, and also the seven lunar months of winter. These seven birds are illuminated by the Sun at noon each day, except during the first month of winter when the shadow of pillar 19 obscures one of the birds, as shown in Figure 8, corresponding to the one month interval in 9500 BCE between the winter solstice, and the heliacal rising of the Pleiades.

6.2. Nabta Playa

Nabta Playa, in Egypt’s Nubian Desert, is dated to ~ 6000 BCE. and is widely accepted as the world’s second oldest known astronomical observatory after Warren Field in the UK ([Gaffney et al., 2013](#)). It is claimed ([Malville et al., 2008](#)) that the megalithic structures at Nabta Playa indicate not only calendrical positions of the Sun, but also bright stars such as Sirius and Orion’s belt.

Again, these predate the traditionally assumed Mesopotamian origin of the constellations, although in this case the alignments are to individual stars, with no suggestion of a representation of constellations.

6.3. Metsamor

Metsamor is an archaeological site in the Armavir province of Armenia. It includes structures dating from 4000 BCE through to medieval times, including several megaliths. [Malkhasyan \(2024\)](#) and [Broutian \(2017\)](#) argue that a petroglyph on the “small hill” platform at Metsamor resembles both the appearance of the Pleiades at its heliacal rising, and the Sumerian cuneiform symbol for the Pleiades. [Broutian \(2017\)](#) also points out that the major axis of the petroglyph points towards the azimuth of the rising Pleiades in about 9000 BC, although this is much earlier than the dates obtained from archaeological evidence.

6.4. Carahunge

The Syunik province in south-east Armenia contains many archaeological sites, including megalithic monuments and thousands of petroglyphs. Particularly important is the site known as Carahunge, or Zorats Karer, which may have served as an astronomical observatory ([Belmonte, 2015](#), [González-García, 2015](#), [Herouni, 2004](#), [Simonia & Jijelava, 2015](#)) and has been called the “Armenian Stonehenge” ([Herouni, 2004](#)). This site, thought to date from the Bronze Age, consists of more than 200 massive basalt stones, many featuring precisely drilled holes, some of which have been claimed to represent astronomical alignments, although this has been disputed ([González-García, 2015](#)). [Malkhasyan \(2024\)](#) has also noted that the Pleiades may have been observed from this site.

7. Conclusion

The Seven Sisters stories associated with the Pleiades cluster are widespread across the world. While many variations exist, a common version is that the Pleiades represents seven girls who are being chased by Orion, who intends to rape one of them. Although called the Seven Sisters, most people see only six stars in the Pleiades, and this is explained in the stories in terms of one girl being captured, or in hiding, or otherwise hidden. This paper has supported the hypotheses that

- based on the similarity between Greek and Australian versions, which have been culturally disconnected since at least 65000 BCE, this story is very old, perhaps dating back to the mass migrations out of Africa, and
- that at that time, because of proper motion, the Pleiades did indeed appear to most human eyes as seven stars.

To test these hypotheses, we need to collect data on early myths and representations from around the world. The region around Armenia appears to be fertile ground for this search, but so far only circumstantial evidence has been found.

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