ANALELE BANATULUI, S.N., ARHEOLOGIE – ISTORIE, XXXIII, 2025
http://analelebanatului.ro/aparitii-issues/analele-banatului-xxxiii-2025/

ENGRAVING ON THE GURA HAITII MEGALITH: ASTRONOMICAL INVESTIGATIONS

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Cuvinte cheie: megalit, Romania, calendar, Pleiadele, planete, stele
Keywords: megalith, Romania, calendar, Pleiades, planets, stars

(Abstract)

This study gives perspectives on the basic astronomical symbolic signs and meanings connected with the engraving on the Gura Haitii megalith from Romania (Eastern Carpathian Mountains, geographic latitude 47°11′50″N, geographic longitude 25°15′49″E, altitude of the village 1040 m, and altitude of the *Twelve Apostles* peak 1771 m). The andesite megalith at Gura Haitii was found at the confluence of the Paltinu and Haitii streams, at an elevation of 1055 m (Naum *et alii* 1988). The engravings consist exclusively of incised symbols in the form of circles of various sizes (circles with a central point, concentric circles, and with rotated rays). The circle with rotated rays has the largest diameter (21.5 cm), and above it, smaller circles were engraved, two of which have the center marked with a dot. On the left side of the circles with six rotated rays, there is a more complicated engraving, which is probably the most interesting representation on this megalith. It is a circle with a diameter of 5.8 cm, which has a smaller circle, and three semicircles engraved inside. This is a captivating artwork that imitates prehistoric motifs and rituals in pictures. Since the discovery of the engraved megalith from Gura Haitii in 1987, scientists and amateurs have had presumptions about its meaning and design. One part of the researchers assume that the pictogram use had astronomic, mathematic meanings, calendar aspects (Lazarovici *et alii* 2011), the other part suppose that the more complicated circle depict an anthropomorphic figure in an abstract manner, some idol in a cosmogonist composition (Colan-Cârciumaru 2023), and some believe that the symbols can be interpreted as signs for marking directions, routes, location. The engraving elements on the Gura Haitii megalith can be interpreted as representing a kind of geometrical construction: circles, semicircles, with a centered point, and rotated rays. It is assumed that the Gura Haitii megalith has astronomical content, and the geometric structure of its symbolism is due to the manufacturing process, which was carried out using a compass. We assume some astronomical elements depicted on the megalith at first view as the crescent Moon or the Sun, total or partial eclipses, the Sun, the Moon, the planets (the *Solar System*); or the *Pleiades* (M45) the nearest open star cluster to Earth, containing stars in the northwest of the constellation *Taurus* and can be observe to the naked eye in the night sky, and which in 2330 BC marked the vernal point (the stellar system); or groups of bright stars from the *Milky Way* a band of stars in the night sky that is a view of our spiral galaxy from the inside. The analysis from an astronomical point of view communicates plainly that the engraved megalith is a symbolic object with basic astronomical readings (calendar, cosmic myth, cosmovision).

On November 8, 2024, I received an email from Boss (Prof. G. Lazarovici), in which he writes: "I'll give you a topic to think about: on the image below (see Fig. 1). Is the solar eclipse on the megalith?" This was the first time I saw the image with a marker line. More than ten years ago, at the request of archaeologist Z. Maxim, I visited the museum with the inscribed megaliths, but I didn't see much detail in the photos taken. Prof. Lazarovici enlarged the image and marked it with blue color where it was engraved, which helped me a lot in deciphering. We wanted to publish an article on this topic. Below you will find my detailed answer to the Boss' question.

A megalith is a large stone that has been used to construct a prehistoric structure or monument, either alone or together with other stones. Usually, megaliths are funerary or religious monuments of prehistoric civilizations (Neolithic and early Bronze Age), and they are found almost everywhere in the world. More than 35,000 structures or arrangements can be found in Europe, located widely from Sweden to the Mediterranean Sea[1]. It

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[1] Paulsson 2017, Thom-Thom 1977.

is believed that around 4500 BC, settlers who carried the knowledge of building megaliths reached Orkney, northern Scotland, Sweden, Italy and even the Caucasus. Megaliths from the Stone Age can be found in almost every European country[2], for example Göbekli Tepe, Turkey; Antequera, Spain; Alignments of Carnac, France; Vinquoy Cairn, Scotland; Newgrange, Ireland; Ħal Saflieni Hypogeum, Malta; Raevehoj, Denmark; Kungagraven, Southern Sweden; etc.

The ancient burial structures, strikingly similar across Europe and the Mediterranean have puzzled scientists and historians for centuries[3].

In Suceava County (Romania), at Gura Haitii (Carpathian Mountains), carved megaliths with inscriptions on them were discovered[4]. In 1987, in the valley of the Paltinu Stream (the village of Gura Haitii, 27 km from Vatra Dornei in Suceava county), the student Claudiu Paţa discovered, about 400 m from the confluence with the Haita Stream, the megalith with engravings. Therefore, the andesite megalith at Gura Haitii was found at the confluence of the Paltinu and Haitii streams, at an elevation of 1055 m (Naum *et alii* 1988), in the Căliman Caldera, near the zoomorphic and anthropomorphic representations on the Hârlei Foot and in the *Twelve Apostles* group. The *Twelve Apostles* is a peak in Dorna Candrenilor, Suceava and has an elevation of 1,771 meters, and it is situated nearby to the village of Gura Haitii.

We mention that originally, andesite stone was defined as an intermediate *volcanic* rock containing between 53% and 63% SiO_2[5], and the Călimani Mountains represent the largest and most complex volcanic structure in the northern part of the Călimani-Gurghiu-Harghita range in Romania[6]. This volcanic sequence, although erupted on continental-type basement, has been considered a typical island arc calc-alkaline suite from petrological and geochemical evidence. In this zone, the predominant lithological types are andesites with minor basaltic andesites and rare acidic products (dacite-rhyodacite). The series shows the characteristics of island arc calc-alkaline suites such as high $A1_2O_3$, low TiO_2 and no Fe enrichment[7].

The engraved megalith is 135 cm high, 92 cm wide and weighs over 1.5 tons. The block shows obvious traces of processing. The trace of the rock-cutting ditch is preserved. The engravings are centered on the flattest side of the andesite block. They are incised quite deeply and seem to have been made with a metal tool, given their regularity. The engravings represent concentric circles, circles with semicircles inside, other smaller circles, the largest of the circles having six radii formed by semicircles (rotated), at equal distances to the size of a radius. The megalith also presents incisions on the opposite side, but they are less well preserved. Near the engraved block, a block was discovered, also made of andesite, with regular shapes inscribed in a parallelepiped. Due to their correspondence, it is assumed that the two blocks supported the slab of a dolmen[8].

Moreover, on the height of several mountains there are megalithic stones with signs from different historic periods related to astronomy (as those from Gura Haitii, Teasc – Grueţu) or hermits, and in the last case the signs has to be interpret as marking directions, routes, locating (such as the megalith at Colţ etc.)[9].

Fig. 1. The sun-shaped idol seems to be supported by a hand[10]

Lazarovici *et alii* in 2011 concluded that on the megalith of Gura Haitii, an attempt was made to represent, in an extremely abstract manner, the human figure. It would therefore be a rendering by engraving of an idol in a sun-shaped composition, considering the inscription of the entire representation in a circle and the obtaining of the other details through circles or semicircles inscribed within its limits (Fig. 1). This sun-shaped idol

[2] Gommer 2023.
[3] Gimbutas 1991.
[4] Lazarovici *et alii* 2011.
[5] Thorpe *et alii* 1981; Gill 1981.
[6] Seghedi *et alii* 2005, 67.
[7] Peccerillo-Taylor 1976, 121; Bocaletti *et alii* 1973, 310.
[8] Lazarovici *et alii* 2011, Lazarovici-Lazarovici 2019.
[9] Lazarovici *et alii* 2011, 77; Lazarovici-Musceleanu 2017.
[10] Lazarovici *et alii* 2011, 70, fig. 24.

seems to be supported by a hand made in a schematic style, but which is reminiscent, through the length of the fingers, of the rays related to the cult of the sun. The lower part of the megalith presents several concentric semicircles, and grid incisions also appear (frequent in Bronze Age engravings, in France).

In the following, I will outline what I saw from an astronomical point of view on the sketch, which I have grouped into three categories: *Solar System*, a stellar system and the *Milky Way* views.

Fig. 2. Engraved megalith at Gura Haitii. 1–2 general view of the megalith; 3-circle-shaped Engravings[14]

1. The Solar System view

Fig. 3. Planetary alignments at 4493 BC, Nov. 25, morning 6h seen from Cluj-Napoca[17]

The circles on the megalith have different sizes: the bigger one with rotated radius representing the Sun[11], the middle one ("sun-shaped idol supported by a hand"[12]) with semicircles could symbolize the Sun-Moon couple (Earth-Moon) with eclipses (where we are – supported by a hand), and the smaller circles the other planets (Fig. 2). Also, in the areas of the Carpathian Basin, the Sun is decorated with concentric circles and spirals, and displays radial rays[13].

Many anthropologists who have studied Stonehenge and similar megalith structures from that era believe that part of its function was to serve as a calendar, and that the stones were used for that purpose[15]. Of course, it may have had religious significance as well, since the stars and planets were regarded as gods. Besides, it is generally recognized that the alignment of the Pyramids of Egypt was influenced by the alignment of the stars[16].

Planetary alignment is an astronomical term

[11] Lazarovici 2008; Szücs-Csillik 2021.
[12] Lazarovici *et alii* 2011, 70.
[13] Lazarovici 2008.
[14] Colan-Cârciumaru 2023, 154, fig. 16.
[15] Bickerman 1980; Biémont 2000; Paulsson 2017.
[16] Fairall 1999, 3.
[17] Zotti *et alii* 2021.

that means that several planets gather closely on one side of the Sun at the same time.

A visual phenomenon when the planets appear close together in a small sky sector, as seen from the Earth. Using the Stellarium planetarium program, for 4493 BC, one can see a planetary alignment on the night sky: Jupiter, Venus, Mercury, Saturn rising, and Mars and Moon setting (Fig. 3). This event could have been so fascinating that it was engraved on an andesite stone to remain in memory.

2. A stellar system view

The circles could also be stars, a stellar system. Starting from the image of the sun-shaped idol, which seems to be supported by a hand, we could match the marked Y-shaped figure with the *Taurus* constellation (Fig. 4 a), and the interesting circle with semicircles with *Aldebaran*[18] star, *Hyades*[19] and *Pleiades* open clusters group, namely the *Golden Gate of the Ecliptic*[20].

of Gura Haitii could be a location representation of the *Pleiades*, and the right part an enlarged view of the *Pleiades* open cluster, whose bright stars are grouped in the shape of a chariot (Fig. 4 c). The seven stars of the *Pleiades* are fairly bright and together they look like a small version of the *Big Dipper*.

In the Mediterranean Sea, the season of navigation began with the *Pleiades* heliacal rising. In Greek mythology, the *Pleiades* were the seven daughters of Atlas and the oceanic Pleione, after whom they are named[21].

Ridpath mentions that the *Pleiades* are so distinctive that the ancient Greeks regarded them as a separate mini-constellation and used them as a calendar marker. Hesiod, in his agricultural poem entitled *Works and Days*, instructs farmers to begin harvesting when the Pleiades rise at dawn, which in Greek times would have been in May, and to plough when they set at dawn, which would have been in November. In the Romanian tradition,

Fig. 4. a. Pleiades (M45) open cluster near the Taurus (supported hand) constellation; b. The Pleiades consisting of approximately 3,000 stars at a 400 light-years from Earth in the constellation of Taurus. Known as 'The Seven Sisters'; c. Pleiades shape is a tiny chariot.

We know that all planets, as well as the Moon and the Sun, always move along the apparent circle of the ecliptic. These celestial bodies regularly pass through the Golden Gate of the Ecliptic. Since the Moon is the closest of these heavenly bodies to the Earth and it is inclined at a high enough angle to the ecliptic, on some occasions, the Moon can cover the stars of the open star clusters or even pass outside the Gate.

As we know, the *Pleiades* is an open star cluster that is the nearest and obvious star cluster that we can see with the naked eye (Fig. 4 b).

The left part of the engravings on the megalith

Pleiades was *the Hatching Hen with Her Chicks,* an agrarian constellation. Moreover, in 4500 BC, *Pleiades* open cluster had a heliacal rising at the spring equinox[22], and in 2330 BC marked the vernal point.

Pleiades were used by the Paleolithic hunter-gatherers for orientation in space and for time-reckoning. These star patterns also played an important role in the cosmovision of archaic cultures. Together with the depictions of the course of the Moon and the Sun, they helped to organize the spatiotemporal structure of daily and spiritual life of Paleolithic man[23].

Let me bring to your attention that a larger part of the scholars identifies the small point shape on the *Nebra sky disc*[24] (1600 BC) with the open

[18] *Aldebaran* (α Tau) is the brightest star in the *Taurus* constellation, and it is a variable star best seen at midnight between late September and early October in 4500 BC.

[19] Together with the *Pleiades*, the *Hyades* form the *Golden Gate of the Ecliptic*, which has been known for several thousand years (Rappenglück 1999).

[20] Rappenglück 1999.

[21] Ridpath 2018.

[22] Szücs-Csillik–Maxim 2022, 224.

[23] Rappenglück 1999, 391.

[24] Haustein *et alii* 2010.

cluster of the *Pleiades*. Rappenglück states that cultural traditions from all over the world and across time provide evidence for equating the pattern of a pentagonal or hexagonal set of points around a dot in the center with the *Pleiades*[25]. The *Nebra disc* was a symbolic expression of the cosmos with some reference to the iconographical system of the Nordic Bronze Age[26]. We recognized that concentric circles could represent the brightness of stars. This observation comes from comparing the patterns of bright stars in the Pleiades star cluster with the engraved upper scene on Gura Haitii's megalith (Fig. 5).

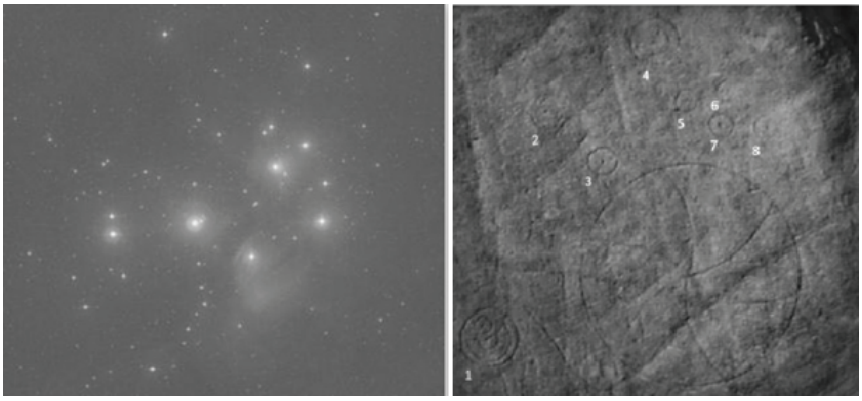

Fig. 5. *Comparison of the Pleiades star cluster (telescope view) with the engraved scene on megalith.*

Fig. 6. Constellations Orion and Taurus. The red line connects Orion's belt, Aldebaran star and Hyades star cluster with Pleiades star clusters.

To find the *Pleiades* (M45) open cluster in the sky, we need to find the *Orion* constellation. *Orion*, the *Hunter*, is one of the most distinct constellations in the sky. On a winter evening at mid-northern latitude, he stands almost due south, about halfway between the horizon and the sky directly above your head. Locate him by his belt, a straight line of three bright stars closes together. Take *Orion's belt* as an arrow moving from left to right in the sky and pointing in this direction a bright, red-orange star, *Aldebaran*. This bright star is the eye of the Bull and the follower star, which chases the *Pleiades* each night. Fairly near to Aldebaran star, one should see a tight cluster of blue stars. These are the Pleiades, also called the *Seven Sisters* (Fig. 6). Most people can only see six stars with the naked eye. We also mention that the *Hyades* star cluster nearby forms *the Chin of the Bull*.

The open cluster of stars seen with the naked eye (the *Pleiades*) may have been so phenomenal near the vernal equinox in the Neolithic that it was marked in the sacred area of the Carpathian Mountains.

3. The Milky Way galaxy view

On the right side of the engravings, the larger, rotated circle may be indicating the Sun in a galaxy, the Milky Way. Some scholars believe that the rotated Sun may symbolize the Milky Way[27]. Presumably, the other small circles are bright stars on the *Milky Way*, the bright, white band of the night sky. On the left side of the engravings is our home (the Earth, the idol) from where we can see two large, similar-sized celestial bodies: the Moon with its phases and the Sun.

The brightest stars on the Northern Hemisphere are *Arcturus* (α Boo), *Vega* (α Lyr), *Capella* (α Aur), *Rigel* (β Ori), *Procyon* (α CMi), *Betelgeuse* (α Ori), *Altair* (α Aqu), *Aldebaran* (α Tau), *Spica* (α Vir), *Antares* (α Sco), *Pollux* (α Gem), *Deneb* (α Cyg), *Regulus* (α Leo). If we analyze these stars' position on the sky, one can observe that near the *Taurus* constellation (the Bull with Y-shape) more than half of these enumerated brightest stars are located. We know that around 4500 BC, the vernal equinox

[25] Rappenglück 1989, 53.
[26] Pasztor-Roslund 2007, 277.
[27] Szücs-Csillik-Maxim 2023.

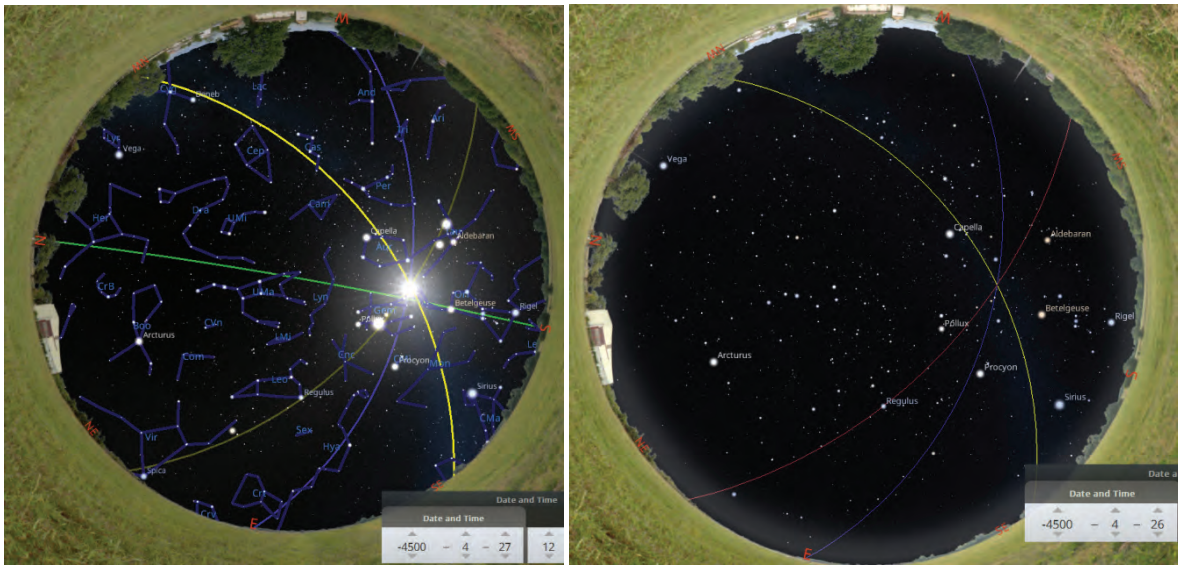

Fig. 7. The Sun position on the sky in Neolithic vernal equinox time (4500 BC) modeled using the Stellarium program (yellow line – Milky way, blue line – celestial equator, brown or red line – ecliptic, and the green line is the meridian).[29]

was between the *Gemini* and *Taurus* constellations[28] (Fig. 7).

Fig. 8. The Winter Hexagon asterism

The vernal point, which marks the spring equinox, is the intersection of the ecliptic and the equator. In 4500 BC, it also aligned with the *Milky Way*'s bright, white band (Fig. 7). During the Neolithic period, the vernal point was located within the *Winter Hexagon*, an asterism shaped like a hexagon, with vertices at the stars *Rigel, Aldebaran, Capella, Pollux, Procyon*, and *Sirius* (Fig. 8).

The main preoccupation of Neolithic people was agriculture[30], and their sacred megalith shows the position of the Sun, the most important symbol, in the beginning of the spring season (spring time) between the bright stars (Fig. 9) and in the *Taurus* constellation ("the sun-shaped idol seems to be supported by a hand"[31]).

Measurements

Using a new technique that involves approximate measurements within an image (see Fig. 2),

Fig. 9. Comparison of the engraved scene with the bright stars position at vernal equinox in 4500 BC.

[28] Szücs-Csillik–Maxim 2021.
[29] Zotti *et alii* 2021.
[30] Szücs-Csillik–Maxim 2022.
[31] Lazarovici *et alii* 2011; Szücs-Csillik *et alii* 2023.

we can estimate the ratio of distances by referencing an object with known dimensions, such as a stone. This allows us to hypothesize about the potential purpose of the megalithic scene. Determining distances on maps or technical drawings is straightforward when we have a scale and a ruler. However, in this case, we only have an image and a description of the megalith. Since everything is represented within a single image, we can take direct measurements. It's important to note that photographs are two-dimensional projections (images) of three-dimensional objects. Consequently, objects appear smaller as their distance from the camera increases (perspective). Without additional information, we cannot ascertain whether an object is a small one situated nearby or a large one that is far away. To accurately determine the size of an object from a singular image, we need a reference object of scale within the same image plane, meaning it should be close by and at the same distance from the camera. Additionally, camera lenses can introduce distortions. Therefore, while this method can provide useful estimates, its accuracy is highly dependent on the quality of the image (refer to Fig. 2).

The megalithic stone stands at a height of 135 cm, and the diameter of the large circle measures 21.5 cm. Note that the diameter of the large circle corresponds to the distance between the centers of the large and medium circles, and the distance between the large and the circle 2 (Fig. 10, Table 1).

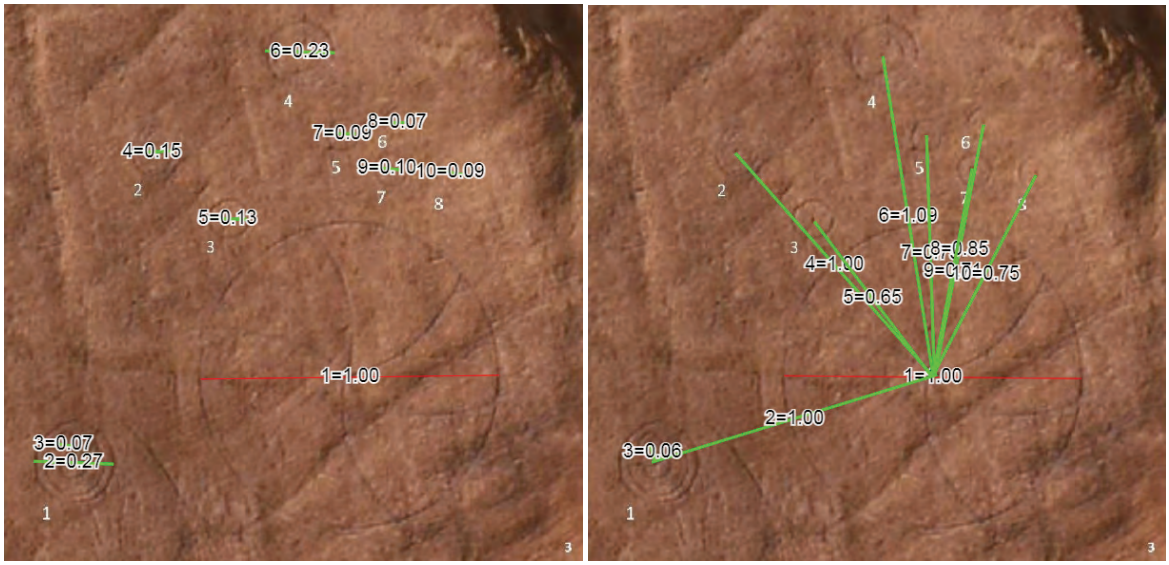

Fig. 10. Measurements in Fig. 2 (diameter of circles and distances).

Table 1. Scales on the megalith

Diameter on Fig. 2 (see Fig. 10)	**Unit and cm In diameter**	**Distance on Fig. 2 (see Fig. 10)**	**Unit and cm In distance**
1 (Sun, the largest circle)	1 unit = 21.5 cm	1 (unit)	1 unit = 21.5 cm
2 (medium circle, idol)	0.27 unit = 5.8 cm	2 (largest-medium circles)	1 unit =21.5 cm
3 (small circle in medium circle, Moon)	0.07 unit = 1.5 cm	3 (smallest-medium and medium circles)	0.06 unit =1.3 cm
4 (small circle 2)*	0.15 unit=3.2 cm	4 (largest and 2 circles)	1 unit =21.5 cm
5 (small circle 3)	0.13 unit =2.8 cm	5 (largest and 3 circles)	0.65 unit =14 cm
6 (small circle 4)	0.23 unit =4.9 cm	6 (largest and 4 circles)	1.09 unit =23.4 cm
7 (small circle 5)	0.09 unit =1.9 cm	7 (largest and 5 circles)	0.79 unit =17 cm
8 (small circle 6)	0.07 unit =1.5 cm	8 (largest and 6 circles)	0.85 unit =18.3 cm
9 (small circle 7)	0.10 unit =2.1 cm	9 (largest and 7 circles)	0.71 unit =15.3 cm
10 (small circle 8)	0.09 unit =1.9 cm	10 (largest and 8 circles)	0.75 unit =16.1 cm

* Circles 2 and 4 (bold in table 1) are concentric.

By measuring the diameters of the circles and the distances from the center of the Sun (Table 1), we can compare these ratios to the solar diameter and the astronomical unit (the distance from the Sun to the Earth). When we match this data against real astronomical measurements (see Table 2), we find that only the diameter of the Moon aligns with actual values.

Table 2. Scale of the Solar System.

	Semimajor axis in A.U.	Actual Diameter in km	Nr. of steps if Mercury were one step from Sun	Scale diameter if Sun were 21.5 cm globe	Scale diameter if Earth were 5.8 cm globe	Scale distance if Sun were 21.5 cm globe	Scale distance if Earth were a 5.8 cm globe
Sun	-	1,392,000	-	21.5 cm	633 cm	-	-
Mercury	0.387	4879	1	0.08 cm	2.2 cm	18 m	0.5 km
Venus	0.723	12,104	2	0.19 cm	5.5 cm	33 m	1 km
Earth	1	12,756	3	0.2 cm	5.8 cm	46 m	1.4 km
Mars	1.523	6794	4	0.1 cm	3 cm	70 m	2 km
Jupiter	5.205	139,822	13	2.2 cm	64 cm	240 m	7 km
Saturn	9.579	116,464	25	1.8 cm	53 cm	442 m	13 km
Moon	0.3844	3474	-	0.05 cm	1.8 cm	-	-

Fig. 11. Location of the Seven Sister's stars (Pleiades)

This indicates that our estimation of the lower part of the image is accurate: the large circle represents the Sun, and the middle circle signifies the Earth (idol) with the Moon and Sun (indicating the location of humans). The upper section with the smaller circles reflects the correlation between diameter of the small circles and the apparent magnitude of the brightest stars in *Pleiades* (Table 1 – diameters in cm and Table 3 apparent magnitudes). This indicates that the megalith may represent stars rather than planets from our Solar System. The stars *Alcyone, Merope* and *Electra* could form the small circles 2, 3, 4, and *Maia, Taygeta, Celaeno, Asterope* the small circles 5, 6, 7, 8 (Fig 4 and Fig. 11).

When we compared the seven bright stars of the *Pleiades* (also known as the *Seven Sisters*) with the small circles depicted in megalithic scenes, it is important to note that while we cannot measure distances from Earth in the Neolithic era, we can only identify positions in the sky and brightness levels (as shown in Table 3). The seven bright stars in the *Pleiades* cluster, *Alcyone, Electra, Maia, Merope, Taygeta, Celaeno,*

Table 3. Apparent magnitude, distances from Earth and positions of the bright stars in Pleiades (Seven Sisters).

Name	Designation	App. Magn.[a]	Absolute Magn.	Distance 1 ly = 63241 AU	Distance in AU	Distance in pc 1pc = 3.26 ly	Distance in pc/130 pc[b]
Alcyone[c]	*25 Tauri*	2.86	–2.62	409±50 ly	25865160 AU	125.4 pc	0.96
Electra[d]	*17 Tauri*	3.70	–1.77	375±23 ly	23715403 AU	115 pc	0.88
Maia	*20 Tauri*	3.86	–1.54	344±25 ly	21754930 AU	105.5 pc	0.81
Merope[e]	*23 Tauri*	4.17	–1.29	344±16 ly	21754930 AU	105.5 pc	0.81
Taygeta	*19 Tauri*	4.29	–1.19	364±16 ly	23019752 AU	111.6 pc	0.86
Celaeno[7f]	*16 Tauri*	5.44	-0.76	434±10 ly	27446627 AU	133 pc	1.02
Asterope	*21 Tauri*	5.64	0.34	431±8 ly	27256904 AU	132 pc	1.01

[a] The seven bright stars of the *Pleiades* are variable stars.
[b] The distance to the open cluster *Pleiades* is 130±10 parsec (420±30 light year) from us per Hipparcos parallax measurement.
[c] *Alcyone* is nearly ten times as the Sun, and it is a multiple star system with at least four components. *Alcyone A*, is surrounded by a gaseous disk. This is caused by the star's fast rotation with a rotational velocity of 149 km/s.
[d] *Electra* is a blue-white giant star, and its projected rotational velocity is 181 km/s.
[e] Surrounding *Merope* is the *Merope Nebula* (NGC 1435).
[f] *Celaeno* is a blue-white sub giant, and approximately 344 times brighter than our Sun, having surface average temperatures of around 12,800 K. This star is also a fast spinner, having a rotational velocity of 185 km/s.

and Asterope are classified as pulsating B-type stars, meaning they change in brightness every one to five days. This variability in brightness (Fig. 12) could explain the representation of points with concentric circles.

The Neolithic era is also known for its stone circles, though the connection between these structures and the stars remains uncertain. However, stone circles have been linked to lunar observations[32], and remnants of such circles are sometimes found near petroglyph sites[33].

If we examine the position and apparent magnitude of the bright stars in the *Pleiades*, we find that there is a correlation between the location and size of the circles on the megalith and the telescope image.

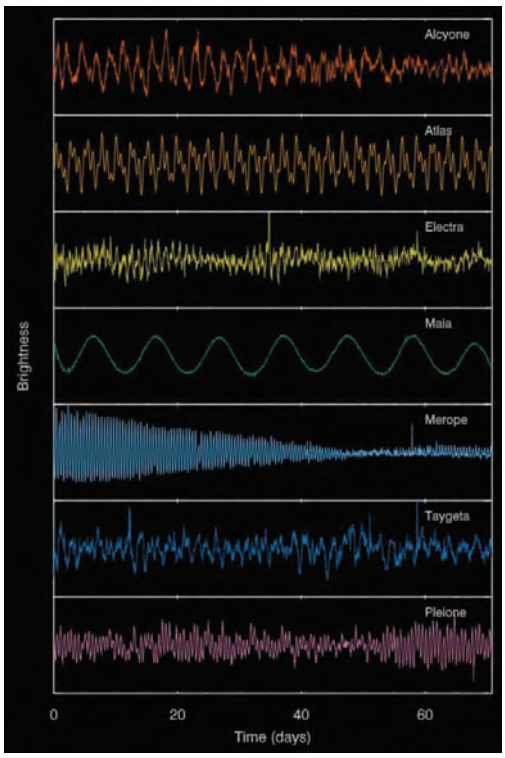

Fig. 12. Kepler captured brightness variations in the Seven Sisters (credit Aarhus University/T. White)[34].

These indicate that the megalith may represent the bright stars of the *Seven Sisters* (*Pleiades)*, group of bright stars which were significant to Neolithic people from Gura Haitii, and which in 2330 BC marked the vernal equinox. This implies that the megalith stone from Gura Haitii dates back to the Bronze Age.

Moreover, when we gaze upon the brightest stars near the *Taurus* constellation (shaped like a "Y") and compare them to the bright stars of the *Milky Way*, we unveil the enchanting form of the *Winter Hexagon*. Nestled within this celestial asterism is the vernal equinox in Neolithic era, a point of profound significance for early agricultural societies. This moment, heralding the arrival of spring, marked a crucial turning point for farming communities, setting the stage for growth, renewal, and the promise of abundance.

Brightest stars	**Apparent; absolute magnitude**	**Distances (light-year; parsec)**
Sirius	-1.44; 1.43	8.6 ly; 2.64 pc
*Arcturus**	-0.05; -0.3	37 ly; 11.3 pc
*Vega***	0.03; 0.58	25 ly; 7.76 pc
Capella	0.08; -0.48	42.9 ly; 13.2 pc
Rigel	0.18; -7.84	860 ly; 265 pc
Procyon	0.4; 2.67	11.5 ly; 3.51 pc
Betelgeuse	0.45; -6	548 ly; 168 pc
Aldebaran	0.87; -0.63	65 ly; 20 pc

* *Arcturus* is a red giant individual star.
** *Vega* was the northern pole star around 12,000 BC and will be again around the year 13,727.

By comparing the apparent magnitudes of these stars with the sizes of the small circles in the image (Fig. 2), along with their positions on the sky map and the stone (Table 3), we find that this hypothesis is not so likely as the *Seven Sisters* (*Pleiades*) groups of stars to decode the scheme. Furthermore, the location of the *Winter Hexagon* is near the *Golden Gate of the Ecliptic*, which, during the Neolithic period, was aligned with the *Milky Way* at vernal equinox.

In summary, the engravings can be interpreted from an astronomical perspective as follows: *At the beginning of spring, the Sun is situated near the bright stars that form a pattern of small circles on the megalith.*

Conclusions

The investigation into the Gura Haitii engraved megalith reveals that it was part of a dolmen and holds significant meaning from an astronomical perspective, particularly regarding the symbolism of the Sun and cosmology. Dolmens are typically associated with burials, graves, and funeral rites, while the engravings on this megalith depict a celestial scene, illustrating the Sun, Moon, planets, and stellar system – a reflection of ancient cosmology (cosmovision).

Consequently, in my opinion, the engravings could represent a map of a celestial road (connected with the belief in afterlife, sun cult and

[32] Thom 1967.
[33] Tullett 2019, 2.
[34] White *et alii* 2017.

funerary cult), how the ancestors imagined the celestial vault. I enumerated three possibilities of modeling the scene on megalith (Solar System, Stellar system, Milky Way view), from which due to the investigations shows that the second one is thought-provoking, namely, a calendar purpose of the megalith – the celestial scene represents our Sun position on the sky at vernal equinox in Neolithic time as we can see from Earth. Therefore, the e*quinox may hold the key to* understanding the mysterious alignment depicted on the Gura Haitii megalith. *My response to Boss is that on Fig. 1, it is possible to see a solar eclipse in Neolithic, when the Sun was in the Taurus constellation (sun-shaped idol seems to be supported by a hand), but I think now Boss know better.*

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