



# THE ASTRONOMICAL RELATION OF THE RITUAL PLATFORMS OF THE PEAK SANCTUARY KOKINO

**Olgica Kuzmanovska<sup>1</sup> and Jovica Stankovski<sup>2</sup>**

<sup>1</sup>*Ss Cyril and Methodius University, Faculty of Natural Sciences and Mathematics,  
P.O. Box 162, Skopje, FYR Macedonia*

<sup>2</sup>*National Museum Kumanovo, FYR Macedonia*

---

*Corresponding author: Olgica Kuzmanovska (olgicak@pmf.ukim.mk)*

---

## **ABSTRACT**

The rituals performed on the peak sanctuary “Tatičev Kamen” (Tatič Rock), located near the village of Kokino, FYR Macedonia, were connected with the agricultural activities of the Bronze Age people in the surrounding area and with the change of seasons. For that purpose the motion of the sun and some other celestial objects were observed over the course of several centuries and their positions on specific dates were marked by stone notches. We present here the new results of the archaeoastronomical research of the site. By relating the stone notch that was used to simultaneously mark two different sky events, the sunrise on the specific morning in May and the heliacal rising of Aldebaran, we indicate the mutual astronomical relation of two different observational platforms: the one with the thrones, on which a ritual that had solar characteristics was performed, and the platform located on the north part of the locality, which was probably used as a observation point of the heliacal rising of Aldebaran.

---

**KEYWORDS:** Peak sanctuary, Bronze Age, solar-chthonic rituals, stone carvings, heliacal rising, equinox

---

## 1. INTRODUCTION

The locality "Tatičev Kamen" (Tatič Rock), also called "Megalithic observatory Kokino" (or "Ancient observatory Kokino"), is located on the summit of a volcanic hill, about 30km away from the town of Kumanovo, in the northeast part of FYR Macedonia. Its geographical coordinates are  $\varphi = 42^{\circ} 15' 48''$  north latitude, and  $\lambda = 21^{\circ} 57' 10''$  east longitude. With an altitude of 1013m, the site dominates the surrounding area and the village of Kokino at the foot of the hill (Fig. 1). It consists of several artificially carved and flattened surfaces (platforms) shown on the map of Fig. 2. The first platform (A) is located on the west side of the locality and includes human-made stone seats, or thrones, cut in the natural rock in such manner that a person who sits on them faces the eastern horizon. The second platform (C) is positioned approximately 30m southwest of the first platform and had a strictly astronomical purpose. A side path (I) leads to it. The third newly discovered platform (E) is located on the north part, on the so-called northern terrace. There is also one more artificially flattened platform 70m to the east of the first one and 15m higher (B).

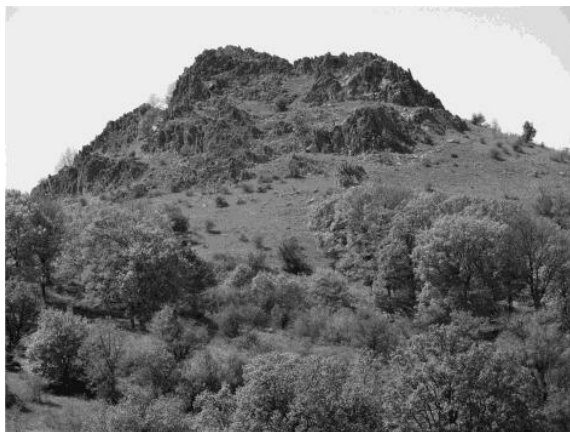


Figure 1. Peak sanctuary Kokino

The platforms identified on the locality had strong links with the most important events in the life of the agricultural and stockbreeding community in the surrounding region during the whole period of the Bronze Age. The large number of excavated artefacts discovered in the archaeological context, as well as the topographic

characteristics of the site (its dominant position on the hill, the large radius of visibility from the top that can be approached from a slope lit by the morning sun and positioned on the southeast side of the locality), leave no doubts as to the use of "Tatičev Kamen" as an extra-urban (i.e. peak) sanctuary on which the local Bronze Age people carried out several mountain rituals (Stankovski, 2010; Nowicki, 1994; Rutkowski, 1988; Peatfield, 1983). The excavated archaeological material dates from all three phases of the Bronze Age, i.e., Early Bronze (22<sup>nd</sup>-17<sup>th</sup> c. BC), Middle Bronze Age (17<sup>th</sup>-14<sup>th</sup> c. BC) and Late Bronze Age (14<sup>th</sup>-11<sup>th</sup> c. BC), according to the chronology of the central Balkans, which approximately corresponds to the BrA, BrA<sub>2</sub>-C and BrC-D periods of the Reinecke chronology of the Bronze Age for central Europe. Although the different ethno-cultural Mediterranean regions have their own unique specifics, some aspects of the ritual practice, especially in the Bronze Age peak sanctuaries, are astonishingly similar, even when the regions are relatively far from each other (Rutkowski, 1986; Dietrich, 1967). In this context the archeological material of Kokino is similar to that uncovered on mountain sanctuaries on Crete from the Early Minoan and Middle Minoan Period (from around 2300 BC till 1700 BC), i.e., before the Crete mountain cults had been centralised around the regional palatial centres (Peatfield, 1994).

Extended astronomical research indicates that the platforms were also used as observational points for tracking the annual motion of the sun and some other celestial objects. The observations were dated with great accuracy for the purpose of creating a simple solar calendar that counted the annual cycles of nature and was used for planning the agricultural activities upon which the whole community depended (Kuzmanovska-Barandovska and Stankovski, 2011).

In this paper, we will present some new archaeoastronomical findings that link the role of the different parts of the sanctuary with the formation of the comprehensive

beliefs of the Bronze Age Kokino people concerning the influence of the celestial objects on forces of nature. The recent discovery of a stone marker carved in such a manner that it simultaneously marks the sunrise in the second part of May and the position of Aldebaran, which coincided with the equinox point in 2000 BC, viewed from two different observational sites (platforms 'A' and 'E'), provides direct evidence of the astronomical relation of the platforms. As the platforms were used for carrying out religious rites (according to archaeological findings), the close connection of the astronomical alignments throws new light on the motives and also the time of the year that the ritual celebrations on two different parts of the sanctuary were performed.

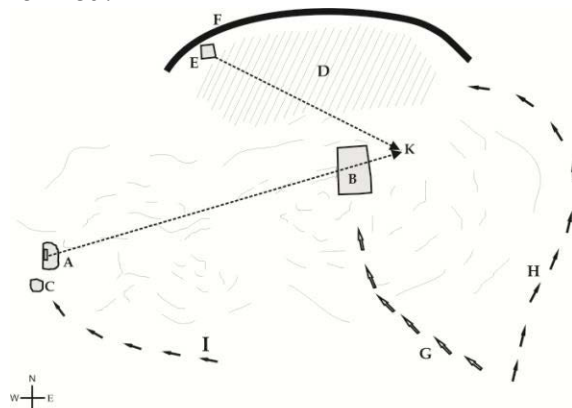


Figure 2. Map of the locality "Tatičev kamen". A - first platform with the stone seats. B - upper eastern platform. C - astronomical platform (second platform). E - astronomical platform (third platform). D - northern terrace. F - sanctuary wall. G - main access path. H - access to the northern terrace. I - side path. K - mutual marker

## 2. ARCHAEOLOGICAL SUMMARY

The finds of the continuous archaeological research that began in 2001 confirmed that the site was a monumental mountain sanctuary for more than one millennium (21<sup>st</sup>-8<sup>th</sup> c. BC), i.e., through the whole Bronze Age and also in the early Iron Age. Almost all of the archaeological artefacts were found on the highest part of the locality and slightly lower, on the north slope of the hill, where the area for practising religious ceremonies was enclosed with a 80m-long wall shown on Fig. 3 (noted with 'F')

on Fig. 2). The sacred enclosure, or "temenos", occupies an area of about 1200m<sup>2</sup> and is among the largest of this type that have been registered.



Figure 3. Sanctuary wall

In the archaeological research of the "temenos" area, two types of religious structures were identified: a. ritual pits and b. circular stone constructions. So far, approximately 100 ritual pits, formed around natural fissures of the rocks, have been discovered (Fig 4).

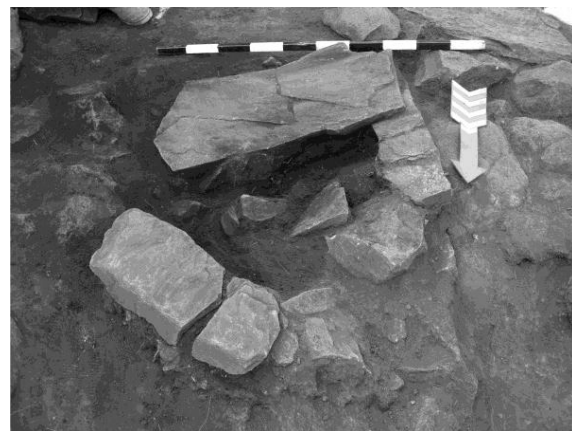


Figure 4. Ritual pit

The openings surrounding the fissures were delimited with stones mixed with earth and sometimes clay, and in them were deposited ceramic vessels or their fragments, as well as ceramic votive figurines, hand mills, pyramidal weights, moulds for casting bronze objects and stone axes. The deposits were put at the bottom of the pits and covered with earth and small stones. The pits were then enclosed with stone plaques that do not originate from the locality. This ritual is similar

to the ones performed on peak sanctuaries on Crete, where the cult was intensely practised in MMI and through the whole MM period (22<sup>nd</sup>-17<sup>th</sup> c. BC) (Nowicki, 1994; Dietrich, 1969).

The same types of deposits were used to fill another kind of religious formations, the so-called circular stone constructions (Fig. 5). They were composed of big stones arranged in circles with diameters of 1-2m. The building of such structures required the artificial flattening of the hill slope, which was done by building short stone walls. Structures with a "tumulus" shape were formed by covering the deposits with earth and small stones.



Figure 5 Circular stone constructions

Some of the ceramics found in both the pits and stone constructions bear traces of burning. This fact, coupled with the fragments of carbonized wood and baked clay discovered on the site, indicates the use of fire in the cult practise. On the other hand, the funnel-like vessels were probably used for libations. Fragments of the same ceramic vessel found in both types of constructions are sometimes found scattered a few meters away from the pits, indicating the practise of smashing the vessels and scattering the pieces during religious rituals.

In addition to the fragments of small and large ceramic vessels of better or worse quality (with or without decorations), numerous fragments of stone tools were found on the site: hand mills, pestles for grinding grain, stone hatchets and moulds for casting bronze objects such as spears,

hatchets, spearheads, knives, decorative buttons, needles, wedges and pendants. However, despite the large number of moulds, just a few bronze objects were found: a spear, a knife and two needles. On the other hand, plenty of fragments of hand mills and parts of movable ovens, "puranoi", indicate that a ritual food was prepared and consumed during the ceremonies. Most of the archaeological artefacts found in Kokino (some shown on Fig. 6) date from the early Bronze Age (21<sup>st</sup>-17<sup>th</sup> c. BC) and late Bronze Age (14<sup>th</sup>-11<sup>th</sup> c. BC), according to the Reinecke chronology of the Bronze Age for the central Balkans. Finds from the middle Bronze Age (17<sup>th</sup>-14<sup>th</sup> c. BC) are rare.

The discovery of ceramic figurines, including a female torso, a small figurine of a bovine and four representations of a human leg (Fig. 7) are similar to those found at early Minoan peak sanctuaries (Rutkowski, 1988; Chryssoulaki, 2001). Almost identical figurines of a human leg were found on the hill of Traostalos on Crete (Faure, 1963, fig. 3; Faure, 1967, fig 10). They probably had the function of providing fertility and good health for people and livestock.



Figure 6. Archaeological artefacts from the Early Bronze Age (a - cups; b - fragment of a vessel decorated with images of the sun), Middle Bronze Age (c - lamp; d - vessel), and Late Bronze Age (e - spear; mould for casting bronze amulet)



Figure 7. Ceramic votive figurines

Although not all the aspects of the mountain cults practised on Kokino have been identified, the material evidence leads to the conclusion that they had solar-chthonic characteristics (Stankovski, 2007). The explicit archaeological proof of the solar character of some of the rituals is a fragment of a vessel found in one of the “temene” that dates from the early Bronze Age. It bears incised decoration representing the sun, combined with wavy lines (see Fig 6b). The ornamental wavy lines were quite common in the Bronze Age ceramics of the central Balkans, but were never presented together with an image of the sun. Additional support for the archaeological identification of the solar cult is provided by the astronomical research of the site, which will be presented in the following section.

### 3. ASTRONOMICAL RESEARCH

The platforms are constructed in such a manner that large andesite rocks at a distance of several dozen meters mostly cover the observer’s eastern horizon. The natural disposition of the rocks to crack horizontally and vertically was taken advantage of for the creation of stone markers of the rising positions of some celestial bodies on specific calendar dates. Despite the inevitable erosion of the terrain and minor earthquakes in the past, the artificially made notches are still distinguishable from the natural cracks. There are indications that they were covered on top with horizontally

placed stones in order to create narrow apertures that emphasized the astronomical event being observed. Regarding the primitive techniques of the ancient builders, the relatively small distance of the stone markers from the observational platforms enabled a direct communication between the observer on the platform and the man carving a notch and increased the precision of marking the particular positions of the celestial objects in the rocks.



Figure 8. Ritual marker observed from the first platform (path of the sunray noted with dashed line) and the equinox marker observed from the third platform (path of the sunray noted with full line), both seen from the highest part of the locality.

The platform located on the lower western part of the locality (or the so-called first platform, noted with ‘A’ on Fig. 2) was used for performing the sanctuary’s main ritual: the “*hieros gamos*” concept of uniting the Sun God with the Great Mother Goddess (Earth). The *hieros gamos*, i.e. “sacred marriage”, is a prominent motif in Near Eastern mythology. The data about the cult given by the historian Strabo refers to the antiquity period, but a variety of sources suggest that people in the Aegean believed in similar myths and had practiced corresponding rituals at least until 1400 BC (Koehl, 2001; also Graves, 1972; Frankfort, 1948). The rock that covers the eastern horizon of the observer standing on the first platform contains an artificially made aperture placed just below the highest part of the locality. On certain days of the year the sun rises through this aperture. The sun’s rays pass through the right edge of the artificially cut trench on the eastern

platform (noted with 'B' on Fig. 2) and then through another notch below in order to be directed to the ensemble of stone seats in the centre of the first platform. As a result, they illuminate just one of the seats, where the person who had the principal role in executing the mountain ritual probably sat - the tribal leader in the role of head priest (Fig. 8 and Fig. 9).

We calculated the declination  $\delta$  (latitude above the celestial equator) of this marker using the formula:

$$\sin \delta = \cos A \cos \varphi \cos h + \sin \varphi \sin h. \quad (1)$$

The azimuth  $A$ , estimated from the north horizontal point and the altitude over the horizon  $h$ , were measured by a geodetic instrument with laser, while  $\varphi$  is the observer's geographical latitude. Taking into account the small correction due to astronomical refraction, we found that  $\delta=18.26^\circ$ , which coincides well with the sunrise positions in the middle of May and in the end of July. In the early Bronze Age the sun rose through the marker in the third week of May and at the beginning of August due to change in obliquity of the Earth's rotational axis. The archaeological findings suggest that the cult performed on the thrones celebrated the fertility and had solar characteristics. Bearing this in mind, in the analyses that we have carried out thus far, we suggested that the latter date (beginning of August) was the one reserved for performing the *hieros gamos* ritual (Kuzmanovska - Barandovska and Stankovski, 2011). At this time of the year people in the region were finishing the harvest, which was undoubtedly a reason for arranging celebrations.

The astronomical observations were performed from a small platform composed of an artificially flattened stone (noted with 'C' on Fig. 2). Only one person can stand on it. Although the second platform can be accessed directly from the first one, an additional side path (noted with 'I' on Fig. 2) was created because of the sacred role of the space around the thrones, allowing it to be accessed only on special occasions.

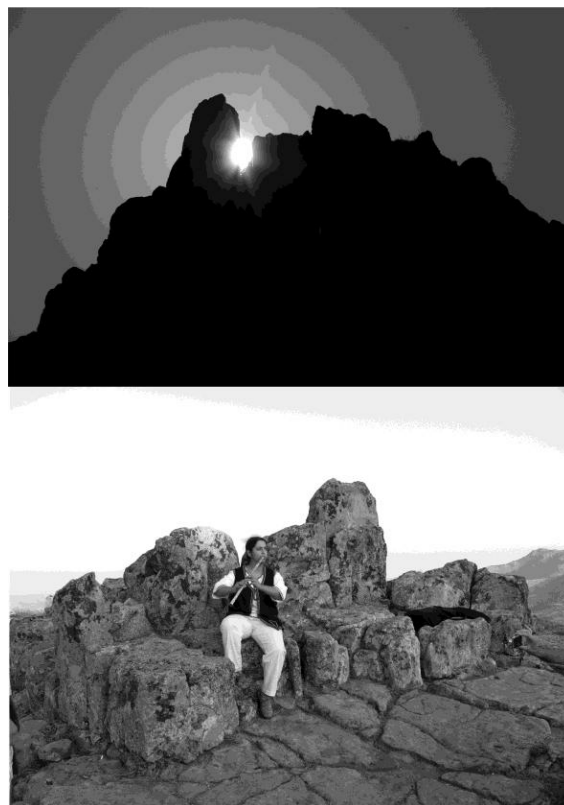


Figure 9. Rising sun seen through the ritual marker in the middle of May (above). Throne illuminated by the sun (bottom).

This side path was the daily route of the ancient celestial observers who eventually marked the extreme positions of the rising sun on the nearby rocks. With no archaeological artefacts found on it, this so-called second platform had a strictly astronomical purpose. It satisfies one of the basic criteria that Hawkins laid out for a site to be considered as a megalithic observatory if the postulated alignments for a homogeneous group of markers can be observed from a single central point (Hawkins, 1966). The positions of three noticeable stone notches having approximately the magnitude of the solar disk and observed from it coincide almost exactly with the sunrise on the winter and summer solstices as well as the equinoxes in the beginning of the second millennium BC (Kuzmanovska-Barandovska and Stankovski, 2011, table 1, p. 224). The sun rising at dawn through the markers on these characteristic dates are shown on Fig. 10. The artificially made astronomical platform 'C' is narrow and distinguishable from its natural surroundings,

and a slight shift in position of the observer within the platform does not alter the calendared value of the solar alignments. For the observer on the platform, the sun on solstices and equinoxes rises strictly through the particular notches.



Figure 10. The rising sun seen through the stone markers on the days of summer solstice, autumnal equinox and winter solstice, respectively (from top to bottom), observed from the second platform.

The notch that marks the equinox is placed lower on the skyline of the observer than all the other notches; it was probably taller and closed on top in the past. The very concept of the existence of the megalithic equinox, first introduced by Thom (1967), has been subject to a lot of controversy (Ruggles, 1997). Most likely the equinoxes were marked to indicate the turning

point between the two extremes and divide the solar cycle into a warm and a hot season. The vernal and autumnal equinoxes divide the year into two halves, as do the summer and winter solstices (Hughes, 2005). Our findings on the third platform located on the northern terrace provide strong evidence that equinoxes were important for the Kokino people.

The rock that covers the eastern horizon of an observer standing on the third platform (noted with 'E' on Fig. 2) contains an easily discernible artificially carved stone notch. With an equatorial declination of  $\delta=0.14^\circ$  its position coincides well with the rising sun on the equinoxes. The notch is emphasized with another one with the same shape, creating a trench for the sunbeam that reaches the astronomical (third) platform on the northern terrace. The platform was also used for marking the position of Aldebaran, the brightest star in constellation Taurus. The declinations of the four prominent markers that can be observed from the third platform match almost exactly the theoretical declinations of Aldebaran in the first half of the second millennium BC (see Table 1). Figure 11 shows the rising sun through the marker on the day of spring equinox and the four notches that mark Aldebaran's position in the first five centuries of the second millennium BC, observed from the third platform. Similarly to the astronomical platform 'C', this platform is also narrow and flat and does not allow significant changes in the position of the observer and the astronomical coordinates of the observed stone markers.

Table 1 Declinations of the five markers observed from the third platform on the northern terrace (including the equinox marker - 0), compared with the theoretical declinations of Aldebaran in the years of almost exact match, according to the Red Shift 4 program.

Marker No.	Declination (°)	Theoretical Declination (°)	Year (B.C.)
0	0.14	0°8'32"	2083
1	1.03	1°01'54"	1867
2	2.02	2°01'02"	1683
3	2.64	2°37'44'	1568

Together with the star cluster Pleiades, which appears in the sky a little bit earlier, Aldebaran is one of the most noticeable objects in the geographical latitudes of Kokino. Rising in the evening sky in the autumn and just before sunrise in the summer, Aldebaran and the Pleiades are an important part of the folklore of the local people, determining the time for waking up and starting agricultural work (West, 1999, p. 53). The star and its nearby cluster were probably known to the Palaeolithic hunter-gatherers (Rappenglueck, 1999) and were related to the Nile inundation and the grape harvest in ancient Egypt (Muller, 2004, p. 40). Their heliacal and acronychal rising marked the beginning of new seasons in many ancient calendars (Ruggles, 2005). The topography and the orientation of the four dolmens in Carregal de Sol, Portugal, is toward the heliacal rising of Aldebaran and Betelgeuse in the period of the megalithic building (Silva, 2010). The megalithic monuments of Arles-Fontvieille contain equinox alignments, and there is evidence that observations were also being made of heliacal rising and settings of the Pleiades and Orion (Salleta, 2011). The peak sanctuary of Petsophas on Crete, located on a smaller geographical latitude than Kokino, is oriented toward the heliacal rising of Arcturus (Henriksson and Blomberg, 2011).



**Figure 11.** The rising sun on the spring equinox through the marker which coincided with position of star Aldebaran in 2000 BC, seen from the third platform. Aldebaran's in the first half of the second millennium BC is marked with notches 1,2,3,4, respectively.

Using Red Shift 4 program simulations, we estimated the heliacal rising of Aldebaran in the Bronze Age. It occurred on the apparent horizon of the observer standing

on the third platform around 67 days after the vernal equinox, the precision of the date being within several days, taking into account the visibility, climate conditions and the observational criteria of the ancient sky-watchers. Hence, at the end of May the star was visible in the stone markers just before sunrise for the first time in the year after a period of invisibility.

A very important "coincidence" arises from this fact: the event occurred at the same date when the sun rose in the ritual marker on the first platform. The construction of the markers additionally emphasizes the astronomical relation of the two platforms: the equinox notch on the third platform and the narrow sun notch on the first platform are carved in the same stone block and match almost exactly (see Fig. 8, also dashed arrow lines on Fig. 2). In other words, the marker is "mutual" for both platforms (noted with 'K' on Fig. 2). The archaeological dating suggests the usage of the sanctuary had started around 2000 BC when Aldebaran was placed very near the equinox point, having a declination  $\delta=0^{\circ}08'32''=0.14^{\circ}$  for the year 2083 BC (see Table 1); i.e., the equinox marker was also Aldebaran's marker at the time that the sanctuary was built. The coinciding dates and the manner the marker(s) were made suggest a complex relation between the events marked on the first and third platform; the heliacal rising of Aldebaran positioned at the equinox point, which happened two months after the vernal equinox (observed from the third platform - 'E'), and the rising of the sun through the same "mutual" marker on the very same day (observed from the first platform - 'A').

#### 4. DISCUSSION AND CONCLUSION

The Bronze Age peak sanctuary Kokino was one of the main religious centres of the agricultural community and was established in the northeast part of FYR Macedonia in the beginning of the second millennium BC. The cults that had been practised for approximately one thousand years had solar-chthonic characteristics. The es-



tablishment of these cults was inevitably connected with prominent astronomical events that were repeated in strict temporal intervals and ensured the cyclic changes of nature. The approach to the sacred ground of the sanctuary was permissible to the religious elite and the tribal leaders, but its dominant position and the large radius of visibility enabled the people in the surrounding area to observe the fires lit during the cult practises and celebrations and organise seasonal agricultural work accordingly.

The archaeoastronomical research of the excavated platforms, made of artificially flattened stone blocks, shows beyond doubt their interrelated religious and astronomical purpose. In the course of several centuries during the second millennium BC, man-made narrow stone notches that mark the rising positions of the sun and some stars were carved on different parts of the sanctuary.

We emphasize that the ritual practises on the site, its construction date and the period it was used as a sanctuary were estimated by archaeological methods, with the independent astronomical research of the stone markers providing support for the archaeological findings. Bearing in mind that the concept of solstices and heliacal rising of bright stars have been widely spread in the folklore of the people in the region and related to various agricultural activities since the ancient times, the existence of astronomical alignments threw more light on the purpose of the religious practise of the Bronze Age people in Kokino. On the main ritual site, the platform with the stone thrones, the *hieros-gamos* ritual was performed in the middle of summer, celebrating the harvest. As a part of the ritual, on a single morning in the beginning of August sunrays illuminated a limited area (one of the thrones) by passing through a specially constructed stone marker.

However, the sun rises through the marker more than once in a solar year. At around 2000 BC the event happened at the end of May. We guess that this latter date

was equally important for the Kokino people. This was a time of nature's renewal and of the ripening of the crops, when the weather had started to be consistently warm, after a period of temperature oscillations in the early spring. There are strong indications that rituals that marked the beginning of the new season were also arranged and related with two important astronomical events: the vernal equinox and the heliacal rising of the star Aldebaran. The indication is strengthened by the fact that the ritual marker observed from the thrones' platform was constructed in a manner to mark the equinox point observed from the third platform. For the observer on the third platform the equinox also coincided with the position of Aldebaran, which had almost zero declination at around 2000 BC.

In spring the sunrise was observed through the Aldebaran marker from the third platform. This is what is now called the vernal equinox. At this time of year Aldebaran was not visible at dawn, as it rose after the sun. Some two months later the heliacal rising of the star occurred through the same marker. Given that it is "mutual" for both platforms, the sunrise through the ritual marker on the morning of the heliacal rising of Aldebaran was also viewed from the thrones' platform as a part of the celebrations and rituals that marked the beginning of the new season. Thus, bearing in mind the archaeological reconstruction of the ritual practise, we can conclude that the construction of a notch that marks the position of Aldebaran had a ritual as well as symbolic purpose, as no marker is necessary for the strictly astronomical observation of a star. The heliacal rising was observed as a part of the ritual celebrations that marked the New Year, in a symbolic manner (we emphasize again) and not in the astronomical meaning of the phrase.

Such a precise construction of narrow stone carvings that indicate two different astronomical events with great accuracy would have inevitably required constant sky observations throughout many days and years. The existence of the second plat-

form, made just for observational purposes, and stone markers of the sunrise on particular dates provide evidence that the annual cyclic motion of celestial objects was quite familiar to the ancient skywatchers in Kokino. The construction of another four Aldebaran markers also proves that the sanctuary had been used as observational site over a long period of time. A slight variation of the star's position in the course of the centuries, due to its own motion and

the Earth's precession, resulted in increasing its declination and moving its position to the north. The last notch was made about half a millennium after the first. We guess that the Aldebaran's position was not marked after this date because of its 'increasing distance' from the equinox point or simply because eventually the sanctuary lost its importance as an astronomical observational site.

## REFERENCES

- Chryssoulaki, S. (2001). The Traostalos peak sanctuary: aspects of spatial organisation, *Aegaeum* 22, 57-66.
- Dietrich, B.C. (1967). Some light from the East on Cretan cult practice, *Historia: Zeitschrift für Alte Geschichte*, vol.16, No 4, 385-413.
- Dietrich, B.C. (1969). Peak cults and their place in Minoan religion, *Historia: Zeitschrift für Alte Geschichte*, vol.18, No 3, 257-275.
- Faure, P. (1963). Cultes de sommets et cultes de caverns en Crète, *Bulletin de Correspondance Hellenique*, vol. 87, 493-508.
- Faure, P. (1967). Nouvelles recherches sur trois sortes de sanctuaires cretois, *Bulletin de Correspondance Hellenique*, 1967-II, 114-150.
- Frankfort, H. (1948). Kingship and the gods. A study of ancient Near Eastern religion as the integration of society. *Nature*, 314-316.
- Graves, R. (1972). *The Greek Myths, Olympic Myth of the Creation of the World*, Penguin Books, Harmondsworth, Middlesex, UK.
- Hawkins, G.S. (1966). Astro-archaeology, *SAO Special Report*, no 26.
- Henriksson, G., and Blomberg, M. (2011). The evidence from Knossos on the Minoan calendar, *Mediterranean Archaeology and Archaeometry*, vol. 11, 59-68.
- Hughes, D.W. (2005). Neolithic and Early Bronze Age skywatchers and the precession of the equinox, *Journal of the British Astronomical Association*, vol. 115, no. 1, 29-35.
- Koehl, B.R. (2001). The "sacred marriage" in Minoan religion and ritual, *Aegaeum* 22, 237-243.
- Kuzmanovska-Barandovska, O. and Stankovski, J. (2011). The role of the astronomical alignments in the rituals on the peak sanctuary at Kokino, Macedonia, *Journal of Astronomical History and Heritage*, vol. 14, no. 3, 221-229.  
Link: <http://adsabs.harvard.edu/abs/2011JAHH...14..221K>
- Muller, W.M. (2004). *Egyptian Mythology*, Plimpton Press, Norwood, MA.
- Nowicki, K. (1994). Some remarks on the pre- and protopalatial peak sanctuaries in Crete, *Aegean Archaeology*, vol. 1, 31-48.
- Peatfield, A.A.D. (1983). The topography of Minoan peak sanctuaries, *The Annual of the British School of Athens*, vol. 78, 273-279.
- Peatfield, A. (1994). The Atsipadhes Korakias peak sanctuary project, *Classics Ireland*, vol. 1, 90-95.
- Rappengluck, M.A. (1999). Paleolithic timekeepers looking at the golden gate of the ecliptic; the lunar cycle and the Pleiades in the Cave of La-Tête-Du-Lion (Ardèche, France) – 21,000 BP, *Earth, Moon and Planets*, vol. 85-86, 391-404.
- Ruggles, C.L.N. (1997). Whose equinox? *Journal for the History of Astronomy, Archaeoastronomy supplement*, vol. 28, 45-50.

- Ruggles, C.L.N. (2005). *Ancient Astronomy: An Encyclopedia of Cosmologies and Myth*, Oxford University Press, Oxford, UK.
- Rutkowski, B. (1986). *The cult places of the Aegean*, Yale University Press, New Haven and London, UK.
- Rutkowski, B. (1988). Minoan peak sanctuaries: the topography and architecture, in R. Laffineur (ed.), *Aegaeum 2. Annales d'archéologie égéenne de l'Université de Liège*, 71-100.
- Saletta, M. (2011). The archaeoastronomy of the megalithic monuments of Arles-Fontvieille: the equinox, the Pleiades and Orion, "Oxford IX" *International Symposium on Archaeoastronomy Proceedings IAU Symposium 28*, C.L.N. Ruggles (ed.), 45-50.
- Silva, C.M. (2010). Neolithic cosmology: the equinox and the spring full moon, *Journal of Cosmology*, vol. 9, 2207-2216.
- Stankovski, J. (2007). The peak sanctuary Tatičev Kamen at the village of Kokino and two of its cults, *Thracia*, vol. 17, 259-268.
- Stankovski, J. (2010). A contribution to the study of the ritual activities at the site Tatičev Kamen, village of Kokino, *Macedoniae Acta Archaeologica*, vol. 19, 115-125.
- Thom, A. (1967). *Megalithic sites in Britain*, Oxford University Press, Oxford, UK.
- West, M.L. (Trans.) (1999). *Hesiod: Theogony and Works and Days*, Oxford University Press, Oxford, UK.