

## **Some Earliest Ancient Astronomical Observatories in Kashmir (India)**

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### **Abstract**

We identify some ancient observatories in the north-west belt of Kashmir (India) and predict that the Site Bumai Sopore as the oldest one in this region belonging to the upper Paleolithic period. All the sites fall in the respective periods of Neolithic, Paleolithic and upper Paleolithic. Detail practices of state-regulated the Meteor impact, supernova, change of seasons in a year and others. This paper reports the earliest structures that support those carvings.

Key words; Ancient astronomy; Observatories; Stone carvings- Supernova

### **1. Introduction**

Archaeoastronomy is the study of ancient or traditional astronomies in their cultural context, utilizing archaeological and anthropological evidence. The use of historical records of heavenly events to answer astronomical problems and the history of astronomy which uses written records to evaluate astronomical traditions. The importance of archaeoastronomy is that some thing is known about prehistoric times and even those times knowledge about astronomy was flourished. The archaeoastronomy can be used to describe astronomical practices of prehistoric times. This kind of study also indicates that humans must have worked hard on getting a deeper understanding of astronomy. Also, most importance of this study is that there are some astronomical problems which require an historical explanation. There are number of ways of studying archaeoastronomy, some of them include:

1. Architecture of ancient monuments (Menon, S. & Vahia, M.N.2006)
2. Simulations of ancient observatories and situations (Hrishikesh et al.2006)
3. Harappanscript pattern recognition (Nisha & Vahia, M.N. 2006)
4. Stone carving (Masood, T; Iqbal N and Vahia, M.N 2006)

Our investigations have found that stone carvings are found rich in Kashmir. Stone carvings have presented great number of unsolved mysteries posed by the history of civilization. These mysteries pose essential questions and lead to new answers about the people of the ancient world, including their culture, language, architecture, astronomy and religion. We know today that the described objects are the warming sun, the waxing and waning moon, the constellations of stars and the planets of the solar system, but the ancients did not know this and they viewed these objects as unknowns and have given their state of knowledge in terms of stone carvings. The first carvings were discovered in the area of Jiepmaluokta about 4 km's from the town center of Alta. The most mysterious of the carving are a set of geometric symbols, which consists of circular objects surrounded by fringes; others show intricate patterns of horizontal and vertical lines (Stemersen O and Liback 2003).

The different carvings found in Kashmir indicate the tradition of recording astronomical events in pre-historic times Iqbal et.al (2008); Vahia et .al (2006) and Joglekar et. al (2006). The stone carving found in Burzaham which is about 17 kms from Srinagar depicts a hunting scene and its astronomical interpretation has described it as the recording of a supernova that has happened about 8,000 years before (Joglekar et.al 2006). The Stone carving found in Sopore ( Kashmir) which is about 60 kms from Srinagar in the N-W belt depict an astronomical event of a meteor fall in the upper Paleolithic period (Vahia,.et.al 2006).

We recently identified some more new places of stone carvings in the areas of Dras (Ladakh) and Chills (on the border of Ladakh in the Pakistan side) and their carvings have this kind of impression that some kind of astronomy can be found out if studied very carefully. The rock carving found in Bomai Sopore has multiple concentric circles distributed all over the scene figure 2(a,b). The carving is situated on the face of a mountain at a height of about 100 meters from the fields and overlooks the famous Wular lake in its east side. Some earlier investigations made by Vahia et. al (2006) has described it as an astronomical event of a meteor impact although a number of results are yet to be verified. A number of circles are very well seen on the carving face Burzuhama is a place located about 15kms of N-E of Srinagar in the kashmir valley and the two important carvings found here are at a distance of 70kms from the carving found in Bomai,Sopor. This carving is already having an international recognition and has been interpreted as the supernova event dated about 8,000 B.C.(Joglekar et.al 2006).At this site six stones are existing, five are vertical and sixth one is lying flat. If all the existing stones at this site are put together, they form a rough circle that will definitely predict an astronomical event

Following the same direction i.e. N-W belt, we have some other sites with stone carvings. We have a place called Dras which is situated on the hilly areas of Kargil (Ladakh). While studying the carvings of this site it is again quiet ambitious here that the rock arts also contain some kind of astronomical information.

We have one more important place called Chillas that too comes in the same belt but presently a part of Pak occupied Kashmir. This place is on the upper course of the Indus river standing under the shadow of the world famous Nanga Parvat (Dhani1983). Here more than 50 carvings have been found, some carvings found in the same belt show like change of seasons in a year, phases of moon, Calendar, sun rise and sunset figure 5(a).

It is also important to mention here that the greatest number of rock carvings at any place in the world is at Chillas proper on either side of river Indus



Figure 1; showing location of different sites in the map of Jammu and Kashmir (India)

## 2. Ancient sites/ Observatories.

On the basis of our field investigation by visiting different sites and studying their astronomical inputs to some extent, we predict the following sites in Kashmir (India) as the oldest ancient observatories used by the ancient cultures from time to time for looking astronomy.

### 2.1 Bomai Sopore( Baramulla-Kashmir).

Starting from the north of Kashmir the place namely Bomai Sopore is about 70 kms in the N-W of Srinagar. The carving rock in this area is situated at  $74^{\circ}30'$  longitude &  $34^{\circ}22'$  latitude. This area is found to be upper Paleolithic around 20,000 B.C.to 6,000 B.P.The whole valley is foot shaped. The N-W end of plateau (stone carving side) has an altitude of about 3000 meters, while the peaks on the S-E are about 3500 meters. We predict that drawing of this carving is that of a meteor shower impact between 40,000 and 6,000 B.P (Vahia et.al 2006). It has already been observed that the falling of meteorites cause fractures on the surface of the object on which they land. These fractures can take the form of concentric rings around the crater. The impact of a

massive meteorite or a small asteroid produce volcanic activity all over the object it strikes, provided that there is hot lava inside the object that can rise up through the crust (Gibilisco stan.2003).

The astronomical interpretation of this stone carving which we predict a meteor fall seems to be very consistent because the carving has multiple concentric circles distributed all over the picture figure 2 ( a,b ). Vahia et. al (2006) have already postulated that a single piece of meteor may have splintered into several pieces as it entered in the atmosphere and if bigger pieces have landed in full, then they have created crater, pits and lakes.

There are four lakes in this region corresponding to four circles of drawing and several small water bodies, all consistent with multiple fragments as shown in figure 2(a,b). Also the manner of location of rock indicate that object originate in the N-W direction and fall towards S-E direction. The three circles are collinear and three lakes also exist collinearly in the same direction. Wular Lake largest in Asia can be taken to have arisen from the top most circle, and then second would have formed Manasbal lake, third circle could have formed Dal lake and the fourth circle may have formed the Anchar lake. The small circle in between the two circles corresponds to the small water bodies which exist between these lakes. The line emanating from circles is an indication of the movement of the object or a light streak, and the size of circle is indicative of its brightness. All this seems to be consistent with the Meteor fall.



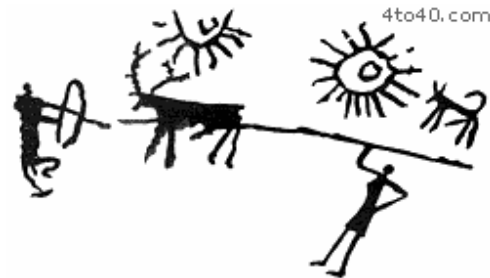


Figure 2(a); Stone carving located in Bomai Sopore of District Baramulla (Kashmir).  
2(b); Drawing showing concentric circles of different sizes.

## 2.2 Burzahama (Srinagar-Kashmir).

Burzahama is located in Srinagar with lat  $34^{\circ} 10'$  north and long  $74^{\circ} 54'$  E. The place is at a distance of 27 km's N-E of Srinagar and 16 km's N-W of Srinagar. To its east is glaciated peak of Mahadev mountain and the glittering water of the Dal lake lies its south. There are also mountain ranges on west. The stone slab obtained from Burzahama is rectangular in shape. Most of the stone slabs were plane without any engravings. Among dozens of such slabs, only two bore the engravings. Even among the two, only one slab with a base width of 70 cm portrayed the most impressive expression of art in relation to Neolithic settlements. The engraved portion is divided into two parts. The top part shows an animal on the right and on the left are depicted two suns, one complete with sixteen radiating lines and the other one is slightly damaged. As from figure 4, it seems that picture depicts the hunting scene but it is postulated that this is not a terrestrial hunting scene but represents actually a sky map giving location of prominent constellations and the moon on that day during which Supernova was observed (Joglekar et.al 2006). One of the hunters on the figure is same as Orion, the central animal is same as the Taurus. The hunter on the right may have been formed from stars of Cetus and the other animal on the right may be Andromeda and Pegasus. The position of Supernova's (HB9'S) is indicated by a spot in the upper part of the picture and moon's position in the carving is indicated by a bigger spot at the centre of the picture. The long curved line in the carving, traditionally interpreted as spear, may be an arc of bright stars. Also the location of HB9 fits perfectly with the left object in the picture, with a supernova of -9.6 magnitudes in the close vicinity. It is already assumed that the figure on the left is Orion and to check this relative distances of various star locations in the figure were measured with the angular separation of stars in the sky. The fitting of these various stars to different points in the figure is reasonably

accurate with some error (Joglekar et.al 2006). These predictions reasonably assume to be an astronomical event which has taken place some 5,000 YB. The event is assumed to be a Supernova (Joglekar et.al 2006).



In this scene carved on the rock, a hunter pierces a stag with an arrow from the front, while another person attacks it with a long spear from behind. Can you guess why the artist might have carved two suns in the sky?

Figure 3; Burzuhama stone carving

The recent study of this site is interpreted in the following points.

1. The stones (of which two are leaning and the rest are fallen) are truly befitting the term "megalith" (megas+lithos) figure 4(a).
2. There seems to be more to the monument than the area attributed to it now. Of particular importance seems a mound located due east of the stones.
3. It is felt that the datum of the location of stones is an artificially constructed mound (as suggested by the placement of rocks as a sort of retaining structure in a part exposed by excavation).
4. "Cup marks" such as observed elsewhere in astronomical connotations (see Ruggles 1999) were observed on two of the fallen stones.
5. The eastern horizon seems to be blocked to a large extent by mountains but the western horizon seems largely unobstructed.



Figure 4a. Panoramic view of the Burzuhama from N-W



Figure 4(b). Some alignment possibilities overlaid on a satellite picture of Burzuhama

### 2.3 Chillas and Drass(Ladakh).

Chillas in (POK) is a small town located near the Dras belt of Ladakh region (India) but comes under the occupation of Pakistan. It is  $35^{\circ}$  north and  $74^{\circ}$  E. The

archaeological surveys have given a list of some 20,000 rock arts and petroglyphs along the Karakorum highway in northern areas of Pakistan. The carvings were left by various invaders, traders and pilgrims who passed along the trade route. The earliest date back to between 5,000 to 1,000 B.C showing pictures of some animals as well as circular type pictures. These carvings were pecked into the rock with stone tools. A number of carvings have been reported from this place and it becomes very interested to have some circular type of pictures carved on various rocks. We report here such kind of pictures figure (5) which seems that the pictures could again resemble with some kind of astronomical event and we propose in the initial moment that it could have been the representation of the change of seasons, Calendar and radiating objects. Although it is again too early yet to give the name of the event but such kinds of predictions become ultimately the future challenging problems. One more way to look on this kind of picture is that the ladakhi people belonging to the budhhism have these kinds of wheels on the rocks because they represent the progress of the soul towards enlightenment and symbolizing the unity of souls awake with the movement of planets, the unity of all the things in the cosmic order.

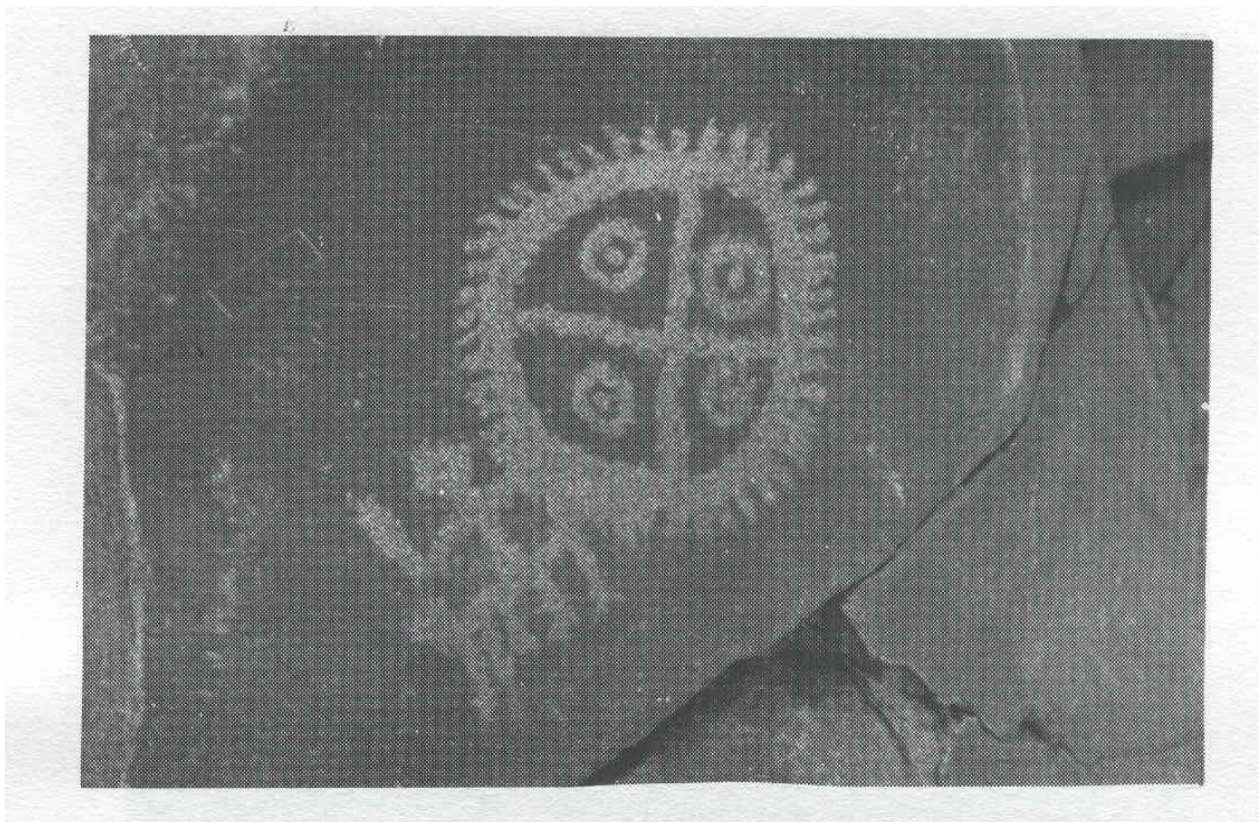




Figure 5(a); A horse rider pulling a circle showing four seasons.

5(b); Solar symbol that has in it 12 triangles possibly showing 12 months.

### 3. Discussion

The overall investigations in this paper are summarized briefly as follows. Watching of sky and other astronomical bodies have remained interesting stories in the prehistoric times irrespective of any kind of culture. Kashmir too has remained an important place for the sky observations in Paleolithic/ upper Paleolithic and Neolithic periods. We have discussed the N-W belt of Kashmir which forms an extreme part of the country with this impression that the ancestors have definitely used the place for watching different events despite the fact that all of them (ancestors) were merely hunters and would always use stone tool things to record their own observations. In this paper we have mentioned the names of three such places where we are sure that these places have definitely astronomy to look in to very seriously. In the first stage an attempt has been made to identify the site observatories for which we have become successful. Once we throw light on the N-W belt route, the same forms an exact path which would have definitely been used by all such ancestors for the travel as well as for watching astronomical events. Water could have been definitely remained an essential thing for their survival and once our identified sites are studied in detail, all of them are situated on the banks of lakes, rivers and other water bodies. Up to now the first two sites i.e Sopore and Burzuhama have already drawn world attention for their

archaeoastronomical potential but the other sites need to be investigated very carefully for their astronomy. Watching of events like meteor impact, supernova, change of seasons and others could have remained as the most popular kind of events with them. We still need to use various kinds of studies both on experimental and geographical basis for strengthening our ideas. Our identified sites definitely gives new insight for looking the archaeoastronomy potential of Kashmir.

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