Indian record for Kepler’s supernova: Evidence from Kashmir Valley

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We revisit a strange representation of the Sagittarius constellation painted on a door arch of a tomb in Kashmir. We show that it is a very strong case of a representation of Kepler’s supernova.

1 Introduction

A supernova is caused by death of a massive star in a violent explosion. During such an explosion, the apparent brightness of the star increases more than ten thousand times the original brightness. As a result, sometimes, an invisible (fainter than faintest visible star) star can become visible after supernova. If the exploding star is sufficiently close to the earth, the post-supernova phase is so bright that the supernova can easily appear brighter than brightest star or planet in the night sky. In some cases, as in the supernova in 1006 AD, the brightness was nearly same as the full moon and the supernova was visible even during the day for nearly a month.

Stephenson & Green (2003) and more recently Green (2009) have noted various supernovae records over period of time by different civilizations. Chinese have been most meticulous with the supernovae records but few of them were also recorded by Arabs, Koreans, Native Americans as well as Europeans. In fact, the last two supernovae in the milky way happened during lives of two great European astronomers, namely Tycho Brahe and Johannes Kepler. These events from 1572 and 1604 were observed by Brahe and Kepler in detail and they maintained daily log of intensities of these supernovae.

On this background, it is indeed surprising that so far no credible Indian record of any supernova has been found. Indian astronomers were expert in calculations of planetary positions and eclipses. The famous Arabian traveler Al-Beruni speaks highly of the astronomical skills of Indians (Sachau 2007). It has been assumed that Indians were either not interested in unpredictable, transient events such as supernovae or preferred not mention of them out of prevailing superstitions.

2 Kepler’s supernova

The Kepler supernova appeared in the constellation of Ophiuchus (see Fig. 1 left) on October 9, 1604. It was seen by various European observatories including Prague, Verona, Rome, Capra, and Padua. Kepler first observed it on October 17 and made systematic study since that date. The Supernova was close to the star θ Ophi. It disappeared in daylight towards end of November and reappeared in late January of 1605. Kepler noted even after reappearance, it was brighter than Antares. It is estimated that at its peak the supernova brightened to –2.25 magnitude (Baade 1943).

One very important aspect of the supernova was the fact that it exploded when Mars, Jupiter and Saturn were within 5 degrees of it (see Fig. 1, right). The four bright objects so close to each other would have formed a bright patch in the sky. The sight would have been a spectacular one and certainly would have made a lasting impression on anyone observing it.

3 The mural in Kashmir

In Srinagar, there is a mosque built in 1444 during the rule of Sultan Zainul-Abidin (1420–1470 AD) for a saint, Sayid Mohammad Al-Madani. After his death the saint was buried

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adjacent to the mosque in a stone enclosure with east facing entrance. The brick arched entrance was once decorated with glazed terracotta tiles. Most of these tiles have fallen off and some of these can be seen in a museum in Srinagar. However, at the middle of 20th century, the mural was pretty much intact, and John Nichols (1955) made a copy of some of the murals adorning the walls. The mural under discussion was pictured by Nichols and a short description of the mural can be found in his work: “In the east facade of the arch way on the southern half of the spandrel was depicted a four feet long beast with the body of a leopard, changing at the neck into the trunk of a human being, shooting with a bow and arrow at its own tail, while a fox is quietly looking on among the flowers and cloud forms” (see Fig. 2). On the blue background tiles, the trunk of man was in red, the body of the leopard in yellow with light green spots, the dragon head of the tail and the fox are in reddish brown and the flowers are in various colours. The shoulders, neck and the head of the human part were missing from the wall but a few tile fragments recovered from the rubble beneath revealed that the man was sporting a beard and long curly hair over which was a white turban.

Nichols claimed that these tiles were fixed at their place in the 15th century itself after the saints death. However, Bandey (1994) has shown that the glazed square tiles in question were introduced in the Indian subcontinent roughly during the early reign of emperor Shah Jahan (born 1592 AD, reign 1627–1666 AD) after their appearance in central Asia towards the end of the 16th century. He has concluded that the archway and the glazed tile decorations must have been added to the tomb site in the 17th century. Bandey (1994) identified the man-leopard motif as the zodiac figure of Sagittarius but offered no explanation why this was made on the arch way.

3.1 The Sagittarius sign during the Mughal Empire

In western culture, Sagittarius is depicted pointing arrow towards the Scorpio but its trunk is behind it i.e. towards Libra. However, there are reasons to believe that astronomers
in the Mughal courts had tradition to depict Sagittarius with turned trunk i.e. shooting arrow behind itself over its body. Most notable example of this tradition is found in the Sagittarius coin of the emperor Jahangir (reign 1605–1627 AD), father of Shah Jahan, as shown in Fig. 3. It is part of the 12 coin zodiac set released by Jahangir.

4 Discussion

One can easily notice similarities as well as differences in Figs. 2 and 3. It is reasonably clear that the beast depicted on the entrance arch is another depiction the Sagittarius zodiac sign. The background blue colour also seems to point to the same fact. The striking difference is absence of the dragon head from the coins. A fire-breathing dragon in the mural may be indicating a bright region of sky.

Figure 4 shows the map of the sky again with assignment of shapes to various groups of stars. It is clear that SN1604 along with 3 planets would form the dragon head which was only a transient feature in the sky and hence not found on the coins. The Corona Australis constellation may have been recorded as the fox like animal in the mural. One should note that the supernova was visible from Kashmir as well as Agra (seat of the Mughal Empire). Although the date of supernova differs from likely date for creation of the said mural by about two decades, it is likely that the supernova would have made an impression on young prince Shah Jahan. Alternatively, it is also likely that royal astronomers in Agra might have chose to ignore it but its memory would have survived in Kashmir Valley and it made its presence felt in this mural.

5 Summary

We present the case for possible representation of Indian record of SN1604. The iconographic representation matches with the date of supernova and its striking deviation from standard Sagittarius depiction points towards transient nature of the celestial event. The chosen icon of dragon head implies brightness. Taken together, all clues indicate towards this being a depiction of SN1604.

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