Pulsar spin down ages in error?

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A supernova remnant (SNR) is the nebular aftermath of supernova explosion. Of particular interest is the SNR G11.2-0.3 (figure 1),[2] which has been described as "a circularly symmetric supernova remnant that contains a dense, rotating dead star at its centre, representing a textbook case of what the remnant of an exploding star should look like after a couple thousand years."[3] The distance of this object is about 15,000 light years. The dense dead star at the centre of the nebula is a pulsar, which is a compressed magnetic stellar core, a neutron star. The pulsar, called PSR J1811-1925, spins very rapidly, taking only 65 milliseconds to complete one rotation. Radiation is beamed along the magnetic axis of the star. Since the magnetic axis is not aligned with the spin axis, the beam of radiation sweeps like a searchlight as the neutron star spins. Every 65 milliseconds we can see two flashes from this beam, one when the beam points more directly at us and the other when the beam is less directly oriented. Deep within the SNR the pulsar is immersed in a hot pulsar wind nebula seen as the small tilted disk in figure 1.

This SNR was recovered in X-rays by the Chandra Space Telescope, and is located not far from the galactic centre in Sagittarius. This position is consistent with a supernova that Chinese astronomers recorded in AD 386. Furthermore, from its expanding debris cloud, modern astronomers determined that the supernova must have exploded about the same time as the Chinese observations. This makes the identification of the pulsar and SNR with this historic event nearly certain, and hence both the SNR and its pulsar must be about 1,625 years old. Over time the rotation rates of pulsars slowly increase, and astronomers think that they can determine a pulsar's age by its spin-down rate. In this case, the so-called spin parameters suggest that PSR J1811-1925 is 15 times older than the remnant age (the 'spin down age' of the pulsar is 24,000 years[4]). This argues strongly that pulsar spin ages are probably very wrong.

This is another case where a natural reference clock (NRC[5,6]) does not match the established evolutionary time scale. The natural reference clock is the observed expansion rate of the supernova remnant which is likely accurate to a year or two (a good example is the crab nebula whose expansion rate accurately predicts the year on the Chinese record of AD 1054). We remind ourselves that a factor of 15, however bad, is not appreciable when addressing the millions to billions of year ages of stellar evolution when compared to young-earth creation ages. But it is important in addressing time dilation cosmologies which seek to specify the apparent age of objects in the region outside 'earth time'.[7] Astronomical ages are likely less 'astronomical'!

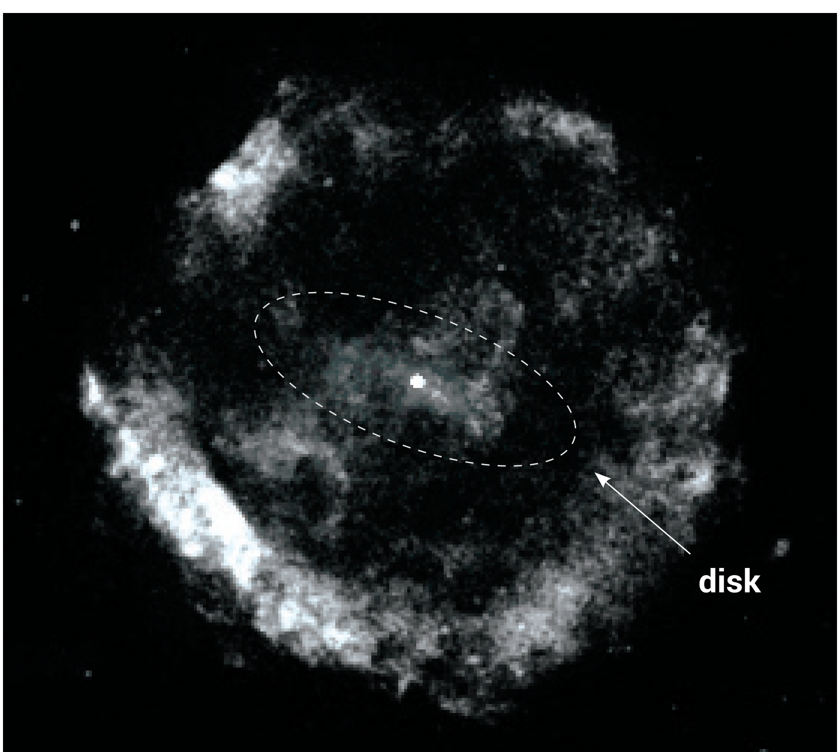

Image: NASA

Figure 1. G11.2-0.3 supernova remnant. NASA's Chandra Space Telescope.

References

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3. http://chandra.harvard.edu/photo/2007/g11/.
4. Torii, K., Tsunemi, H., Dotani, T., Mitsuda, K., Kawai, N., Kinugasa, K., Saito, Y. and Shibata, S., Spin-down of the 65 millisecond X-ray pulsar in the supernova remnant G11.2-0.3, *Astrophysical J.* **523**:L69, 1999.
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6. Samec, R.G., The apparent age of the time dilated universe—explaining the missing intracluster media in globular clusters, *J. Creation* **27**(2):5–6, 2013.
7. By earth time we mean the time dilated zone which evidently includes the solar system where the time is recorded by God to give us the 6 day creation and a ~7,000 year old universe—The Young Earth Creation model. Outside of that zone, we refer to the time as 'apparent time'.