7 Night viewing

No ScopeX would be complete without people bringing their picnic baskets and spend a few hours looking through the wide range of telescopes on display, and this year was no different, especially as this year the skies were nice and clear. This session brought to an end another wonderful ScopeX, attended by a little under 2 000 people – a remarkable achievement by a small group of remarkable people!

Obituary: Doc Jannie Smit

Neville Young

It is with a great sense of loss that we have to announce the passing of Dr Jannie Smit, affectionately known simply as "Doc", long time member of the Pretoria Centre of ASSA and a noted variable star observer.

Fig 1. Dr Jannie Smit

Jannie was born in Reitz in the Free State on 22 September, 1924 and died in Pretoria on 7 September, 2014 - three weeks short of his 90th birthday. After he had qualified as a Mathematics and Science high school teacher, he lived in Swartruggens, followed by several of years teaching in Alberton. In 1962 he moved to Pretoria where, after teaching at Hendrik Verwoerd Hoërskool for a few years, he joined the staff at the University of Pretoria lecturing in Applied Mathematics. By all accounts he was a highly motivated teacher, which explains his willingness to help those of us who were new to astronomy.

Astronomy must have been an interest of his from an early age because his daughter Sonja recalls, that she as a little girl was very proud of her father for having built his own telescope, through which she had her first views of the stars and planets. His enthusiasm to share his own passion for astronomy was clear and he was always showing others how to do things, ranging from astrophotography to setting up grazing occultation trips and weekend observing camps. In order to view a transit of Mercury, he adapted a 4" reflector for solar observing viewing, enabling him to observe the transit at daybreak from his house.

Fig 2. Jannie with his adapted telescope.

Another achievement was that of being the first person to visually observe the occultation of a moon of an asteroid, long before asteroids were known to have companions.

The American Association of Variable Star Observers

The Officers, Councilors, Members, and Observers of the
American Association of Variable Star Observers
extend their sincere thanks and appreciation to

Jan A. Smit

in recognition of his valuable contribution to the AAVSO International Database since 1986 of 19,027 visual observations of Southern Hemisphere variable stars; his contributions to minor planet occultation work; his mentoring of many younger observers in the art of variable star observing; and his public education efforts in introducing basic astronomy to the public during the open evenings and star parties at the Pretoria Centre of the Astronomical Society of Southern Africa.

Jaime R. Garcia, President | Gary Walker, Secretary | Arne A. Henden, Director

Presented at the AAVSO 100th Annual Meeting, Woburn, Massachusetts, October 8, 2011

Fig 4. Plaque awarded to Jannie Smit

His enthusiasm and dedication led to Jannie becoming an avid variable star observer, eventually logging 19,027 visual observations. According to Brian Fraser "Jannie Smit was one of the most accomplished variable star observers in South Africa." His efforts were recognised by the American Association of Variable Star Observers which extended its appreciation by

way of a plaque awarded *in absentia* to him at the 100th meeting of the AAVSO in Massachusetts in 2011. At an informal ceremony attended by various representatives of ASSA and the Pretoria Centre and held at his home in 2012, the plaque was presented to him in person by Brian Fraser.

Fig 5. Standing left to right: Brian Fraser, Tim Cooper, Michael Poll, Johan Smit

After he retired, he decided to devote more time to astronomy and so he built an observatory on the roof of his house. This was accessed from a beautifully crafted staircase in the lounge, which meant that he did not have to go outdoors to observe. He was upset when he had to stop his regular attendance at the Pretoria Centre ASSA meetings, saying that he valued every clear sky opportunity to spend time in his observatory actually 'doing' astronomy as opposed to 'talking' astronomy!

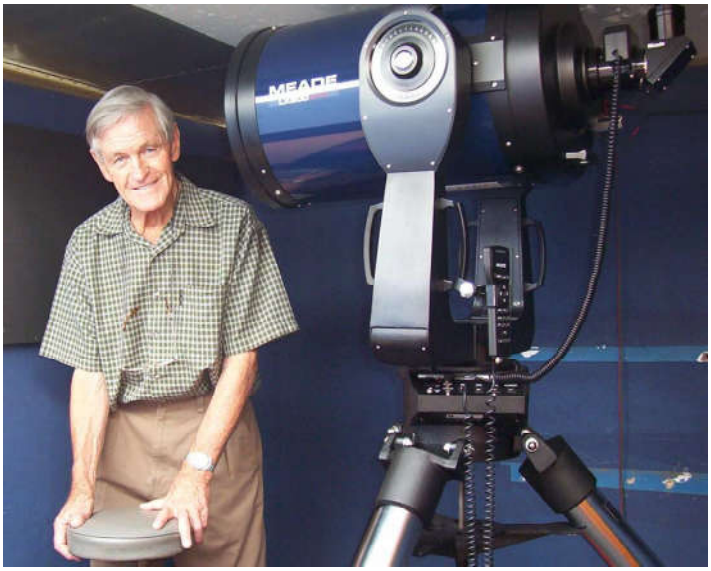

Fig 6. Jannie in his observatory

Jannie was also a keen marksman and was for many years a member of the Springbok Bisley target shooting team. He and his wife, Bokkie, also enjoyed playing tennis and were both 'A' grade players in their club. He leaves his wife Bokkie, daughters Sonja and Estelle and son Jan.

Irregularity observed in the Light Curve of the companion of PSR J1723-2837

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Abstract: The author presents a phased Light Curve (LC) of the companion of PSR J1723-2837, a millisecond pulsar, from photometric measurements with a 30 cm telescope. Variation in the LC agrees well with the orbital period and provides supporting evidence for tidal distortion of the companion in the compact binary system. Short period irregularities in the LC were discovered around $\phi \sim 0.25$.

1. Introduction

It is generally accepted that pulsars lose energy through magnetic dipole radiation and that the rotation rate will decrease over time. When a pulsar's spin slows down sufficiently, the radio pulsar mechanism is believed to turn off (the so-called "death line"). However in the case of binary systems, the theory is that infalling matter transfer from the companion on to the neutron star can increase angular momentum to the neutron star to "recycle" it as a rotation-powered millisecond pulsar (MSP) [Alpar et al, 1982: Bildsen et al. 1997]

PSR J1723-2837 is an eclipsing 1.86 millisecond binary pulsar that was discovered in the Parkes Multibeam (PM) survey. The MSP follows an almost circular 14.8-hour orbit about a companion star (J17232318-2837571) of spectral type G5 that was identified using Infrared, optical, ultraviolet and spectrophotometry [Crawford, 2013]. X-Ray emission was also detected from PSR J1723–2837 and it is presumably a candidate for a radio pulsar/X-ray binary transition object (Bogdanov, 2014).

However, sparse orbital photometric data of the companion did not allow constraining the degree of tidal distortion to date, although suggestions

were made that there are signatures of a strong tidal effects, for example; a large orbital period derivative; the pulsar is eclipsed for a significant portion of its orbit (~15%) and there is significant flux variability in the radio data (2000 MHz) which may be contributed by obscuration material from a mass-losing companion that could be a star nearly filling its Roche lobe.

In this report I would like to present a LC of the companion star that supports evidence for the expected tidal forces and will report on short period irregularities observed in the continuity of the LC.

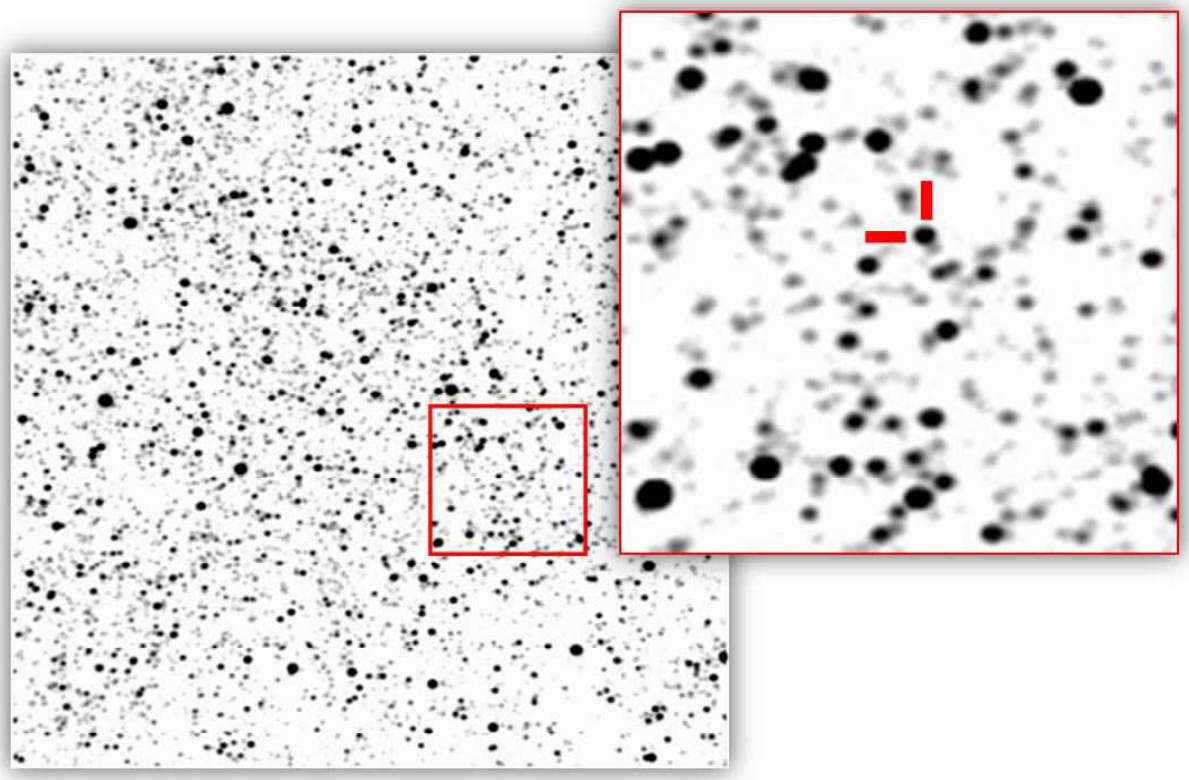

Fig. 1. RA 17h 23m, Dec -28 37': The 300 second image (left) was made with a 30 cm SCT and ST9eCCD. The ~130 arc seconds "cut-out" box (right) shows the position of J17232318-2837571 marked with red bars and the corresponding position on the left image.

2. Observations and data analysis

Data were obtained with a 30 cm amateur class SCT and ST9e CCD (512x512) cooled to -15°C, located at code 641, South Africa. FWHMs were between 2 to 3 arcsec, and occasionally reached < 2 and >3 arcsec. The pulsar position is only 4.3° from the Galactic plane and this results in a crowded star field (see Fig. 1).

Light exposures were all 300 seconds, without filters. Measurements were made between 3 Aug 2014 and 13 Sep 2014 on 14 nights. A public photometric program, Muniwin, was used to reduce the time series photometry.

3. Results

A phased light curve was constructed (fig 2), with ϕ ~0 located at the ascending node [Time of ascending node, T_{asc} (MJD) = 55425.320466] and folded with the pulsar's orbital frequency [f_b (s^{-1}) = 1.88062856(2) × 10^{-5}] corrected with the 1st derivative [$\dot{f}_b$ (s^{-2}) = 1.24(4) × 10^{-18}]. Therefore we see at ϕ ~0.75 the side of the companion facing the pulsar. The radio eclipses in the PM survey were observed at ϕ ~0.25 when the pulsar was behind the companion (at inferior conjunction). All photometric measurements were transforming to Heliocentric times. The Magnitude scale was derived from a virtual comparison star and is only an approximation for V mag.

The LC shows optical variability (~0.12 mag) with two maxima and two minima during each orbit of the companion that nicely correlates with the pulsar's orbital period, confirming variability is associated with the pulsar's binary motion. The observed light curve clearly shows two distinct minima, at phases ϕ ~0.25 and ϕ ~0.75 at the conjunctions and two maxima at quadratures, ϕ ~0.0 and ϕ ~0.5 when the distorted star presents the longest axis of its ellipsoid to the observer. Such a shape is a clear signature of tidal distortions induced by the Neutron Star's tidal field on a highly perturbed, bloated star (Pallanca, 2010).