News Note: Transit of Mercury 9 May, 2016

Transits of Mercury occur 13/14 times per century, always in either May or November. Previous ones occurred on 1999, 2003, 2006, and the next will be on November 11, 2019 and then on November 13, 2032.

Several ASSA members observed the transit from all over South Africa, and one from Canada; unfortunately for most the weather was not good! But many persevered and did get some remarkable images. Below is a selection of observations and images sent to MNASSA. Published in no particular order below, and I have archived all the images that I was regrettably unable to publish. I have also had to edit severely the length of the articles received, but as with the images articles are archived for possible future use. Many thanks to all those who responded and contributed, and I think the article is a fair record of the 2016 transit of Mercury.
Editor.

1 Cape Town

Cliff Turk reports that the weather was bad in Cape Town, but managed to get this image of the Mercury Transit at 13:49 UT with a Canon 450D through a Celestron 8 at f 6.3. Light hazy cloud made it difficult to focus, so just about 8 images were taken and the focus was moved slightly between each one.

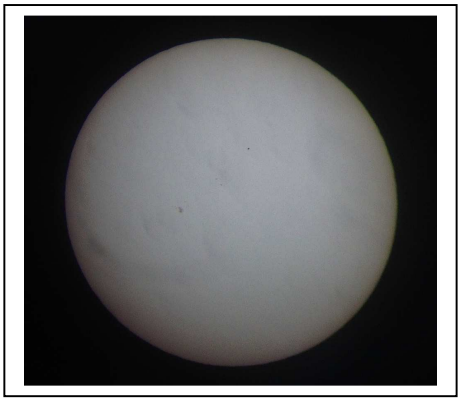
Fig 1. Mercury transit.

2 Paarl

Willie Koorts reports that 10 members and eight telescopes represented OOG (Orion Observation Group), who observed the transit from the Afrikaans Taal Monument in Paarl. The weather was 100% cloud for the

ingress, but it cleared about an hour and a half later! There was much jubilation for the 20+ members of the public that attended..

(Above) Fig 2. A field of telescopes



(Right) Fig3. Cellphone image from a 5-inch telescope.

3 George

Three members of the Garden Route Centre, GRASSA, set up telescopes in the George Botanical Gardens.

Fig 4. Two telescopes ready and waiting.

The weather was poor with 7/8 cloud and well after ingress the sky partially cleared for about a dozen members of the public, who were there to see the transit directly or by a projected image through a 6" Dobsonian.

Fig 5. Case Rijsdijk points out Mercury on a projected image.

Lucas Ferreira was trying the do some time-lapse imaging, but without much success due to clouds.

4 Centurion

Clyde Foster reports that his objective was to capture images using two telescopes which would provide him with both a full solar disk view as well as, hopefully, a close up view of Mercury as it progressed across the face of the Sun.

The first was a 110mm FLT f7 Williams Optics refractor, white light solar filter and Canon eos 60DA DSLR provided a full disk image of the Sun and was the primary instrument to capture the transit.

The second was a 355mm Celestron Edge Hd SCT, 250mm Diameter White Light Solar Filter and ZWO ASI224MC Camera which would give close images of Mercury, and hopefully resolve a discrete disk.
With the above he was able to confirm Mercury's ingress onto the solar disk at 13:15:32(11:15:32UT).

Fig 6.

Mercury's ingress, is shown as a tiny spot on the limb at between 2 and 3 o'clock position. The dark spot to lower right of centre is a sunspot group. The blue colour is due to the combination of the solar filter and the DSLR.)

Fig 7. Showing a high magnification capture at 14:05 local time (12:05UT) with the 355mm SCT.

5 **Glencairn**

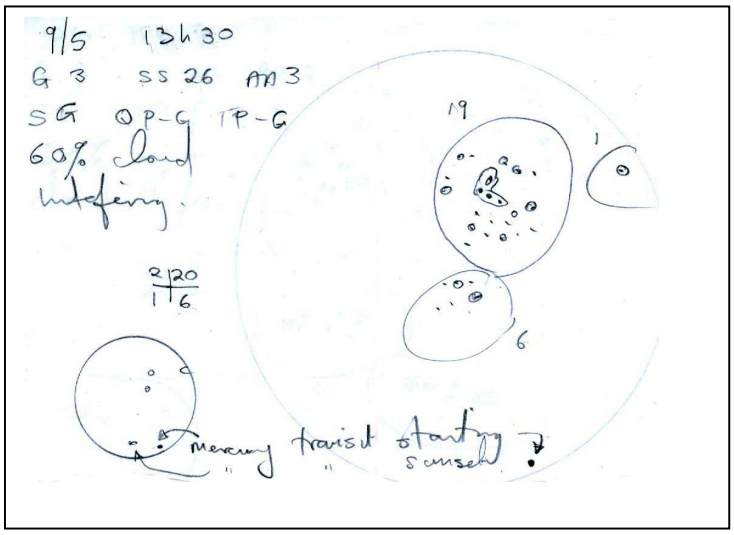


Fig 8. Jim Knight sent in this sketch of the event and added the following notes to help with deciphering it:

From the top down: Date and time in UTC

Second row G = groups of spots, SS = total number of sunspots visible on Sun and AA = activity areas comprising the bright faculae and of course the spot groups.

Third row S = seeing during the observation, Q = quietness and T= transparency. Viewing condition - cloud etc. and its influence on the observation.

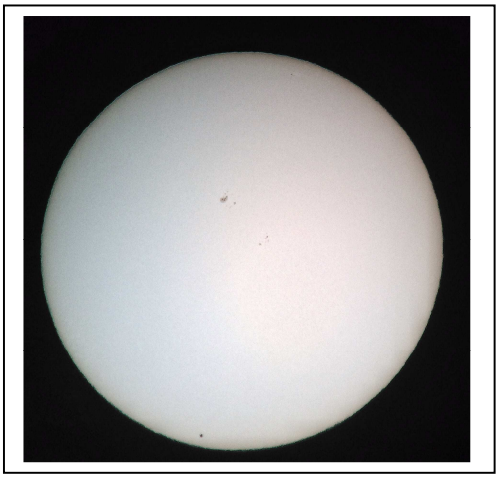
Distribution of groups and spots = 2 groups and 20 spots in the northern hemisphere and 1 group of 6 spots in the southern hemisphere.

The small diagram - approximate of the groups on the solar disk and showing the position of the planet when we first looked and again when the sun went behind the mountain in the afternoon and the viewing was over.

The large diagram is of the details of the spots and their cores found in each group. The drawing is not a detailed drawing of the spots or their spatial distribution but to allow the spots to be counted at the end of the session.

As observations can take over half an hour when the cycle is at a maximum, and the seeing conditions change continuously, it allows one to make an accurate count rather than a guestimate based on memory.

6 **Mississauga Ontario, Canada**.



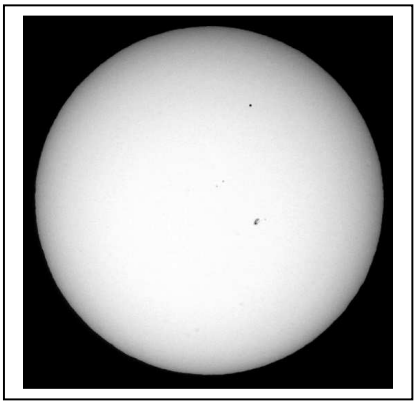
Bruce Dickson, ASSA member in Canada imaged the transit with his 4.5" APM refractor, Herschel wedge and 14mm Delos eyepiece and imaged with an iPhone. He had about 30 people join him and look through his telescope during 2.5 hours of observing.

Fig 9.

7 Hermanus

Pierre de Villers reports that members of the Hermanus Astronomy Centre set up three telescopes equipped with solar filters to view this at two sites: First at Curro Hermanus which attracted about 130 learners and parents. *(see Fig 10, left).*

Then subsequently at Gearing's Point where at least 40 people witnessed this rare astronomical phenomenon which leaves all privileged observers awe-inspired and humbled. The most frequently heard learner comments were "Wow", "Cool" and "Awesome", while adult's comments were the more restrained "Amazing", "Fantastic" and "Incredible". *(See Fig 11, left)*
Even though the transit started at 13:15 the Sun only broke through the clouds at around 13:45, but fortunately was then visible with a few frustrating "clouded over" periods until almost 17:00.



(left) Fig 12.

(right) Fig 13

8 Johannesburg

Gary Els mentions that here was also a lot of haze and wind throughout the day, which made for capturing the Sun quite a challenge, but over a 2 hour period there was an open window to view and take a few images.

The imaging equipment used was a Kowa spotting scope, solar filter with camera attachment and a Canon 550d SLR; ISO 3200 and shutter speed of ¼ second

Oleg Toumilovitch also observed from Johannesburg. The image below, Fig. 14, is a stack of 600 frames from a short video. It was imaged with Canon EOS-550D DSLR at prime focus of an 8-inch F/10 TAL-200K telescope with full aperture black polymer filter. Due to constantly moving clouds, the observing conditions were poor, which was the main factor, reducing the resolution of the images. The image shows Mercury just few seconds after Ingress. The so called "Black Drop" effect can be seen in the image, but it arguable whether the effect is produced by limited resolution, poor observing conditions and post-processing of the images, or is it a purely optical effect?

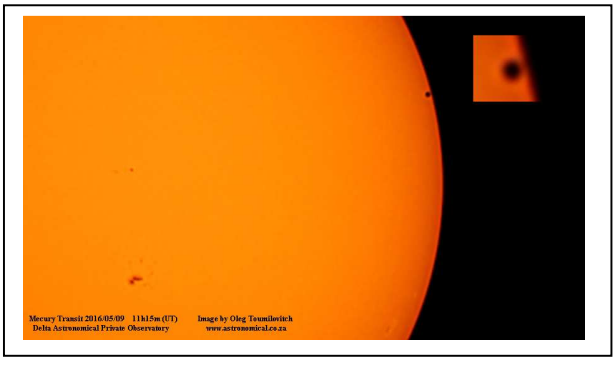


Fig 14

9 Parow

Barry Dumas from his Archer Observatory in Parow used Meade LX90GPS 12” with a Canon 60-Da DX and Canon 550-D DX with a Sigma 150-500 Lens plus a 1.4 x converter to capture Mercury in transit. The image below, Fig. 15, was taken with the telephoto lens. The insert on the upper left shows Mercury within a 12” of arc circle: an enlargement from the main image. The insert on the lower left shows a much less pixelated image, also within a 12” of arc circle was taken with the 12” Meade.

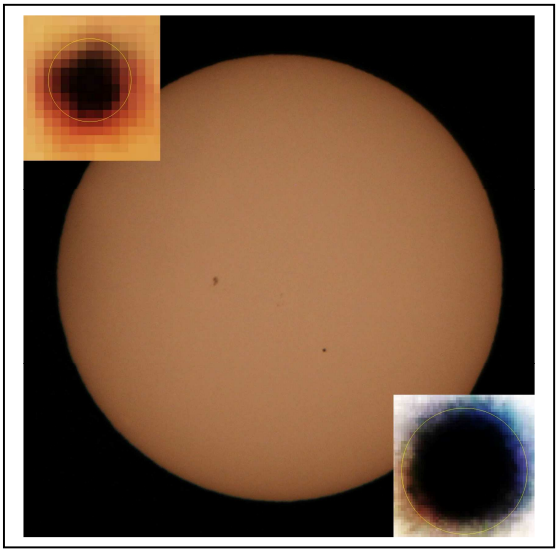


Fig 15.

The yellow circles (calculated) represent the angular size of Mercury during the transit, which was 12” (Fred Espenak). The fuzziness outside the circle is caused by the accuracy of focusing, the condition of seeing (it was cloudy & misty) as well as the quality of tracking during exposure (wind).

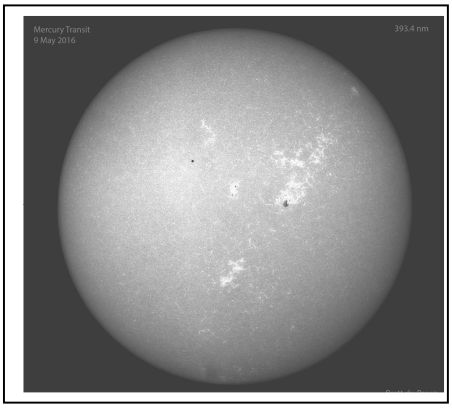
Fig 16.

10 Pretoria

The Pretoria Centre of the ASSA arranged to present the transit from the International Conference Centre at the CSIR in Pretoria. The western and northern balcony at this venue afforded a convenient and unobstructed view of the entire transit.

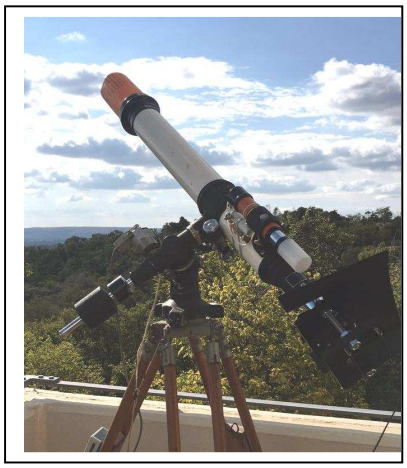
Images of the transit were updated every minute on a website that the conference centre created for the event. The source of these images was a mobile phone camera attached to a 76mm refractor that Jack Bennett bought in the 1960s.

There were about eight telescopes, using techniques ranging from eyepiece projection and visual viewing through the eyepiece, to elaborate video and photographic equipment using H-alpha filters. Neville Young had a solar system model that was used to help explain the transit to the 100+ public that attended.



The Pretoria Centre thanks the CSIR for providing the venue as well as for the tea, coffee and biscuits and even a cash bar.

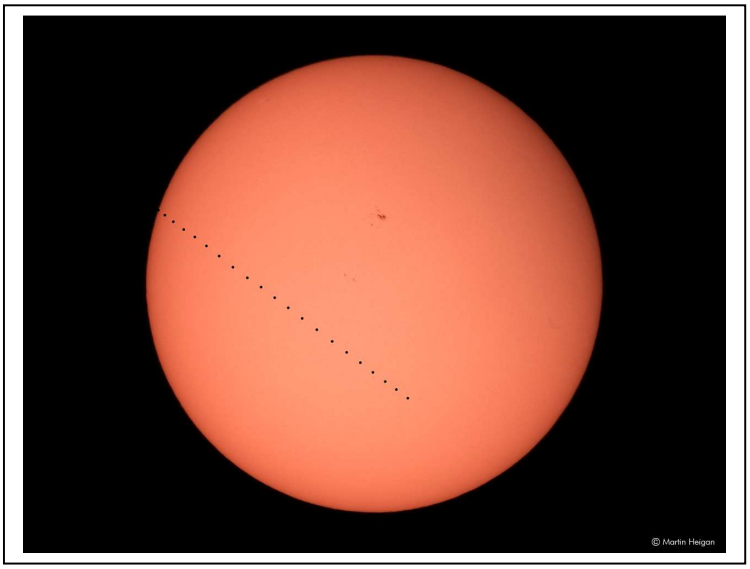
(Above) Fig 17. Bret du Preez image using a 393.4nm filter.



(Right) Fig 18. Bennett Telescope

11 Roodepoort

Martin Heigen reports that it was a bit difficult photographing on the day with partly cloudy conditions; however he did manage to get a composite image of Mercury's path, and also did a HD time-lapse video of the photo sequence.



He used a Canon 60Da DSLR. GSO 6" f/4 Imaging Newtonian Reflector Telescope. 6" Thousand Oaks Optical R-G Solar "White Light" Solar Filter, 2" 2x Tele Vue PowerMate, a Tele Vue Sol-Searcher and a Celestron AVX.

Fig 19.