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Czestochowa astrophotographic observations of a transit of Mercury

On 9th May 2016 there was an opportunity to observe a transit of Mercury over the solar disc. Mercury is one of two inferior planets and the smallest terrestrial planet of the Solar System.

The next full transit can be observed on 13th November 2032.

Mercury, the smallest and the closest of planets revolving around the Sun in the Solar System enables us occasionally to observe an interesting phenomenon. It is the planet's voyage over the solar disc. This kind of observations are possible only with inner planets such as Mercury and Venus. A transit of Venus can be observed in a given place on Earth one time in 243 years. Therefore, it is a rare phenomenon. Mercury is "better" in this respect. Within the entire XXI century there have been or will be 14 such occurrences, among which 5 in May and 9 in November.

Three of May transits (2003, 2016, 2049) and two November ones (2032, 2039) in their entirety were or will be (both November transits and a May one in 2049) possible to observe from the territory of Poland. Mercury can be seen over the solar disc in the following time intervals: every 7, 13, 33 and 46 years. The earliest partial observation will be possible on 11th November 2019¹.

Together with colleagues from Polish Association of Astronomy Enthusiasts branch in Czestochowa under the patronage of priest Bonawentura Metler, we made thorough preparations for observing a transit of Mercury on 9th May 2016²². The meeting place was, as usual in such cases, a rooftop deck of Institute of Physics of Jan Długosz University in Czestochowa. The weather was unfa-

¹ Janiczek R.K., Mietelski J., Zawilski M., *Kalendarz Astronomiczny na XXI wiek*, Prószyński i S-ka, Warszawa 2004, p. 117–122.

² Wszolek B., Kuźmich A. (red.), *Częstochowski Kalendarz Astronomiczny 2016*, Astronomia Nova oraz Wydawnictwo AJD, Częstochowa 2015, s. 13, 21.

vorable. Before the first contact, it was raining heavily, which made it impossible to prepare precious equipment for recording and observation, and one minute before expected contact at 13.11 (11.11 UT) was not enough to achieve it³. A window in the clouds enabling observation of the Sun with Mercury was “open” only for single minutes within that time. To sum up, we didn’t manage to photograph or record neither the first nor the second contact. That’s a shame. There’s no remedy for the weather yet.

A few setups with various observation equipment were prepared. Meniskas 150 Telescope with solar filter and a Telementor refractor (both owned by Institute of Physics, JDU), which enabled observation for more people simultaneously using eyepiece projection (Fig. 7 left side). There were also three setups that could be described as “private”, which belonged to Grzegorz Czepiczek, Artur Lesniczka (Fig. 7 right side) and myself. Grzegorz using a panoramic tripod head and Canon 600D with ZM – 6A 6,3/500mm lens equipped with mylar filter was taking a sequence of photos at 2-minute intervals in order to make a time-lapse video. Artur – Canon 450D + 200 mm Newton telescope on Dobson sky-watcher with mylar filter was taking a sequence of photos as well.

My set of equipment consisted of Nikon D800 (alternatively Nikon D300) + MTO 10/1000mm with a solar filter dedicated to this lens made by Astrokrak from Krakow + x2 Nikon teleconverter.

From 13.30 (11.30 UT) until a sunset at 20.10 (18.10 UT), when treetops on the horizon covered a bottom part of the solar disc with Mercury, we were able, with interruptions, to carry out a show and record this phenomenon. Attendance at the rooftop deck of Institute of Physics JDU wasn’t high, which was mainly caused by capricious weather. During our duty, the sturdiest fans of observing phenomena in the sky participated unfailingly in that 7-hour long transit of Mercury this year.

I’d like to thank to the authorities of Jan Długosz University and Institute of Physics JDU in Czestochowa for granting permission to use equipment and the rooftop deck in order to carry out a public show for citizens of Czestochowa of this phenomenon.

Bibliography

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³ Wszolek B., Kuźmich A. (red.), *Częstochowski Kalendarz Astronomiczny 2016*, Astronomia Nova oraz Wydawnictwo AJD, Częstochowa 2015, p. 161–164.