

TREPTOW GIANT OPEN-AIR REFRACTOR

PEDRO RÉ

<http://re.apaaweb.com>

Archenhold Observatory, the oldest public observatory in Germany, houses the largest moveable refractor in existence, the Treptow giant open-air refractor. This refractor has a 68 cm (26.8 inch) lens with a long focal length (21 m, $f/31$) (Figure 1 to 5).

This lens was manufactured at the workshop of C.A. Steinheil & Sons in Munich. The telescope was designed by the engineering firm of C. Hoppe in Berlin. It was unveiled at the Treptow exhibition of 1896¹. The equatorial mounted telescope was designed to be used by the public as an educational instrument. At the time of the exhibition² the telescope was still unfinished. Regular observations started in September 1896.

The Treptow refractor has an unusual design. It weighs 120 metric tons with two large counterweights, and it is a massive example of iron and rivet engineering. Four adjustable steel rods helped to stiffen the 21 m iron telescope tube³. The large telescope has a fixed position eyepiece. The observer stands at the centre of rotation of the equatorial mount and the whole telescope swings around him or her.

The Treptow refractor has always been used in the open-air. The observer and the lower parts of the mount are protected by a surrounding brick and stone platform⁴.

During the second world war, the telescope suffered some damage due to its unusual appearance⁵. In 1948 the refractor was in a dilapidated condition and had to be restored. Carl Zeiss of Jena refigured the lens and repaired the tube.

After the Berlin Exposition, the telescope was installed in Treptower Park sheltered by a wooden building. Friedrich Simon Archenhold (1861/1939) (Figure 1) was able to find the necessary funds to replace the original wooden structure with the building that stands today. The observatory was then operated by the *Verein Treptow-Sternwarte* society, with Archenhold acting as president. F.C. Archenhold was succeeded as director by his son Günter Archenhold⁶. The Archenhold family was, during the war period, expelled from the observatory grounds; some emigrated, others ended up in Nazi concentration camps and the observatory was integrated into the city's school system.

In 1946 the city of Berlin renamed the observatory *Archenhold-Sternwarte*. From 1959 onwards, the observatory was mainly used for school education in physics and astronomy. To support this objective, in 1962, two observing domes were erected in the grounds, north of the main building. These domes house a Zeiss Cassegrain 500 mm $f/15$ telescope and a 150 mm $f/15$ Zeiss Coudé refractor. Two further domes at the roof of the main building house an astrograph (120 mm $f/5$) and the historical Urania refractor (1888).

¹ Great Industrial Exposition of Berlin (1896).

² 1 May 1896.

³ This telescope tube remains the largest today (21 m).

⁴ This unusual telescope design departs from other great refractors (the telescope is operated in the open-air and there is no elevated floor inside a conventional dome).

⁵ It was often confused for a long antiaircraft cannon.

⁶ Due to his Jewish ancestry, F.C. Archenhold was forced to resign in 1936.

Significant repairs of the Great Refractor had to be carried out in 1989/1990 and 1995⁷. The telescope remains operational and it is regularly used for public observation.

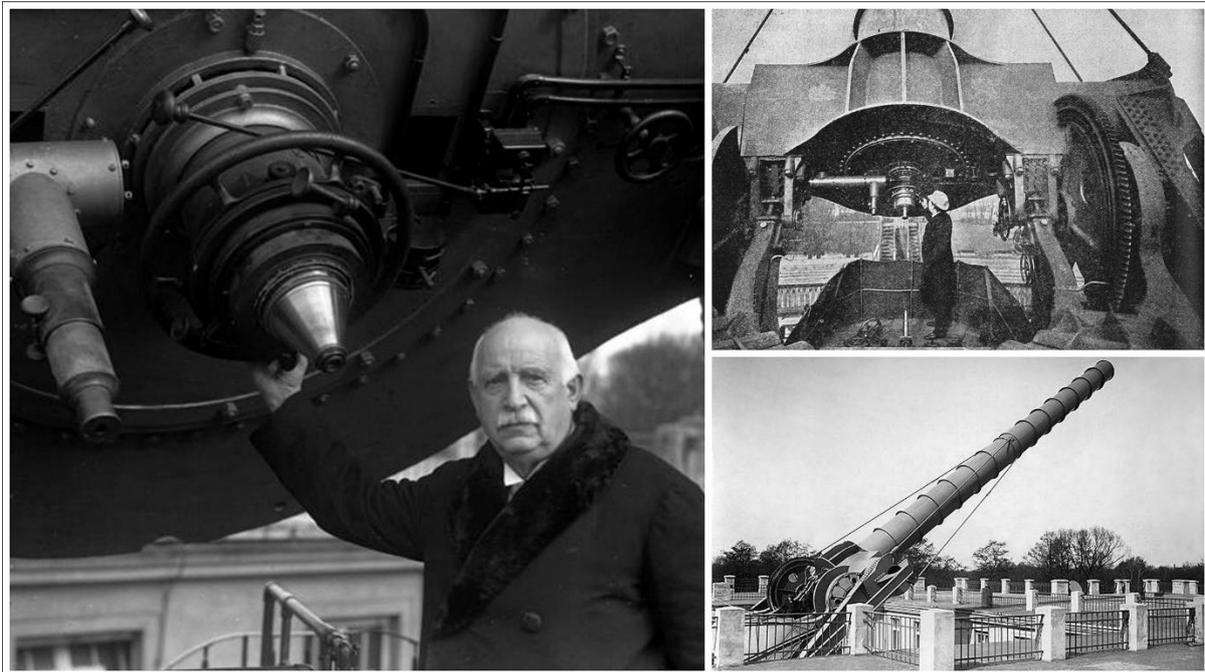


Figure 1- Friedrich Simon Archenhold and the Treptow giant open-air refractor

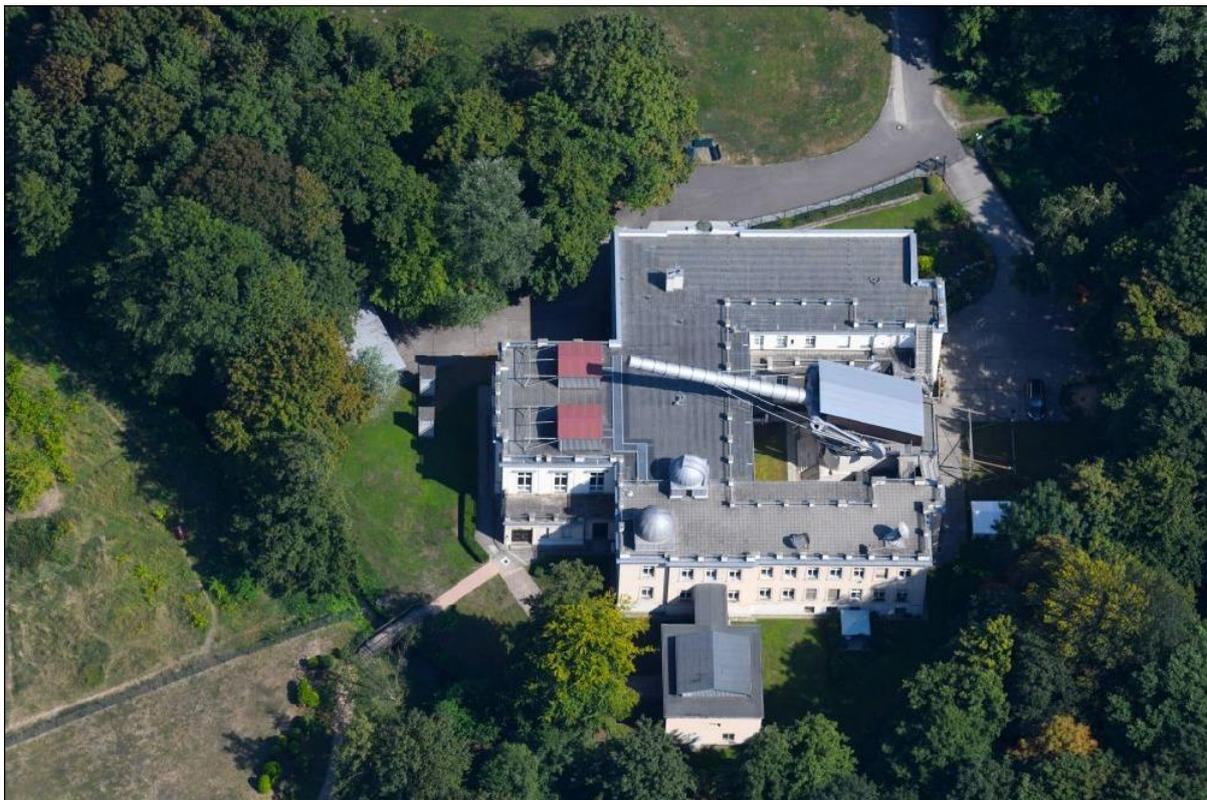


Figure 2- Archenhold Observatory (Berlin, Germany).

⁷ The Treptow refractor is a protected monument since 1967.

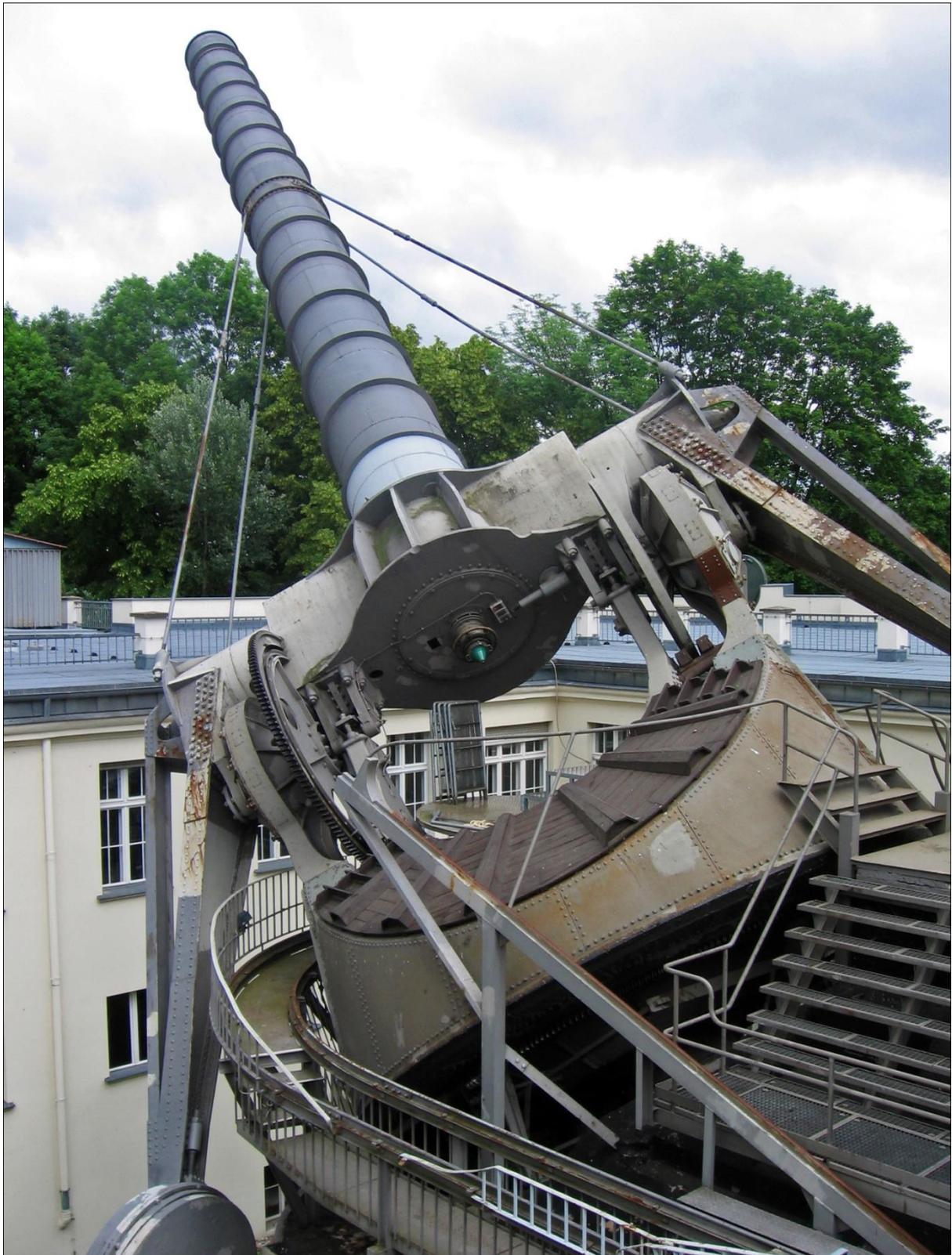


Figure 3- Treptow 68 cm f/31 refractor, Archenhold Observatory (Berlin, Germany).



Figure 4- Treptow refractor, public observation (Moon).

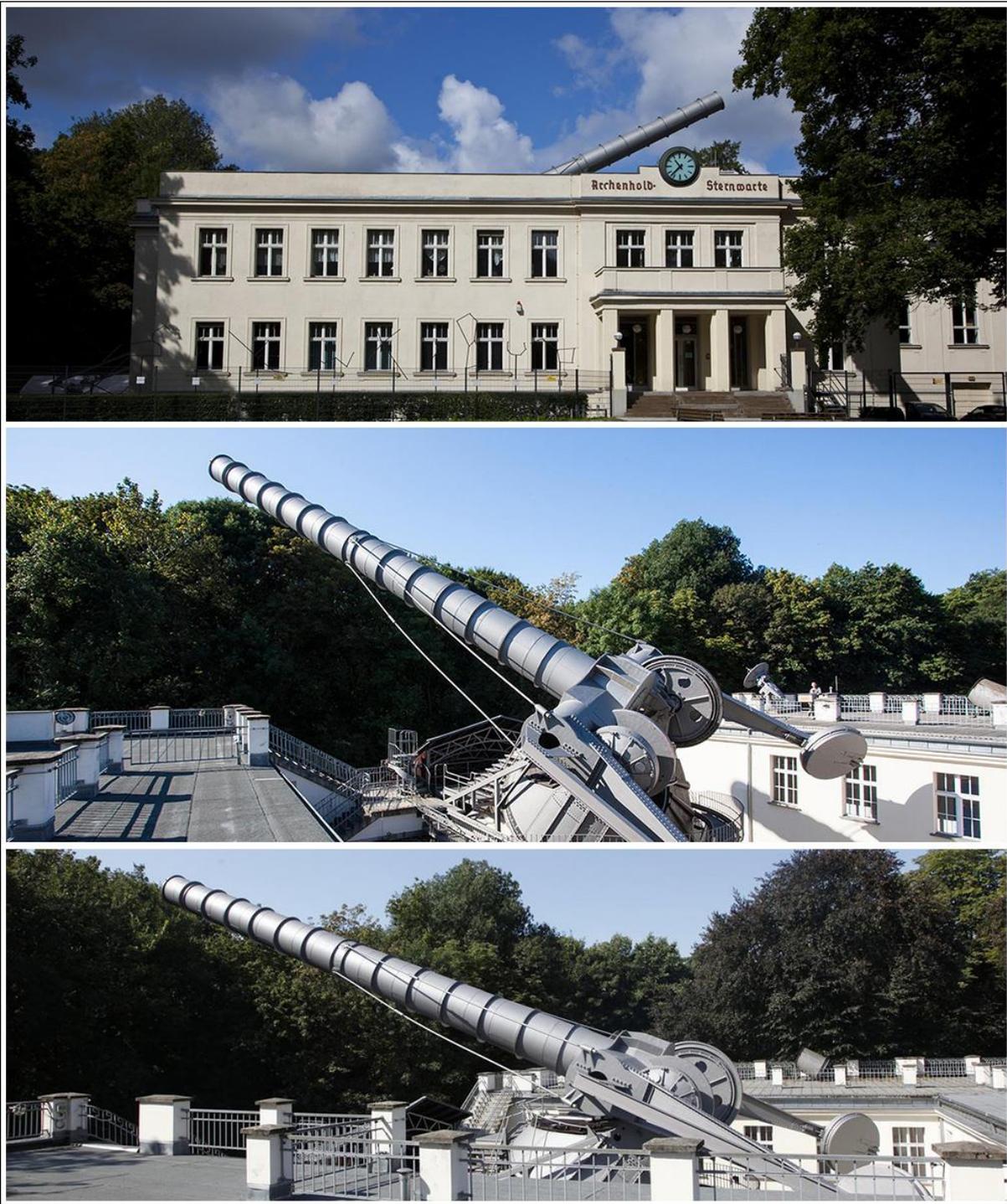


Figure 5- Archenhold Observatory (Berlin, Germany).

Sources:

- Herrmann, D.B. (1984). Archenhold Observatry Past and Present. *Sky & Telescope*, July 1984.
- King, H.C (1955). *History of the Telescope*. Dover Publications.
- Manly, P. (1991). *Unusual Telescopes*. Cambridge University Press.
- Mitchell, S.A. (1910). A great open-air telescope. *Scientific American*, January 29, 1910.