

Gothard Astrophotographic Plate Library: Digitization and Archiving of the Original Plates taken by Eugen von Gothard at the End of the XIX Century

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Abstract. Jenő Gothard (E. von Gothard, 1857-1909) played a very important role in European astronomy at the end of the nineteenth century. From the 1880s, he focused his scientific activity on astronomical photography. His pioneering work in this field made him known worldwide and forever entered his name in the annals of science history. The scientific inheritance of Gothard is maintained by Gothard Astrophysical Observatory at the Loránd Eötvös University. A valuable part of this material is the astronomical plate collection of 455 pieces taken between 1882 and 1900, containing unique images of comets, star clusters, nebulae, galaxies and stellar spectra, (e.g., the plate recorded the central star of the Ring Nebula (M57) for the first time in September 1, 1886).

1. Introduction

Jenő Gothard, a science-oriented squire, established his astronomical observatory on his estate in Herény (Fig. 1), near Szombathely, in 1881 based on the advice of Miklós Konkoly Thege, owner of the Observatory in Ógyalla, today in Slovakia. The first observations in the new observatory were carried out on October 20, 1881. The main instrument of the observatory was a 254 mm Newton telescope (Fig. 1) manufactured by the Browning Company (London, 1873) and brought from Konkoly in 1881. From its founding, the telescope expanded its instruments for use in astrophotography and spectroscopy. Gothard acquired a degree in mechanical engineering from the Polytechnische Hochschule in Vienna, which laid the start of his career as an instrument designer and constructor. The main building of the observatory housed physical, chemical and photographic laboratories and a precision mechanics workshop. He also equipped several leading European astronomical institutes (e.g., Vienna, Potsdam, Heidelberg, Brussels) with instruments that were versions of the original model.



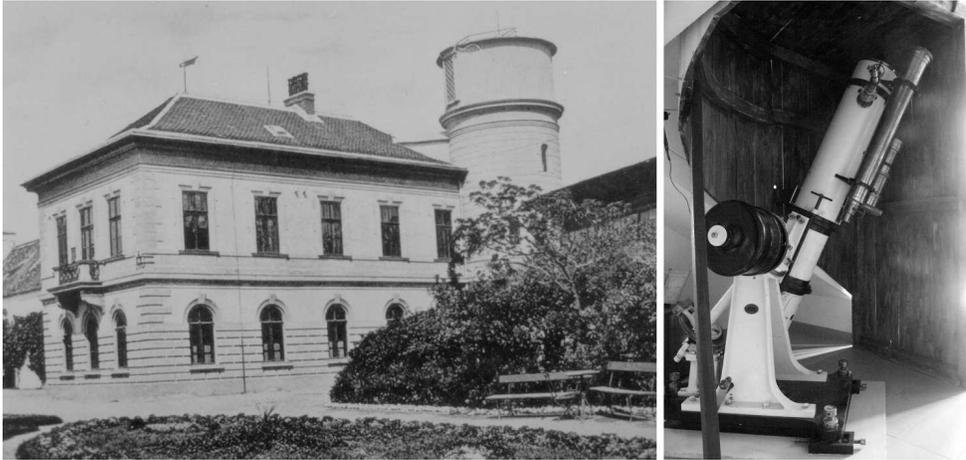


Figure 1. The Gothard castle with the drum-shaped dome housing the Browning reflector in Herény, near Szombathely (1881) and the telescope itself in the partly reconstructed dome (GME, 2002).

2. Gothard's scientific activity

Until 1883, Gothard was assisted in his astronomical observations by his brother Sándor (1859-1939), while their youngest brother István (1869-1948) took part in the recording of meteorological data at the weather station located in the garden of the observatory. At the time of foundation, Jenő's aim was spectroscopic investigation of emission line stars and comets, while Sándor observed planets and Sun's surface.

After 1882, he turned his attention to the astronomical application of the photography (Fig. 4, left). For example, he managed to produce a world-famous series of photographs of the total solar eclipse of May 17, 1882, which was partially visible from Hungary (Fig. 2). In addition, he was the first to detect the central star of the Ring Nebula (Fig. 3); and, in autumn of 1886, he photographed eye for the first time (e.g., Comet Barnard-Hartwig 1886 (*1887, AN, 116, 121-124. c.*)).

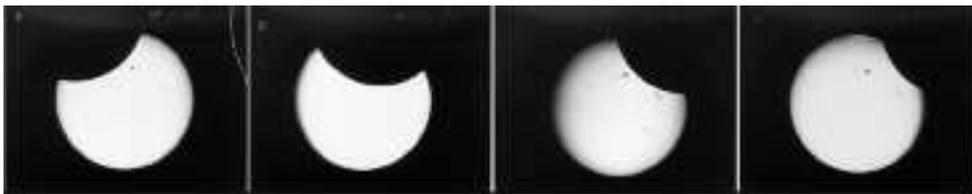


Figure 2. Gothard's original plates of the total solar eclipse of May 17, 1882, visible partial from Hungary. First published by Gothard in "*Tanulmányok a katonai ért. a math - tudományok köréből 1883. X. K. 8. sz.*"

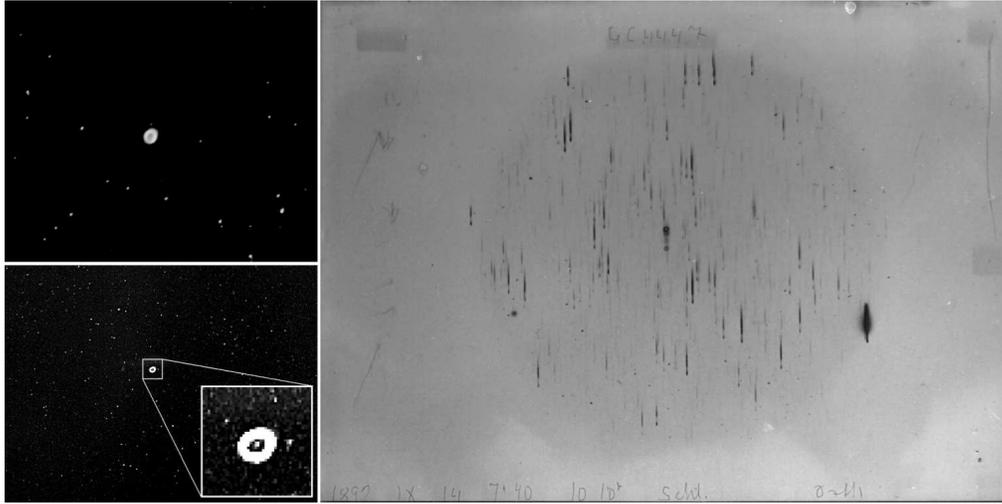


Figure 3. Gothard's original plate recording the central star of the Ring Nebula (M57) for the first time in September 1, 1886 (upper left, reporting in 1886, *AN*, 115, 303-304. c.). Another one from 1892 (bottom left) and the objective prism spectrum of the nebula also taken in 1892 (right).

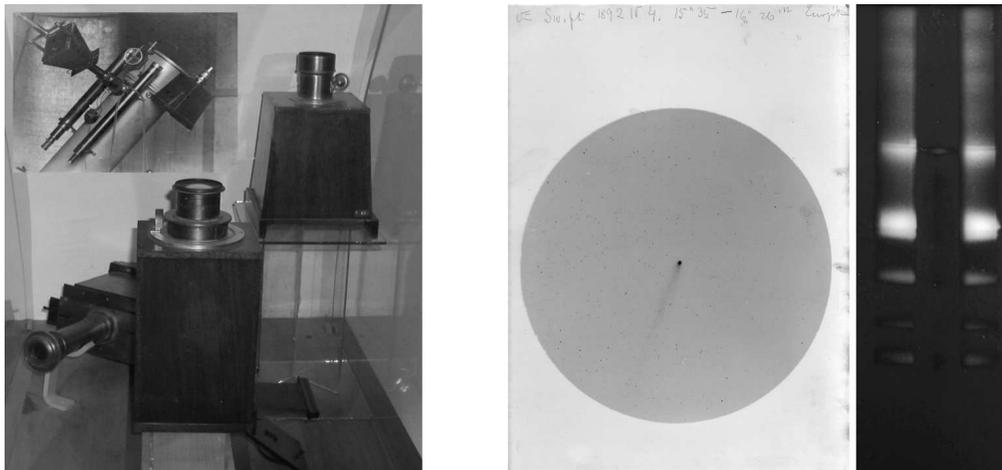


Figure 4. Astrocams used by Gothard for taking the plates (GME, 2002) and Comet Swift with its spectrum, both taken in 1892. The report and discussion of spectra see in 1892, *AN*, 129, 405-408. c.

In conjunction with the photographic observations of various objects (planets, comets, nebulae and galaxies), he continued his spectroscopic work (Fig. 5). He pointed out the periodic appearance and disappearance of hydrogen and helium emission lines in the spectrum of β Lyrae. However, his discovery did not get any attention, as there was insufficient astrophysical background for the

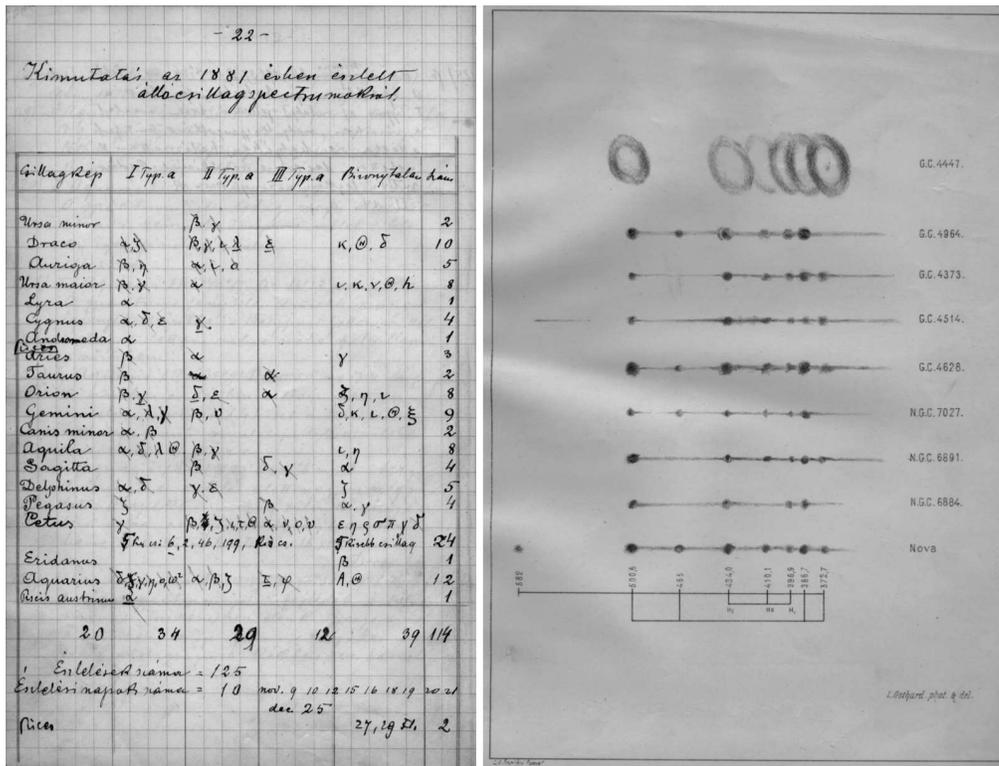


Figure 5. Sample page from Gothard’s observational logbook summarizing his stellar spectroscopic observations in 1881 (left) and the reproduction from the original publication (1892, *MNRAS*, 53, 55) of Gothard’s most important scientific result: common features in the spectra of novae and planetary nebulae (right).

interpretation of the phenomenon. During the investigation of the spectrum of Nova Aurigae, he found a principal relationship regarding the connection between novae and planetary nebulae in 1892 (Fig. 5).

In honor of his pioneering work, he was elected, along with other eminent European astronomers of the time, to the Astronomische Gesellschaft in 1881, the Royal Astronomical Society in 1883, and, as corresponding member to the Hungarian Academy of Sciences in 1890.

3. Gothard Memorial Exhibition - GME

The scientific inheritance of Gothard is maintained by Gothard Observatory. The instruments are exhibited in the frame of GME, newly installed in 2002.

A valuable part of this material is the astronomical plate collection of 455 pieces taken between 1882 and 1900, including the plate recording the central star of the Ring Nebula and the supernova that appeared in Andromeda Galaxy in 1885. It is very important to preserve and to publish this unique and early

collection in digital format and, in so doing, turn the attention of the astronomical community once again toward the scientific achievements of Gothard. This important work is already in progress at the Gothard Observatory.

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