

## **“Daylight Photometry of Betelgeuse at conjunction with the sun”**

### **Otmer Nickel**

Betelgeuse is a variable star of great astrophysical interest with many observations in the AAVSO database. There is an annual gap of 3-4 months, where Betelgeuse is close to the sun and is not observable at night. This gap could be filled with daylight observations, because the star is bright enough to be imaged with small telescopes at daytime.

Daylight photometry of Betelgeuse was taken with an amateur telescope equipped with an interline-transfer CCD camera, a photometric V and a neutral density filter. The method used is a variation on ensemble photometry (using other bright daytime stars), and involves large stacks of short exposures. This method provided V magnitudes of Betelgeuse with calculated errors of  $0.020 \pm 0.008$  mag from February to April 2021. The results compared favorably with contemporaneous nighttime photometry. From May to July 2021, at the closest distances to the sun, the photometry of Betelgeuse could be continued with mean errors of  $0.040 \pm 0.013$  mag.

CCD photometry in daylight with amateur equipment is possible with an acceptable accuracy. Observers with suitable equipment are encouraged to contribute such observations of Betelgeuse to fill the light curve gaps in the future.