



Contribution ID: 775

Type: **Invited talk in the parallel session**

# Photometry of Betelgeuse at daylight

*Thursday, 8 July 2021 16:45 (7 minutes)*

In a backyard observatory in Mainz, Germany, several stars have been observed at daylight using a 250mm Newton telescope and a CCD camera (ATIK 460exm). To measure the intensity of the sky background, the intensity of a background aperture was compared to the intensity of the star aperture and normalized to the known star magnitude. In this way sky background values of 1.8 - 4.7 mag/arcsec<sup>2</sup> were found at angles of 10°-100° distance to the sun. Photometry of Betelgeuse was performed as a first attempt in 2020 with stacked images of Betelgeuse; Aldebaran (Alpha Tau) was used as comparison star on 4 days (July 22 to Sept 07, 2020). The measured magnitudes were comparable to results of the STEREO A spacecraft in July 2020. Photometry was improved in 2021 by using a neutral density filter (1% transmission) and measuring calibration and extinction coefficients on 4-8 bright reference stars. Photometry of Betelgeuse resulted in calculated errors of less than 0.05 mag from February to June 2021. Photometry of a 2 mag star (alpha Ari) at a distance of 10° to the sun gave also results with an error of less than 0.05 mag. The daylight observations of Betelgeuse will be continued this year, hopefully the observational gap, when Betelgeuse is near to the sun, can be filled in this way with reliable data.

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**Session Classification:** The "Fall and Rise" of Betelgeuse

**Track Classification:** History of Relativity: The "Fall and Rise" of Betelgeuse