



Das Institut für Physik

Institutsbereich Geophysik, Astrophysik und Meteorologie

lädt zu folgendem Vortrag

im Rahmen des **Astrophysikalischen Kolloquiums** ein:

## "The recent 'Fainting' of the bright Red Supergiant Betelgeuse: Prelude to a Supernova?"

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Betelgeuse (Yad al-Jauzā; Beteigeuze; Alpha Ori) is the brightest red supergiant (RSG). At a distance of  $\sim 222$  pc ( $\sim 724$  ly), it is one of nearest core-collapse supernova progenitors. The star is huge with a radius of  $\sim 1000 R_{\text{sun}}$  ( $\sim 4.65$  AU) and a luminosity of  $120,000 - 140,000 L_{\text{sun}}$ ; its mass is  $\sim 12 \pm 5/-2 M_{\text{sun}}$ . Even though Betelgeuse is young ( $\sim 8-9$  Myr), stellar evolution models (e.g. Dolan et al. 2016) indicate that this beloved star may be nearing the end of its short (but brilliant) life and is destined "to go supernova" anytime within the next  $\sim 10^3$  to  $10^5$  yr. — the sooner the better.

From over 180 yrs of observations Betelgeuse has been a relatively well-behaved semi-regular variable RSG. This includes 100-yrns of AAVSO observations, and for the last  $\sim 25$ -yrns, Villanova V-band and TiO/near-IR solid-state photometry. But this dramatically changed during 2019/20 when the star underwent a surprising 1.0 mag "fainting". By mid-February 2020, fading to  $V \sim 1.62$  mag. It is not well known how core-collapse SN II stars behave months, weeks, and days prior to exploding. This unprecedented behavior triggered speculations that Betelgeuse was about to explode. The reports of the unusual fading led to intensive observations using many instruments (e.g. *Chandra*, *HST*, *VLT/SPHERE*, *SOFIA*, *e-Merlin*, etc.) covering X-ray to the radio wavelengths.

After giving some background about this amazing star and summarizing its properties, I will discuss what has been learned so far about the "great dimming". Also discussed is what to expect when Betelgeuse becomes a supernova. Planned future observations are also briefly discussed.

Zeit: **Mittwoch, 17. Juni 2020 um 17:00 Uhr s.t.**

Ort: <https://us02web.zoom.us/j/87514684984>

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