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Betelgeuse as didactic introductory tool for stellar variabilty, airmass computation and spectral analysis

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According to Dorrit Hoffleit Mira is the educational star. But it requires the use of a telescope at its minimum, and a binocular for its maximum phase, to spot in in city lights. Betelgeuse is a semiregular variable star of first magnitude, in the most famous constellation, achievable from both hemispheres. It is available to the naked eye for nine months a year. Its magnitude estimate, according to the Argelander method, requires other first magnitude stars, separated by several degrees, at rather different airmasses. Procyon, Aldebaran, Pollux, Castor as well as Gamma Geminorum, Regulus, Denebola, Mars and even Mercury have been used as comparison stars, and their airmass corrections included. Since January 2019 a project in schools (Liceums Morgagni and Ferraris in Rome and in Ostia and Galilei in Pescara) to observe Betelgeuse and its comparison stars with a special colored quadrant where the angular height in sight corresponds to the airmass exctinction with respect to the zenit. The great dimming of Betelgeuse was then observed and measured to the nearest 0.01 magnitude at naked eye. These observations have been sent to AAVSO, contributes of students to citizen science. Similar operations have been realized with the students inscribed to Sapienza University of Rome, Astrophysics Laboratory exam. The Newton's disk for solar spectrum has been replicated for Betelgeuse with red-yellowish tonalities.
Summer holidays' homeworks are offered by Antares, a first magnitude stars greatly separated by its more suitable comparison stars. Recently Saturn worked as reference, but a planet is not a constant standard candle. The introduction to photometry, colorimetry and spectrometry with these naked-eye cases is complete and historically meaningful.

References

Purkinje effect and Bayer's Uranometria
Magnitude visual estimate method
Evaluating the 2020 minimum from visual data
Betelgeuse, Sirius and Antares since Ptolemy

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