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Type: Talk in the parallel session

Celestial mechanics and variable stars before the telescope: from the meridian line of the Vatican obelisk (1586-1817), to the stars on Santa Maria degli Angeli meridian line (1702) in Rome.

Thursday, 8 July 2021 16:30 (5 minutes)

Ancient observations were transmitted to posterity through mythology, cities and temples' orientations and mere time and position data. While stellar variability does not fit Aristotles' aetherian-eternal nature of the last celestial sphere, Greek myths on the painful shoulder of Orion explained the observed Betelgeuse's variability.

The meridian line in saint Peter's square was designed by Egnazio Danti (1586) and realized by Filippo Luigi Gigli and Pietro Maccarani (1817); it exploits the Vatican obelisk as gnomon.

Here black stars mark only the zodiacal signs, hit by the obelisk top's shadows at their ingress' dates.

The alignments of Bianchini and Gigli lines are respectively 5' and 1' from true North. The measurements of Summer solstice are compared for both indoor-outdoor cases, with a special technique adopted in the sunny square to catch the obelisk's shadows penumbral limit. The sampietrini, cobblestones paving circularly the square, allow to measure the shadow's length also off-meridian. In night-time this the stellar, lunar and planetary transits are still observable from the square.

Betelgeuse is reported on the pinhole-illuminated meridian line of Francesco Bianchini (1702) in Santa Maria degli Angeli as Orionis Humerus Orientalis, along with Rigel (Orionis Pes Lucidus), Bellatrix and the tree Orion's belt stars. From the traditional latin names the magnitudes respects Almagest's order (150 AD).

The accuracy of the positional observations, is valorized when compared with similar measurements before/after centuries, to measure the tropical year and the obliquity's secular variation.

References

Sigismondi, The Eclipses of Betelgeuse, SIF Congress 2020, <https://agenda.infn.it/event/23656/contributions/120466/>

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