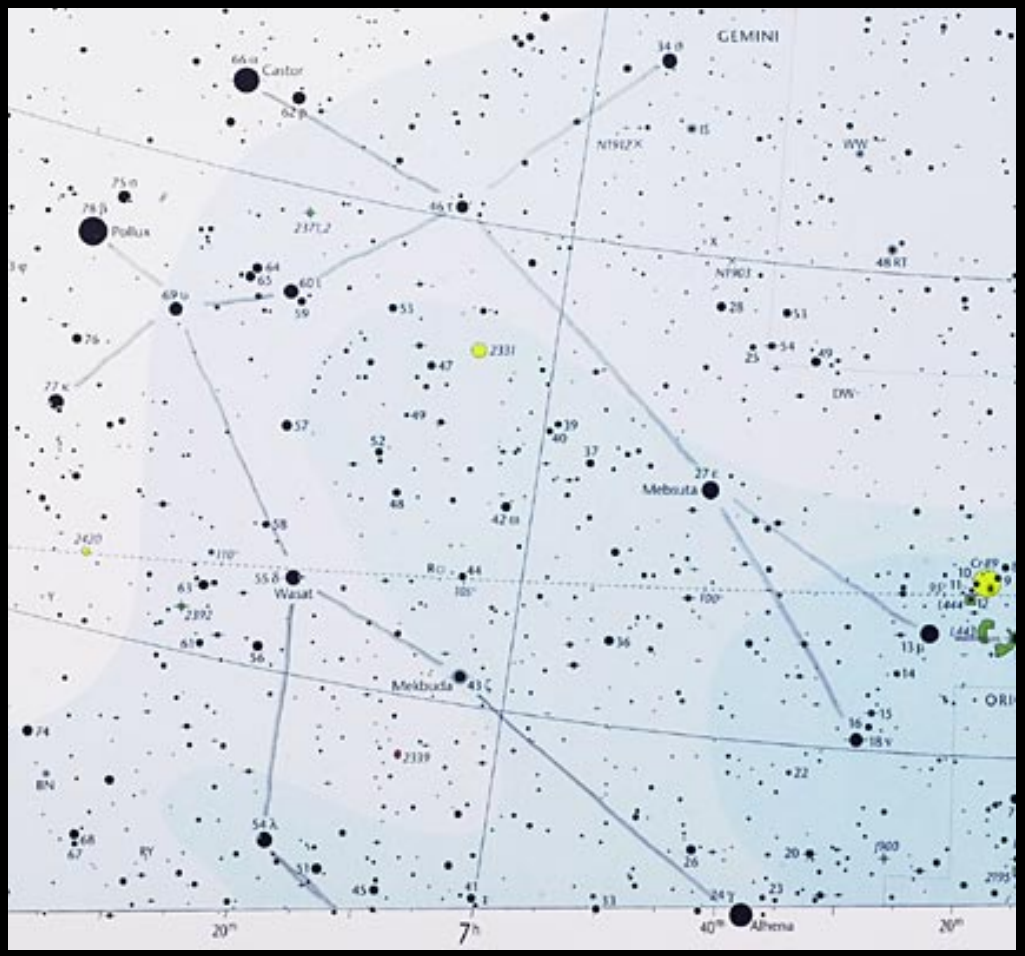
The Magnitude Scale



Sky Atlas 2000.0

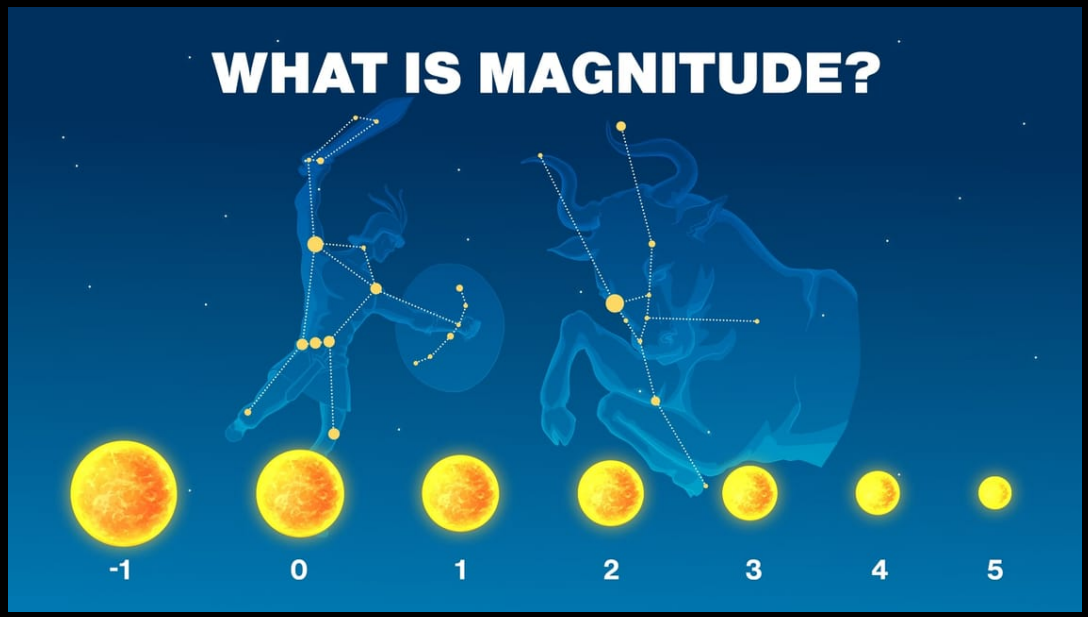
Peterborough Astronomical Association
Novice Astronomy Class
October 3, 2025
Brett Hardy

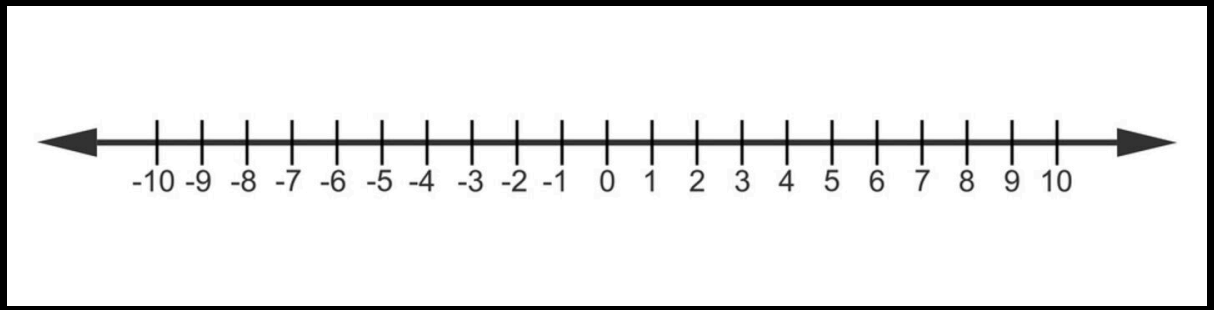
Introduction

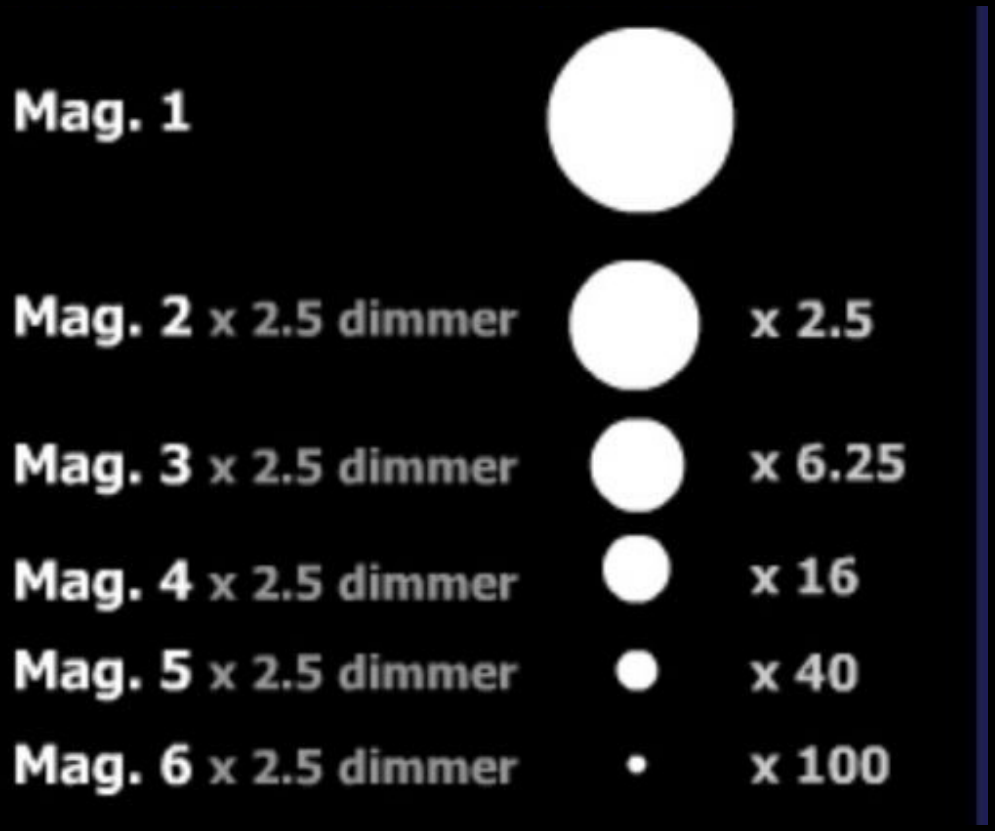
- Stars appear in a wide variety of brightness
- The brightest stars have proper names
- Most stars are too dim to see without telescopes or binoculars

History

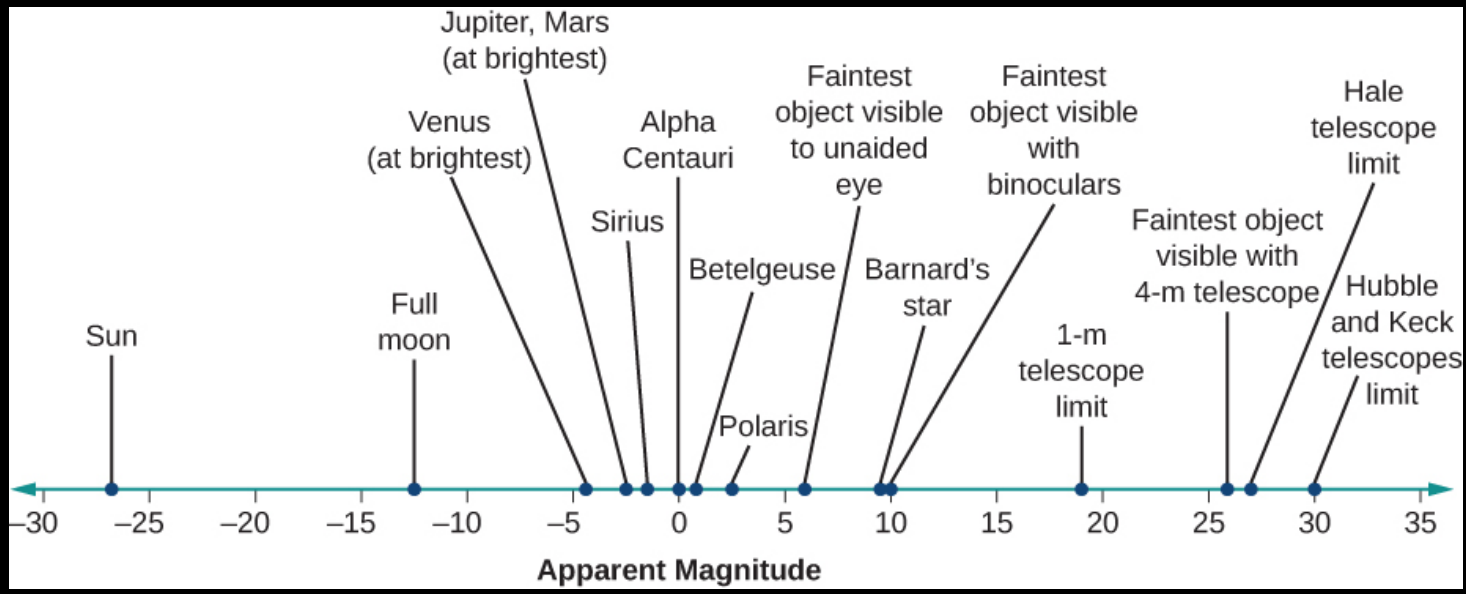
- Hipparchus 150 B.C.E.
- Catalogued 1000 bright stars
- Sorted the stars into 6 brightness categories
- During 19th century made more precise and expanded
- Smaller the number, the brighter the star
- Each whole number magnitude is 2.5 times different
- Sirius magnitude − 1.5







Orion Bear Astronomy



British Columbia/
Yukon PressBooks

Apparent & Absolute Magnitude

- Luminosity
- Magnitude (apparent magnitude)
- Absolute magnitude
- Limiting magnitude

Apparent vs Absolute Magnitude

Orion

Rigel

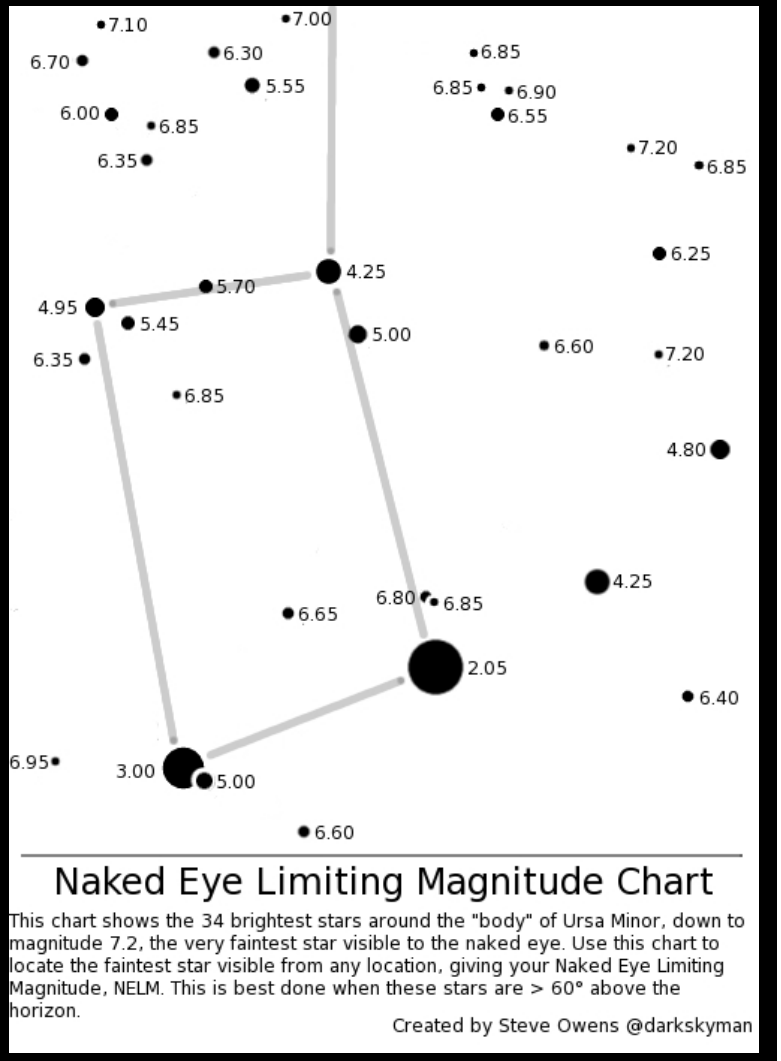
Canis Major

Sirius

stars	absolute magnitude	apparent magnitude	distance
Rigel	-6.69	+0.18	772 l.y.
Sun	+4.83	-26.75	1AU
Sirius	+1.42	-1.46	8.6 l.y.

If $M_{App} < M_{Abs}$ obj is closer than 10pc

If $M_{App} > M_{Abs}$ obj is further than 10pc



Naked Eye Limiting Magnitude Chart

This chart shows the 34 brightest stars around the "body" of Ursa Minor, down to magnitude 7.2, the very faintest star visible to the naked eye. Use this chart to locate the faintest star visible from any location, giving your Naked Eye Limiting Magnitude, NELM. This is best done when these stars are > 60° above the horizon.

Created by Steve Owens @darkskyman

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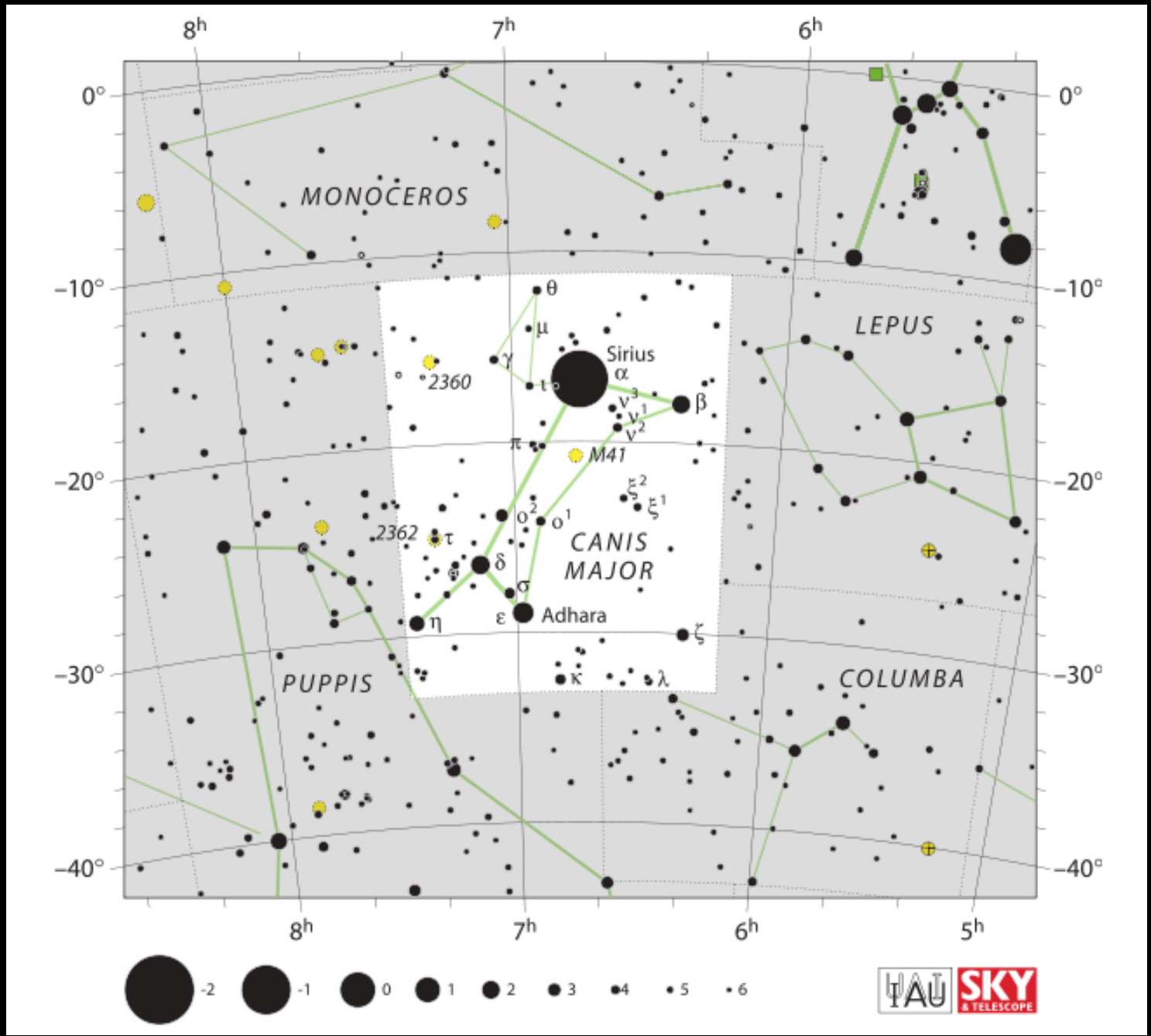
8h
7h
6h
5h
0°
−10°
−20°
−30°
−40°
MONOCEROS
LEPUS
CANIS MAJOR
PUPPIS
COLUMBA
Sirius
Adhara
M41
2360
2362
θ
μ
γ
α
ι
ν3
ν1
ν2
β
π
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ξ1
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6
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Solar System Series: Earth & Moon

November 7

Bill Anders