STARS AND CONSTELLATIONS LESSON

DEMILUNE ACADEMICS

INTRODUCTION

Stars are balls of gas burning in our universe. Our sun is the closest star to us. The stars that glow in the night sky make constellations.

Let’s take a closer look at what stars and constellations are!

WHAT MAKES A STAR SHINE?

FORMATION

Stars form when when clouds of gas and dust (molecular clouds) collapse, causing dense clumps to form and eventually heat up enough to initiate nuclear fusion at the core, marking the birth of a star.

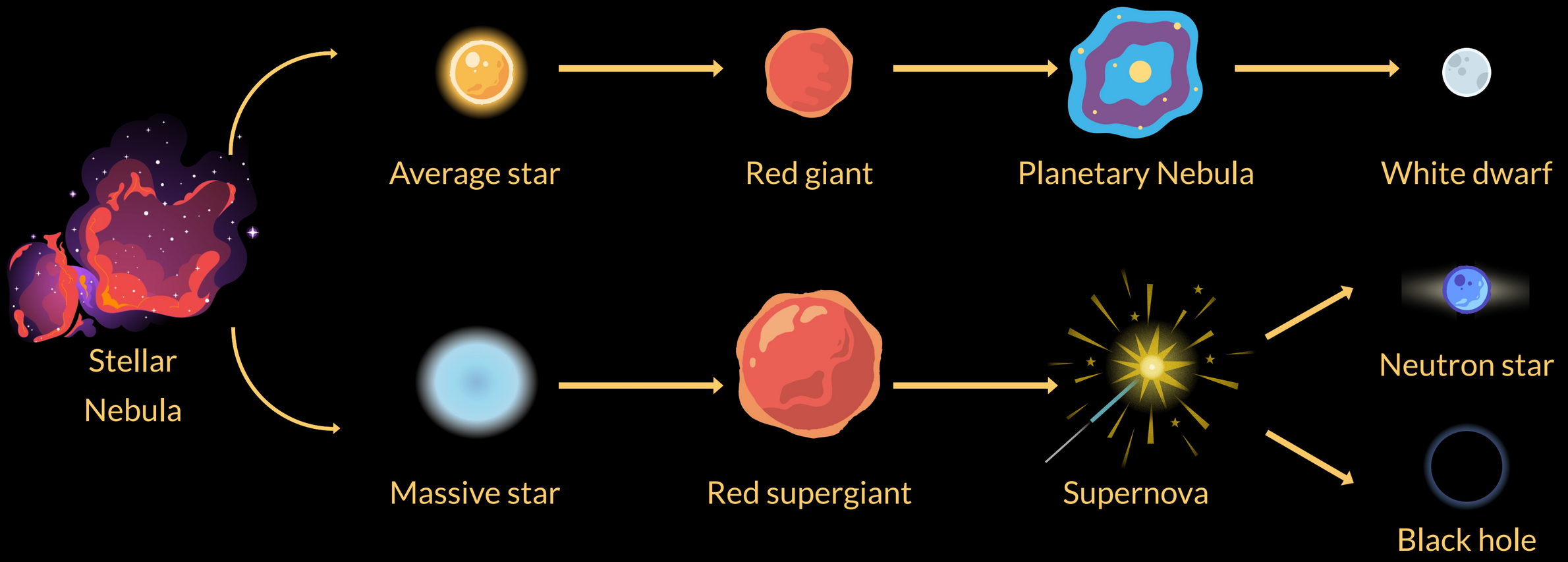
NUCLEAR FUSION

Nuclear fusion powers a star for most of its life. It is the process of combining the nuclei of hydrogen atoms (light elements) into helium nuclei (a heavier element) within its core, releasing a tremendous amount of heat and light.

CONCLUSION

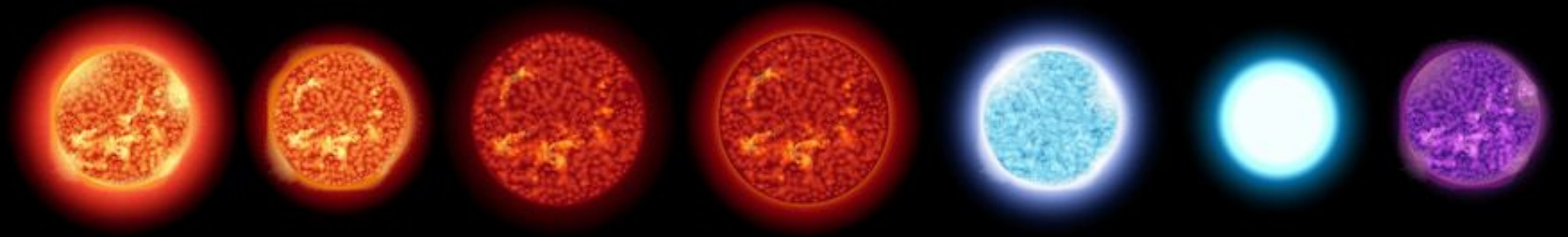
Stars are powered because their immense mass caused synthesis of hydrogen into helium. The loss of mass generate energy because energy and mass cannot be created or destroyed.

LIFE CYCLE OF STARS



Description of the stages in the life cycle of a star, from formation to death.

Types of Stars



Class	Color	Surface Temperature	Examples of stars
O	Blue	above 30,000	10 Lacertae
B	Blue-White	10,000-30,000	Rigel, Spica
A	Blue-White	7,500-10,000	Vega, Sirius
F	Yellow-White	6,000-7,500	Canopus, Procyon
G	Yellow	5,000-6,000	the sun, Capella
K	Orange	3,500-5,500	Arcturus, Aldebaran
M	Red	less than 3,500	Betelgeuse, Antares

STAR LIGHT, STAR BRIGHT

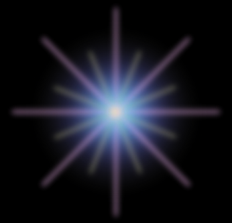
Stars are enormous celestial bodies comprised of incandescent gases such as hydrogen and helium. The closer a star is to our planet, the brighter it will appear in our sky.

0.00001581 light-years

The **Sun** is our brightest and closest star. It is visible during the daytime.

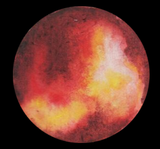
4.367 light-years

The third brightest star in the night sky, **Alpha Centauri** which has a magnitude of -0.29.



8.6 light-years

Sirius A is the brightest star in the night sky, with a magnitude of -1.5.



36.66 light-years

With a magnitude of -0.05, **Arcturus** is considered to be the fourth brightest star in the night sky.

309.8 light-years

Canopus is the Earth's second brightest star in the night sky. It has a visual magnitude of 0.73.

WHY DO OTHER STARS APPEAR BRIGHTER?

A star is a gaseous object in space that gives off heat and light. Some factors affect the apparent brightness of a star.

ACTUAL BRIGHTNESS

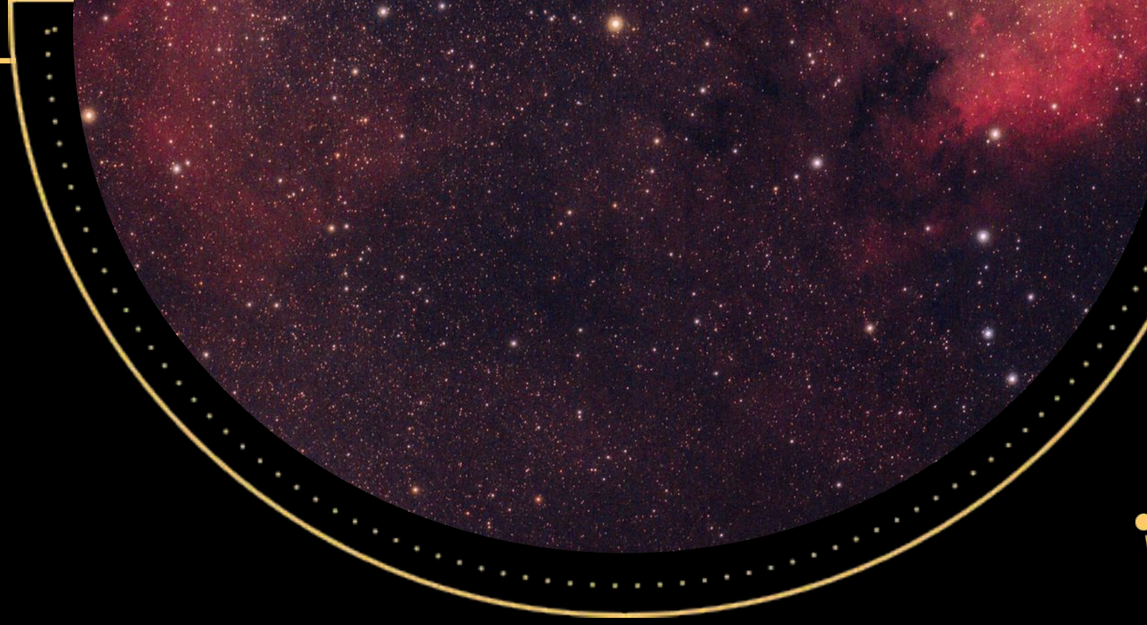
- Stars have different luminosities. Some stars naturally emit more light than other stars.

SIZE

- Larger stars have greater surface area. This is the reason why they tend to shine brighter in the night sky.

DISTANCE

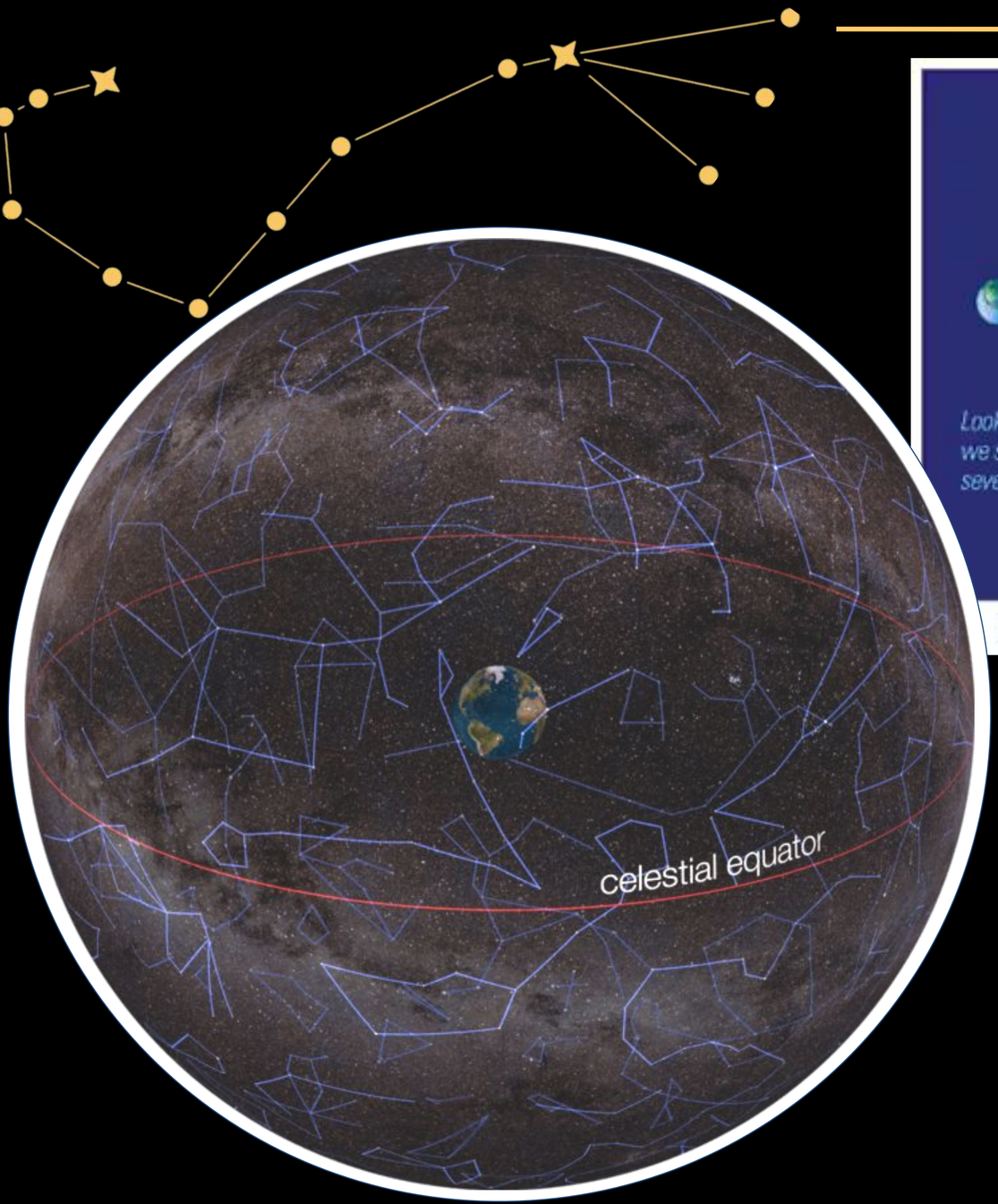
- The closer the star, the brighter it appears. Sirius A is a star that is twice as massive as the Sun. However, because the Sun is closer to Earth, it appears brighter in the Earth's sky.

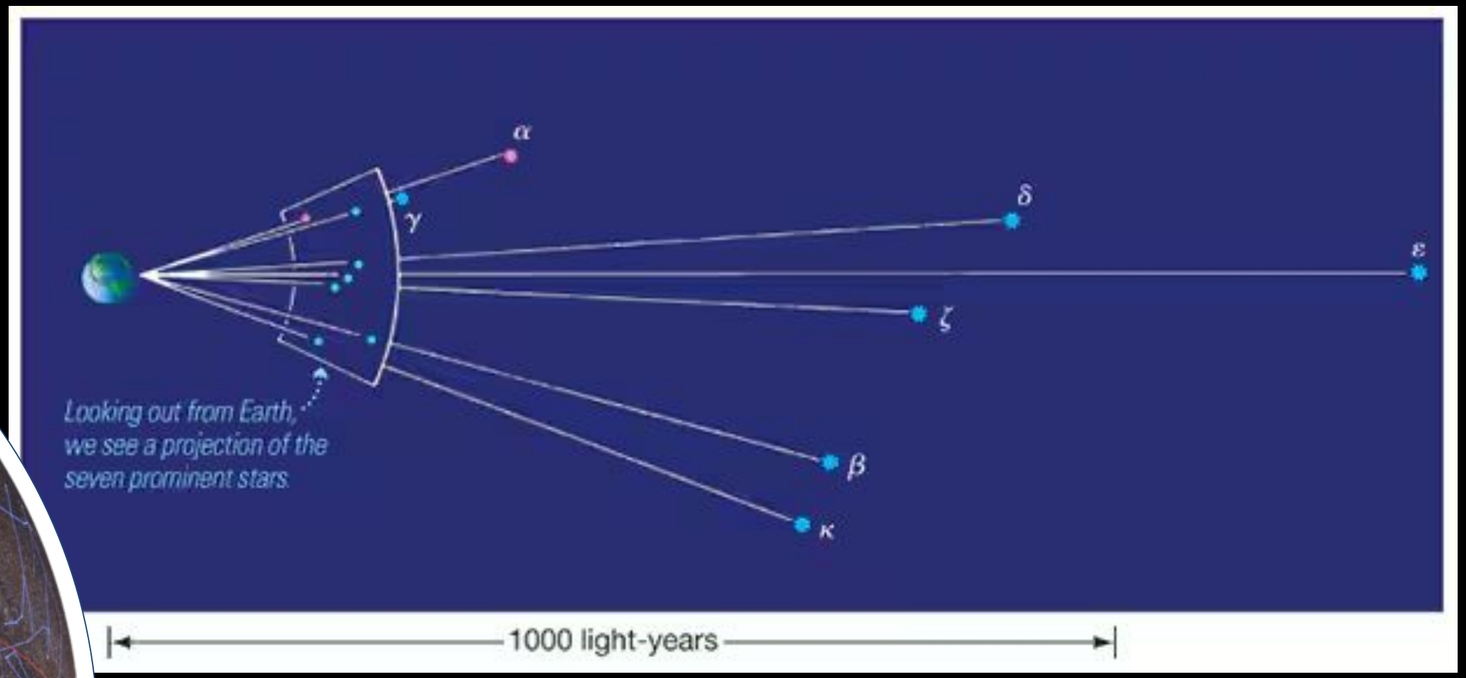


A star's magnitude is measured by how bright it appears on Earth. The brighter a star is, the lower magnitude is assigned. Some stars are also naturally brighter than others.

A light-year is the distance light travels in one Earth year.

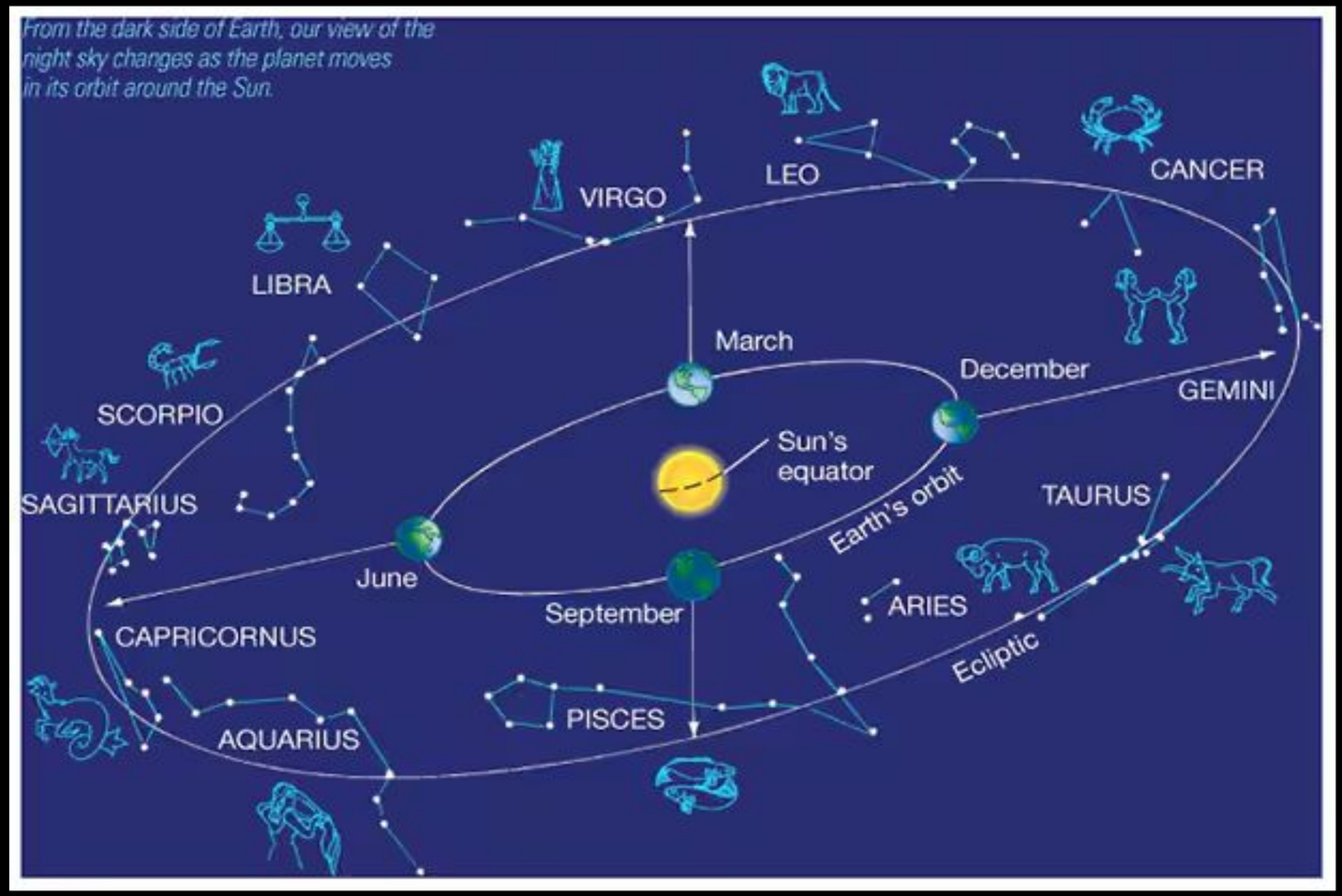
Now that we know about stars we can learn about the patterns they make in the sky - constellations!

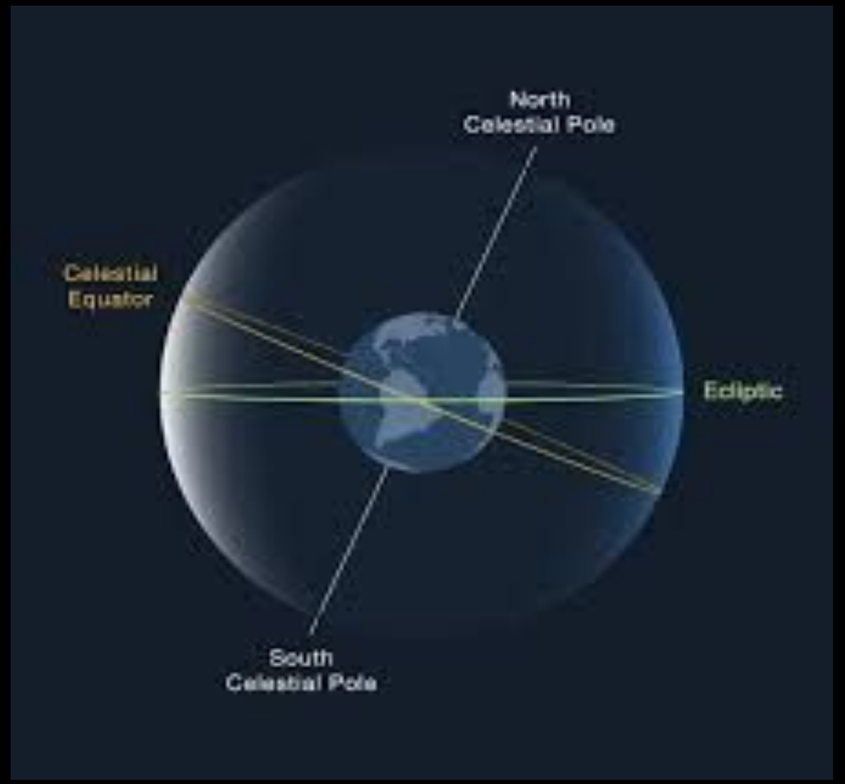




CELESTIAL SPHERE

ZODIAC CONSTELLATIONS





DID YOU KNOW?

The western zodiac group of constellations was named by Ptolemy, a Greek-born Egyptian astronomer, mathematician, and geographer. It is based on the Sun's path in the sky throughout the year. Hence, these constellations differ in visibility and position during different seasons.


Northern Sky
September
Pisces
Cetus
Great Square
Pegasus
Equuleus
Aries
Triangulum
Andromeda
Delphinus
Lacerta
Perseus
Taurus
Cygnus
Cassiopeia
Cepheus
Lyra
Auriga
Camelopardalis
Orion
June
December
Draco
Polaris (North Star)
Ursa Minor (Little Dipper)
Ophiuchus
Hercules
Lynx
Gemini
Corona Borealis
Ursa Major
Serpens
Bootes
Canes Venatici
Cancer
Leo Minor
Leo
Virgo
March
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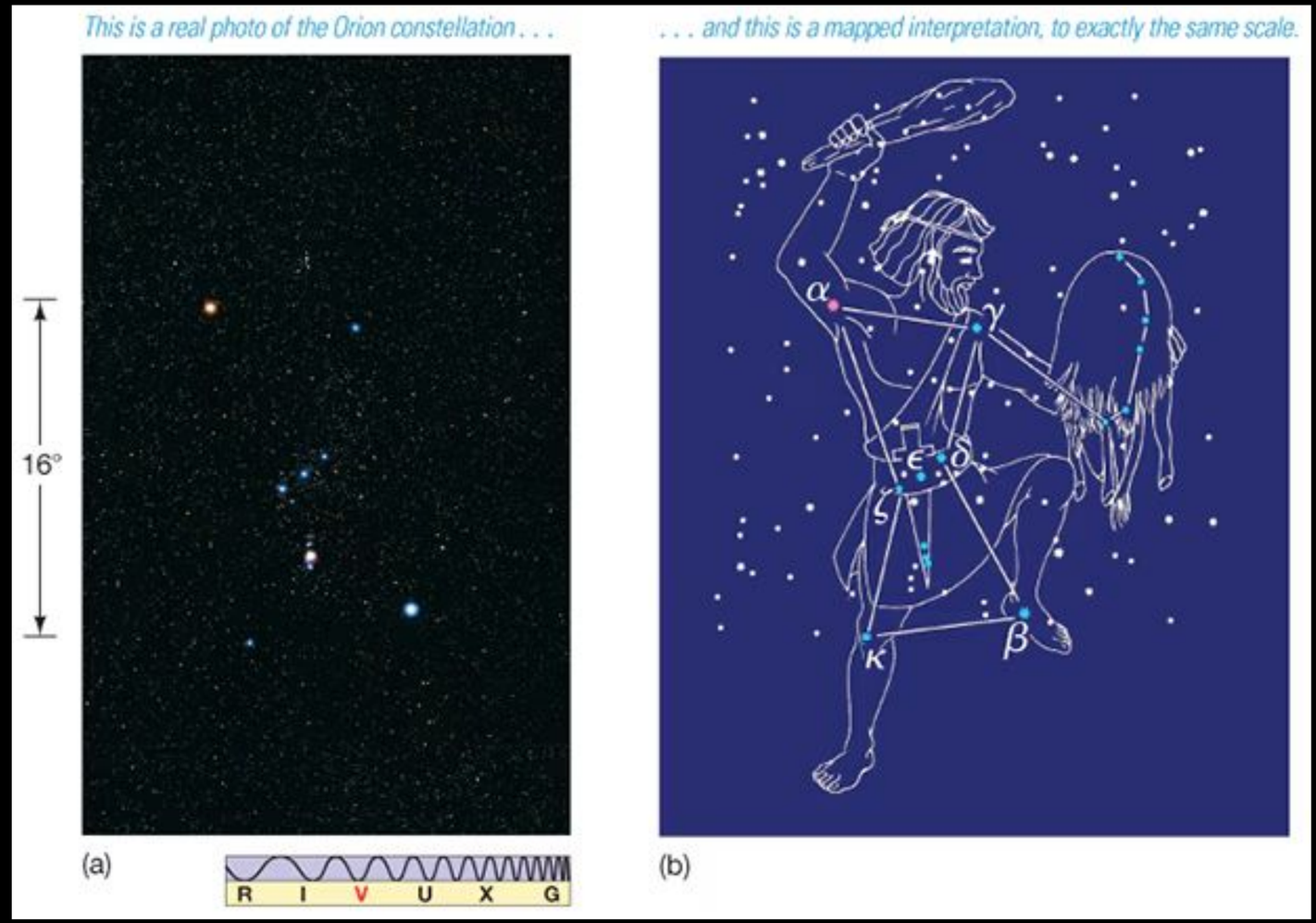
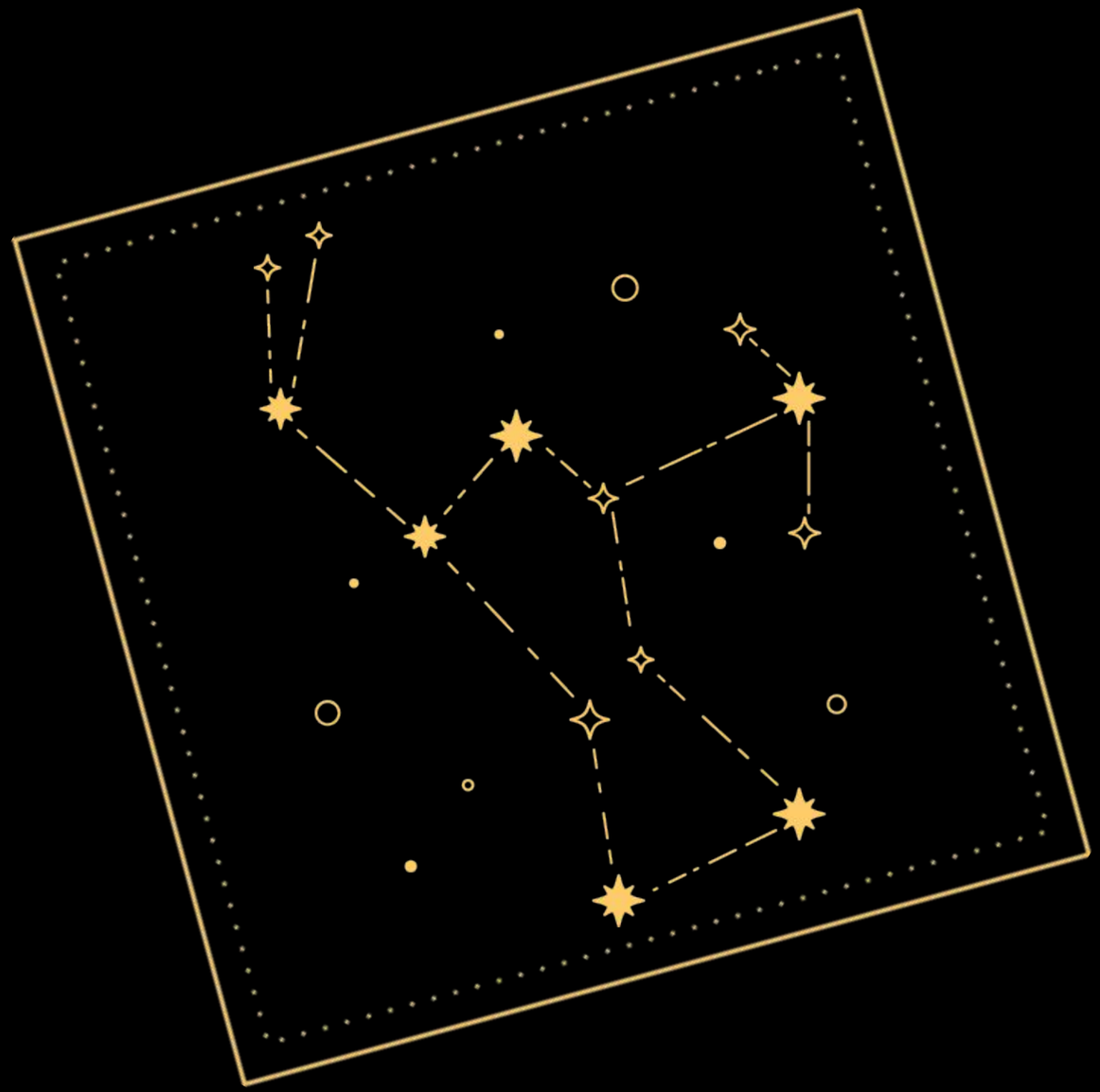

This is a real photo of the Orion constellation . . .
. . . and this is a mapped interpretation, to exactly the same scale.
16°
(a)
R I V U X G
(b)



ABOUT ORION

Orion is one of the most recognizable constellations in the night sky, named after a mighty hunter from Greek mythology. It is characterized by its distinctive shape, which includes three bright stars in a straight line representing Orion's belt, along with Betelgeuse and Rigel as prominent stars.

FINDING CONSTELLATIONS

01

Tips for observing and finding constellations in the night sky, including using star maps and smartphone apps.

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