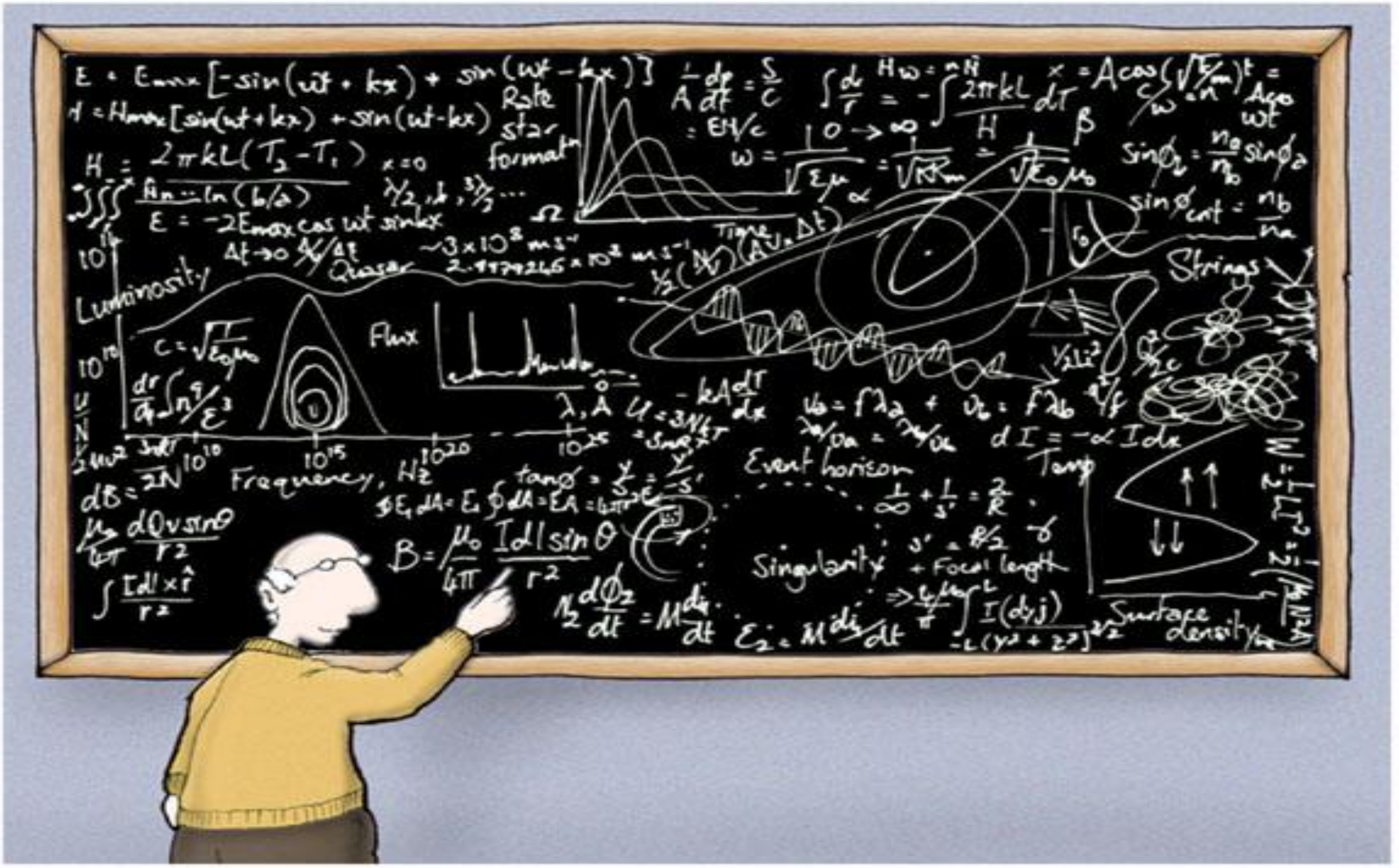
Evening Classes

Week One

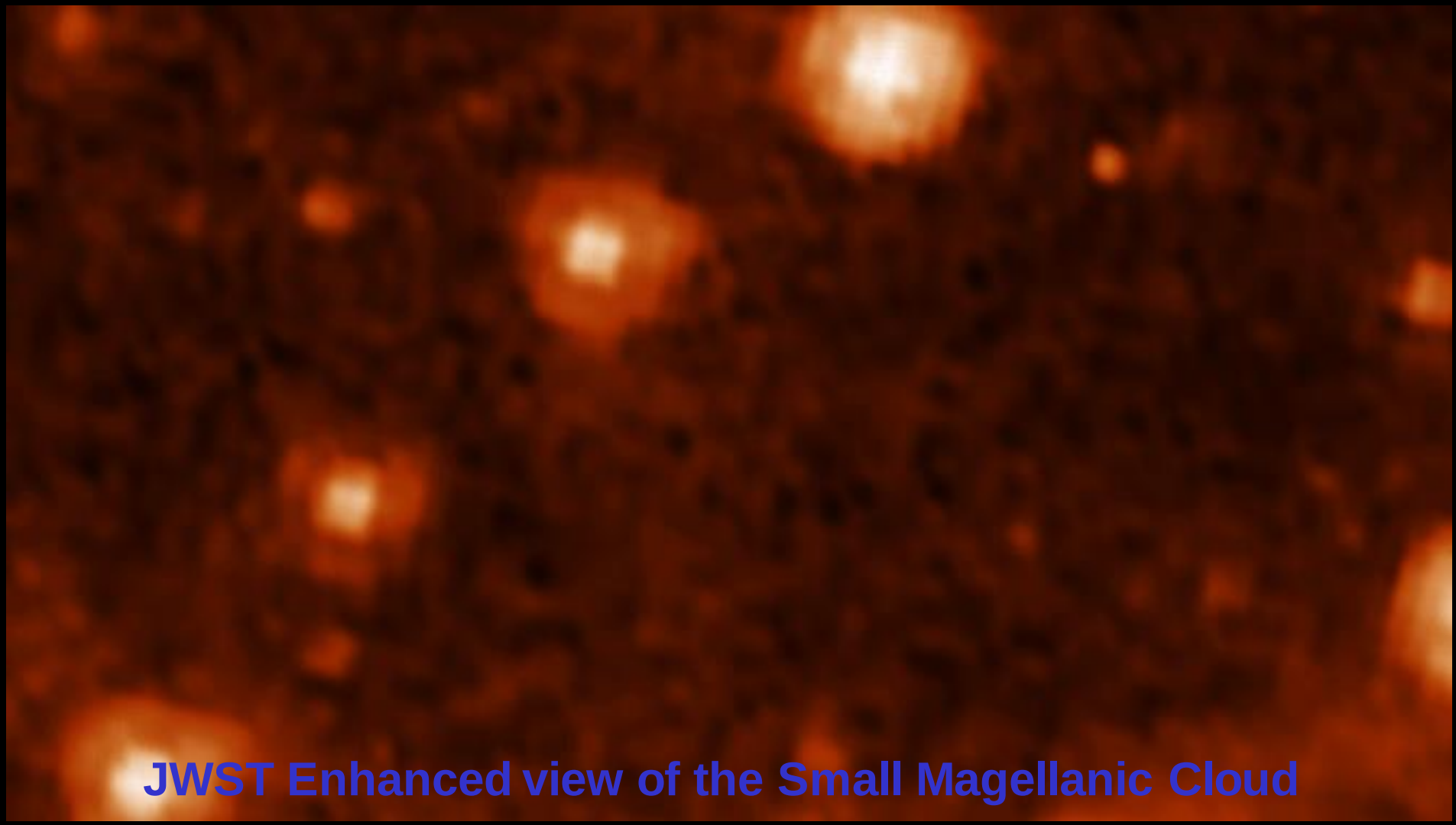
How the Sky Moves (relative to us!)

Presented by John Campbell



Astrophysics made simple

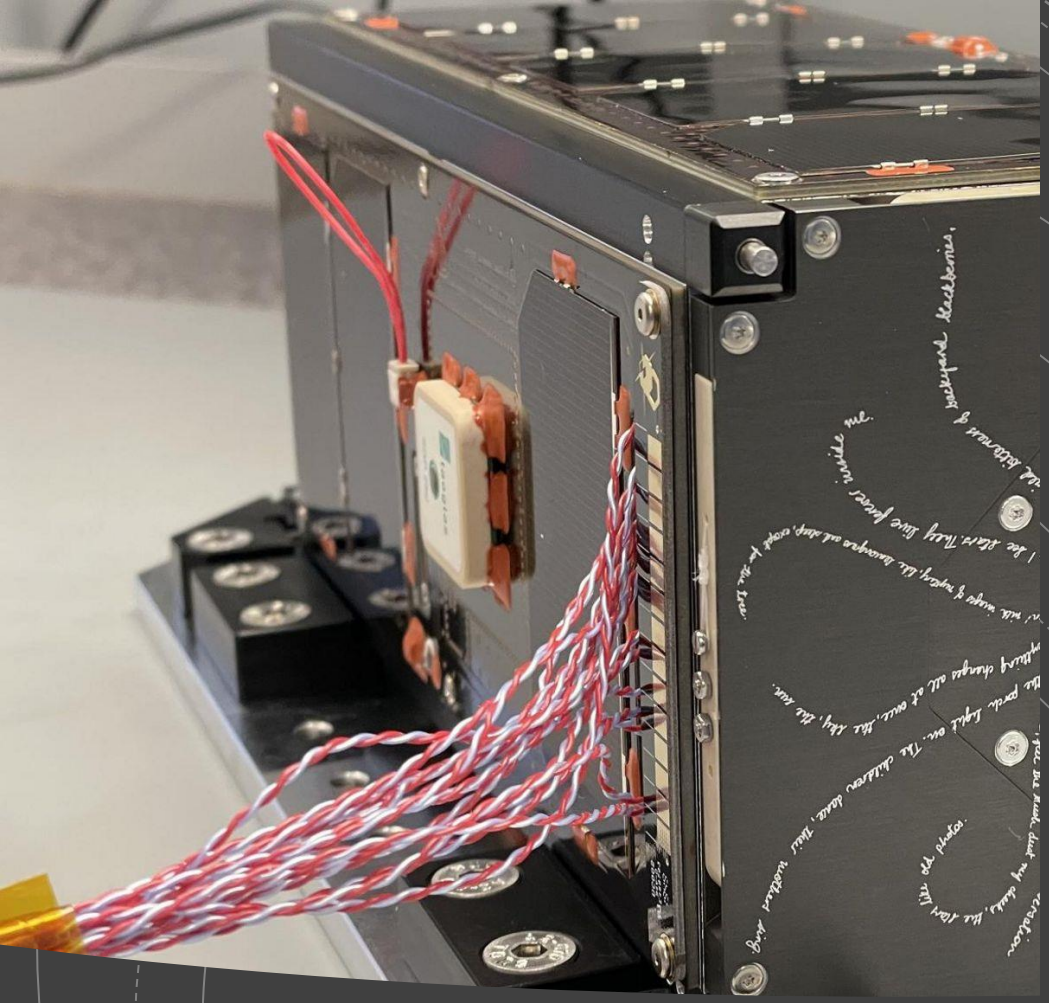
Great time to be interested in astronomy and space science as lots of new observations are being made – James Webb Space Telescope Surpasses the Spitzer Space Telescopes view of the Universe



JWST Enhanced view of the Small Magellanic Cloud

Meanwhile scientists are crashing DARTs into asteroids to "Engineer" The Solar System

Artists Depiction...



Ireland to Launch its First Satellite

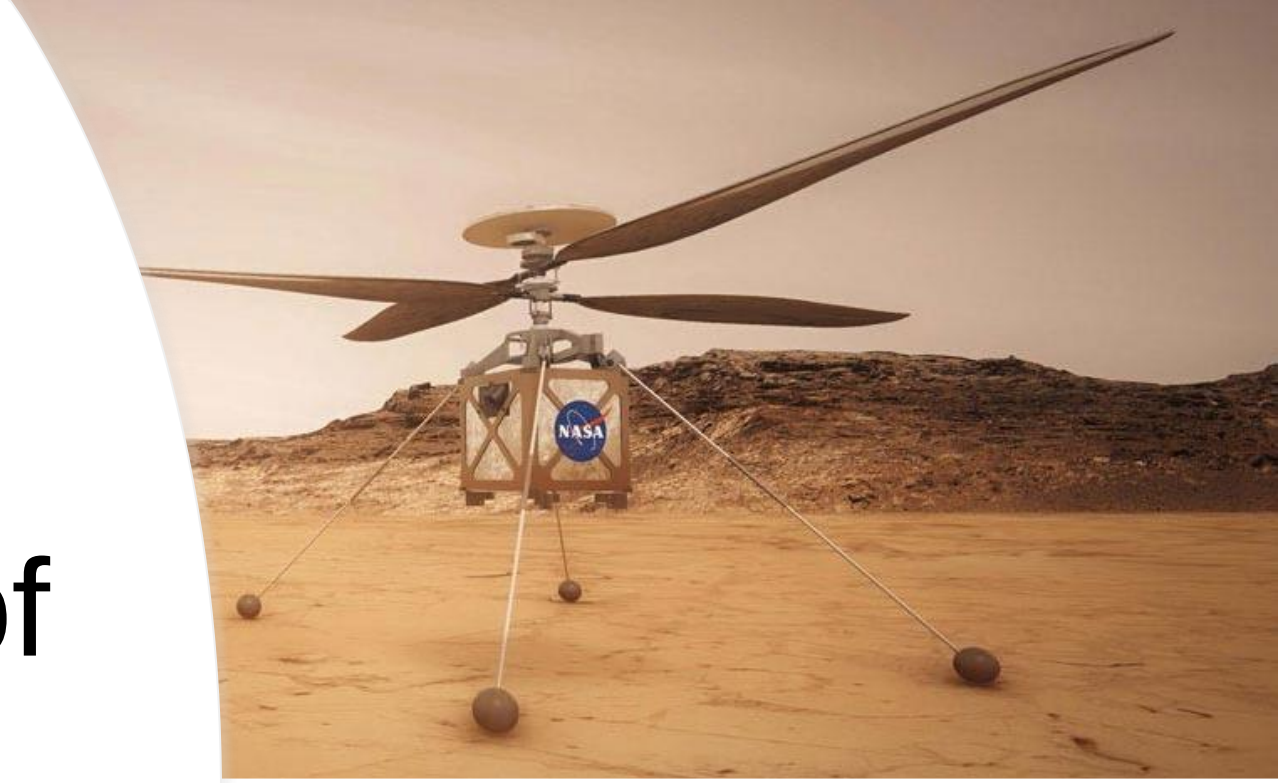
A Student CubeSat with scientific payload on board (gamma ray detector)

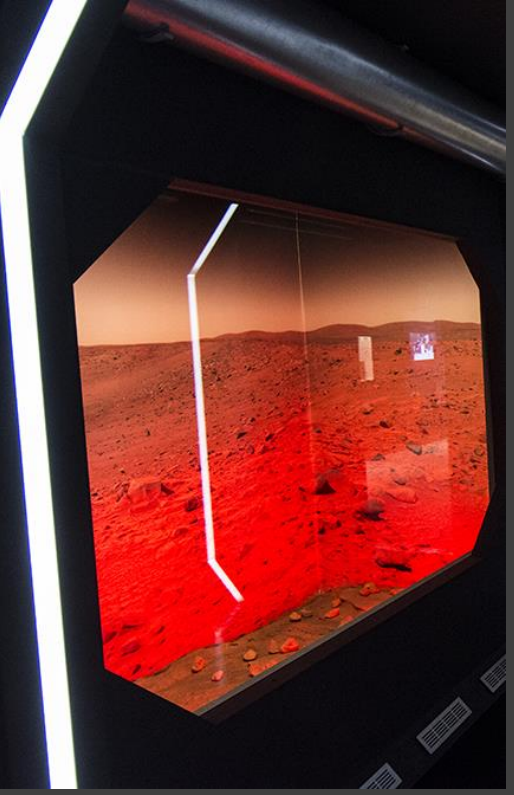
New kinds of robotic spacecraft

From Drones on Mars to

Proposed Drones on Titan

(Saturn'sLargest Moon)





Emerging Technologies Condensing The Universe into our Lives

Augmented/Virtual Reality,

Alien Art Generated by AI

World-Building and Immersive Experiences

In Museums, Theme Parks, Online Games Etc

(perhaps preparing us for Space Tourism

as a concept)

All helping to make astronomy and

space science less abstract and more

Of an experience everyone can partake.


What a time to be alive.

With New Events Happening all the time

Such as a visit from a 50,000 year period comet – a rare green object in the night sky!

Comet ZTF – February 2023

Comet Nishimura – July-Aug 2023

Partial Eclipse of the Moon Upcoming Sat Oct 28th

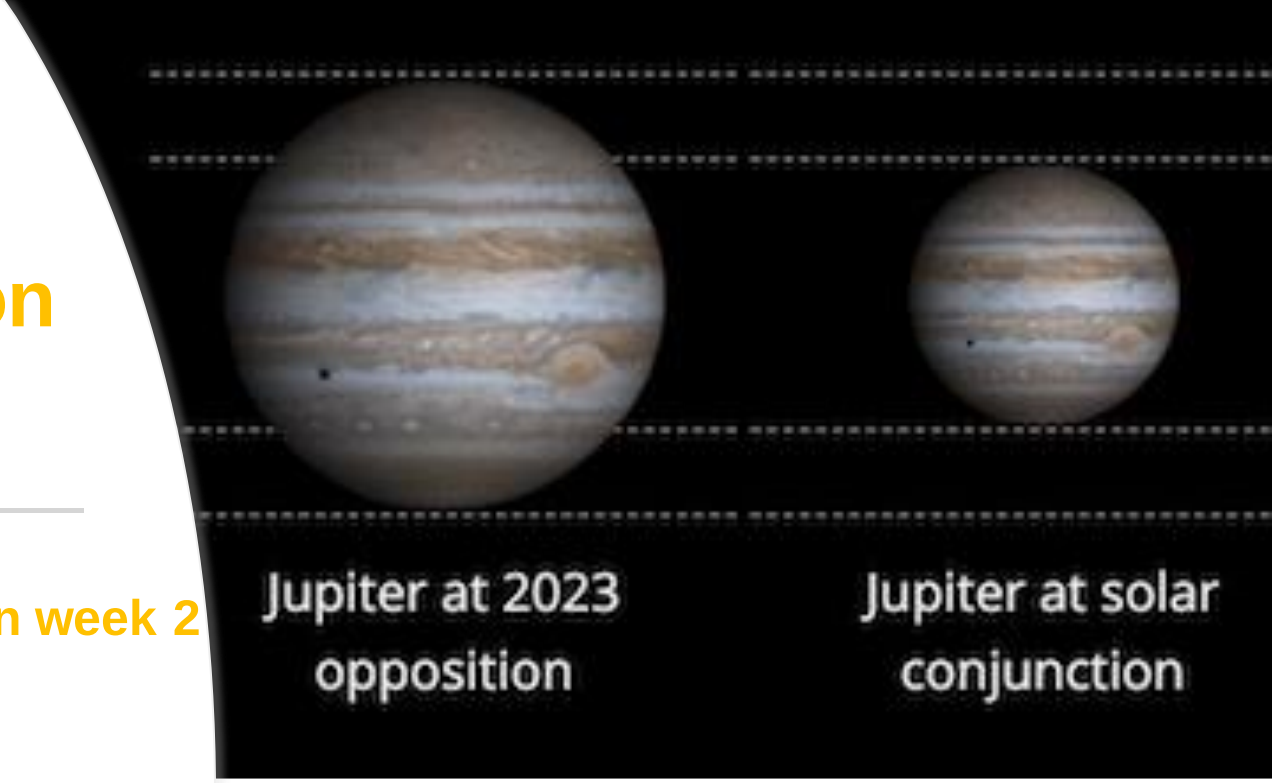
	Partial Lunar Eclipse
Begins:	Sat, 28 Oct 2023, 19:01
Maximum:	Sat, 28 Oct 2023, 21:14 0.122 Magnitude
Ends:	Sat, 28 Oct 2023, 23:26
Duration:	4 hours, 25 minutes

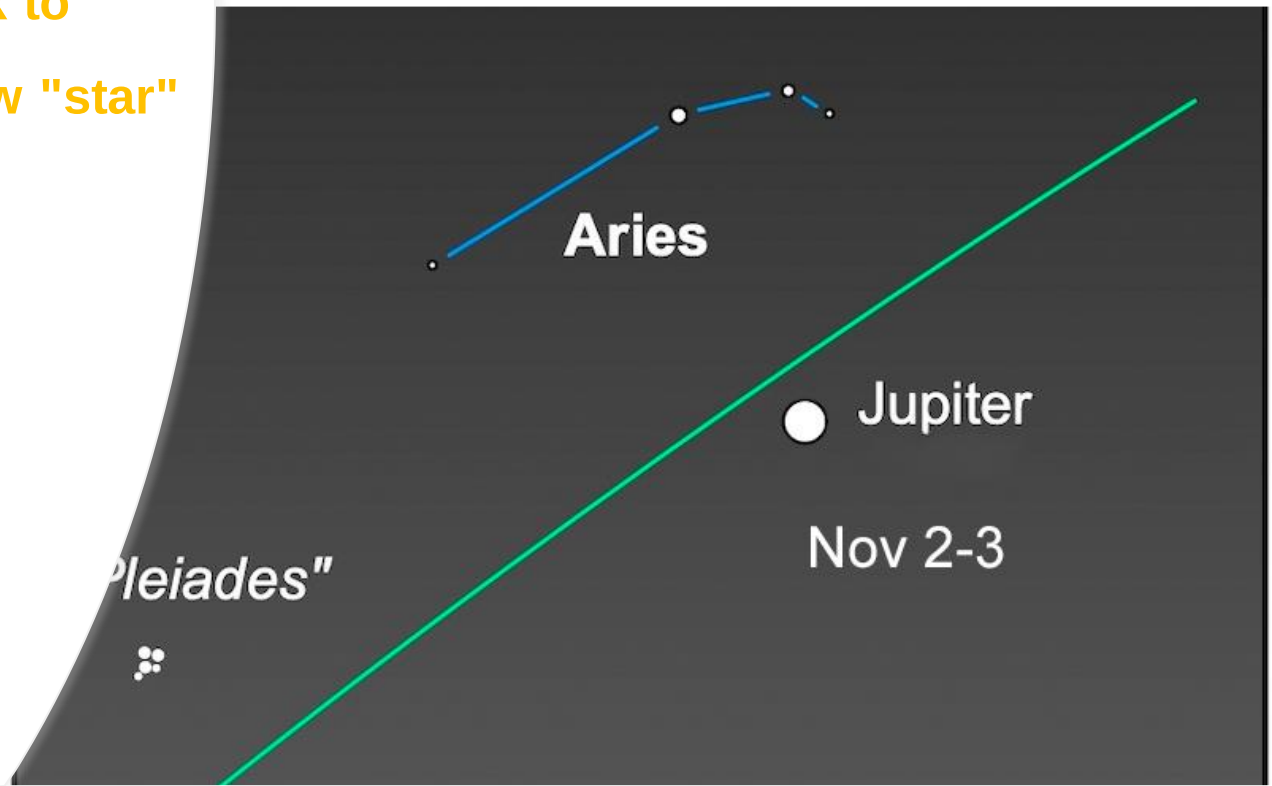
What to expect to see?

Jupiter at Opposition = Very Bright!

We will cover what this means in week 2

But in the meantime have a look to the east, to that big bright yellow "star"





Course Outline

Week 1: The Sky as we see it

Week 2: The Planets

Week 3: The Stars

Week 4: History of Astronomy

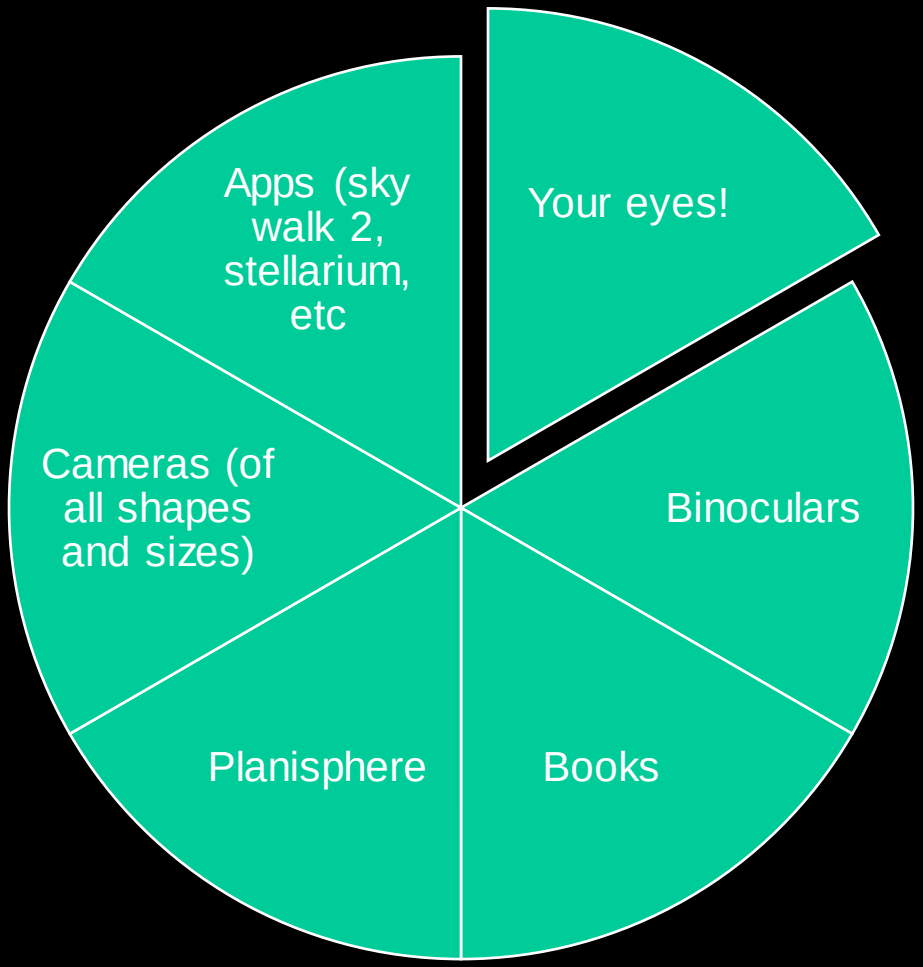
Week 5: Telescopes

Week 6: Deep Sky Objects

Week 7: Cosmology

Week 8: Alien Worlds

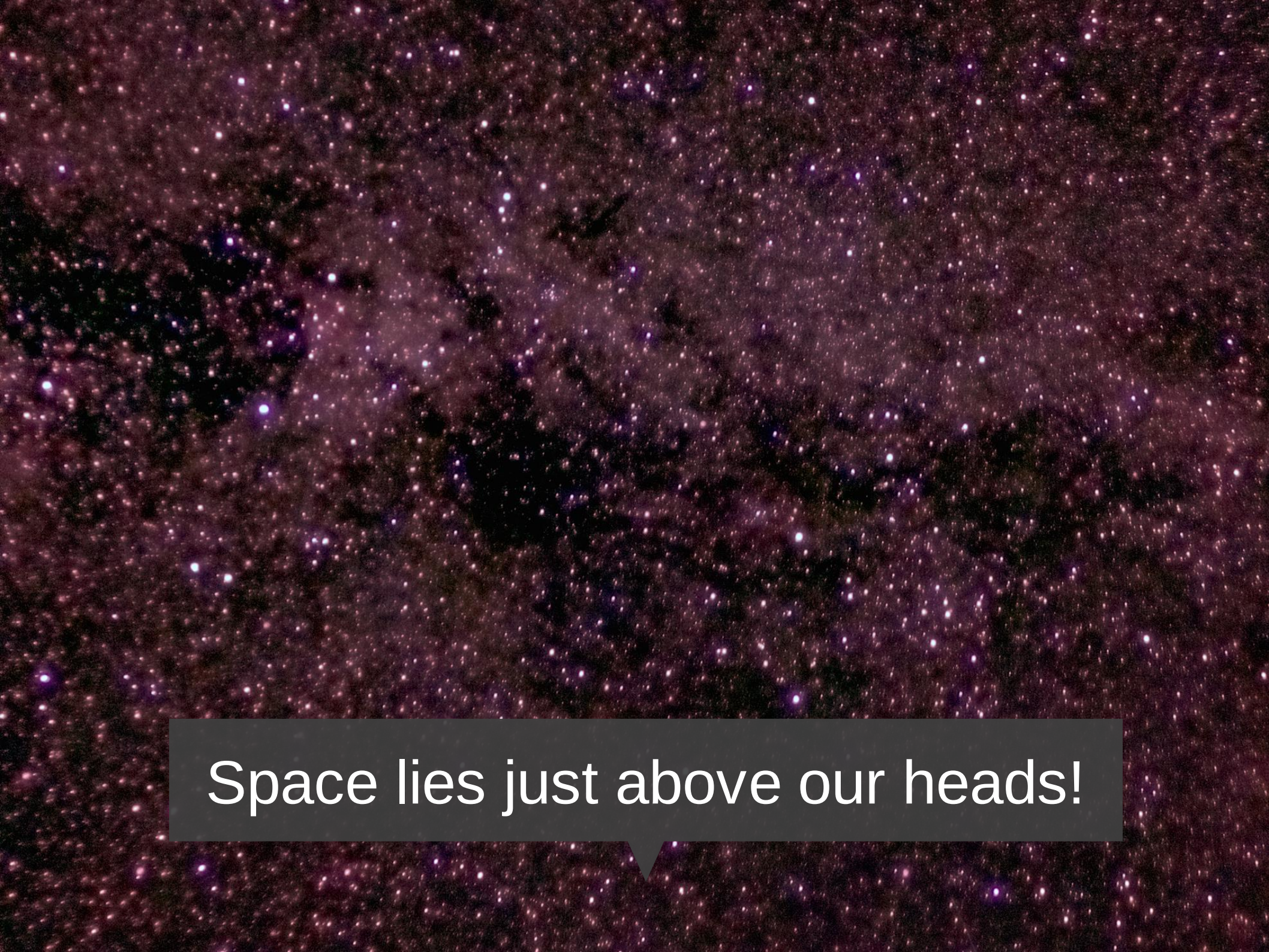
Traditional Equipment for astronomy

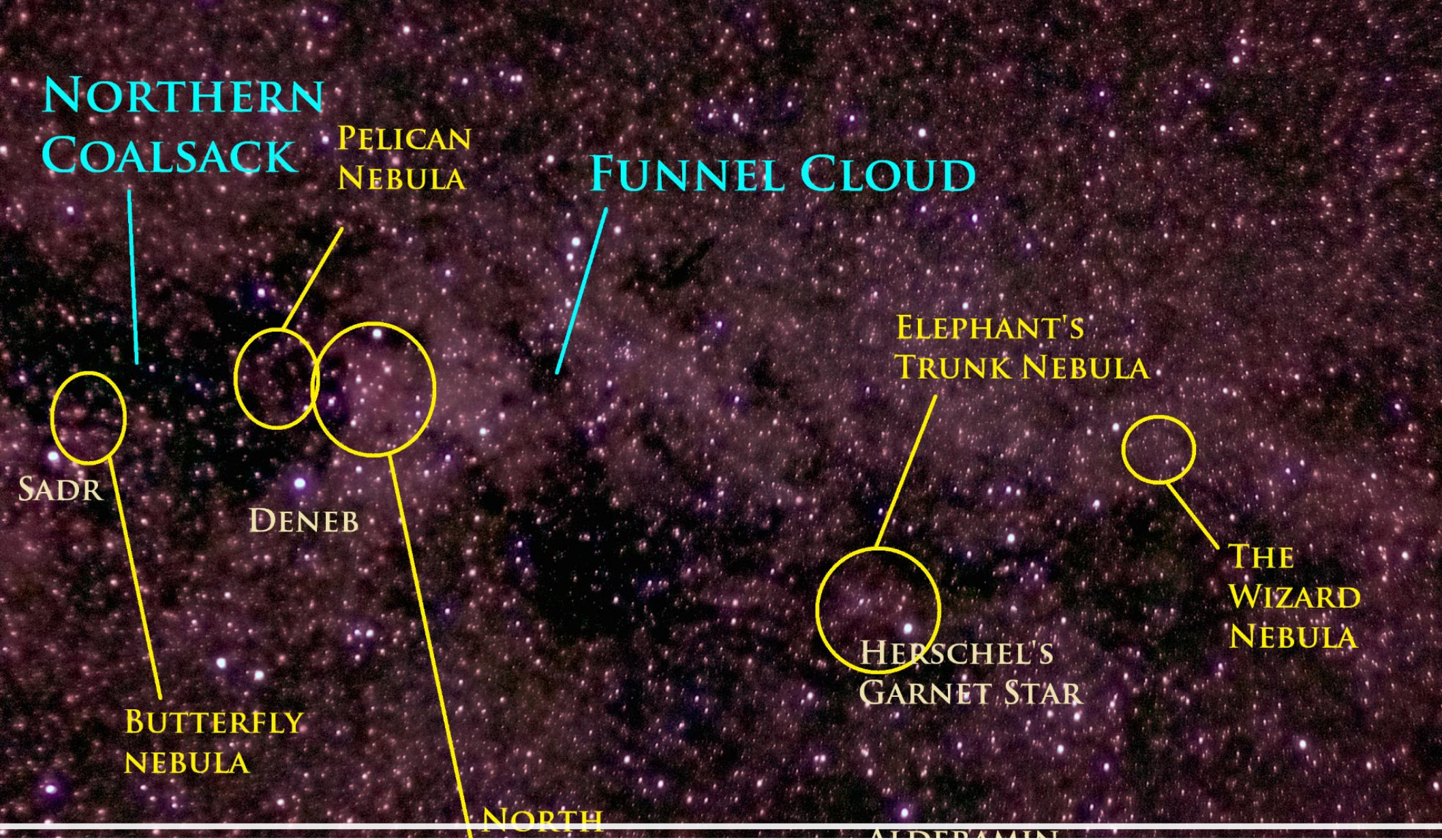


Using "Flying Cameras" for Astro-Photography at Star-BQ 2021

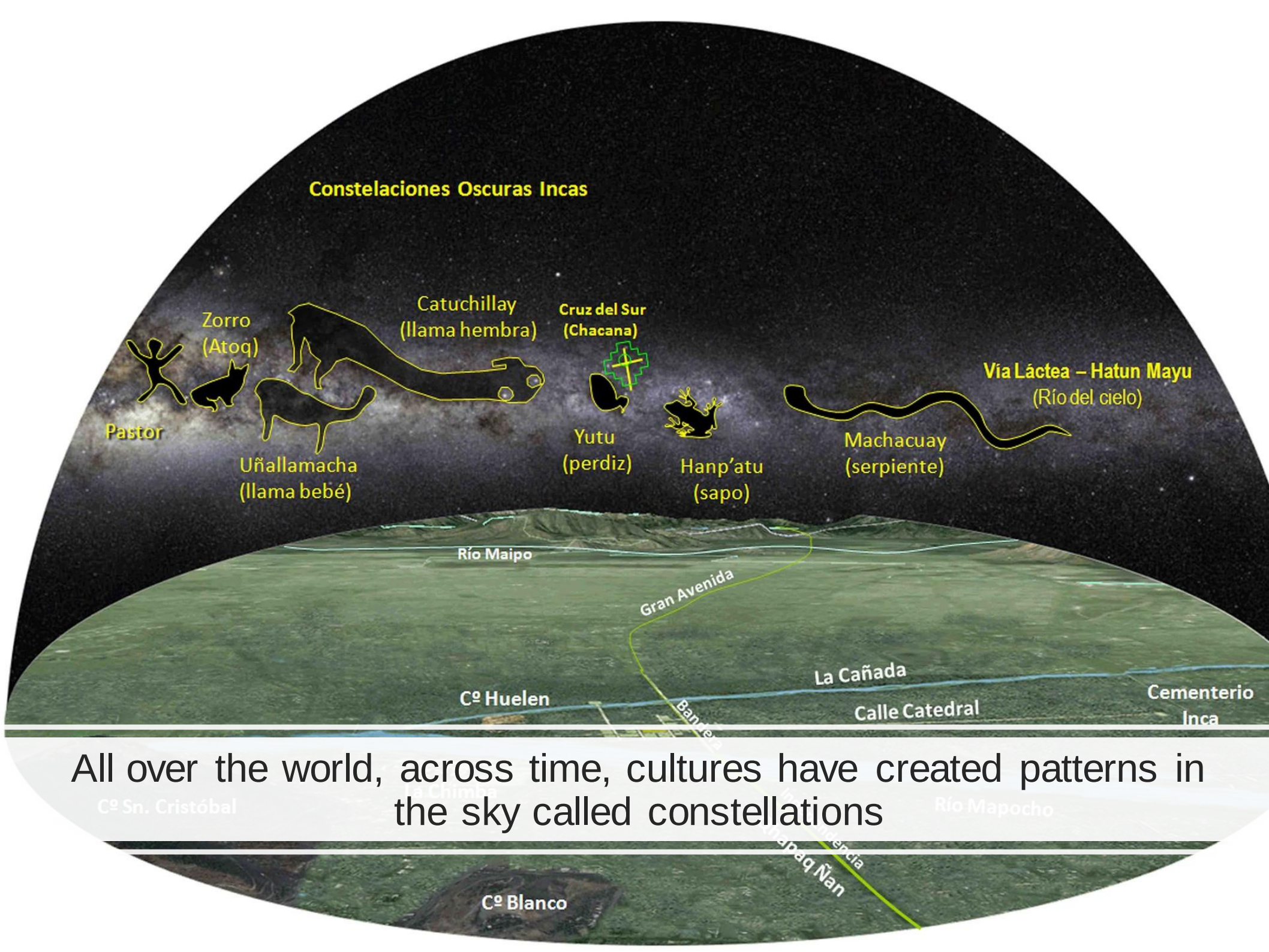
What can I see?

- **Stars & Constellations**
- The Moon and Planets (W2)
- Galaxies & Nebulae (W6)
- The Sun (CAREFUL!)


Space lies just above our heads!

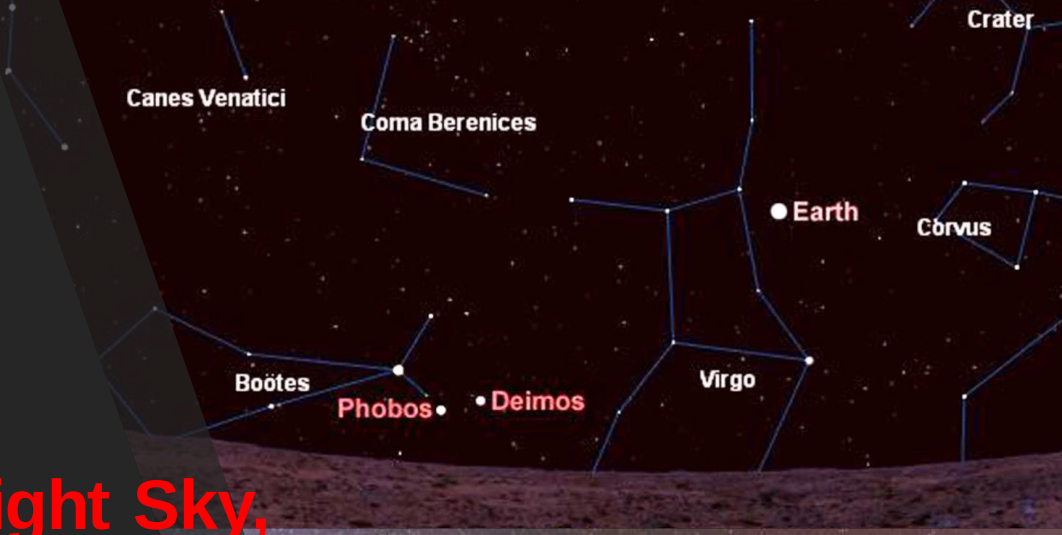


The human eye/mind can't help but add structure...



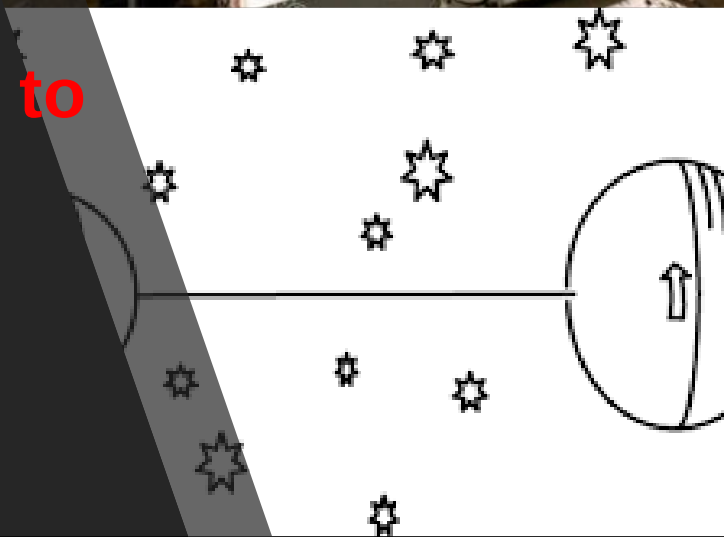
All over the world, across time, cultures have created patterns in the sky called constellations

The Goal of this class is....



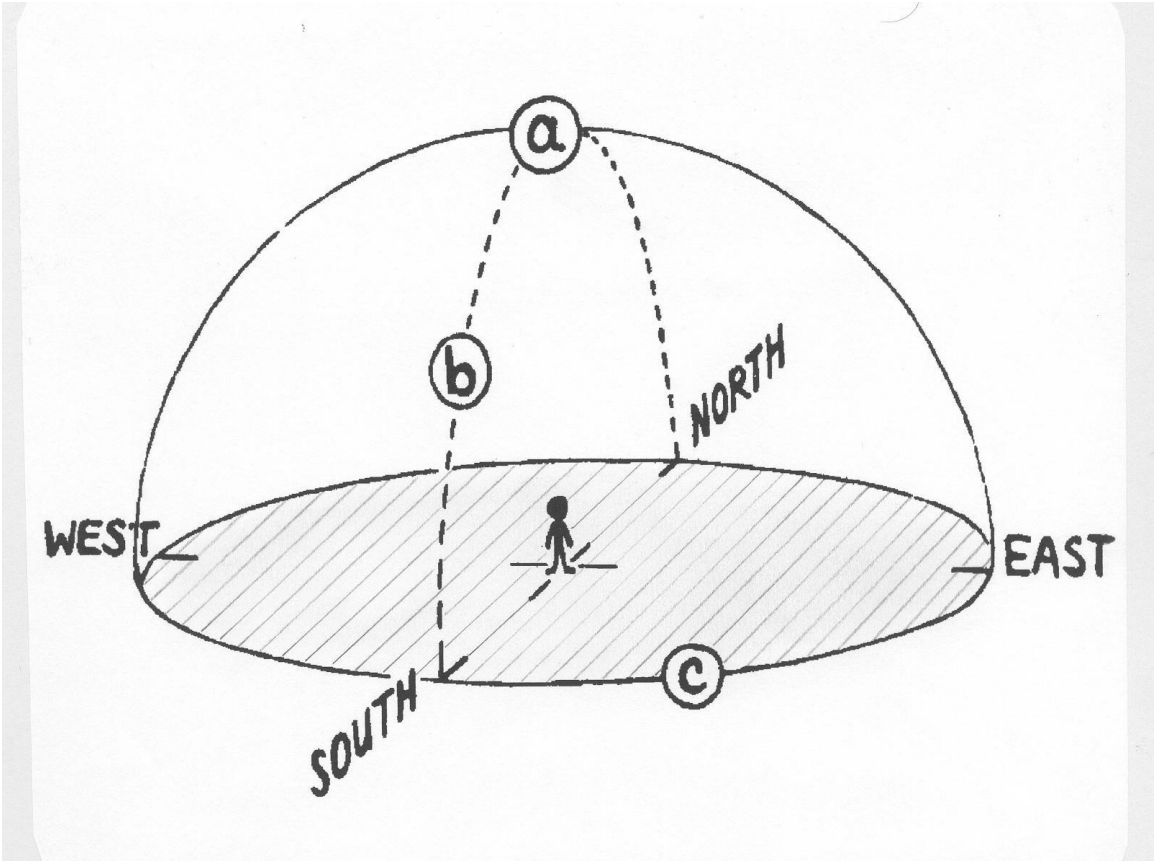
To Convince You that the Night Sky,
Containing the Stars, Planets, Galaxies, etc
Appears to Move relative
to the Earth (or any other planet)
Spinning!

To give you some information on how to
Navigate the night sky
With your unaided eye



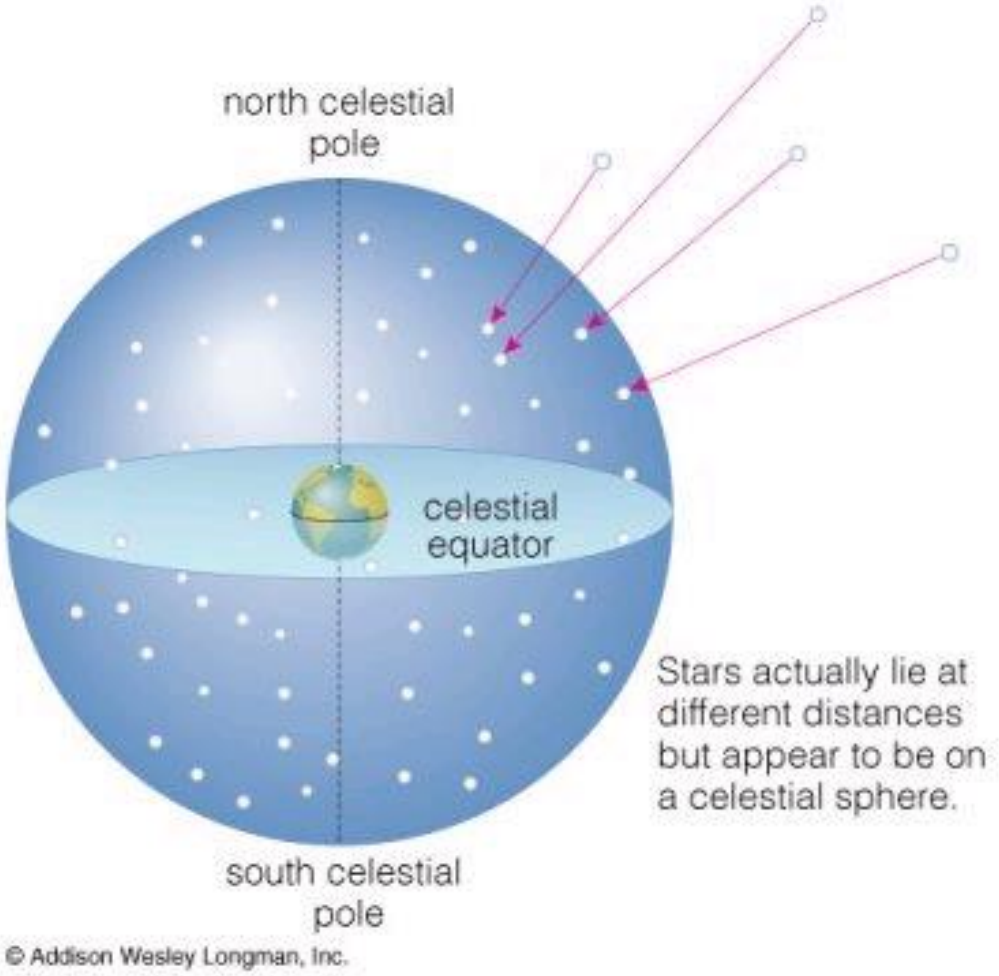
The night sky is like an up-turned bowl above the astronomer's head.

- a: Zenith
- b: Meridian
- c: Horizon

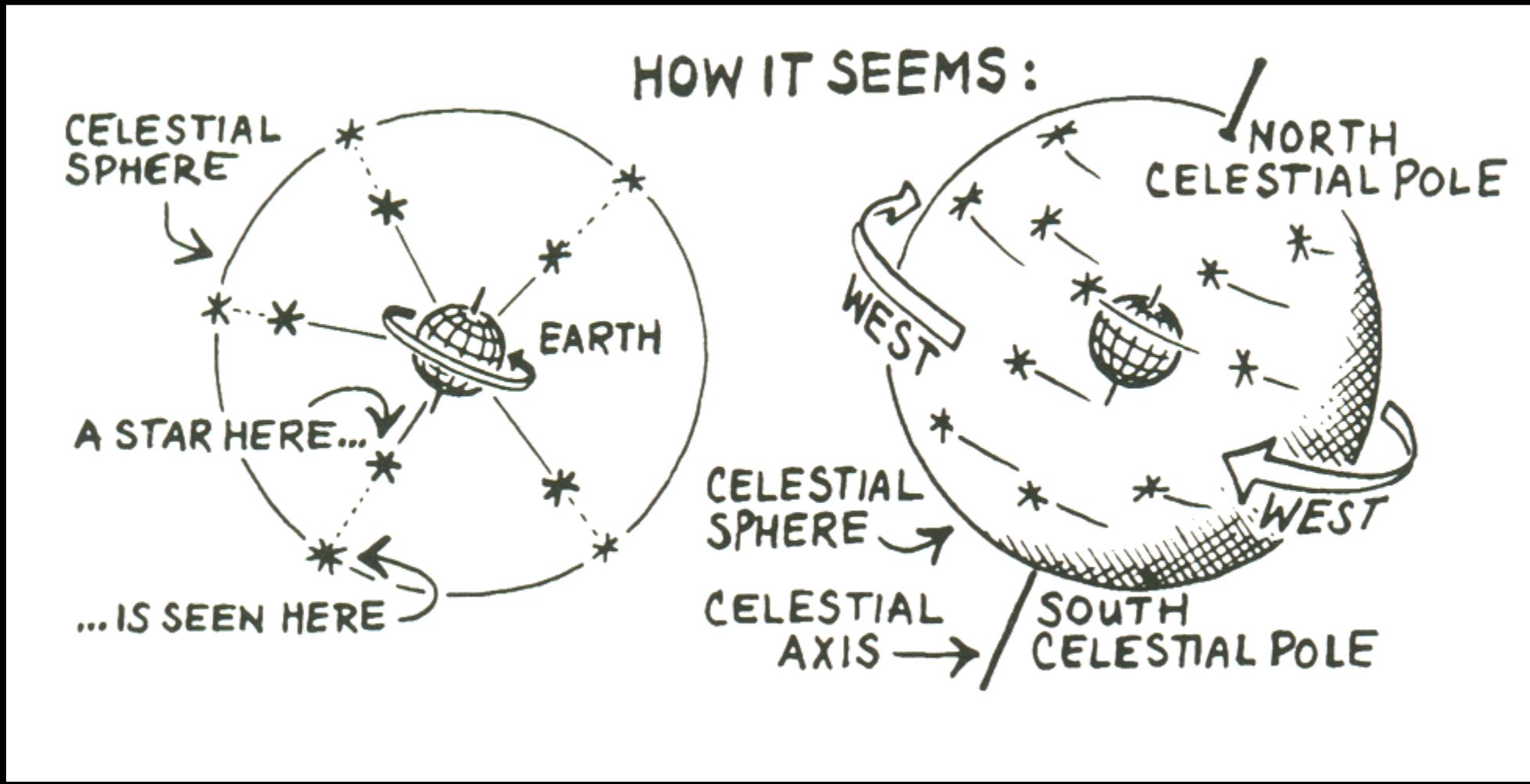


The Celestial Sphere

- We can pretend the
- night sky is a sphere,
- because all its stars
- are so far away from
- us, they don't appear
- to move at all.



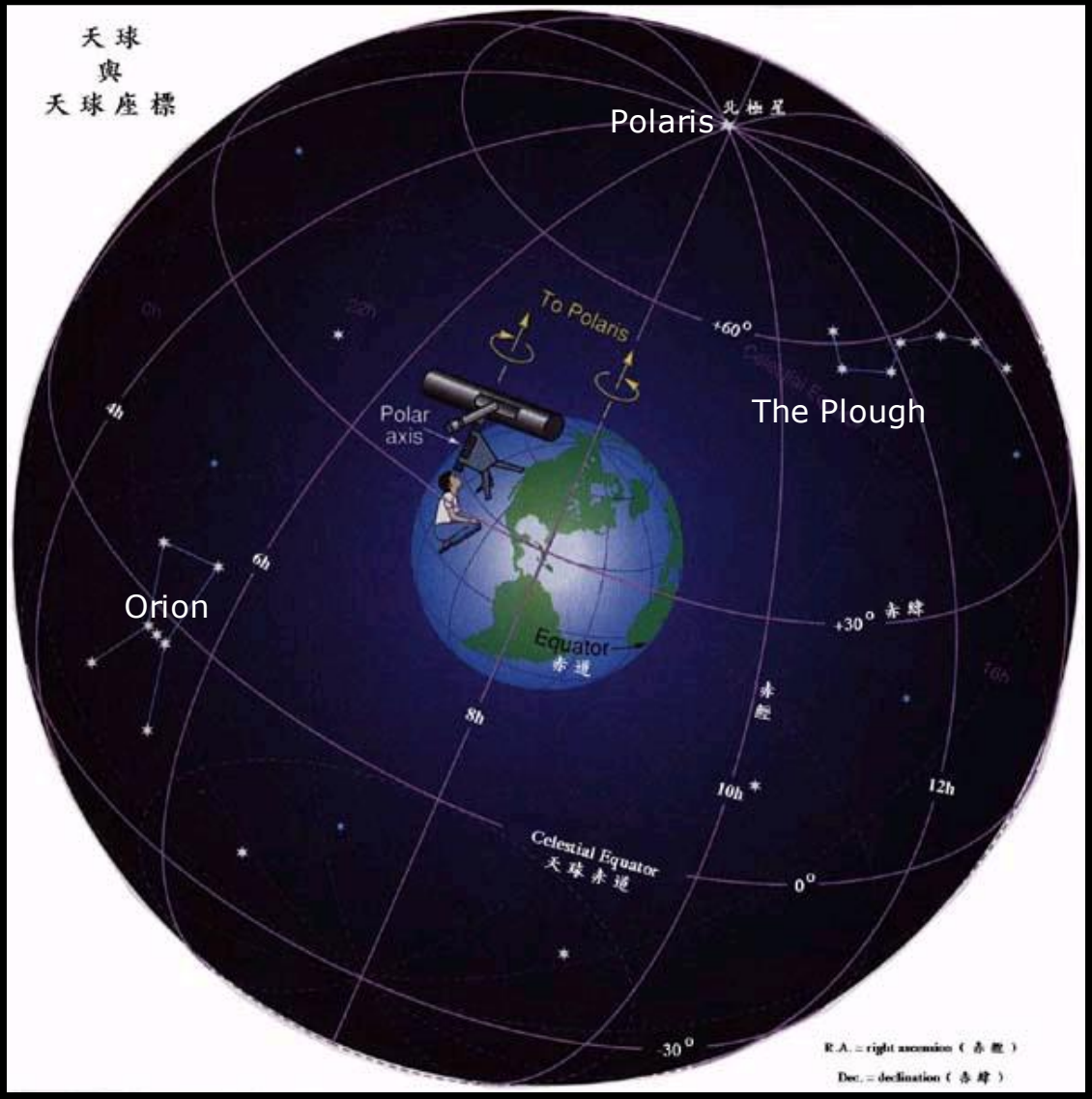
The Celestial Sphere appears to spin because we see it from the surface of the spinning Earth.



Stars appear fixed on the Celestial Sphere.

Note the positions of –

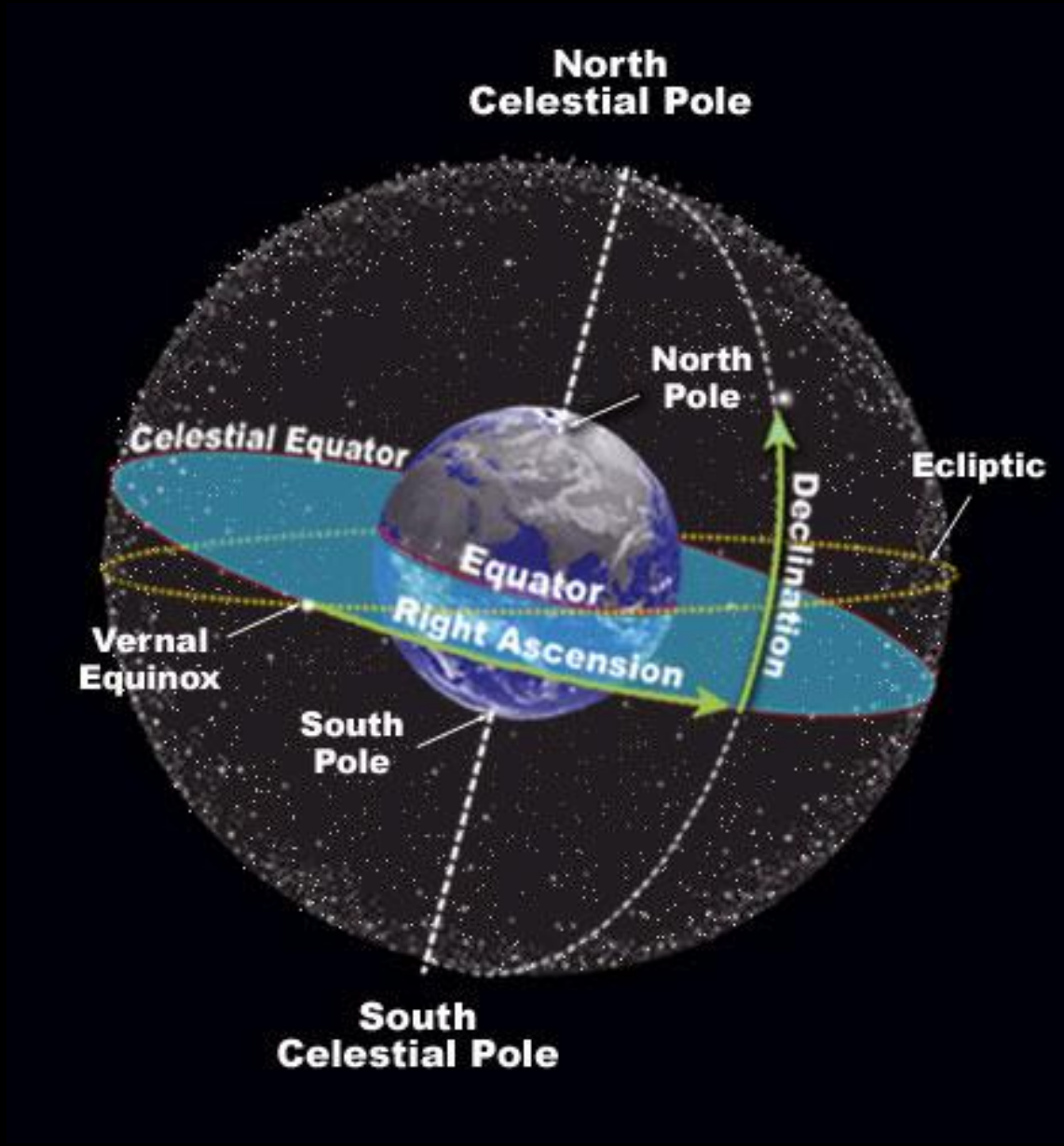
- **The Plough**
- **(Or Big Dipper)**
- **Polaris**
- **Orion**



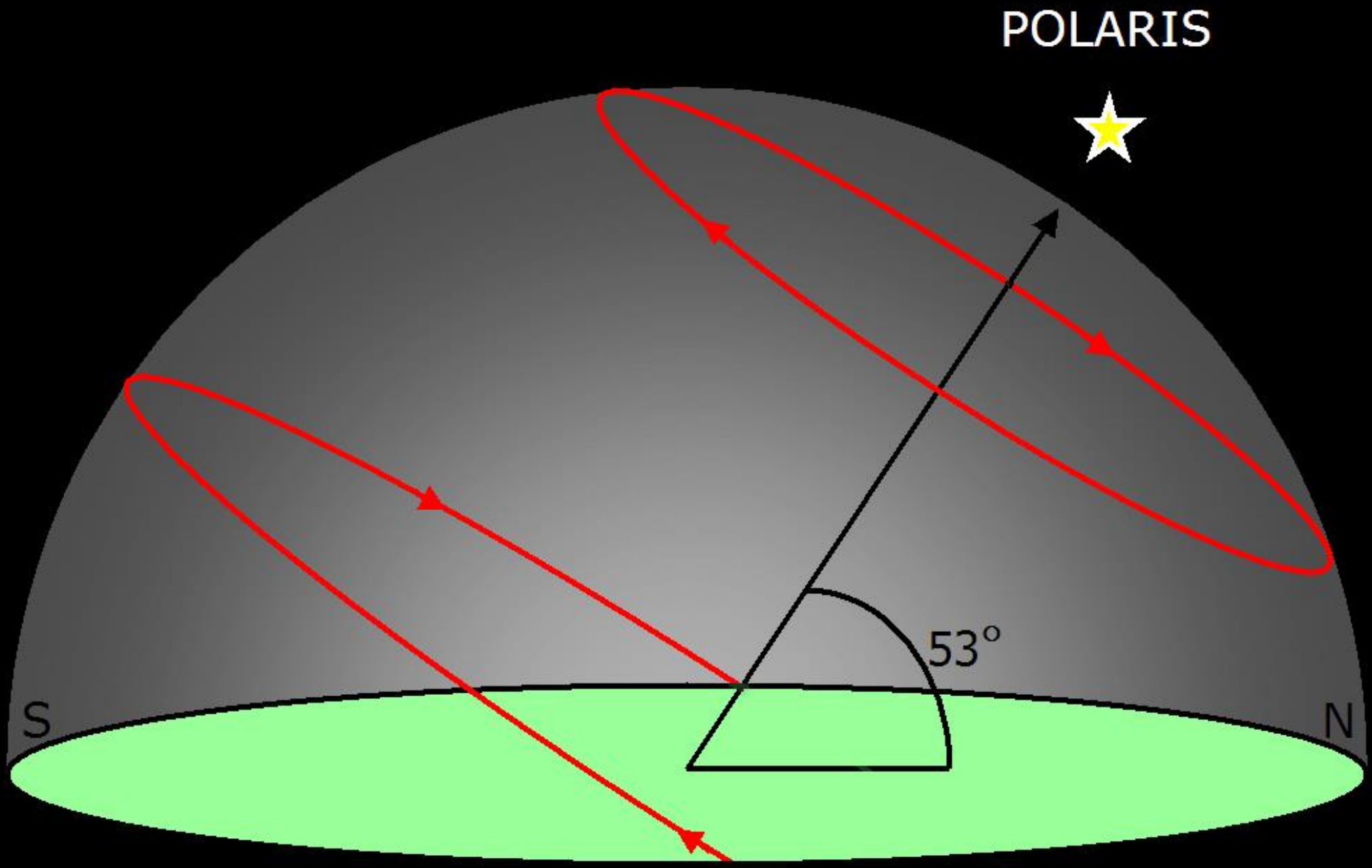
Celestial Coordinates

Declination is equivalent to latitiude and is measured in degrees.

Right Ascension is equivalent to longitude and is measured in hours, minutes and seconds.



The View from Leixlip - 53° North at roughly 8pm



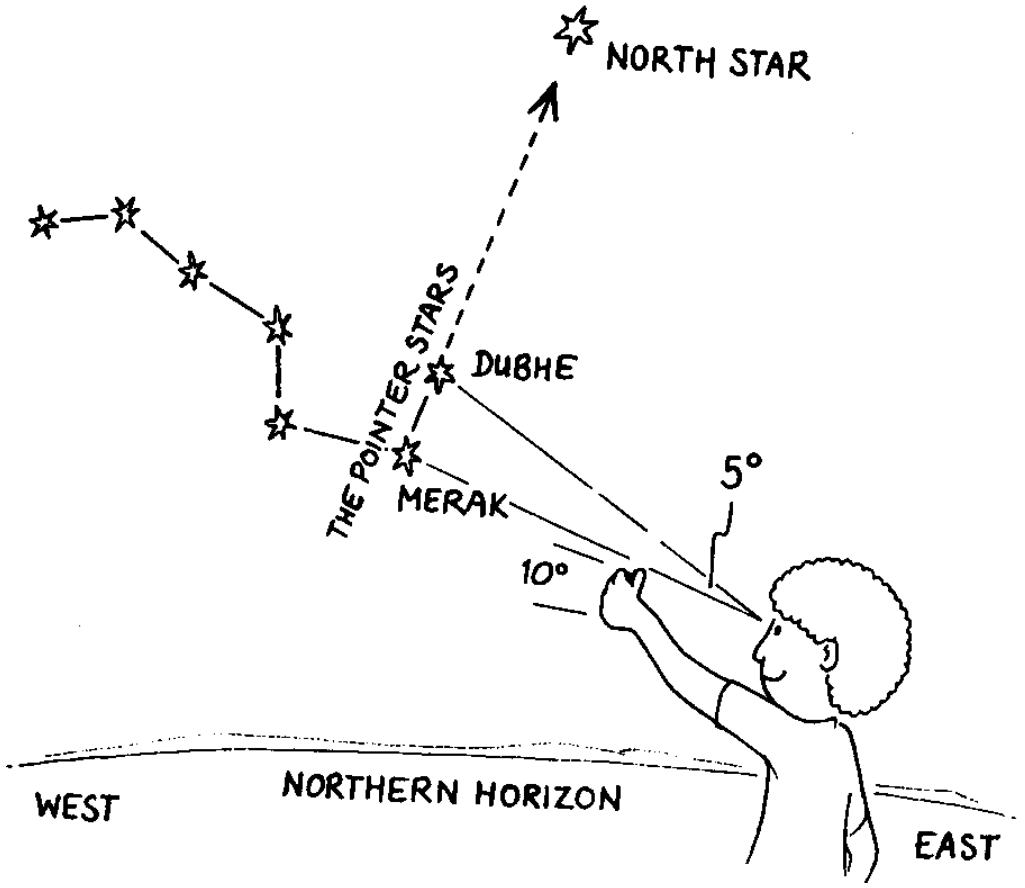
PATH OF THE POLE TH
PRECESSIONAL

- **Precession of**
- **the Equinoxes**

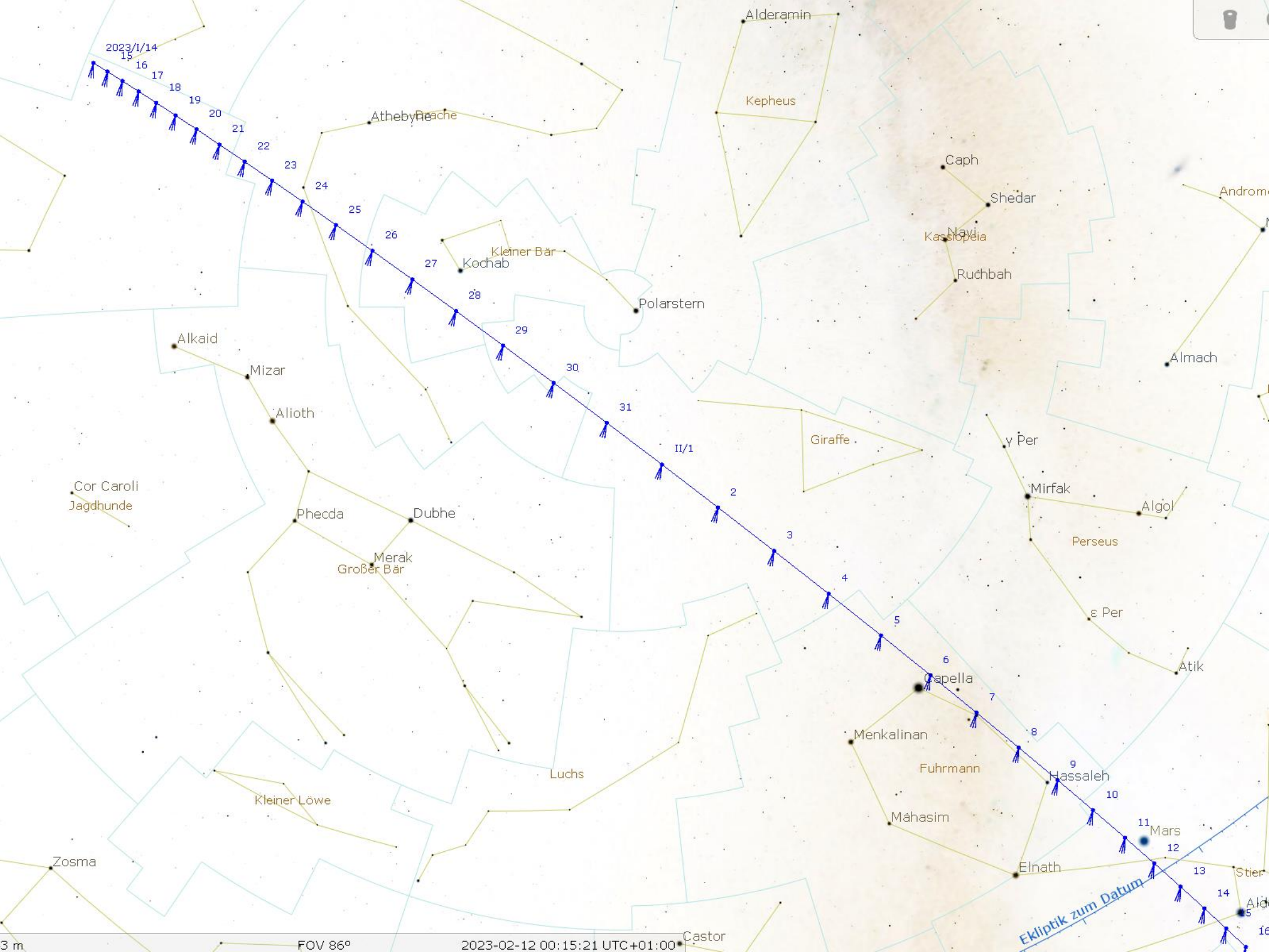
- The spinning
- Earth wobbles on its axis once every 26,000 years.

- So Our current "Pole Star" was not always
- Polaris

Polaris stays in the same place – always directly North, 53° above the horizon.



Examples of Benefits of learning the constellations – tracking an upcoming rendezvous with a Comet!
Comet ZTF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Kassiopeia
Ruchbah
Kleiner Bär
Kochab
Polarstern
Alkaid
Mizar
Alioth
Almach
Giraffe
γ Per
Mirfak
Algol
Perseus
ε Per
Atik
Cor Caroli
Jagdhunde
Phecda
Dubhe
Merak
Großer Bär
Capella
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Fuhrmann
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Mahasim
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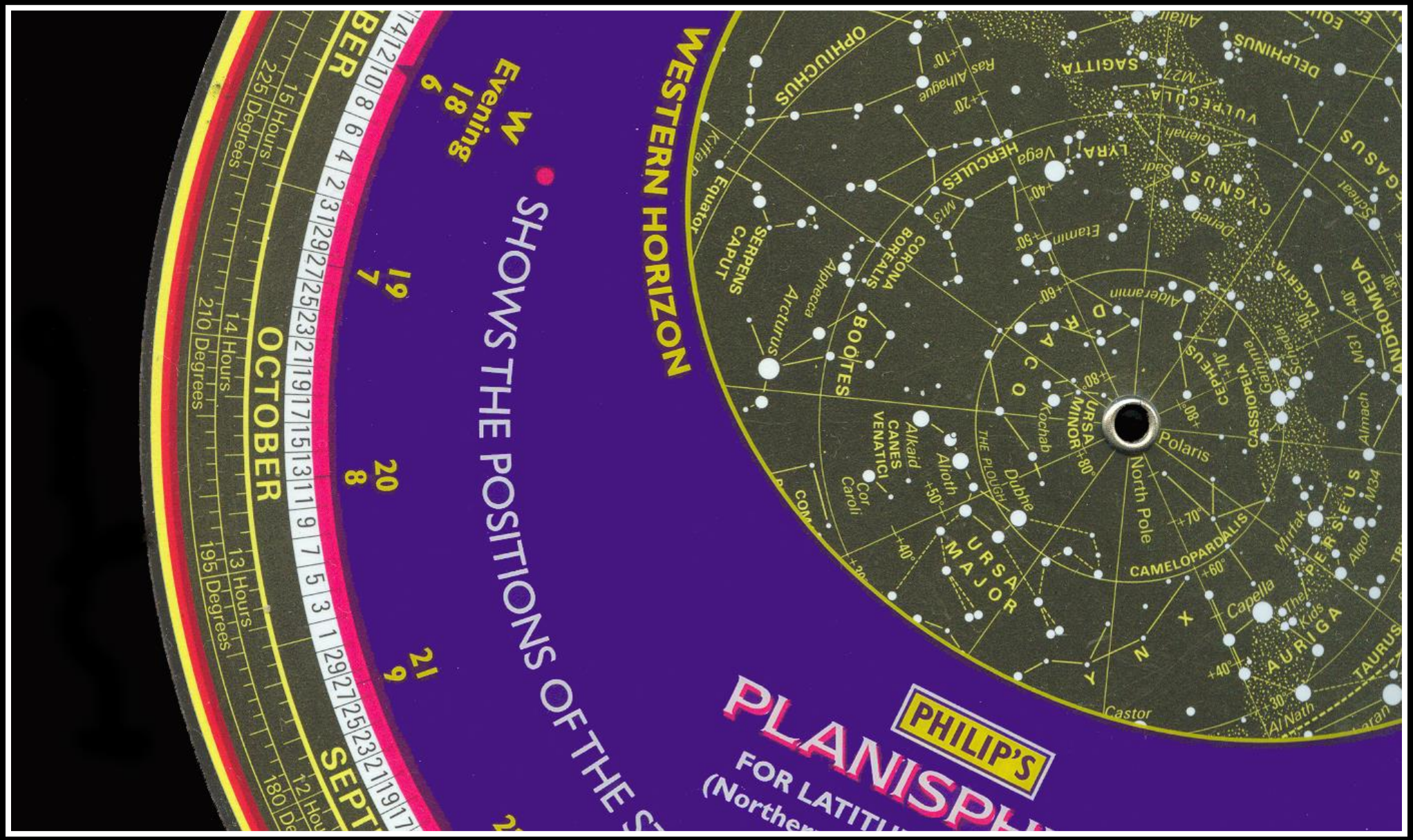
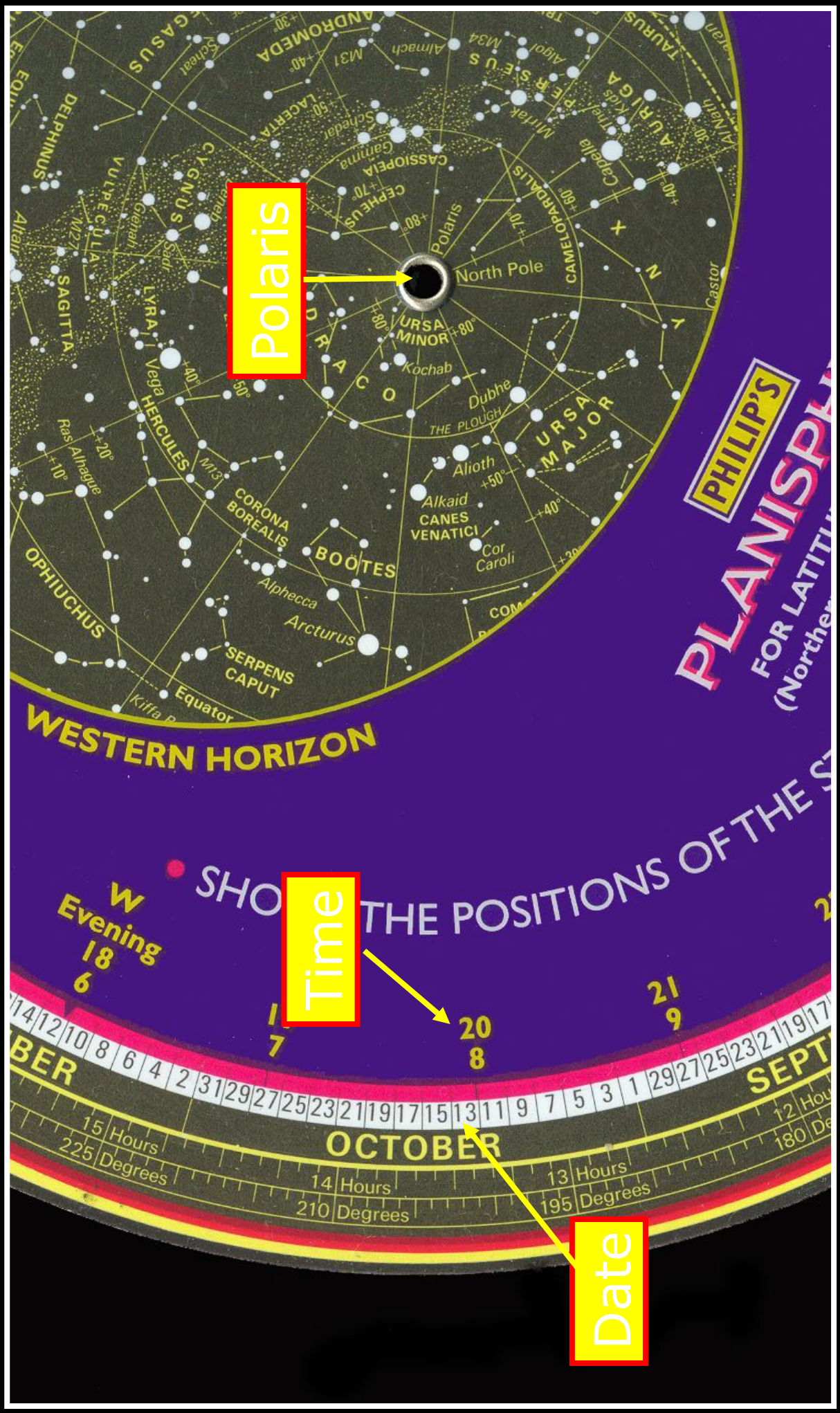
Using A Planisphere

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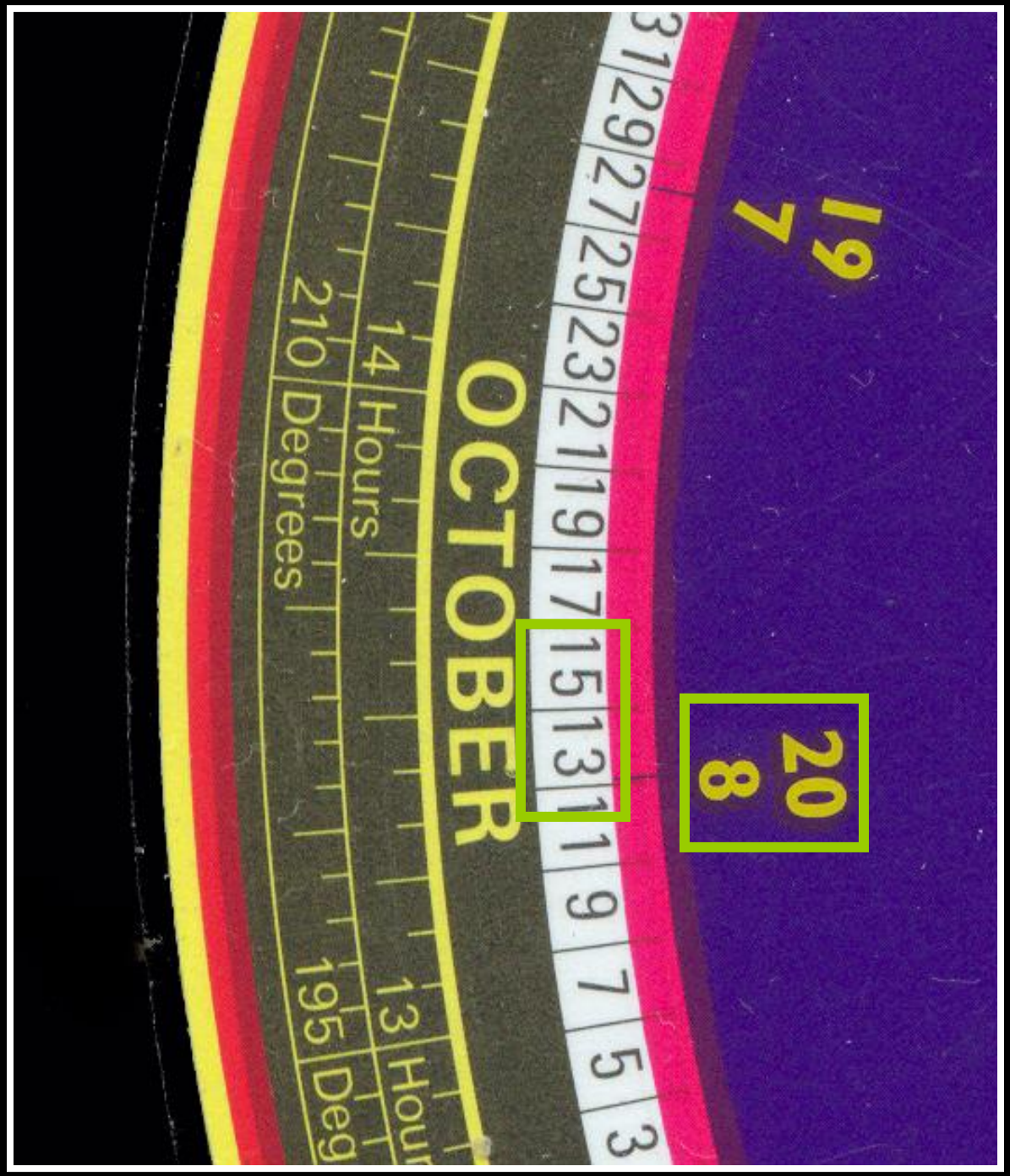
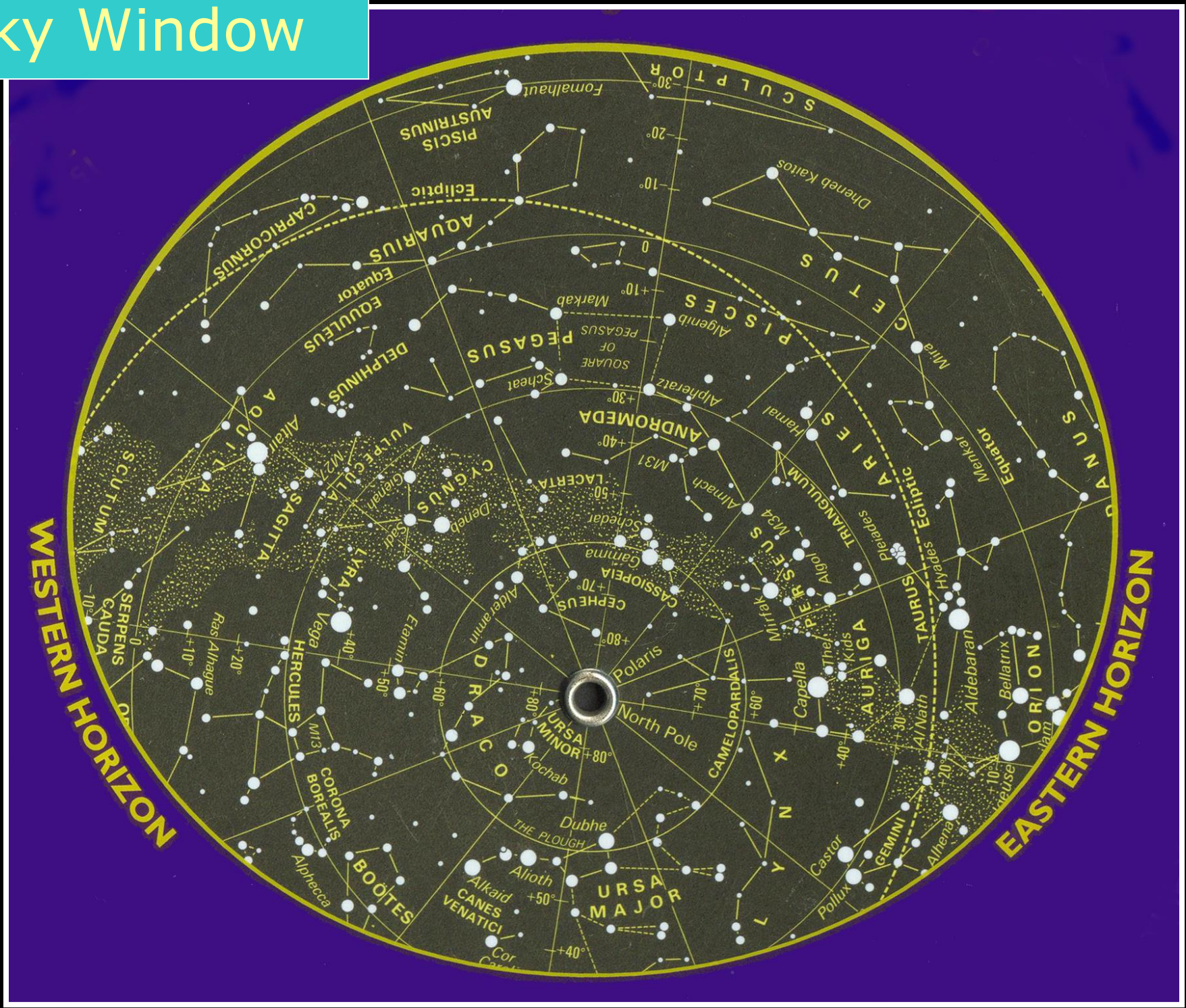
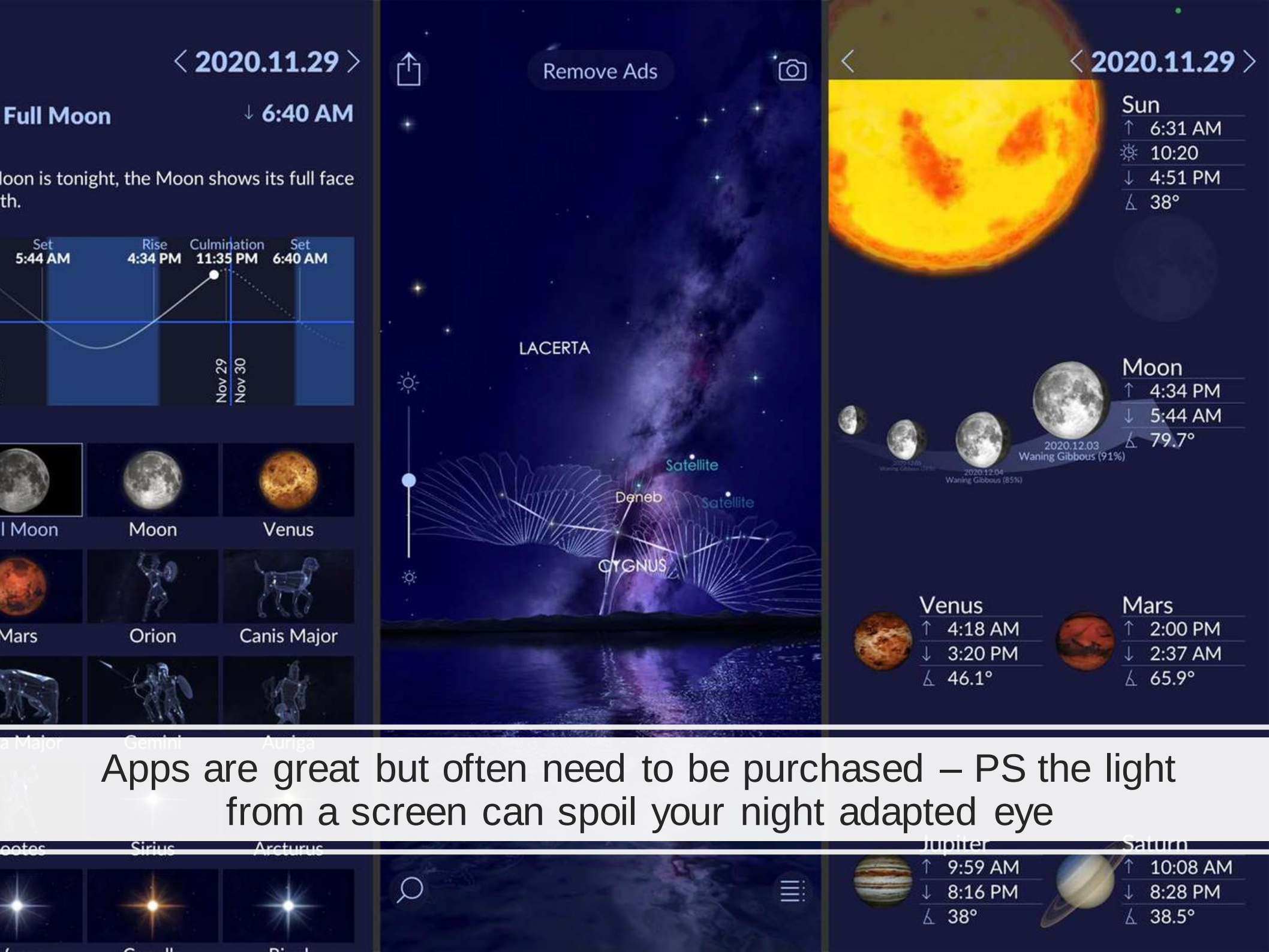
180 De
North Pole
Polaris
URSA MINOR
Kochab
Dubhe
THE PLOUGH
URSA MAJOR
Alioth
Alkaid
CANES VENATICI
Cor Caroli
BOÖTES
Arcturus
Alphecca
CORONA BOREALIS
HERCULES
Vega
LYRA
SAGITTA
OPHIUCHUS
SERPENS CAPUT
Equator
Ras Alhague
CAMELOPARDALIS
CASSIOPEIA
CEPHEUS
ANDROMEDA
PERSEUS
AURIGA
TAURUS
Capella
Castor
DRACO
CYGNUS
VULPECULA
DELPHINUS
PEGASUS

Match the time with the date



The Sky Window




2020.11.29
Full Moon
↓ 6:40 AM
loon is tonight, the Moon shows its full face
th.
Set 5:44 AM
Rise 4:34 PM
Culmination 11:35 PM
Set 6:40 AM
Nov 29
Nov 30
l Moon
Moon
Venus
Mars
Orion
Canis Major
a Major
Gemini
Auriga
Remove Ads
LACERTA
Satellite
Deneb
Satellite
CYGNUS
2020.11.29
Sun
↑ 6:31 AM
10:20
↓ 4:51 PM
38°
Moon
↑ 4:34 PM
↓ 5:44 AM
79.7°
2020.12.03
Waning Gibbous (91%)
2020.12.04
Waning Gibbous (85%)
Venus
↑ 4:18 AM
↓ 3:20 PM
46.1°
Mars
↑ 2:00 PM
↓ 2:37 AM
65.9°
Apps are great but often need to be purchased – PS the light from a screen can spoil your night adapted eye
ootes
Sirius
Arcturus
Jupiter
↑ 9:59 AM
↓ 8:16 PM
38°
Saturn
↑ 10:08 AM
↓ 8:28 PM
38.5°

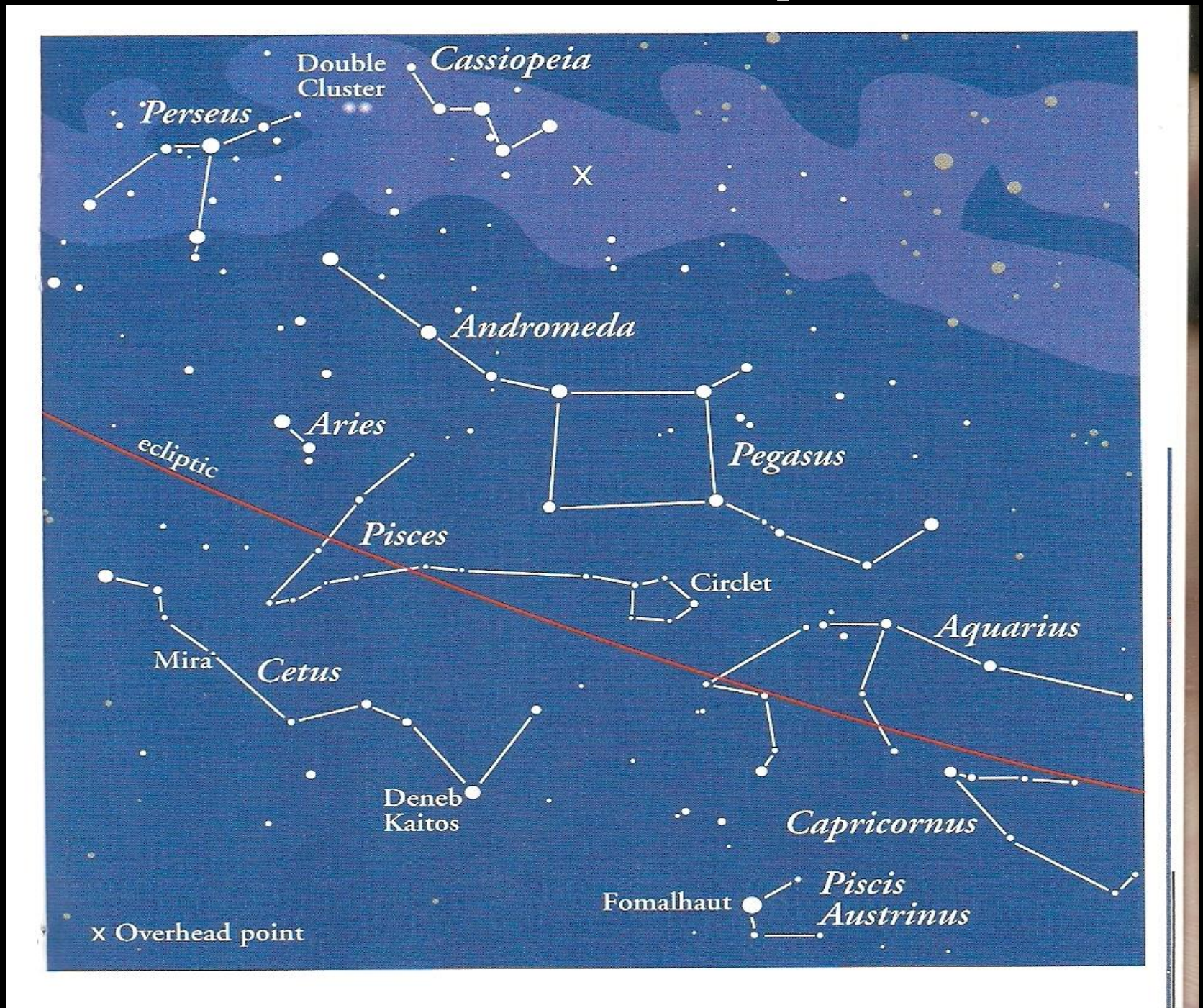
We can use the accurate skycharts in the astronomy Ireland magazine to guide us to what might be interesting in the night sky.

Chart has Moon, Planetary Locations

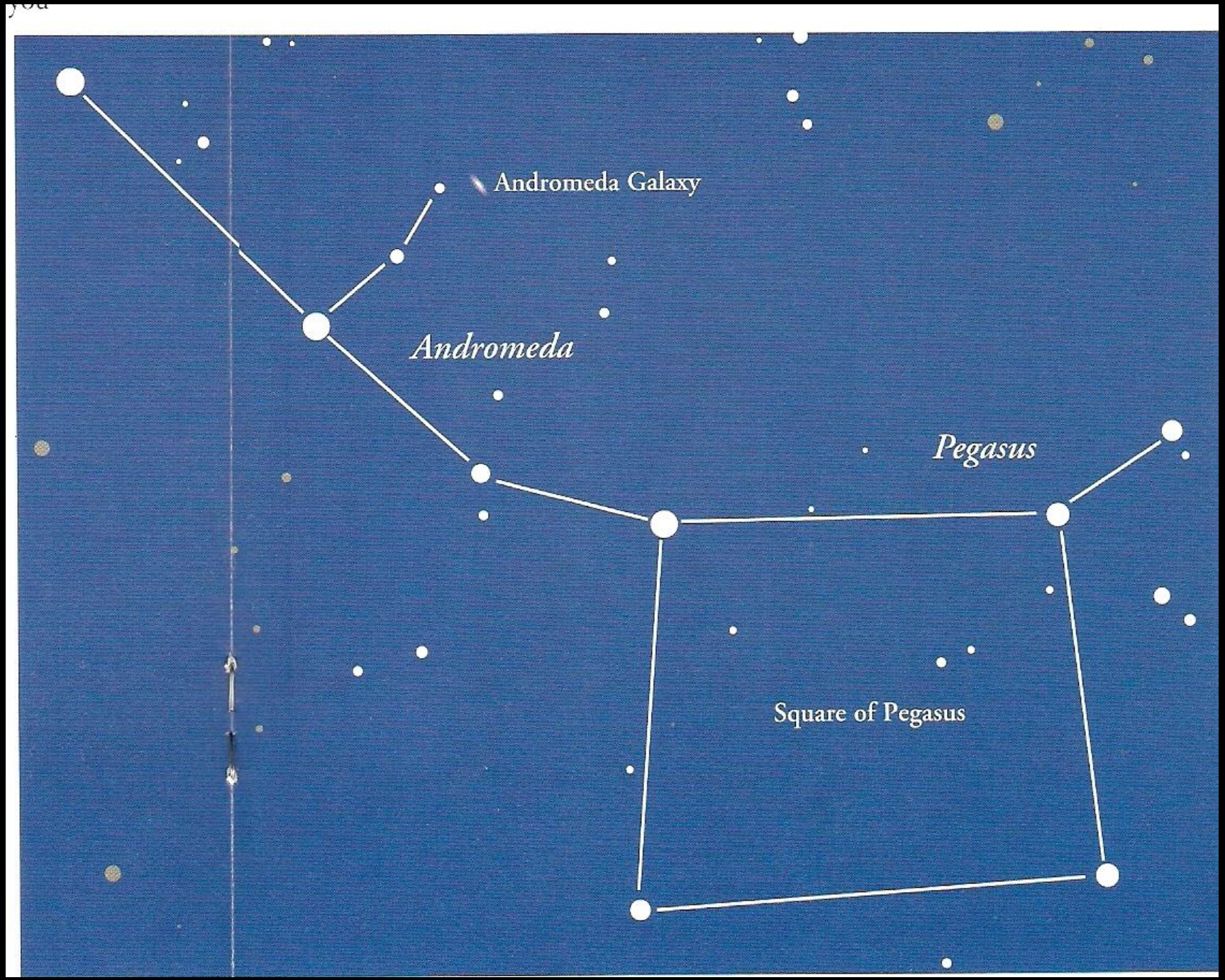
Timestamped over the course of a Month

Keep up to date!

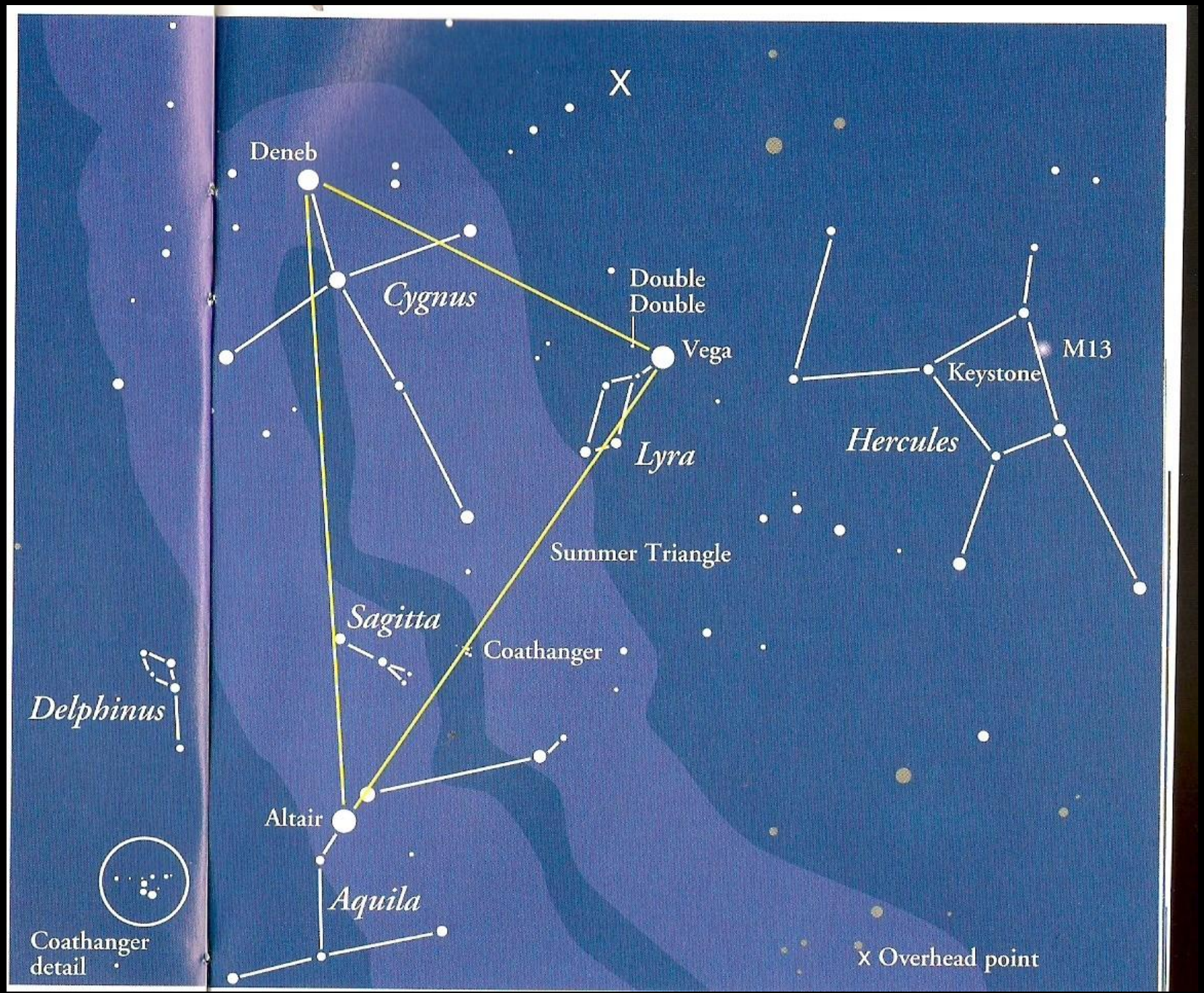
Summer and Autumn Sky- Andromeda

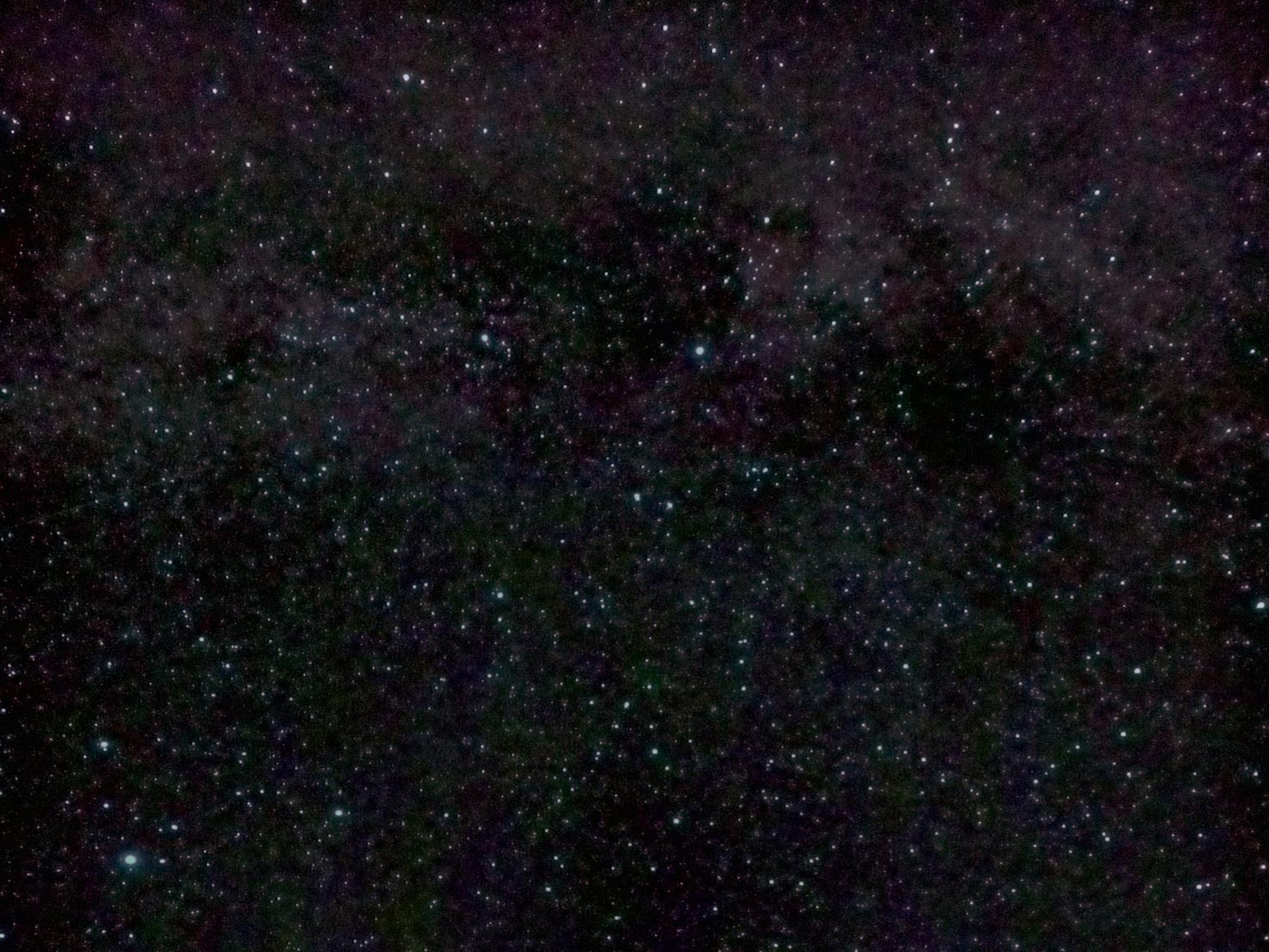


Autumn Sky- Andromeda

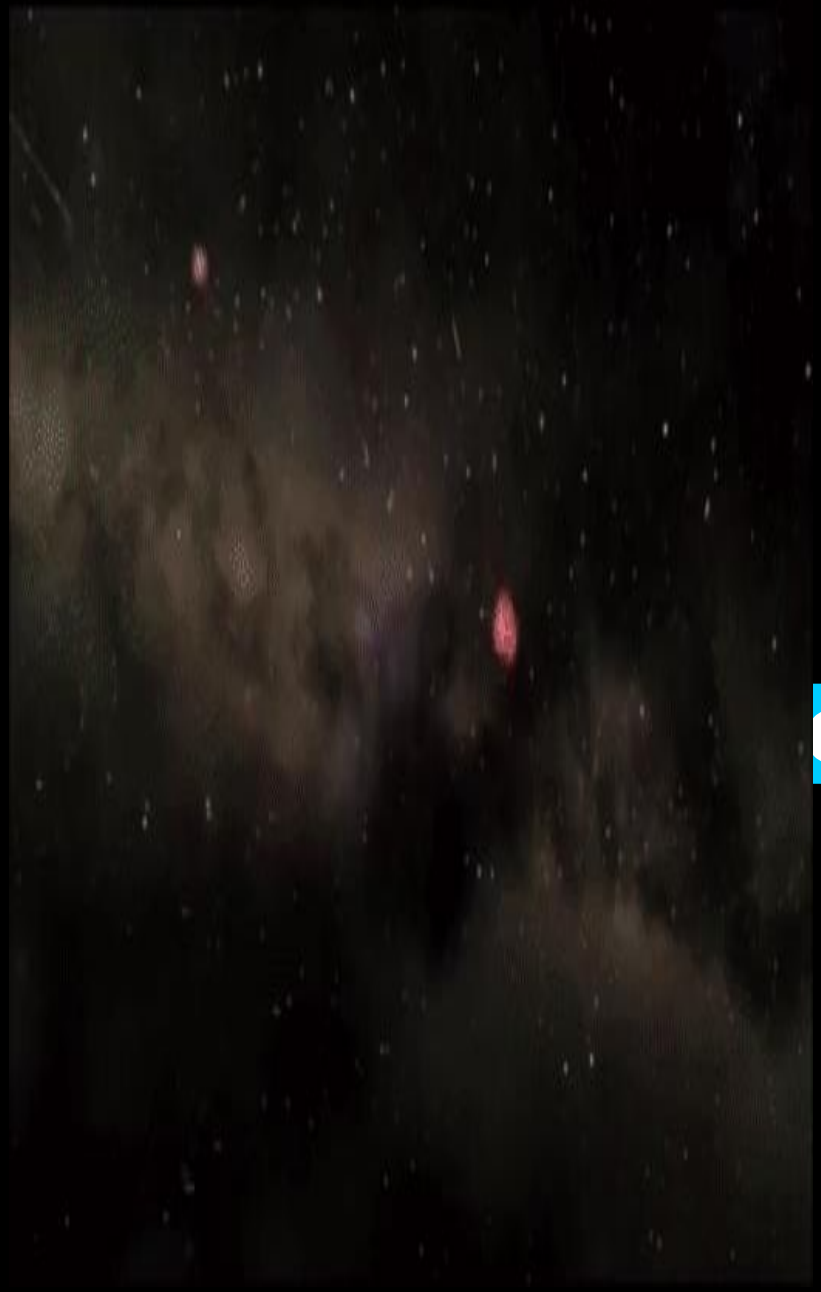


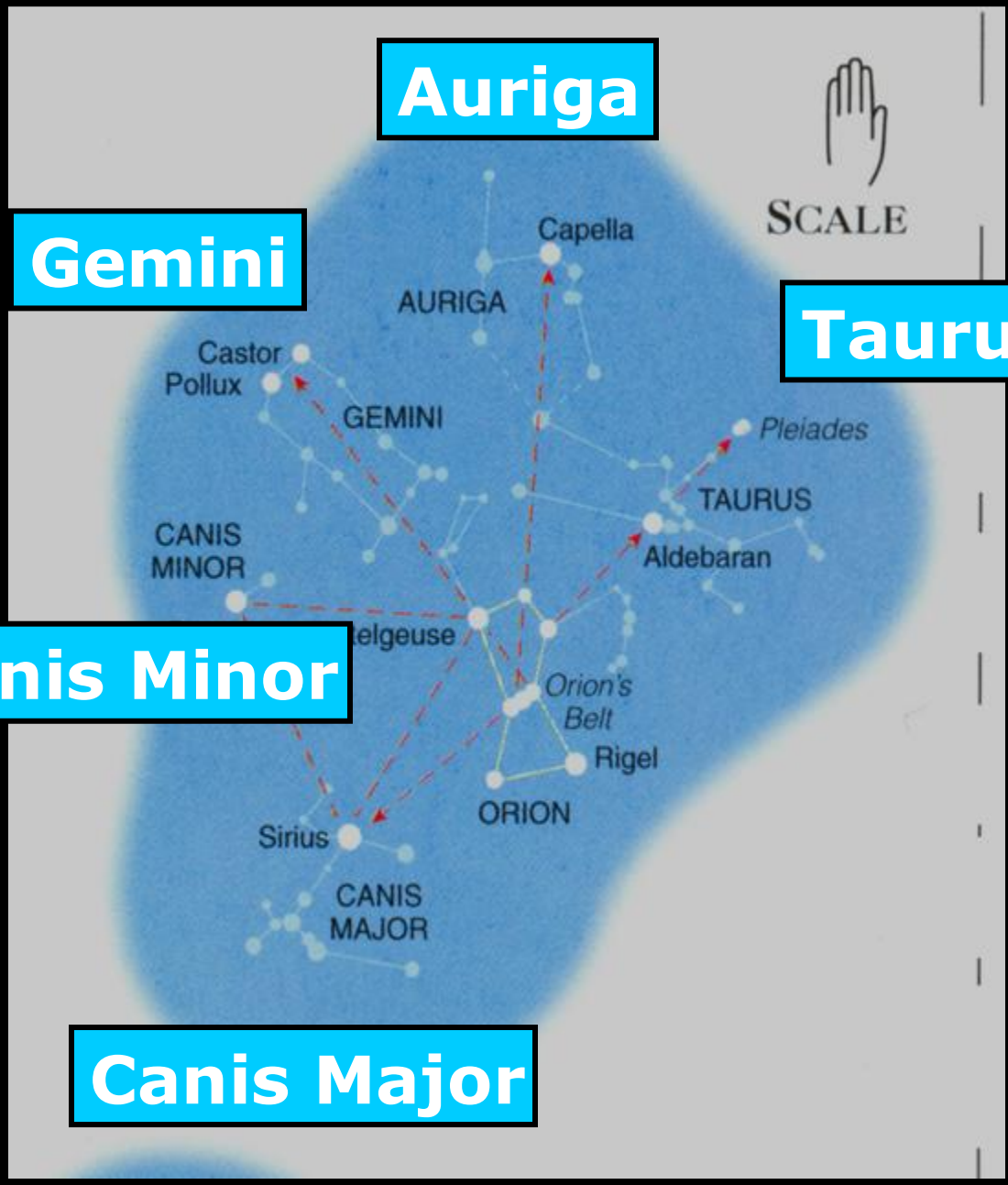
Autumn Sky- Cygnus 'The Swan'

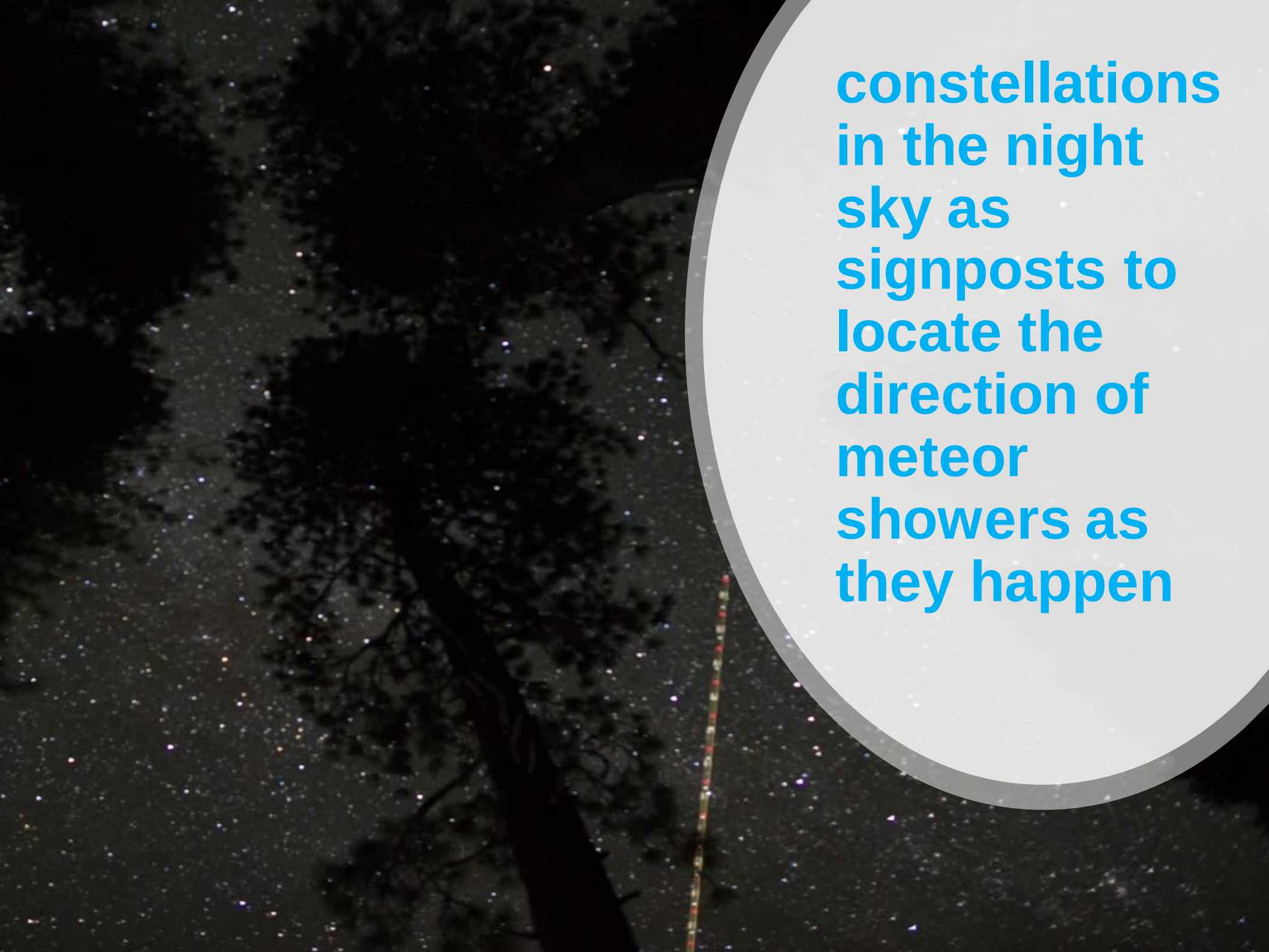




Orion as a perfect stellar signpost







constellations in the night sky as signposts to locate the direction of meteor showers as they happen

Why not use the Moon as a Signpost? – Its big, bright and obvious!

- **- We can use the Moon to guide us but we just mentioned the problem with using a full bright moon as a signpost**

-Can You say what it is?

NEXT WEEK

The Planets! (and comets/asteroids)

Particular emphasis on Jupiter

events- keep up to date monthly

lectures, eclipse Sat 28th

watch and answer questions

Please send any photos to magazine@astronomy.ie to get them published! Make (positive) history!

astronomy ireland

Useful websites

www.astronomy.ie/handouts

www.stellarium.org

Thank You