

Indigenous Astronomy



Aboriginal and Torres Strait Islander people should be aware
that this content may contain images of deceased persons.

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SEB104 Grand Challenges in Science: Space Exploration



School of Chemistry and Physics
Faculty of Science

History of Astronomy

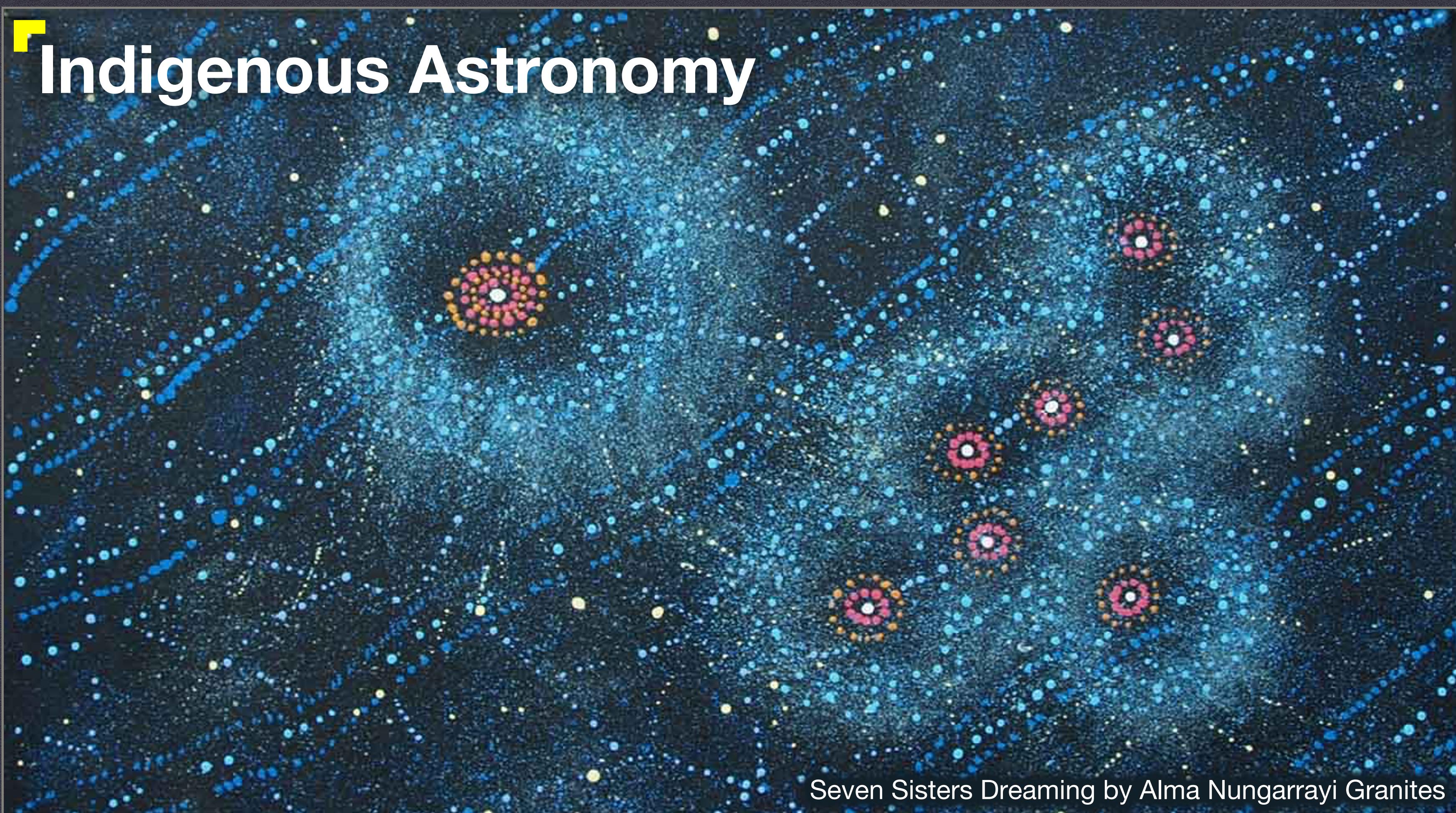
4,500 BC	Earliest Egyptian Pyramids
4,236 BC	Ancient Egyptian 365-day Calendar
2,300 BC	Maya Astronomers Study the Moon and Planets
2,296 BC	Chinese Astronomers Record Comet Sighting
1,800 BC	Babylonian 12 Lunar Month Calendar
733 BC	Chinese Astronomers Observe Solar Eclipse
550 BC	Pythagoras proposes Earth is a Sphere
434 BC	Anaxagoras proposes the Sun is a fiery Sphere
350 BC	Enter the Greek Scientists and Philosophers, Plato and Aristotle...

History of Astronomy

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Indigenous Astronomy



Seven Sisters Dreaming by Alma Nungarrayi Granites



Indigenous Astronomy

Australia's First Astronomers

- Australian Aboriginal cultures have passed down astronomical lore from generation to generation over more than 65,000 years.
- They've linked their stories and ceremonies intimately with the stars and planets.
- Some groups even used the motions of stars and planets for calendar purposes.



Oral Tradition



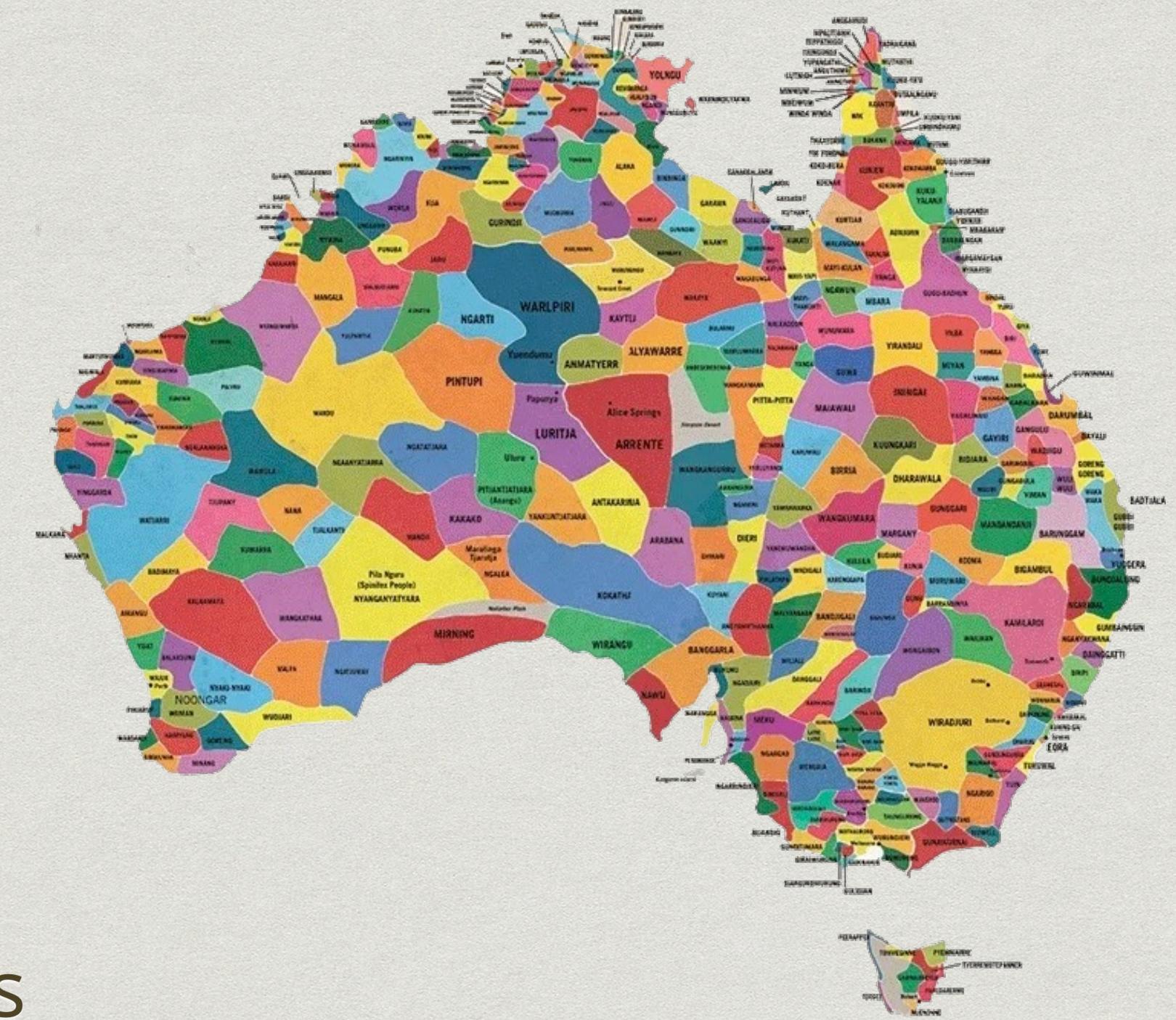
Song and Dance



Artwork

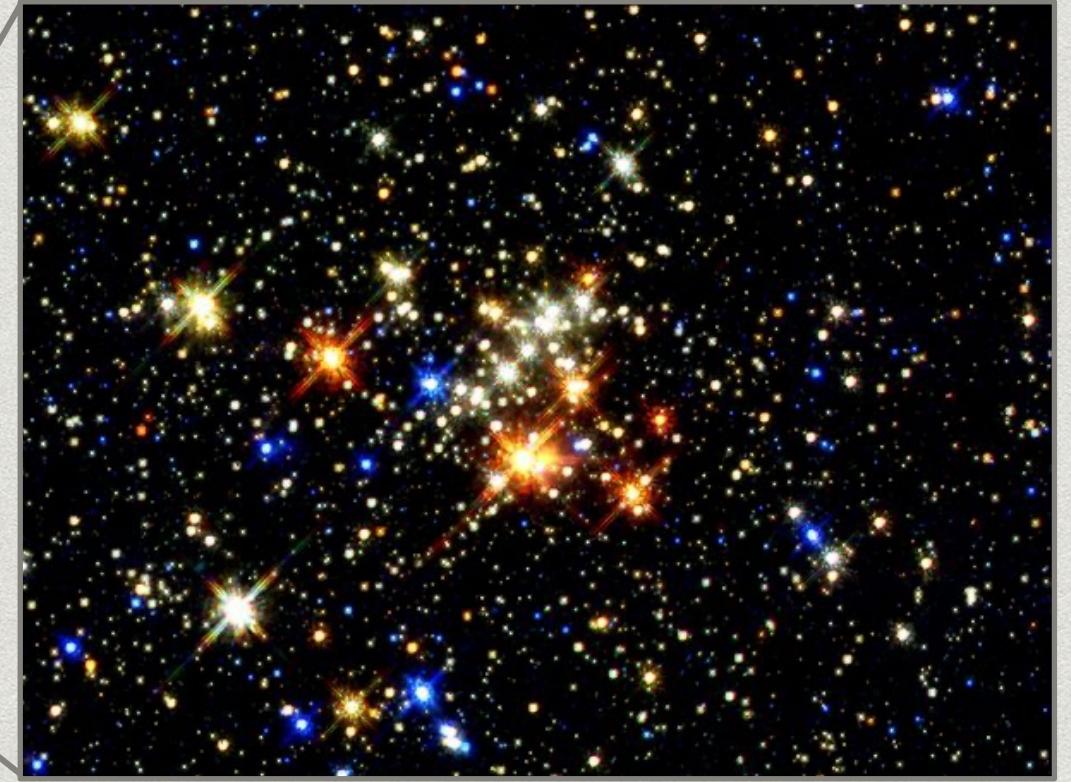
First Nations Map

- In Australia there are more than 250 Indigenous languages including around 800 dialects
- Each language is specific to a particular place and people
- Languages are living things that connect people to Country, culture and ancestors



Astronomy

Astronomy is the study of the sun, the moon, planets, stars, and space.



Today, we know the Stars are giant spheres of superhot gas made up mostly of hydrogen and helium.

The Stars

- To the Aboriginal people, the stars are the homes of ancestors, animals, plants, and spirits
- They serve as calendars, a law book, and inform many aspects of their daily life and culture
- Some groups observed the properties of stars - such as their brightness, colour, and position – noticing even the most subtle changes in these properties



Star in Southern Cross constellation now known by traditional Aboriginal name

15 Jan 2018

- Ginan, also known as Epsilon Crucis, is a single, orange-hued star in the southern constellation of Crux (The Southern Cross).
- Ginan is the fifth brightest star in Crux
- The name originates from the Wardaman people of the Northern Territory of Australia, and refers to a dilly bag - a "Bag of Songs and knowledge".



The Stars

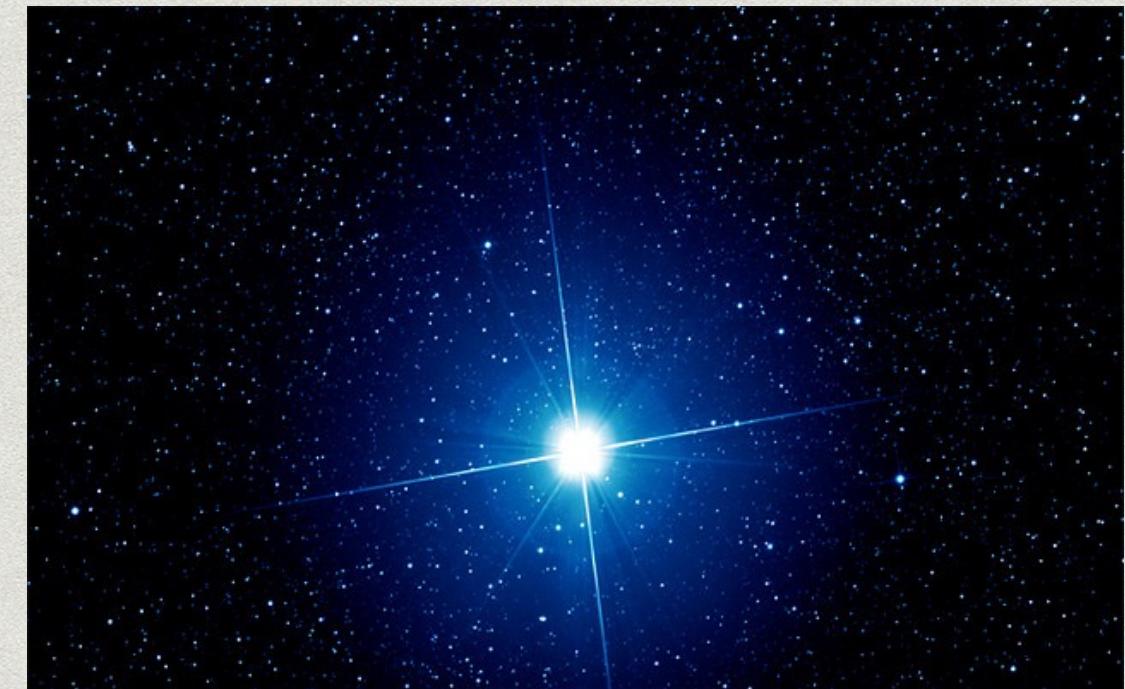
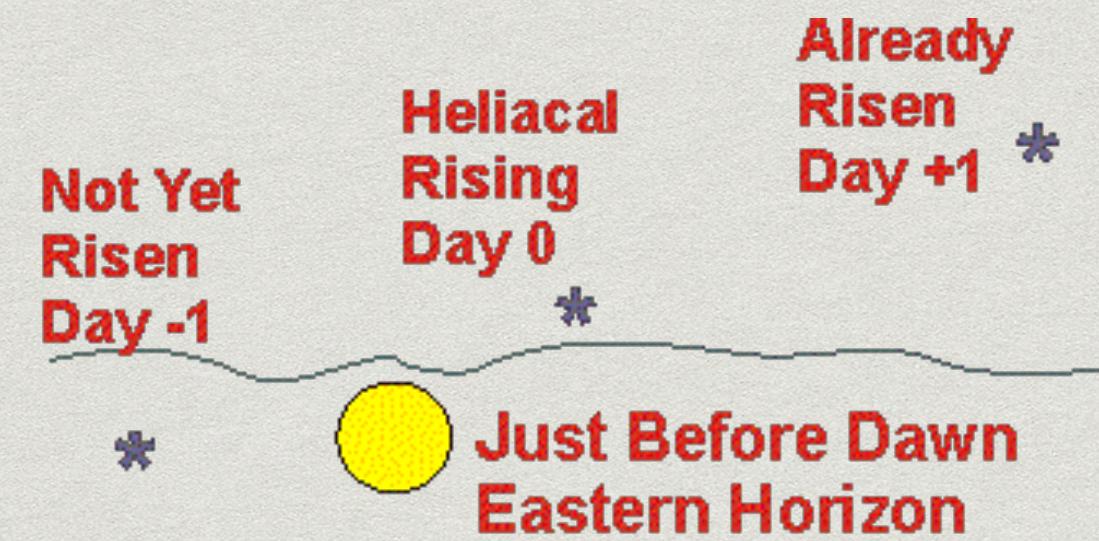
- Each community lived according to an annual cycle, which informed what they ate and hunted and where they travelled.
- By recognizing signals such as the movement of astronomical objects, they divided the year into seasons.
- The number of seasons differs among Aboriginal groups according to where they were based.



"Four Seasons" by Roseanne Ellis

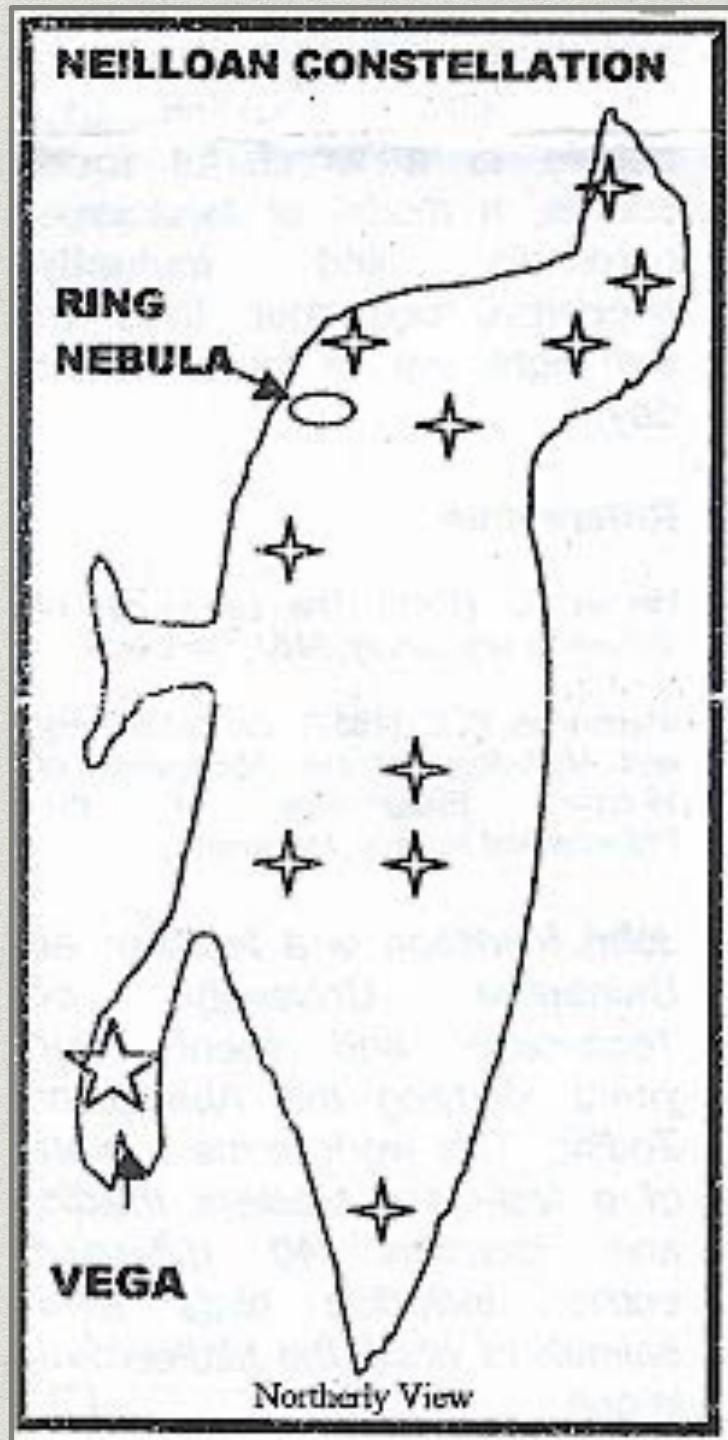
Helical Rising

- Heliacal means 'near the Sun', from Greek, Helios (Sun)
- The heliacal rising of a star occurs on the day of the year when the star can be seen just before the dawn
- On the day of helical rising, the star will be briefly visible before the Sun's light drown it out
- The next day, the star will be visible in the night sky for longer before dawn arrives



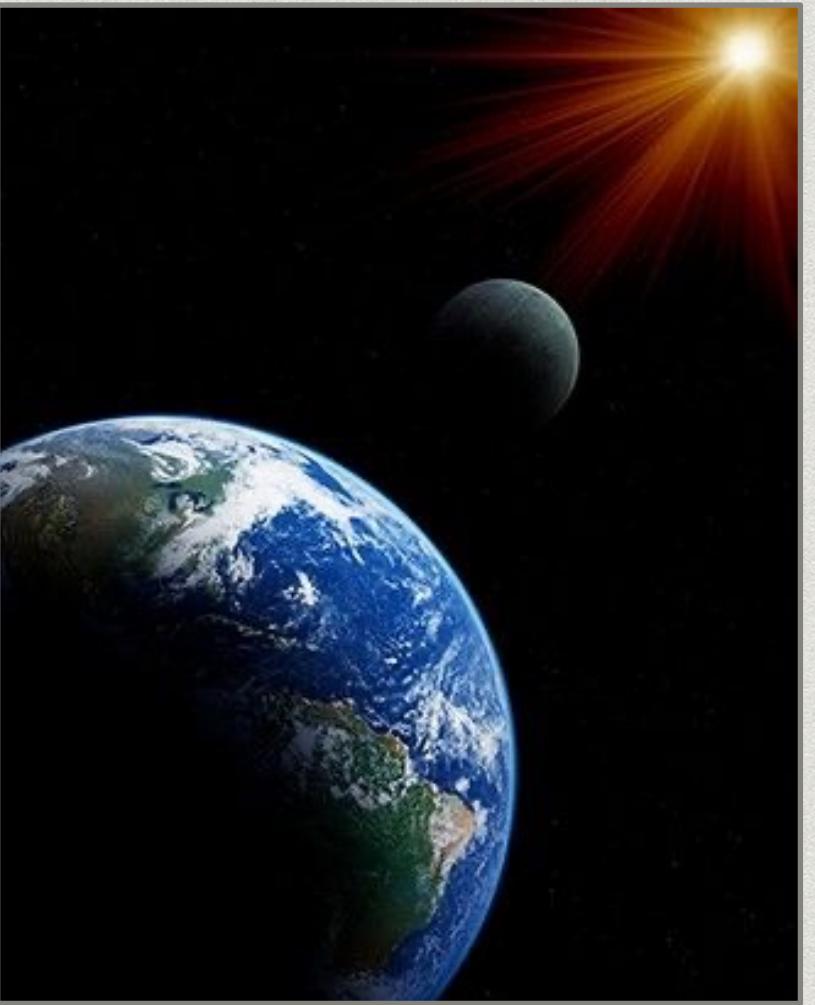
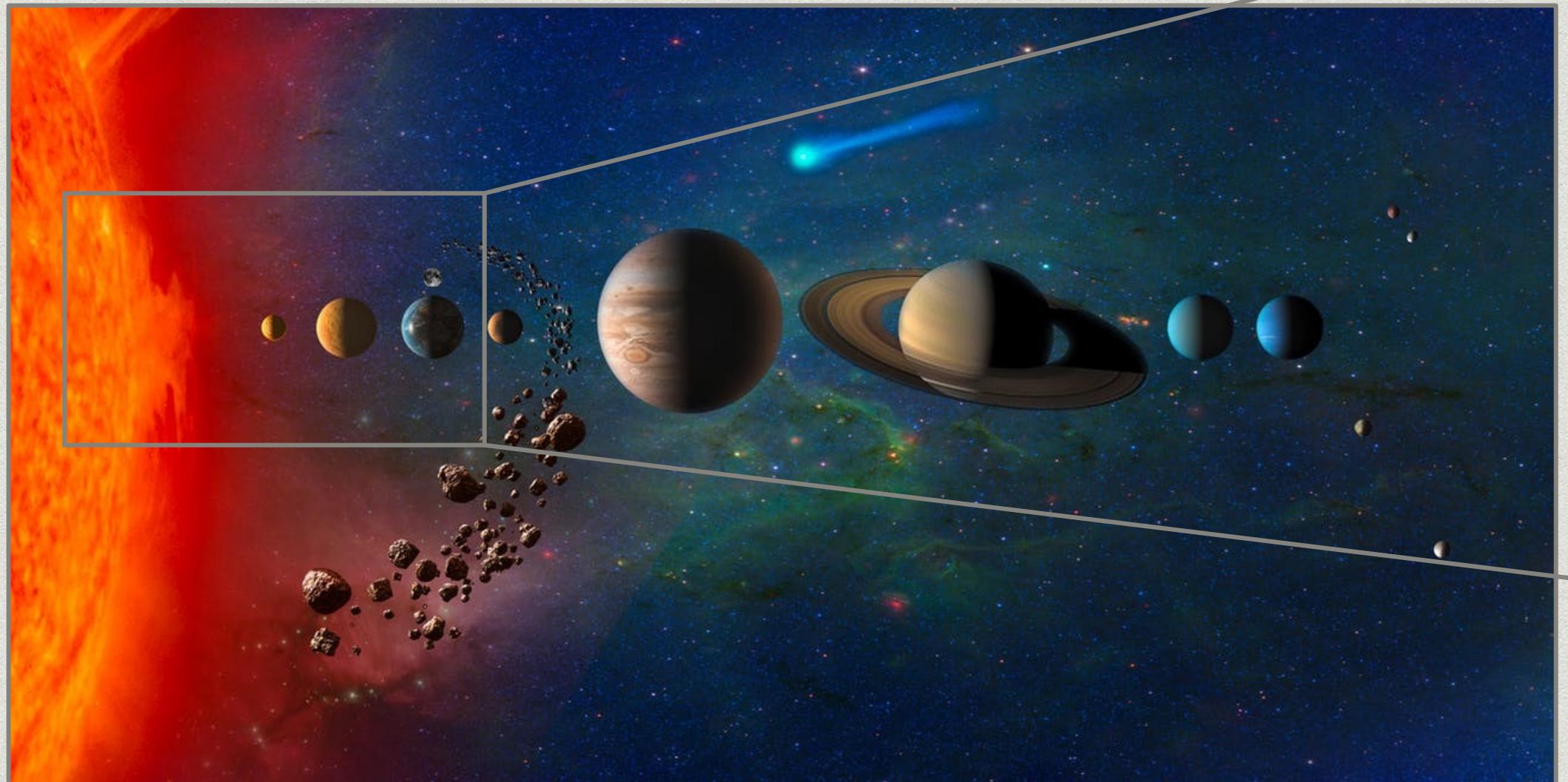
Helical Rising

- The heliacal rising of the malleefowl constellation (Lyra) in March signifies to the Boorong people of Victoria that the malleefowl are about to build their nests
- When Lyra disappears in October, the eggs are laid and are ready to be collected



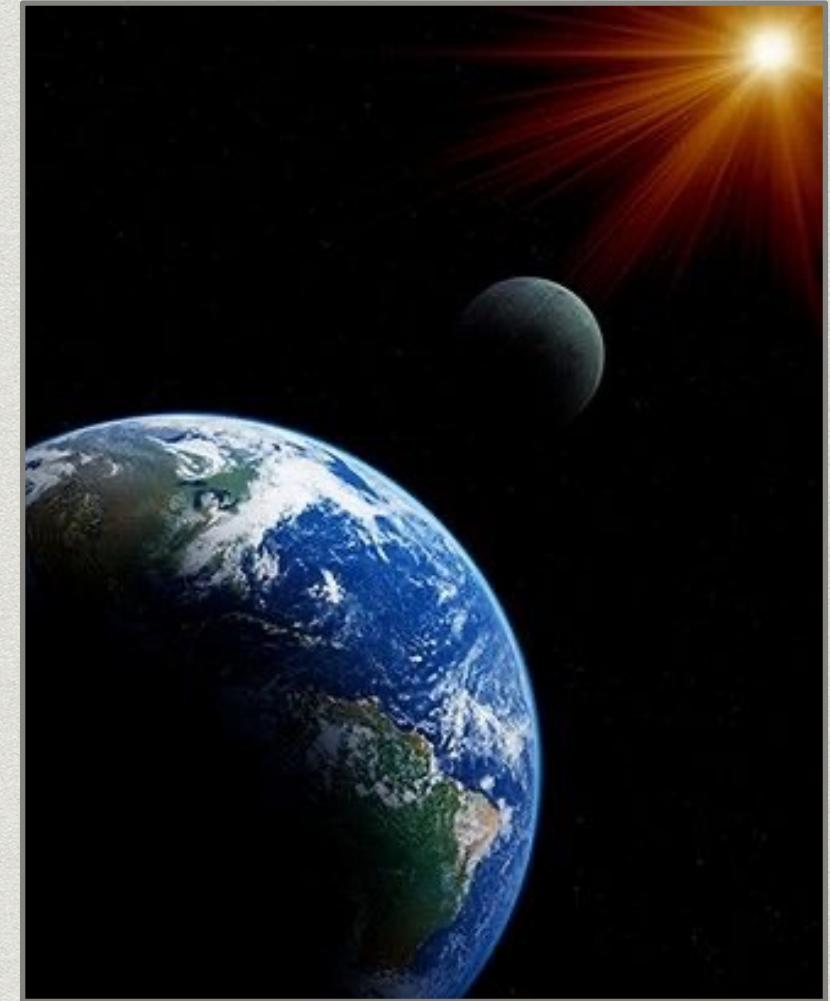
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The Sun, Moon and Planets

- The Sun, Moon and visible planets were known to the Aboriginal people
- They recorded and passed on information to successive generations through stories
- They distinguished planets from background stars



The Sun, Moon and Planets

The Yolngu people tell a story of how the Moon-man was a fat and lazy man who demanded that his wives and sons feed him. His wives attacked him with their axes, cutting chunks out of him. Finally he died, and remained dead for three days. But then he came back to life, grew fatter and round and the cycle continues forever.



Full



Waning



New



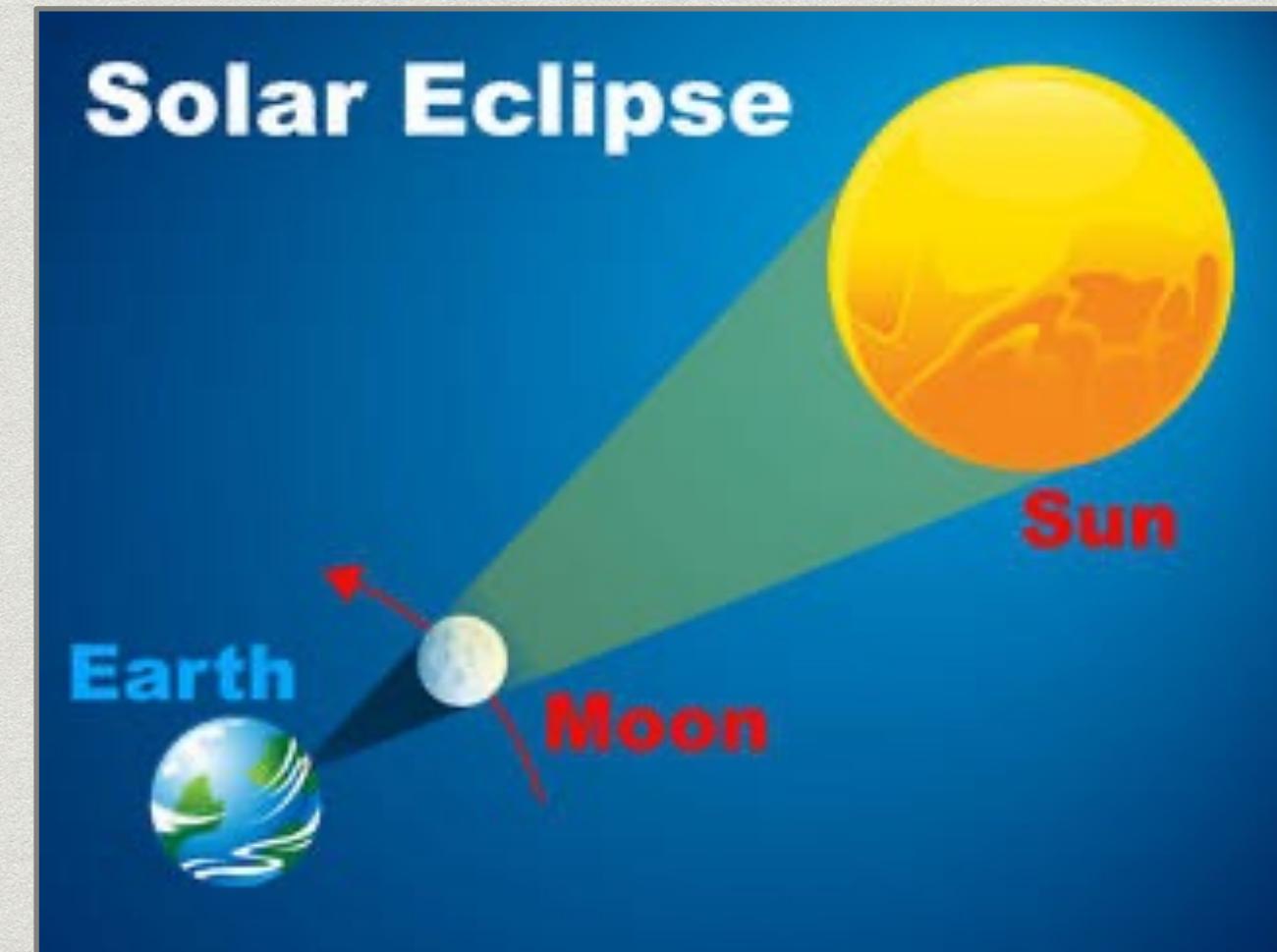
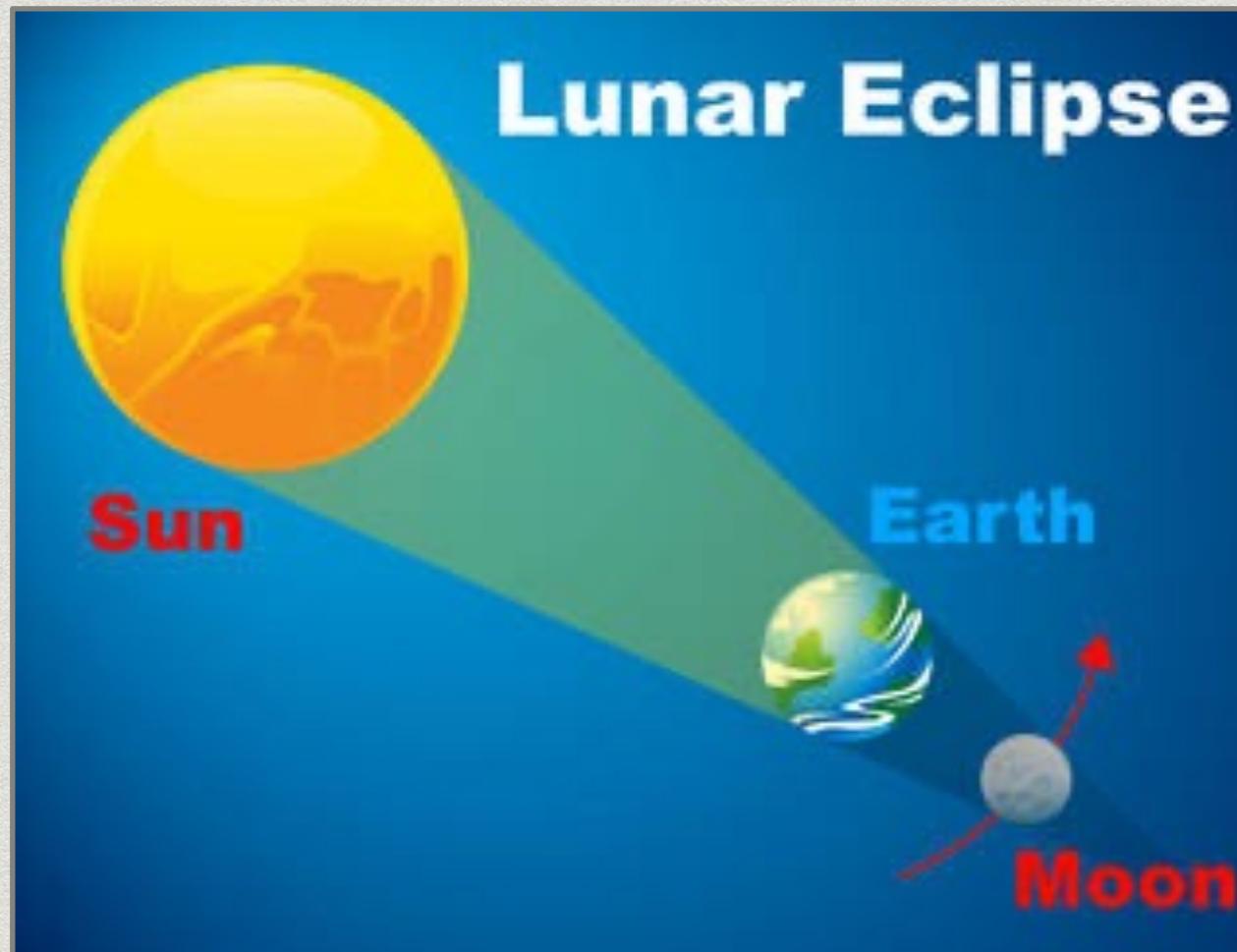
Waxing



Full

Eclipses

An eclipse takes place when one astronomical body such as a moon or planet moves into the shadow of another body. There are two types of eclipses on Earth: an eclipse of the moon and an eclipse of the sun.



Eclipses

- For thousands of years, some other cultures superstitiously feared that the Sun had died during a solar eclipse, yet the Aboriginal people knew that eclipses were caused by a conjunction of the Sun and Moon
- The Aboriginal people used stories to explain a solar eclipse as being the Sun-woman being hidden by the Moon-man as he kisses her
- As for a lunar eclipse, they say this is caused when the Moon-man is threatened by the Sun-woman who is pursuing him and perhaps catching up



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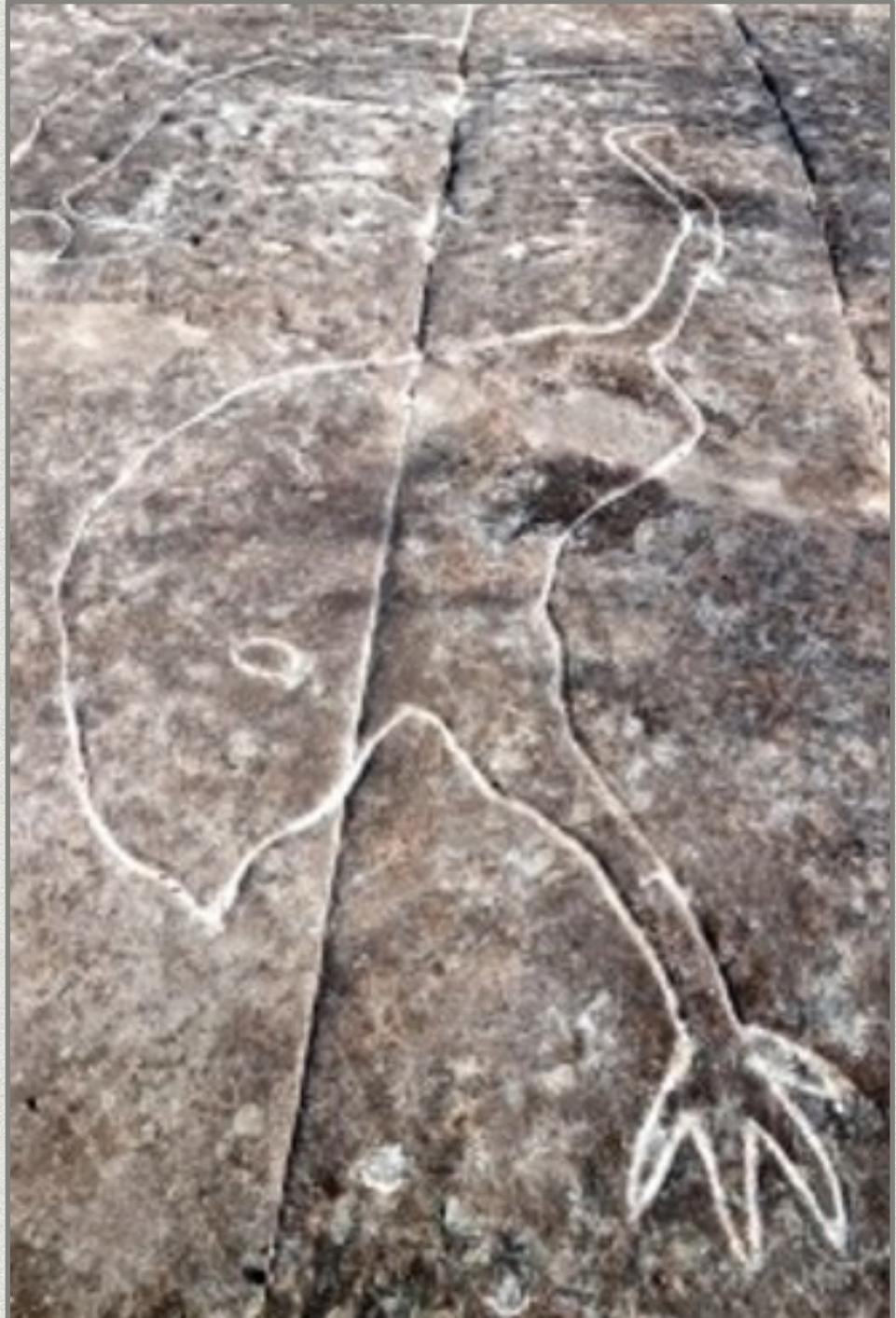
The Emu in the Sky

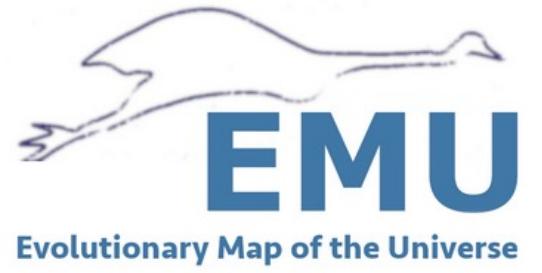
- Many Aboriginal groups have stories about the “Coalsack”
- These groups tell stories of a great emu whose head is the Coalsack, and whose neck, body, and legs are the dust lanes of the Milky Way
- However, it's not just stories in Aboriginal astronomy – it also contains a map to understanding, surviving and living in harmony in Australia



The Emu in the Sky

- Ku-ring-gai Chase National Park, is home to numerous rock engravings, showing people, animals, creator spirits, and astronomical objects
- Situated at the National Park is finely engraved emu, in a position never seen in a real-life emu, but one that matches exactly that of the Emu in the Sky





Evolutionary Map of the Universe is a new-generation radio survey conducted with the Australian SKA Pathfinder (ASKAP). EMU will survey the entire Southern sky extending as far North as +30 deg in declination.

Indigenous Science

Those who criticise the notion of 'Indigenous science' will argue that culture is irrelevant to science, citing arguments like 'The behaviour of atoms or galaxies is not based on culture!'

The rules of quantum theory or astrophysics may not 'care' about that, but how we come to learn about, understand, and apply those rules certainly is based in culture. Science and culture are inseparable.

Trek to the North Pole



Inughuit, or Arctic Highlander women, sewing clothing for Robert Peary's expedition to the North Pole.

Indigenous Astronomy

Aboriginal star stories are not just stories, they are lessons that educate us about the relationship between the sky and the land, as well as how the universe functions around us. This knowledge has existed for more than 65,000 years. Today, in modern Australia, we are working to learn more and revive the knowledge of Indigenous Australian astronomy. When we look at the sky in this new light, we can feel a greater appreciation for the knowledge of Indigenous Australia.

- Kirsten Banks (PhD Student and Wiradjuri woman)