



Reading the Indigenous night sky to interpret wildlife patterns

Like so much else that is being rediscovered about First Australians' culture, storylines and knowledge of the seasons – and behaviours of wildlife across the continent – the night sky is rich with vital information. As part of his remarkable research with the Australian Indigenous Astronomy Research Group, cultural astronomer Trevor Leaman has mapped out a treasure trove of celestial clusters and legends that describe land and sea creatures, and their seasonal behaviours, which have helped Indigenous people sustain effective hunting and gathering practices for millennia.

Milky Way, taken at Hyams Beach, New South Wales, Australia. Photo: Rachel Fitzhardinge.

UNLIKE how the Western world views the heavens, Aboriginal and Torres Strait Islander peoples do not separate the realms of Earth, Sea and Sky, but rather see them as aspects of a unified 'Cosmoscape'.

Their skyworld is every bit as real as here on Earth, complete with rivers and forests inhabited with fish, birds, animals, and ancestral beings.

Certain important stars and asterisms are seen as the skyworld counterpart of many terrestrial animals, and their annual appearance and movement through the night sky informed people of the seasonal migrations, lifecycles, abundance and food resource availability of the animals they represent.

Reflecting the many diverse bio-geographic regions and habitats across the continent, and the Dreamings connecting them to the people of that country, a single star or asterism can represent a different animal 'constellation' to each of the many language groups. There is, therefore, no single *Aboriginal Astronomy* – each of the 250 or more language groups has their own Dreamings associated with the land, sea and sky, but they all interconnect through the Songlines which criss-cross the land.

The following examples are only a handful of the many Dreamings linking the celestial cycles of the animal constellations in the sky with their terrestrial counterparts, and serve to demonstrate the keen-eyed observations of the natural world by the First Australians.

The Celestial Emu

Perhaps the best known of all the Aboriginal constellations is the Emu in the Sky, or Celestial Emu. The Celestial Emu is found in the dark dust lanes of the Milky Way between the Southern Cross (head), Scorpius-Sagittarius (body) and Ophiuchus-Aquila (feet).

This constellation is found right across the continent, but the best studied version of the Dreaming narrative associated with it comes from the Wiradjuri, Kamilaroi and Euahlayi peoples of central west New South Wales. The Emu's form can also be seen among the extensive rock art sites around the Sydney Basin.

The name for the Celestial Emu in Wiradjuri is *Gugurmin*, and in Kamilaroi/Euahlayi it is *Gawarrgay/Gawarghoo*.

The changing orientation of the Celestial Emu in the dusk sky just after sunset was linked to the breeding cycle of the terrestrial emu (*Dromaius novaehollandiae*). Its first appearance of the Celestial Emu in April-May signifies the start of the emu breeding season, when the females chase the males before mating.

When the Celestial Emu is horizontal in the sky in June, this is the time when terrestrial Emus are nesting and laying eggs. This is the best time to harvest emu eggs, but when doing so the Aboriginal people take only enough for their needs and leave a couple of eggs behind in each nest to ensure viability of the breeding population. When the Celestial Emu starts to dip head-down in July, this signifies that it is too late to harvest eggs as they now contain chicks ready to hatch.

Neilloan and Marpeankurrk

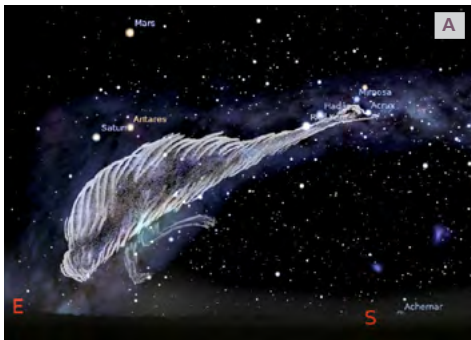
To the Wergaia people of northern Victoria, the star Vega, in our modern day constellation of Lyra, The Harp, is *Neilloan*, the Mallee Fowl (*Leipoa ocellata*). The star's first appearance in the east after sunset in



^ The Celestial Emu is one of the easiest of all the Aboriginal constellations to find and recognise. Look for the dark dust lanes of the Milky Way between the Southern Cross (the head of the emu, marked by the Coalsack Nebula) and Scorpius (the big bulge of the emu's body). His legs stretch further still across the sky, making it a very large constellation. Photo: BQ Octantis/Cloudy Nights.



^ The emu rock engraving at Elvina Track, Ku-ring-gai National Park, Sydney, is thought to be a representation of the Celestial Emu. Photo: Wikimedia Commons/ Barnaby Norris.



late winter-early spring coincides with the males preparing the nest for the breeding season.

Later, coinciding with Vega crossing the meridian – an imaginary line running north to south, marking the highest elevation any star will reach in the sky between rising and setting at sunset in September – and hence *Neilloan* reaching its highest elevation in the sky, the females start to lay eggs. The first chicks of the season start to hatch in November, coinciding with the last appearance of Vega in the north-western sky after sunset.

Also from Wergaia country is an important Dreaming associated with the star Arcturus, in the modern constellation of Boötes, The Herdsman.

The Dreaming tells of a time long ago when the people were suffering under a big drought. Marpeankurrk wandered away from camp to die in peace. While awaiting the inevitable, she noticed a trail of ants disappearing down a hole. She dug down to uncover an ants nest full of larvae (*Bitturr*). She started eating the *Bitturr* and noticed her strength returning. By showing other members of her family how to find more *Bitturr* she ensured their survival.

To commemorate her deed, she was placed in the sky on her passing to become the star we know as Arcturus, but to the Wergaia it was known as *Marpeankurrk*, 'Wise Woman Star'. Its dusk meridian crossing in August served as a reminder to her people of her deed, and tells them the time of year when *Bitturr* was available as a food source. The orange hue of Arcturus also mimics the colour of the species of ant from that particular region of Northern Victoria.

The Pleiades, or Seven Sisters

The asterism known as The Pleiades, or Seven Sisters, is linked to many important dreamings across Australia. It is a very young (in astronomical terms, about 115 million years old) open cluster of stars in the zodiacal constellation of Taurus, The Bull.

Along the east coast, the first predawn appearance, or heliacal rise, of the Pleiades in early June signifies the beginning of the northern migration of Humpback Whales (*Megaptera novaeangliae*) from their summer feeding grounds in Antarctica to their winter breeding grounds in Northern NSW and Southern Queensland, usually with Orca (*Orcinus orca*) following close behind.

The Acronychal setting (last appearance in the west just after sunrise) of the Pleiades in late October to early November coincides with the southerly migration back to Antarctica, with young calves in tow and Orca in pursuit.

In the central desert, the heliacal rise of the Pleiades signified the 'official' start of winter and the peak in the Dingo (*Canis lupus dingo*) breeding cycle. Dingoes were important to the desert Aboriginal people, both as a source of warmth against the cold winter nights, and as a source of food when other foods were scarce during droughts.

Seeing the Pleiades in the dawn sky told them it was time to look for Dingo pups. The Seven Sisters were also totemically-linked to many other plants, insects and animals through interrelated dreamings, such as bush tomatoes (*Kutjera* – *Solanum centrale*), ▶

^ The orientation of the Celestial Emu in the sky after sunset was used to inform Aboriginal people of the lifecycle of the terrestrial emu, and specifically when it was the best time to collect eggs, an important protein resource. The first appearance of the Celestial Emu in April–May (A) indicated that the emus were starting to pair up and mate. When it was horizontal in the sky in June (B), it indicated that the terrestrial emu now had eggs in the nest available to harvest. When the Celestial Emu started to dip head-down in July (C), it was an indication that it was now too late to harvest eggs as they now have chicks in them ready to hatch. Photo: Stellarium/ Robert Fuller.



^ To the Wergaia people of northern Victoria, the star Vega in the constellation of Lyra, the Harp, was Neilloan the Mallee Fowl. Its dusk meridian crossing in September coincided with the laying of eggs in the nest. Inset: A Mallee Fowl. Photo: Main image by John Moreison/Stellarium; Inset from Wikimedia Commons.

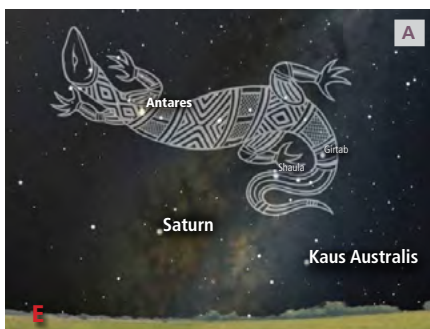
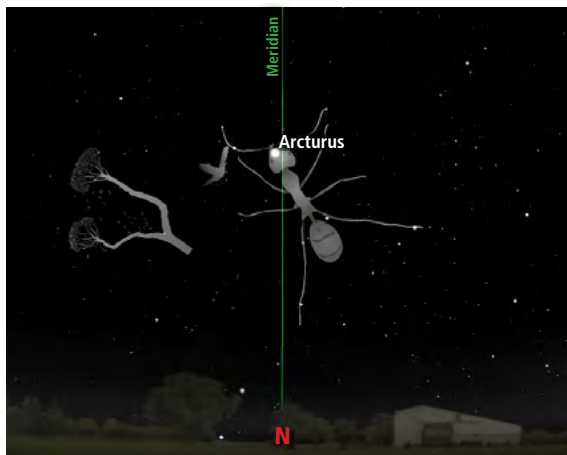
^ Another Dreaming from Wergaia country tells of how the dusk meridian crossing of the star Arcturus was used to inform the people that it was time to harvest ant larvae (*Bitturr*), an important high-protein food source. Photo: John Moreison/Stellarium.

honey ants (*Tjala – Camponotus inflatus*) and Thorny Devils (*Mingari – Moloch horridus*).

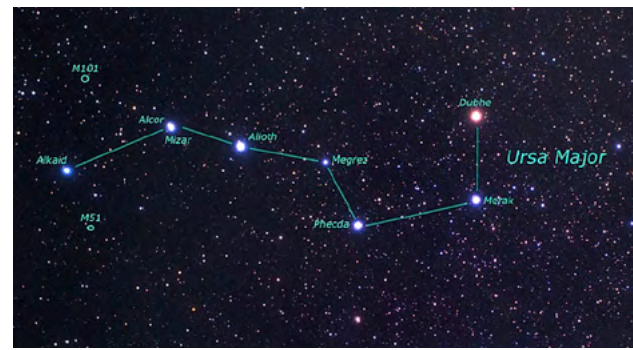
The Tree Goanna

According to the Wiradjuri and related language groups of central New South Wales, the bright orange star Antares and associated stars making up the modern constellation of Scorpius, The Scorpion, was *Guggaa*, the Tree Goanna. This constellation informed the Wiradjuri of the best time of year to hunt the tree Goanna, or Lace Monitor (*Varanus varius*).

When the *Guggaa* was first seen to rise in the dusk sky in July–August, and hence was about to ‘climb up’ his celestial tree, it was deemed the wrong time of year



^ The Tree goanna, or Lace Monitor was represented in the sky by the Wiradjuri constellation of *Guggaa*. His changing orientation at dusk was used as a food resource calendar to inform the people the best time of year to hunt it. When it was seen to rise (“climbing up the tree to feed”) in the Eastern sky at dusk in July–August (A) the Tree Goannas were considered too thin and lean to bother with, but when the *Guggaa* started to face downwards (“climbing down the tree after feeding”) in the October–November evening sky (B), this informed the people that the Tree Goannas had fattened up over Spring and were worth hunting. Photo: Stellarium/Scott “Sauce” Towney/Trevor Leaman.



^ In the Torres Strait, the stars of The Big Dipper form Beizam, The Shark. Photo: Brian Robinson/Summer Ash.

to hunt the goanna as it was still lean and thin from lack of food availability over winter. However, when it was seen to be facing downwards in the western sky at dusk in October–November, it informed the people that it had now climbed down from the trees after feasting on eggs and chicks from nesting birds, and was full of the nutritious fat that was both an important food source and valuable medicine.

Beizam the Shark

In the astronomical traditions of the Torres Strait, the shark constellation, *Beizam*, is made up of the stars in the asterism of The Big Dipper, which is part of the constellation of Ursa Major, The Big Bear. When these stars appear in the northern sky in the direction of New Guinea in July–August, Islanders know the mating season of the shark is starting.

This is when sharks are more plentiful close to shore, so the Islanders are extra wary and vigilant when wading into the shallow waters close to the shoreline. The appearance of *Beizam* also informs the Islanders that it is a good time to plant banana, sugar cane, and sweet potato.

Conclusion and further information

Cultural Astronomy and seasonal resources calendars are exciting areas of research that help to rediscover and preserve traditional knowledge systems.

Much of the work conducted by the Australian Indigenous Astronomy Research Group is done so with support and in collaboration with various First Australian communities.

It is our hope that our cohort of indigenous researchers will continue to grow and that the growing awareness, recognition and value of this knowledge empowers the communities that these stories belong to.

For further information, and to follow our current research please visit the website www.aboriginalastronomy.com.au ■

FURTHER READING ■ Fuller RS, Anderson MG, Norris RP, Trudgett M. 2014. The Emu Sky knowledge of the Kamilaroi and Euhlayi peoples. *Journal of Astronomical History and Heritage* 17(2):171–179. ■ Leaman TM, Hamacher DW, Carter MT. 2016. Aboriginal Astronomical traditions from Ooldea, South Australia, Part 2: Animals in the Ooldean sky. *Journal of Astronomical History and Heritage* 19(1):61–78. ■ Stanbridge WE. 1857. On the astronomy and mythology of the Aborigines of Victoria. *Proceedings of the Philosophical Institute of Victoria, Transactions* 2:137–140. ■ Tindale N.B. 1983. Celestial lore of some Australian Aboriginal tribes *Archaeoastronomy*, 12/13:258–379.

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