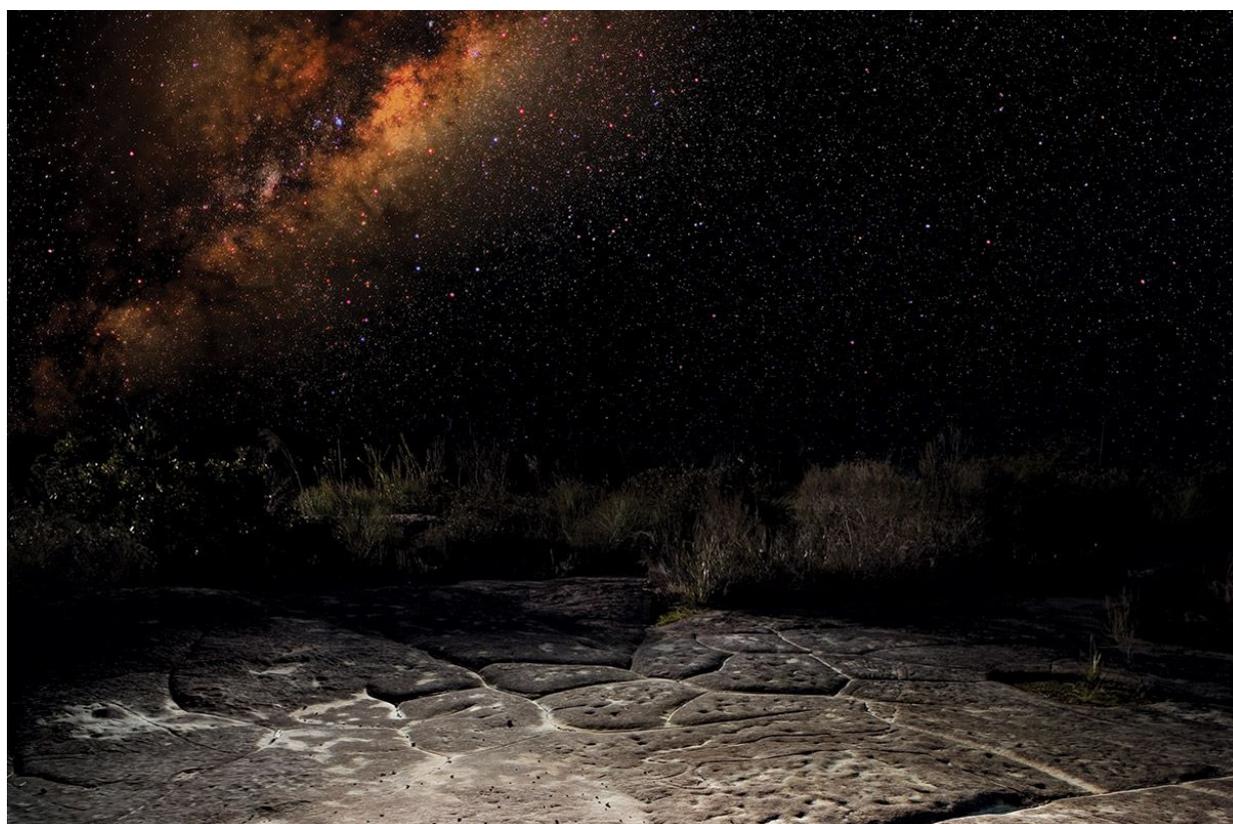


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# Were Aboriginal Australians the first astronomers?

The ability of Aboriginal Australian peoples to navigate by the night sky suggests they have been stargazing from before Stonehenge or the Pyramids



**What's in the stars?**

Barnaby Norris

By **Ray Norris**

On a good night, I can name about 20 stars. Bill Yidumduma Harney can name roughly 3000. I am originally from Hertfordshire, UK, and studied astronomy at university in Cambridge and Manchester. Bill grew up in a remote Aboriginal community in northern Australia, and learned his astronomy in the bush.

Bill and I have become good mates. For several years we appeared together in a stage show, *The First Astronomers*, which toured arts festivals in Australia. Bill can certainly tell a good story about the night sky. For thousands of years, he and his ancestors have built an impressive body of knowledge. It is knowledge that, without any written

language, has passed from generation to generation through rote learning.

The word “astronomy” implies a quest to understand the heavens: to measure heavenly bodies and use them for practical purposes such as navigation or timekeeping. Bill and other Indigenous Australians certainly do that today, but how long has astronomy been part of their cultures? The lack of written records means answers are hard to come by – but a growing body of evidence suggests it is a very long time indeed. Can they claim to have been the first astronomers?

Humans arrived in Australia at least 50,000 years ago. Unlike in Europe and Asia, however, there were no further major waves of immigration until the British invasion of 1788. Until that time, the Australian Aboriginal peoples were isolated from the rest of the world, making theirs the world’s oldest continuous cultures. Each of roughly 300 groups has a different language and cultural practices, united by threads such as a belief in the “Dreaming”, a time when creator spirits roamed the land.

When the British arrived in Australia, they noted that the indigenous population took a keen interest in astronomy. But the colonial snobbery of early anthropologists meant that they tended to underestimate Aboriginal culture and documented art and spirituality rather than intellectual achievements such as astronomy, navigation or numeracy. Others simply lacked the astronomical knowledge to interpret what they were being told.

One amateur anthropologist who wrote extensively about Aboriginal astronomy was Irish immigrant Daisy Bates. Bates lived in an Aboriginal community in South Australia from 1899 for much of her life. An orphan, she claimed to have aristocratic roots, and it seems her writings were heavily embellished, too. She said she had witnessed cannibalism, but the buried remains of a half-eaten child she wrote about turned out to be those of a cat.

Then there was engineer-turned-anthropologist Charles Mountford, who, in the second half of the 20th century, wrote two massive volumes about Aboriginal culture, including astronomy – the second of which had to be withdrawn from sale because of its identification of secret sacred sites.

## **Greek parallels**

Even now, some aspects of the study of Aboriginal astronomy are clouded by wishful thinking, new age ideas and other fruit-loopery. But a growing body of well-grounded research is also offering some startling insights.

One is the remarkable similarity between Aboriginal stories about stars and those of the Ancient Greeks. The constellation of Orion, the hunter of Greek mythology, is described as a hunter or a young man or group of young men in most Aboriginal cultures. In almost all cultures, the Pleiades star cluster – the seven sisters – is also depicted as a group of girls. Some cultures actually call them the “Seven Sisters”, even though the stars usually appear as no more than six to the naked eye. Some stories explain this discrepancy as a sister who died or was taken away. Just as in the Greek myths, Aboriginal stories depict Orion chasing the Pleiades.

It seems unlikely that these stories were imported to Australia from Europe post-1788: their breadth across Australia, and their many different versions, suggest they are very old. It seems to me most likely that the mythology dates back about 100,000 years, to



**Aboriginal astronomical culture is under threat**

Jarod Rawsthorne/Getty

when the ancestors of all humans were sharing stories around campfires in Africa.

Even within Australia, there are hints of this antiquity. The Euahlayi people of New South Wales depict the constellation Scorpius as a crocodile, which is odd considering there haven't been any crocodiles in New South Wales for at least 40,000 years. The Euahlayi language is remarkably similar to a language spoken by people in far northern Queensland, where crocodiles abound. The Euahlayi perhaps migrated from there, bringing their stories with them.

So Aboriginal Australians were probably telling stories about the sky long before Stonehenge or the Pyramids. But how long have they been doing astronomy – using those stories to understand the world?

It's something people like Bill Yidumduma Harney are certainly doing today. He is a senior elder of the Wardaman people, an Aboriginal community in the Northern Territory. Being an elder doesn't necessarily mean you're old; it means you've spent half your life meticulously committing stuff to memory. Bill not only learned a name – and a story – for virtually every star visible to the naked eye, but he also learned how the whole pattern rotates overhead during the night, and how it shifts during the year. He can describe, too, the ecliptic path through the sky of the five planets visible to the naked eye, and use that for navigation. “The planets come straight across like you and I doing walk, pad up and down, walking backwards, forwards, make a little track there, a pad... Pad is straight across country,” he says.

Again, the widespread distribution of such stories suggests they are very old – and they often reveal an intriguing perspective on the world. In Arnhem Land in northern Australia, for example, the Yolngu people say the two tides of the day are caused by the moon's passage through the oceans to the east and west as it rises and sets. A full or

new moon means more water flowing into or out of the moon, and larger tides. A crescent moon means a smaller tide.



**The Yolngu morning star ceremony relies on predictions of when Venus will appear**  
Ray Norris

That sounds odd to modern scientists. But bear in mind that, in the early 17th century, Galileo had formulated a model of tides as caused by Earth's rotation and motion around the sun – and his gave only one tide a day, not two. The Yolngu model, by contrast, is consistent with all the available data, explains why tidal range varies with the phase of the moon, and even has predictive power.

I call these models “ethnoscience”, something pretty much like modern science, but framed within the indigenous culture and the available knowledge. Another example is the Aboriginal explanation of why Venus is never seen high in the sky. According to Yolngu mythology, her sisters tied a rope to her to stop her flying too high and getting lost. In a dark sky you can see this rope – what I might call the zodiacal light.

In Yolngu mythology, Venus was also responsible for the Aboriginal peoples' most important navigational tool, the songline. She guided the first humans to Australia from the east, and then continued flying westward, singing a song about the land beneath her – a mountain here, a waterhole there, and over there an impenetrable swamp. Such songlines criss-cross Australia, forming oral maps that Aboriginal people have used for thousands of years to navigate across the outback's vast expanse (see “Guided by music”).

Alignments of stone rows found in eastern Australia also show that the indigenous peoples have long known the cardinal directions – north, south, east and west – to within a few degrees. This is an impressive feat without astronomical measurements. Even if you are an experienced navigator, you probably can't point west with an accuracy of better than 10 degrees. Just pointing at the setting sun won't help – it sets

anywhere from north-west to south-west depending on latitude and season.

A stone ring called Wurdi Youang in Victoria shows how they may have achieved this accuracy. It is sometimes called an “Aboriginal Stonehenge” for the way its stones seem to have been aligned around the sun’s position. Looking through the gaps between the largest three stones and outlying stones indicates the setting sun’s position at midsummer, midwinter and the equinoxes. These same directions are also built into the stone ring itself, which is not so much a circle as a rounded kite-shape.

Wurdi Youang exemplifies many of the frustrations of studying Aboriginal astronomy. We know it was built by the Wathaurong people, but we don’t know when – it could be hundreds or perhaps thousands of years ago. There are no written records, and the modern Wathaurong don’t know how the stone ring was used, because their culture was largely destroyed following the British invasion.

In 1803, William Buckley, a convict from Macclesfield in the UK, escaped his captors and lived with the Wathaurong for about 30 years. He subsequently told of his adventures, and mentioned their interest in astronomy – but not Wurdi Youang. Perhaps he was safeguarding what his Wathaurong friends may have regarded as a sacred secret.

Aboriginal astronomical culture, like all Aboriginal culture, is now under greater threat than ever. Few young people are willing to adopt the traditional lifestyle, and elders are passing away, taking their knowledge with them. It’s impossible to answer conclusively the question Bill and I posed in our stage show, whether Aboriginal Australians were the first astronomers. But the continuity of the Aboriginal presence in Australia, and the evidence of astronomical observations stretching back perhaps millennia make a strong case. Either way, it is a legacy too precious to lose.

## Guided by music

Wardaman elder Bill Yidumduma Harney isn't entirely sure what year he was born. But he remembers how, as a small boy in the 1930s, some "whitefellas" came to their camp near Katherine in the Northern Territory, asking for an Aboriginal guide to take them across to Western Australia.

Bill recalls walking alongside his grandfather, who sang a songline, using the instructions in the words to navigate for hundreds of kilometres from the Northern Territory to Western Australia.

The strangers cleared a track as they went – a track that has become the Victoria Highway. Many main roads in Australia follow ancient Aboriginal songlines, perhaps most famously the Great Western Highway from Sydney to the Blue Mountains. This follows a Darug songline, and is marked by rock engravings to either side.

A little further north, the Euahlayi people even reflect songlines in the sky, using the stars to help them remember the words. "You can see these stories in the sky... and you can see where these waterholes are... up there... you follow that trail. You make sure you know which way the waterholes are... You get taught all those things," says Euahlayi lawman Ghillar Michael Anderson.

For Aboriginal peoples, the sky has always been as much part of their world as the ground.

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**Ray Norris** surveys the southern skies from the Australia Telescope National Facility

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