

ASTRONOMY OF THE FIRST PEOPLE OF AUSTRALIA



Milky Way. Private Collection.

Note: If you have any suggestions or comments please send them to Dr Ragbir Bhathal (r.bhathal@uws.edu.au) who will make the necessary changes or additions or deletions.

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FROM THE ARCHIVES AND THE INDIGENOUS COMMUNITY



Milky Way. Private Collection

Like the other ancient peoples of the world the Aboriginal and Torres Strait Islander people have constructed oral narratives of the celestial bodies that appear in the Australian night sky. There are many narratives about the celestial bodies. Some of the celestial bodies have many interpretations. Thus, the same celestial body can have different interpretations in different parts of Australia. Because of the different language groups the celestial bodies also have different names across Australia.

Aboriginal astronomy is social-cultural astronomy and unlike modern astronomy it is not appropriate for it to be tested by the same methods of modern science or try to infer scientific interpretations from the narratives. It is a belief system and it is classified under other knowledge traditions.

As Justice von Doussa wrote in his judgement of the Hindmarsh Island Affair, “Spiritual beliefs do not lend themselves to proof in strictly formal terms. Their acceptance by true believers necessarily involves a leap of faith. To use lack of logic as a test to discredit those asserting a particular spiritual belief is to pose a test that is both unhelpful and inappropriate”.

The information given here is available on open access to members of the public in the National Library of Australia, State and University libraries. The knowledge belongs to the First People of Australia and is common knowledge to them. Some knowledge is secret knowledge and we will not know the content of it except by those who are entitled to know it. The content that appears here has been vetted by a number of members of the First People of Australia. Teachers are welcome to use it in the preparation for their teaching lessons for the new Australian Curriculum. Ragbir Bhathal, Les Vozzo and Terry Mason are researching and working on curriculum material on Aboriginal studies, including Aboriginal astronomy which has relevance to the new Australian Curriculum which is being implemented in schools throughout Australia.

Students who wish to do postgraduate studies in Aboriginal Astronomy & Education should contact Dr Ragbir Bhathal (r.bhathal@uws.edu.au). Their application will be discussed by Dr Ragbir Bhathal, Dr Les Vozzo and Terry Mason.

The Badanami Centre for Indigenous Education is the Aboriginal and Torres Strait Islander support centre at the University of Western Sydney. UWS offers two block-mode degrees for Aboriginal and Torres Strait Islander students: Bachelor of Education (Primary) and Bachelor of Community and Social Development. The Alternative Entry Program is a pathway for Aboriginal and Torres Strait Islander people who wish to study at UWS. The Alternative Entry Program is a two-day test that is offered in June, November and January of each year. For more information please phone 1300 897 669.

We welcome information and corrections to the information that is presented here. Please send your email to r.bhathal@uws.edu.au. Terry Mason (Badanami Centre for Indigenous Education), Les Vozzo (School of Education), and Ragbir Bhathal (School of Computing, Engineering & Mathematics) acknowledge the use of the knowledge of the Aboriginal Elders and the Aboriginal and Torres Strait Islander communities for educational purposes. We also thank Aunty Jean South (Badanami Centre’s Elder) and Uncle Darryl Wright (CEO, Tharawal Aboriginal Corporation and UWS Elder) for their support.

AUSTRALIA'S FIRST SOCIAL CULTURAL ASTRONOMER

Yarrum Parpur Tarneen is Australia's first social cultural astronomer. According to Dawson¹, she was the daughter of Weerat Kuyuut, the chief of the Moporr tribe in Victoria. She and her husband (Wombeet Tuulawarn) informed her people and visiting scholars, surveyors and government officials about the night sky over Victoria. They had names for the various celestial bodies and stories associated with them.

For example, according to Dawson¹, they informed him that the 'Sun is called *tring* and is of feminine gender, the Moon is called *meehearong kuurtaruung* and is masculine, and the coal sack (the dark patch near the Southern Cross) is called *torong*, a fabulous animal, said to live in waterholes and lakes, known by the name of bunyip'. The Aborigines used the stars for travelling at night. According to Dawson¹, 'Hydra is of great service to the Aborigines in their nightly journeys, enabling them to judge the time of the night and the course to be taken in travelling'. It is common knowledge that the Aborigines used songlines and the heavens on their journeys across the continent.

[1. Dawson, J. 1881. Australian Aborigines. George Robertson. Melbourne.]

ORIGIN OF THE UNIVERSE

Anthropologist, W.H. Stanner¹ probably gives the best explanation of the origin of the universe from an Aboriginal perspective. According to him:

"The Australian Aborigines' outlook on the universe and man is shaped by a remarkable conception, which Spencer and Gillen^{2,3} immortalised as 'the dreamtime' or *Alcheringa* of the Arunta or Aranda tribe ... Some anthropologists have called it the Eternal Dream Time. I prefer to call it what many Aborigines call it in English: The Dreaming or just, Dreaming. A central meaning of The Dreaming is that of a sacred, heroic time long ago when man and nature came to be as they are; but neither 'time' nor 'history' as we understand them is involved in this meaning ... One cannot 'fix' the Dreaming in time: it was, and is, everywhen". The translation of the meaning of 'Alcheringa' into English does not do justice to its real and inner meaning for Aboriginal and Torres Strait Islander people.

Wandjuk Marika, the well known artist and former Chairman of the Aboriginal Arts Board calls it the Dreamtime rather than the Dreaming. He notes that for the Aboriginal people 'their cultural self is inextricably bound up with their stories and legends, in which the past becomes present, and the Dreamtime exists once again'. He also notes that, '**Today we want to stand by ourselves, live on our land in accordance with our own beliefs and traditional ways, determine our own future**'⁴.

To Silas Roberts, the first Chairman of the Northern Land Council, '**Aboriginals have a special connection with everything that is natural. Aboriginals see themselves as part of nature. We see all things natural as part of us.** All things on Earth we see as part human. This is told through the ideas of dreaming. By dreaming we mean the belief that long ago these creatures started human society'⁵. The observer and the observed are the same.

Note: Stanner gave the 1968 ABC's Boyer Lectures in which he told the wider Australian community about the 'great Australian silence', the facts about Aboriginal dispossession. It is a book that should be read by all Australian university students, academics and members of the public.

[1. W. E. H. Stanner. 1979. White man got no dreaming. Essays 1938-1973. Australian National University Press. Canberra; 2. Spencer, B. and Gillen, F. J. 1899. The native tribes of central Australia. Macmillan. London; 3. Spencer, B. and Gillen, F. J. 1966. The Arunta: A study of stone age people. Anthropological Publications. Oosterhout. The Netherlands; 4. K.L. Parker, 1978. From Australian Legendary Tales, with an introduction by Andrew Land and Wandjuk Marika. The Bodley Head in Australia, Sydney; 5. Silas Roberts quoted in B. Neidjie, S. Davis, and A. Fox. 1985. Kakadu Man: Bill Neidjie. p. 13]

THE WANDJINA'S AND CREATION



The Wandjina figures, Kimberley. J. Nylands. Private Collection.

In the Kimberley region in north-western Australia the Wandjina figures that adorn the caves are responsible for the creation of the universe, the stars, the people, the fauna and flora^{1,2}. The Wandjina figures were discovered in 1838 by George Grey³ who had travelled by horseback into the Kimberley with the hope of discovering new pastoral country. After completing their creation activities they lay down in the caves and disappeared into the rock face, leaving their images on the walls. Their most remarkable feature is the halo around the head and no mouth. Elkin, the noted anthropologist and later observers provided the meaning of these figures^{4,5,6}.

There many are other stories told by the Aboriginal people across Australia.

[1. Love, J. R. B. 1917. Notes on the Wororra Tribe of North-Western Australia. Transactions of the Royal Society of South Australia. 41, 21 ; 2. Love, J. R. B. 1930. Rock paintings of the Wororra and their mythological interpretation. Journal of the Royal Society of Western Australia. 16, 1; 3. Grey, G. 1841. Journal of two expeditions in north-west Australia. London; 4. Elkin, A. P. 1930. Rock paintings of north-west Australia. Oceania. 1, 3; 5. Capell, A. 1972. Cave painting myths, North Kimberley. Oceania Monograph; Cowan, J. G. 1994. Myths of the dreaming: Interpreting Aboriginal legends. Prism Press, Bridport.]

THE SUN



The Sun. Private Collection

According to the Wotjobaluk people of northern Victoria¹, Knowee, the Sun was a woman and like everyone else on Earth she had to use a torch made of bark to see where she was going. One day she had gone away to search for food for her young son who was sleeping. However, in her search for food she lost her way. Not knowing where she had left her son she ascended into the sky with her great torch. Ever since then she has been wandering in the sky looking for her son. The torch she carries became the Sun.

There are other stories about how the Sun came into being according to the Aboriginal people. Kathleen Langloh Parker in her book Australian Legendary Tales² published in 1896 tells us this story.

'For a long time there was no Sun, only a Moon and stars. One day Dinewan the emu and Brolga the native companion were on a large plain near the Murrumbidgee. There they were quarrelling and fighting. Brolga, in her rage, rushed to the nest of Dinewan and seized from it one of the huge eggs, which she threw with all her force up to the sky. There it broke on a heap of firewood, which burst into flame as the yellow yolk spilt all over it, which flame lit up the world below'. Thus, the Sun was born. From that time onwards, she says the good spirit who lived in the sky made a fire each day. 'They then told Goo-goor-gaga that, as the morning star faded and the day dawned, he was every morning to laugh his loudest, that his laughter might awaken all sleepers before sunrise'.

[1. Massola, A. 1968. Bunjil's cave: Myths, legends and superstitions of the Aborigines of south east Australia. Landsdowne Press; 2. Parker, K. L. 1896. Australian Legendary Tales. London. David Nutt.]

THE MOON



Gurgurr – the Moon man. Australia Post.

The Moon is considered a man in most Aboriginal communities but there are exceptions where the Moon is seen as a woman. It is associated with fertility, death and initiation ceremonies.

According to the artist Yirawala¹ the Moon man and his dog were responsible for the formation of the Liverpool River. It took place during the Dreamtime. The Moon man (Gurgurr) and his dog Mulutji had gone far into the inland and became very thirsty. The dog sniffed water and began digging the ground. Gurgurr assisted his dog and soon the trickle of water became a flood. They could hardly stay afloat in the water and were subsequently drowned. When they died they were transported to the Moon and now look down on humanity from up above. They are depicted on an Australia Post stamp.

According to Charles Mountford² the Aboriginal people of Groote Eylandt and Yirrkalla in Arnhem Land have an explanation of the waxing and waning of the Moon. They believe that when you have a full Moon it is because at high tide the sea water runs into the Moon and at low tide the sea water runs out of the Moon. The Moon then has a crescent shape. However, there is no scientific evidence that they have actually seen the sea water rushing up or coming out of the Moon.

[1. Holms, Sandra Le Brun. 1972. Yirawala: Artist and man. Jacaranda Press. Milton. 2. Mountford, C. P. 1956. Art, myth and symbolism. Records of the American-Australian Scientific Expedition. Arnhem Land. Vol. 1. Melbourne University Press.]

THE MORNING STAR AND OTHERS

Venus, Mars, Jupiter and Saturn can be seen with the naked eye. The ancient peoples of the world made stories about them. So it is not surprising that the Aboriginal people also had stories associated with these planets. Each language group had their own names for the planets. Here are

some Aboriginal names as provided by members of the Aboriginal community. Some of the names are shown in the table below.

Mars	Waiyunggari	Murray River
Jupiter	Ginabonbearp	Victoria
Saturn	Irukulpinja	Western Desert
Venus	Barnumbir	Arnhem Land
Venus	Chargee-gnowee	Victoria
Venus	Iruwanja	Western Desert



Banumbir. Buku-Larrnggay Mulka Centre

The flight of the Morning Star. The bag in which the Morning Star (Barnumbir) is held by two spirit women is shown in the bottom of the painting. The blossoms at the end of each branch are the localities visited by the Morning Star to convey messages from the dead.

Venus is the most conspicuous planet. Stories about Venus, the Morning Star which is known as Barnumbir are well known and common knowledge to the Aboriginal people. To the Aborigines in north-eastern Arnhem Land, Barnumbir is associated with death. Charles Mountford, an ethnologist from South Australia who led the American-Australian Scientific Expedition to Arnhem Land recorded this story about Barnumbir^{1,2}. According to the Aboriginal people, Barnumbir is held on a long string held by two old women on the Island of the Dead (known as Purelko in Yirrkalla and Djiraia in Millingimbi). Just before dawn Banumbir is let out of the bag so that the star can wake up the people and give them messages from the dead. At dawn the star is pulled back to the shore and kept in a bag during the day. The process is repeated again next morning. The Aboriginal people in north-eastern Arnhem Land perform morning star ceremonies to ensure that the deceased travels safely to the Land of the Dead. In the performance of the ceremony the Aborigines use a large pole decorated with feathered strings and a ball or bunches of sea gull feathers³. The ball represents the Morning Star. The Australian Museum in Sydney has several examples of the morning star poles in their collections.

[1. Mountford, C. P. 1956. Art, myth and symbolism. Vol 1. Records of the American-Australian Scientific Expedition to Arnhem Land. Melbourne University Press; 2. Haynes, R., Haynes, R., Malin, D & McGee, R. 1996. Explorers of the Southern Sky. Cambridge University Press; 3. Berndt, R. M. Berndt, C. H. with Stanton, J. E. 1998. Aboriginal Australian Art. New Holland. Sydney.]

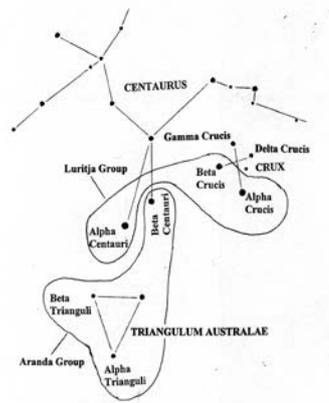
SEASONS, SEASONAL SUPPLY OF FOOD AND FAMILY RELATIONSHIPS

The Aboriginal people not only observed but also noted the movements of the stars and correlated these to the seasons and the seasonal supply of food.

The Aborigines of central Australia were able to differentiate between the nightly movement of the stars from east to west and also the gradual annual shift of the constellations in the same direction.

According to Charles Mountford¹, the Aborigines of central Australia have a seasonal sky map, viz: the winter sky consisting of Scorpio, Argo, Centaurus and the adjacent stars belonging to the *nananduraka* group and the summer sky consisting of Orion, the Pleiades and Eridanus belong to the *tanamildjan*.

Mountford tells us that when the Aborigines in Arnhem Land saw the red giant star Arcturus in the sky they knew that it was time to harvest the spike rush or *rakia*,^{2,3}. However, to the Boorong Aborigines of Victoria Arcturus represented the spirit of *Marpeankurrk* who showed them where to find the pupa of the wood ant or the termite while Vega which represents the spirit of the Mallee hen shows them where to find its eggs^{2,3,4,5}.



Aboriginal family relationships

Family relationships and marriage classes invariably found their place in the stars. According to Maegraith^{6,7}, amongst the Aranda and Luritja peoples the stars illustrated the marriage traditions in their societies. Thus, the two bright stars of the Southern Cross (Alpha Crucis and Beta Crucis) are the parents of the Pointer, Alpha Centauri. Alpha and Beta Trianguli are the parents of Beta Centauri.

The Aboriginal names provided by the Aboriginal community for some of the stars are shown in the table below.

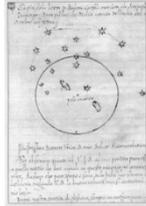
Achernar	Angnura	Groote Eylandt
Aldebaran	Karambal	Clarence River, NSW
Antares	Djuuit	Boorong, Victoria
Arcturus	Guembila	Weilwun, NSW
Arcturus	Marpeankurrk	Boorong, Victoria
Canopus	Dromerdene	Tasmania
Canopus	War	Boorong, Victoria
Sirius	Warepil	Boorong, Victoria

[1. Mountford, C.P. 1976. *Nomads of the Australian desert*. Rigby; 2. Mountford, C. P. 1956. *Art, Myth and Symbolism*. Vol 1 of *Records of the American-Australian Scientific Expedition to Arnhem Land*. Melbourne University Press; 3. Haynes, R., Haynes, R., Malin, D & McGee, R. 1996. *Explorers of the Southern Sky*. Cambridge University Press; 4. Stanbridge, W. 1861. Some particulars of the general characteristics, astronomy and mythology of the tribes in central part of Victoria. *Transactions of the Ethnological Society of London*. 1 (22); 5. Bhathal, R. & White, G. 1991. *Under the Southern Cross*. Kangaroo Press. Kenthurst. 6. Maegraith, B. G. 1932. The astronomy of the Aranda and Luritja tribes. *Transactions and Proceedings of the Royal Society of South Australia*. 56/1. 19-26. Johnson, D. 1998. *Night skies of Aboriginal Australia: A noctuary*. Oceania Monograph 47. University of Sydney.]

MIRRABOOKA - THE SOUTHERN CROSS



Southern Cross on an old star map.



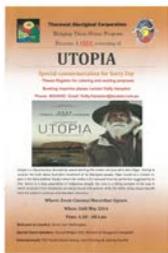
Andrea Corsali's drawing of the Southern Cross. SLNSW.

The Southern Cross is one of the most famous constellations in the southern hemisphere. It appears in one form or another on the national flags of Australia, New Zealand, Western Samoa and New Guinea. It was first observed by European explorers and adventurers in the 16th century. In fact, Andrea Corsali¹ a Florentine traveler who sailed with a Portuguese expedition to Goa in India in 1515, described a distinctive constellation of stars as a cross. For him it had a resonance with his Christian culture – the cross on which Jesus Christ died for his fellow human beings. It was variously named on maps as ‘cross’, ‘crosiers’, ‘crucero’ or ‘cruz’.

In her book *Stradbroke Dreamtime*, the well known Aboriginal poet and Aboriginal rights campaigner Oodgeroo Noonuccal (Kath Walker)² gives us an account of how the Southern Cross came into being. It is based on the stories she heard when she was growing up with her Aboriginal family on Stradbroke Island off the coast of Queensland. Biame, the Good Spirit was extremely busy keeping an eye on the Aboriginal people but found he could not watch them all the time. He decided that he needed the assistance of someone to help him in his guardianship of his people. He chose a man named Mirrabooka who was not only loved by everyone but also looked after the welfare of his people. So, according to Noonuccal, ‘Biame gave him a spirit form and placed him in the sky among the stars, and promised him eternal life. Biame gave Mirrabooka lights for his hands and feet and stretched him across the sky, so that he could watch for ever over the tribes he loved. And the tribes could look up to him from the Earth and see the stars which were Mirrabooka’s eyes gazing down on them’. However, she says when the ‘white invaders came from across the sea and stole the tribal lands, they did not know that this group of stars across the southern sky was Mirrabooka, and they renamed them. They called Mirrabooka by the name of the Southern Cross’. They not only took their lands but also stole their stars. So it came to pass that the invaders who came to take over Australia in

the names of their Kings and Queens not only stole their sky heritage but also their land and in the process according to well known historian Henry Reynolds³, ‘Twenty thousand blacks were killed before federation’. Except for the ‘Memorial’ exhibit at the National Gallery of Australia there are no monuments in the capital cities or country towns or parks in Australia with the three simple words emblazoned on them to say ‘Lest We Forget’ to remember these dead Aboriginal men, women and children who had lost their lives in defending their motherland

Note: There are other views on the history of Aboriginal society and culture. Please visit the University of Western Sydney Library.



Tharawal Aboriginal Corporation

In his most recent documentary UTOPIA shown on SBS and at Campbelltown (Cinemas Macarthur Square), well known film-maker and journalist John Pilger “uncovers the truth about Australia’s treatment of its first inhabitants”.

Note: There are other views about Aboriginal society and culture. Please visit the University of Western Sydney Library.

[1. Corsali, A. Southern Cross. State Library of NSW; 2. Walker, K. 1972. Stradbroke Dreamtime. Angus and Robertson. Sydney; 3. Reynolds, H. 1982. The other side of the frontier. Penguin books.]

SEEING EVERYTHING TWICE

The space between the stars is not empty. It contains interstellar material which is composed of cold, dark clouds of gas and microscopic dust particles. These dark clouds of gas and dust are called nebulae and are scattered abundantly throughout our Galaxy. They are easily visible to the naked eye. These dark spaces were observed by the Aboriginal people a long, long time ago. When you go to the country side they will tell you stories about them.

In the dark spaces of the Milky Way the Aborigines see the shape of an emu. The emu is reflected in rock engravings on the ground. So it is not surprising to learn from Mowaljarlai, ‘Everything under Creation is represented in the soil and in the stars. Everything has two witnesses, one on earth and

one in the sky. You can't get away from it, because all is one, and we're in it. As you see the Milky Way, it ties up the land like a belt, right across'¹.

One of the finest engravings of the emu is to be found at Ku-ring-gai Chase National Park in Sydney. It has been known to the Aboriginal people for thousands of years and the stories have been carried along songlines. It has spiritual significance to them. According to Daisy Bates², 'The kallaia or emu must be given first place for it is the only black constellation in the heavens ... In the dhoogoor or dream times of long ago the emu constellation played a most important and most sacred part



Emu in the sky and on the land. Private Collection.



Engraving of emu in Ku-ring-gai Chase National Park, Sydney.

in the curriculum of the young initiates or the kallaia dhoogoor waddi (emu totem men) of Central Australia. The heavenly kallaia was their religious symbol, and every ceremony and song and myth connected with it was performed and sung and related to the young Oolberu (novices) during the days and nights of their long novitiates. With every performance the sacredness of their symbol was enhanced, so that when the trying period of initiation had been gone through and they had become fully developed waddi (men), the mystic religiosity attached to their spirit totem remained with them and increased in intensity with their years, until finally when their time came to die, they once more lifted their eyes to their sacred emblem (on which they had not dared to look throughout all the years of their manhood and old age) and passed quietly and tranquilly away under its shadow'.

Basedow³ gives us another perspective of this land/sky emu. According to him, 'I ascertained that the black-looking gap in the Milky Way, close to the Southern Cross, which is commonly known as the Coal Sack, was referred to as Kaleya Pubanye, that is the Resting Emu. In the north of Adelaide, the Larrekiya, Wogait, and other tribes have adopted a similar designation for a series of dark spaces along the Milky Way. But they have extended the idea considerably in that the Coal Sack represents the head of a gigantic emu, the beak of which is pointed towards the Musca constellation (i.e. towards

the south). A small star of the Southern Cross group very appropriately stands for the eye of the bird; the nebulous effect usually surrounding this star gives it an extra life-like appearance. The neck is but faintly discernible near the head, but becomes clearly visible in the neighborhood of the nearer Pointer; it passes between the two Pointers and curves slightly towards the constellation of Lupus. Within the constellation of Norma, the dark space widens considerably and represents the body of the emu. The blunt tail turns sharply towards, and into the constellation of Scorpio. A nebulous patch lying practically on the point of the junction between the imaginary areas of Ara, Scorpio and Norma affords a good division between the legs of the bird, while another lying between μ and ξ of the Scorpio group separates the tail. The two lower portions of the legs are not very clear, but some of the more imaginative natives maintain that they can distinguish three toes on each extremity. There is no doubt the primitive eye has herein discovered a striking similarity between an optical phenomenon in the southern sky and a living creature, which is of great importance in the hunting field, and at the same time plays a prominent role in tribal folklore. They refer to this emu by the name of Dangorra'.

Note: The great English physicist, Isaac Newton arrived at the same conclusion that the laws on the land are the same as those in the heavens in the 17th century. He incorporated this in his theory of universal gravitation which is taught to physics and engineering students in universities around the world. However, unlike the Aboriginal people he stated it in mathematical terms, $F = G \frac{m_1 m_2}{r^2}$.

The concept that the law of the land is the same as the law of the heavens was used very effectively to win the Mabo case⁴.

[1. Mowaljarlai and Malnic, J. 2001. Yorro Yorro. Magabala Books Aboriginal Corporation. Broome Western Australia; 2. Bates, D. 1923. An Aboriginal constellation. Daily News. 27 October. Daisy Bates Collection. National Library of Australia, Canberra; 3. Basedow, H. 1925. The Australian Aboriginal. F. W. Reece & Sons. Adelaide. 4. Keon-Cohen, B. 2013. A Mabo Memoir: Islan kustom to Native Title. Malvern: Zemvic Press.]

