

Oxford Research Encyclopedia of Planetary Science

The Planets in Aboriginal Australia

Duane W. Hamacher and Kirsten Banks

Subject: History of Ideas about Planets and Planetary Systems

Online Publication Date: Feb 2019 DOI: 10.1093/acrefore/9780190647926.013.53

Summary and Keywords

Studies in Australian Indigenous astronomical knowledge reveal few accounts of the visible planets in the sky. However, what information we do have tells us that Aboriginal people are close observers of planets and their motions and properties. Indigenous Australians discerned between planets and stars by their placement in the sky and their general lack of scintillation. Traditions generally describe the ecliptic and zodiac as a pathway of sky ancestors represented by the sun, moon, and planets. This included observing the occasional backwards motion of sky ancestors as they communicate with each other during their journey across the sky, representing an explanation of retrograde motion. Aboriginal and Torres Strait Islander people note the relative brightness of the planets over time and information about the roles they play in their traditions around Australia. Knowledge systems outline the importance placed on Venus as the morning and evening star, making connections to the object as it transitions from one to the other through observations and calculation of the planet's synodic period. Traditions note the relative positions of the planets to the moon, sun, and background stars, as well as interplanetary dust through zodiacal light, which is perceived as a celestial rope connecting Venus to the sun.

The relative dearth of descriptions of planets in Aboriginal traditions may be due to the gross incompleteness of recorded astronomical traditions and of ethnographic bias and misidentification in the anthropological record. Ethnographic fieldwork with Aboriginal and Torres Strait Islander communities is revealing new, previously unrecorded knowledge about the planets and their related phenomena.

Keywords: Indigenous knowledge, cultural astronomy, aboriginal Australians, Torres Strait Islanders, ethnoastronomy, archaeoastronomy, history of astronomy

Introduction

The study of Indigenous astronomy has revealed a wealth of information about the role of the sun, moon, stars, and planets in the traditional knowledge systems of Aboriginal Australians (Norris, 2016). Indigenous cultures around the world, particularly the many hundreds that exist in Australia, maintain complex astronomical knowledge systems that link the positions and motions of celestial objects to navigation, calendars, subsistence, and social applications (Cairns & Harney, 2003; Hamacher, 2012; Johnson, 1998).

Indigenous people are careful observers of subtle changes in the positions and properties of celestial objects and have noted both obvious and rare celestial phenomena, such as meteors (Hamacher & Norris, 2010), comets (Hamacher & Norris, 2011B), eclipses (Hamacher & Norris, 2011C), fireballs (Hamacher, Barsa, Passi, & Tapim, 2017), impact events (Hamacher, 2013B; Hamacher & Norris, 2009), meteorite cratering (Hamacher & Goldsmith, 2013), pulsating variable stars (Hamacher, 2017), aurorae (Hamacher, 2013A), stellar scintillation (Guedes, Hamacher, Barsa, Passi, & Tapim, 2017), the analemma (Norris, Norris, Hamacher, & Abrahams, 2013), lunar phases (Hamacher & Norris, 2011A), novae (Hamacher & Frew, 2010), and supernovae (Hamacher, 2014).

The role of the planets in Indigenous Australian cultures (both Aboriginal and Torres Strait) is a topic that has not been researched in detail (Fredrick, 2008). Aboriginal traditions provide insight to ancient knowledge about planets and planetary motion and could help modern researchers in both the sciences and social sciences in their work, focusing on mutual benefits.

The most detailed literature-based study of the planets in Aboriginal traditions was completed by Fredrick (2008). Although the article missed some key references, it provides an informative basis on which we can build a further study. This article presents a preliminary study showing how Indigenous Australians perceived, conceptualized, and applied knowledge of planets and their motions, including the ecliptic, retrograde motion, synodic cycles, the relationship of planets to other celestial objects, zodiacal light, and solar and lunar dynamics.

The Planets in Indigenous Australian Traditions

The Indigenous people of Australia include the Aboriginal people of mainland Australia and Tasmania and the Torres Strait Islanders, who inhabit the archipelago between Cape York and Papua New Guinea. Archaeological evidence places Aboriginal people in Australia (or the larger landmass of Sahul) as long as 65,000 years ago (Clarkson et al., 2017). There are over 500 recorded languages in across Australia, each with a unique culture and traditions (McConnell & Thieberger, 2001). Thus Indigenous views of planets and planetary phenomena are diverse and widespread.

The Planets in Aboriginal Australia

The sun, moon, and visible planets (Mercury, Venus, Mars, Jupiter, and Saturn) were known to Aboriginal and Torres Strait Islander people. These cultures paid careful attention to the motions of solar system bodies through careful observation, which was recorded and passed to successive generations through oral tradition and material culture. Aboriginal and Islander people distinguished planets from the background stars and noted their changing positions in the sky, their changing positions relative to each other, their proximity to each other along the zodiac of the ecliptic, and their dynamic relationship to the sun and moon.

The literature is scant with descriptions of planets in Aboriginal and Torres Strait Islander cultures compared to other astronomical objects and phenomena. Venus features prominently, but planets such as Mercury, Mars, Jupiter, and Saturn are less common. Fredrick (2008, p. 34) collated 526 traditional stories about astronomy, of which 4% included Venus and 3% included the remaining planets. The most prominent objects discussed were the moon (16%), Orion and the Pleiades (11%), and the Milky Way (8%).

Given the plethora of misidentifications, misinterpretations, and conflated identifications in ethnographic research related to Australian Indigenous astronomical knowledge, these omissions are likely the result of the ethnographers' availability of information than a lack of Indigenous traditions about these celestial bodies. Research on the subject is ongoing, but this article provides a current overview on the role of planets and related phenomena in Aboriginal and Torres Strait Islander traditions.

In most Aboriginal cultures (but not all), the moon is a man and the sun is a woman—often spouses (Clarke, 2009; Johnson, 1998). The planets are often seen as prominent sky ancestors and direct relations to the sun and moon. These relationships vary from romantic to familial relationships—and even rival relationships. To the Tiwi people, the moon man follows the path of the sun woman and has four wives who also follow this path. They are represented by Mars, Mercury, Venus, and Jupiter (Mountford, 1958). To the Kamilaroi people, Jupiter is a young boy who is disliked by his mother, the sun. She sends men to spear the boy when he is low in the western sky (Tindale, 1983).

Some planets are viewed as hierarchical figures. Venus—typically represented as both the morning and evening star—for example, is seen as a senior spirit and was the master of all of the other stars (Mathews & Dixon, 1975). In Boorong traditions of western Victoria, Venus is *Chargee Gnowee*, sister of the sun (*Gnowee*) and wife of Jupiter (*Ginabongbearp*). *Ginabongbearp* is chief of the old spirits (*Nurrumbunguttias*) (Stanbridge, 1861).

Planets can also be associated with other entities, such as totems or even emotions. Venus, the Evening Star, is a woman associated with a big lizard totem (Spencer & Gillen, 1927). In Kamilaroi traditions, Venus is an old man who once said something rude and has been laughing at his own joke ever since (Parker, 1905).

The Path of the Sun, Moon, and Planets

The *ecliptic* traces the sun's apparent path around the earth and is the basis of the ecliptic coordinate system. The planets orbit the sun in roughly the same plane and are inclined by approximately 9° from the ecliptic. The region within 9° either side of the ecliptic is the *zodiac*. The path of the sun, moon, and planets is widely known across many Aboriginal regions. It is generally seen as a road or pathway for the primary ancestor spirits, sometimes as a road to the land of the dead on which spirits travel to the afterworld (Cahir, Clark, & Clarke, 2018). Wardaman people see the zodiac as a road that ancestor spirits use to travel across the sky and is utilized for navigation (Cairns & Harney, 2003). In Tiwi traditions of Melville and Bathurst Islands, north of Darwin, the sun woman carries a torch across the sky each day, from east to west (describing diurnal motion). The moon man follows the path of the sun woman but carries a smaller torch. Four planets—Mars, Mercury, Jupiter, and Venus—represent the moon man's four wives, who also travel across this pathway (Mountford, 1958, p. 174). In the Western Desert, amateur anthropologist Daisy Bates (1936) noted that some Aboriginal communities perceived Jupiter and Venus "always following one another along the 'dream road' which they themselves had made" (p. 9). Jupiter and Venus are visible during the day, which may contribute to their close relationship.

Some Aboriginal traditions describe the motions of planetary ancestor spirits as they walk along the zodiacal road in the sky. *Retrograde motion* is a visual effect describing the motion of a planet as it travels through the night sky each night while taking into account the relative position of the planet with respect to the background stars. Derived from the Latin word *retrogrades* (meaning backwards step), it describes the apparent backward motion of a planet. Generally, planets appear to move from the east to the west. When a planet is in retrograde motion, it appears to slow to a stop (relative to the background stars each night) before moving backwards from west to east (Figure 1). All of the planets in the solar system have periods of retrograde motion. The Wardaman people articulate this phenomenon clearly by describing the planets as the old spirits who would walk the path, both forwards and backwards:

The Dreaming Track in the sky! Planets making the pathway! Travelling routes, a pathway you could call it, like a highway! Travelling pathway joins to all different areas, to base place, to camping place, to ceremony place, where the trade routes come in; all this sort of things. The Dreaming Track in the sky, the planets come straight across . . . walking trail becomes a pad, then becomes a wagon road, two wheel tracks, then become a highway. That's how they started off.

(Cairns & Harney, 2003, pp. 64–65)

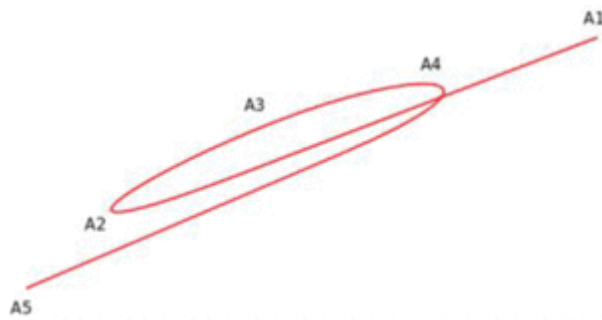


Figure 1. Image displaying retrograde motion of Mars over the course of several months.

Image: NASA, Tunç Tezel.

The roles of the planets themselves are varied and diverse. They are related to totems and marriage classes, as well as ancestral figures in the sky who inform various social practices and traditional laws. For example, the moon and Venus are subordinate totems of Nyai, the sun clan, in western Victoria

(Mathews, 1904). Planets are distinguished from other stars by their movement with respect to background stars, their tendency not to twinkle (e.g., Haddon, 1912, p. 219), as well as the pathway they travel across the sky. Traditions of individual planets, bar Venus, are scant in the ethnographic literature.

Mercury

Very few recorded Aboriginal traditions speak directly about the role of Mercury. The Wardaman people describe the planet as a little girl named *Gowaman* that relates to the damaging actions of the moon man (Cairns & Harney, 2003, pp. 62–65). In Kamilaroi traditions, Mercury probably represents a red kangaroo that relates to ceremony (Fuller, 2015, p. 123). Elders working with Fuller said that “the red kangaroo was a star low in the western sky after sunset, and it was very important in ceremony” (p. 108). The elder said the “star” was red, difficult to see, and only there “some of the time”—suggesting Mercury as its likely identity. The red color of the planet is probably due to reddening caused from its low altitude near the horizon, but the identity of Mercury as the object in question is inferred—not explicitly identified.

Venus

As the third brightest object in the sky, Venus is the most commonly described planet in Aboriginal traditions. It is often described as the morning and evening star. Traditions of Venus are too numerous to include in this article, but they often possess social meaning, rather than subsistence or calendric application, due to its wandering nature in the sky. Given its position as an inferior planet (closer to the sun than the earth), it is commonly linked directly to the sun and moon.

In Kamilaroi and Euahlayi traditions, Venus (particularly when it is low on the horizon) is seen as an old man who is laughing animatedly after telling a rude joke (Parker, 1905, p. 71). These same communities also speak of the Eaglehawk, *Mullyan*, who lived in a large

The Planets in Aboriginal Australia

yarran tree. He hunted people for food near the Barwon River. In response to his killing of the people, a group of young men set his home alight, killing him. The Eaglehawk then ascended into the sky as *Mullyangah*, the morning star (Parker, 1898, pp. 31–32; Reed, 1965, pp. 79–82). The story is reflected in the landscape at waterholes bearing the name and story at Morgan’s Wells near the Glengarry opal fields of northern New South Wales (Fuller, 2015). Other places feature Venus as the morning star, such as *Kabminye*—a place near Tanunda (northeast of Adelaide; Cockburn, 1908/1984, p. 111).

In Murrawarri traditions of western New South Wales, Venus (Mirnkabuli) is a man who lives in a hut (gurli), living on mussels and crayfish (Mathews, 1904, p. 283). The Kamilaroi and Euahlayi people also describe Venus and Mars as the eyes of the celestial being Baayami (Fuller, 2015). During special ceremonies held near Quilpie in western Queensland, the Euahlayi met with the Arrernte of the MacDonnell Ranges in central Australia. The Arrernte bring a red stone, signifying Mars, and the Euahlayi people bring a green and blue stone, representing Venus. With some initial confusion about the nature and role of Venus/morning star in relation to the Eaglehawk and the eyes of Baayami, one of Fuller’s consultants clarified that

during the day, Maliyan’s eyes (the eaglehawk) are the eyes of Baayami. During the night, Maliyan’s eyes are Venus and Mars, which become the eyes of Baayami at night. Because one is red, and one is blue and green, two rocks are brought together for ceremonies: one is red (opal) from Quilpie, QLD, and the Euahlayi have the green and blue one (opal). When the stones are put together, they are Venus and Mars on Earth. Another location for Venus and Mars on Earth is a place called Mordale near Narran Lakes. These are waterholes side by side, called Milmaliyan and Maliyan-ga. (p. 67)

Venus is also connected to sacred ceremony in these communities. According to Fuller’s Aboriginal consultants, the evening star serves as a sign to light the sacred fire. The fire is relit every evening until the morning star is seen, at which time the ceremony takes place (and the sacred fire is doused). This caused confusion, as Venus cannot be seen together as a morning and evening star. An elder explained to Fuller that the morning star in this case was actually Mars, again tying the two planets together as the eyes of Baayami.

In Yolngu traditions of Arnhem Land in the Northern Territory, traditions of Venus as the morning star are commonplace and serve a major role in ceremony (Clarke, 2014). In some Yolngu communities, Venus is perceived as a spirit taking the form of a lotus flower atop a stem representing its path (Berndt, 1948). A related song explains that Venus is “Shining on to the fore-heads of all those head-men. On to the heads of all those Sandfly [clan] people. It sinks into the place of the white gum trees, at Milingimbi” (Berndt, 1948, p. 35).

The Aboriginal people of the Hamilton and Georgina Rivers in Queensland referred to Venus as *Mumungooma*, or “big-eye” (Clarke, 2014; White, 1904). They perceive Venus as fertile grasslands with an abundance of seeds used to make flour. This land, they

The Planets in Aboriginal Australia

believed, had no water, but if the Aboriginal people who inhabited this land grew thirsty, they could travel to Earth via ropes hanging from it. These ropes are reflected in the Banimbirr ceremony, which links white strings connecting Venus to the sun (Figure 2).



Figure 2. Banumbirr morning star poles from Aboriginal artists on Galiwin'ku (Elcho Island), Northern Territory displayed at the Gallery of Modern Art in Brisbane. The white feathers symbolize starlight and the symbolic power of shining.

Photo: Author Supplied.

Aboriginal and Torres Strait Islander people note the distinction between Venus as the morning star and the evening star. They are seen as the same object but are visible at different times (never the same time). The Yolngu, as well as other communities, hold the Banumbirr ceremony when Venus first rises (at a particular azimuth on the horizon) after transitioning from the evening star to the

morning star (e.g., Norris & Norris, 2009, pp. 18–22). Yolngu people hold the Banumbirr ceremony to observe Venus rising between the mainland and Burralku—the sacred island of the dead—to the east as it makes this transition. The ceremony starts at dusk and continues through the night, reaching a climax when Banumbirr rises a few hours before dawn (Norris & Norris, 2009). Banumbirr communicates with the people through a faint rope that also keeps her close to the sun. When Norris and Norris asked a Yolngu elder how they knew when to hold the morning star ceremony, the elder said they simply count the days.

This indicates the Yolngu people were aware—at least to some degree—of the synodic period of Venus. Because Venus and the earth are in 5:8 resonance, if one were to record the position of Venus each night at the same time one would discover that the planet produces five unique “patterns” that repeat every eight years. The first rising of the morning star as it transitions from an evening star occurs approximately every 584 days—a phenomenon closely observed by the Maya of Central America (Aveni, 1997, p. 45). Aboriginal people in other parts of Australia were also careful observers of this phenomenon and kept close track of when the ceremony was to be held (Fuller, 2015).

The morning star pole contains symbolism of a light rope that connects Venus with the sun, representing a pathway by which spirits can travel. This is probably a reference to zodiacal light, which is easily seen from the dark skies of the region. As an inferior planet, Venus does not stray far from the sun and is often visible in the bright band of zodiacal light, which is a reflection of sunlight off of interplanetary dust in the solar system.

The Planets in Aboriginal Australia

Venus has a tighter orbit around the sun compared to the earth's orbit. Due to this, the planet is often seen close to the sun in the sky, either trailing it or leading it. Venus is often referred to in modern astronomy as the morning star or the evening star, depending on what time of day it is visible. This description was also adopted by Indigenous Australians. There are many accounts of Venus being described as the morning star and the evening star. Both terms were often used to refer to the same object, meaning Indigenous Australians knew that both the morning star and the evening star were the same object, namely, Venus.

At Tanunda, northeast of Adelaide, the Aboriginal people describe Venus as *Kabminye*, meaning "morning star" (Cockburn, 1908/1984). In the Gulf of Carpentaria, Venus is recorded to be both the morning and evening stars (record 297). It is explained as

the main female character (as Venus) was both the Morning and Evening Star. She was promised to the sharkman, but did not want to marry him so escaped into the sea, only to be followed by the sharkman. Desperate not to be caught by the man she flew up into the sky and became the Evening Star, the sharkman can still be seen sometimes in the waters around Morington Island.

In the Torres Strait, Venus is given two titles. In the Kala Lagow Ya language of the western islands, the morning star is *Goeyga Thithuuyi* and the evening star is *Woey* (Eseli, 1998). In the Merima Mir language of the eastern Torres Strait, the evening star is *Ilwel* and the morning star is *Gerger Nasau* (Hamacher, 2015).

The morning and evening star are sometimes assigned a social function. For example, it is included in the Arrernte tradition about Tnorala—a ring-shaped mountain range 5 km across and 150 m high in the Central Desert 160 km west of Alice Springs (Figure 3). The Western Arrernte tradition is that, in the creation period, a group of women took the form of stars and danced a corroboree (ceremony) in the Milky Way. One of the women was carrying her baby, so she put him in a wooden basket (*turna*) and set him down near the edge of the Milky Way. As the women danced the corroboree, they shook the Milky Way and the baby fell off. He came tumbling down as a star and struck the ground with the *turna* covering him, driving the rocks around him upwards to create the ring-shaped mountain range.

The Planets in Aboriginal Australia



Figure 3. Tnorala (Gosses Bluff crater) in the Central Desert.

Photo: Author supplied.

Tnorala, called Gosses Bluff by Western scientists, is the remnant of a highly eroded complex impact crater, formed when a low-density projectile (probably a comet) struck the earth around 142 million years ago. The original crater is roughly 22 km wide, with a 5 km wide central uplift. At the time of impact, the land was nearly 2 km higher. Tnorala is the highly eroded central uplift of the

original crater. In Arrernte traditions, the turna can still be seen in the sky—tumbling from the Milky Way—as the western constellation Corona Australis (the Southern Crown). The baby's parents—the morning and evening star—take turns searching for their lost child to this day. Parents warn their children not to stare at the morning or evening star, as the baby's celestial parents might mistake the gazing child as their lost offspring and whisk them away to the sky (Thornton, 2007).

An additional link between Venus and its proximity to other celestial bodies is found in the waning crescent moon's link to Venus as the morning star. In the Gulf country of North Queensland (Hulley, 1996; Isaacs, 1980; Reed, 1993), two brothers travel across the land in the Creation period. The elder brother is the moon and the younger brother is the morning star. They use a boomerang to form landscape features, such as rivers, valleys, hills, and seas. As they move inland, the bush is increasingly thick. They throw their boomerang to the west, clearing a path in front of them from which the ocean tide follows. As the brothers rest that night, the elder moon brother pretends to sleep, then awakens when his younger brother falls asleep. The moon brother uses his boomerang to cut off the genitals of his brother and molds him a pair of breasts, turning him into a woman. When the younger brother awakens, he finds he is now the wife of the moon brother. The sighting of the crescent moon is now linked closely with the morning or evening star (whether the moon is a waxing or waning crescent) and serves as a reminder to the people. Given Venus's inferior orbit to Earth, the moon will always be in a crescent phase when seen near Venus, as either a morning or evening star. The story also informs the people about the diurnal motion of the celestial objects each night and the link between moon phases and ocean tides (Leaman, 2012).

Mars

Mars appears in the traditions of a number of Aboriginal cultures across Australia but is overall poorly represented in the ethnographic literature. The Kamilaroi people refer to it as *gumba*, meaning “fat” (Ridley, 1875). The ruddy color of Mars held special significance. The Anmatyerre-speaking people of the Central Desert described it as *lherrm-penh*, meaning “something that has been burnt in flames” (Green, 2010, p. 395). The Kokatha people of the Western Desert associate Mars and Antares with *Kogolongo*, the red-tailed black cockatoo (Leaman & Hamacher, 2014; Figure 4). This is reminiscent of the Classical traditions of these objects, as Mars is the Roman god of war and Ares is the Greek god of war. Antares means “equal to Ares.” Since both stars are of similar brightness and color, and since they occasionally come close to each other in the sky, they are seen as rivals.



Figure 4. A red-tailed black cockatoo, related to both Mars and Antares in Kokatha traditions. Image: Peter Campbell via Wikimedia license.

The Aboriginal people of Oyster Bay, Tasmania, hold a tradition that two ancestral men stood on a mountaintop and “threw fire, like a star . . . [that] fell among the black men” (Milligan, 1859, p. 274). The pair of men live in the clouds and can be seen as the Greek Gemini twins, Castor and Pollux. In August 1831, the Tasmanian man Mannalargenna told the Englishman George

Augustus Robinson that the men (Pumpermehowlle and Pineterrinner) created fire and now live in the skyworld. “Mars was his [sic] foot and the Milky Way his [sic] road” (Robinson & Plomley, 2008, p. 872). As seen from Australia, the orientation of the Greek Gemini twins is upside down, yet this is the description given by the Tasmanian men: *Pumpermehowlle* and *Pineterrinner* appear to walk along the pathway of the Milky Way. As their foot, Mars would appear in the region between the two stars and the plane of the Milky Way. Earlier, in May 1831, Mars was visible between Castor and Pollux and the Milky Way, which might explain the association. It is peculiar that Mars would be seen as the foot, since Mars wanders the heavens and will only occasionally be in this orientation (Gantevoort, Hamacher, & Lischick, 2016).

Anthropologists recorded a tradition from the Coorong south of Adelaide about a young man going through an initiation ritual named *Waiyungari*, meaning “red man,” since he is covered in red ochre during the ritual period of time (Clarke, 1999). He engages in illicit behavior with two women, breaking a traditional law. To escape punishment, he casts a spear into the Milky Way and pulls himself and the women into the sky. *Waiyungari* is a

The Planets in Aboriginal Australia

red star with the two women flanking him on either side in the celestial canoe (the stars of Scorpius). For 150 years, anthropologists misidentified the red Waiyungari as Mars and suggested the two women were other planets. Hamacher (2018) reanalyzed the traditions and realized that Waiyungari is actually the star Antares (Alpha Scorpii) and the women are Tau and Sigma Scorpii—not Mars, or any other planet.

Jupiter

Jupiter is prominent in the sky but has few identified traditions associated with it in the ethnographic record. Like Mars, it is commonly associated with ruddy colors. Aboriginal people of the Darling River, New South Wales (probably the Murrawarri; see Fuller, 2015) call Jupiter *Wurnda wurnda yarroa*, an ancestral man who subsided on roasted yams. The ruddy color of the planet is a reflection of the fire used to roast the yams (Mathews, 1904, p. 283).

The wandering motion of Jupiter, like other planets, was noted by many Aboriginal groups. In northern New South Wales, the Euahlayi and Kamilaroi share a story about the planet:

In the grasslands of the eastern riverine corridor west of the Great Dividing Range, peoples of several tribes have stories based on the idea that Jupiter is a young boy wandering about the heavens. He is much disliked by his mother, the Sun, so much so that she sends men to spear him at a time when he is moving low down in the western sky. In general the fear of people is that in dry years the grasses may not set seed, and if the Sun woman succeeds in injuring her son this will be sure to happen. An even greater fear is that if the boy were “killed” all people would become ill, would develop blindness, and many would perish. Even Kukura, their Moon man, could go blind. Such ideas appear to reflect their own experiences with drought and with the effects of severe malnutrition caused thereby.

(Fraser, 1888, pp. 8–9)

A Kamilaroi man from the Lake Cocoran area, New South Wales, told Fuller, Norris, and Trudgett (2014) that Jupiter was a “red-eye fella. Kids don’t play with fire; red-eye fella will follow you and stay all winter” (p. 21). He described this as an admonition to kids not to play with the campfire. Another Kamilaroi/Euahlayi person told Fuller et al. that their grandmother taught them Jupiter was a wandering spirit and a bad person: “that big star is watching you. Bad spirit. Do you if you’re alone” (p. 21).

In the Ooldea region of South Australia’s Great Victoria Desert, amateur anthropologist Daisy Bates (1904–1912) recorded that Jupiter and Venus were two men traveling along their dreaming tracks with only heads and no body. She also recorded that Jupiter was a man who assisted two young men who fed him after they were attacked by a mob. Bates

The Planets in Aboriginal Australia

states that Jupiter went up into the sky, with the two boys close by. She does not reveal the celestial identity of the young boys in the sky.

In Wangkamana traditions of central-west Queensland, a son and his mother were traveling across country and became separated, eventually ascending to the sky as Jupiter (the son) and an unnamed star (the mother; Fraser, 1901). A neighboring community wanted to kill the son but were unable to. The mother and son's community were greatly afraid the son would be killed. This would result in them being unable to collect food and they would starve. The recorded story is incomplete and fragmented, leaving us with this unclear and somewhat confusing account.

In these traditions, Jupiter is associated with other stars in the sky, but they are not identified by their Western counterpart. It is unclear if these "stars" are indeed stars or other planets.

Saturn

Like Mercury, Jupiter, and Mars, stories about Saturn are minimal in the recorded literature. The planet is associated with a small bird (*wunyangal*) by the Kamilaroi and Wailwan people (Ridley, 1875, p. 141). In the Western Desert, the local people viewed Venus (Iruwanja) and Saturn (Irukulpinja) as brothers, with Jupiter as their dog. Irukulpinja and the dog spend most of their time catching food for Iruwanja (Mountford, 1976).

References

- Aveni, T. (1997). *Stairways to the stars*. New York, NY: Wiley.
- Bates, D. M. (1904–1935). *Papers of Daisy Bates*. Box 13, Section VII: Myths and Legends, Manuscript 365. Canberra, National Library of Australia.
- Bates, D. M. (1936, January 24). My natives and I: Life story of Daisy M. Bates. *The Advertiser*, p. 9.
- Berndt, R. M. (1948). A "Wonguri-"Mandeikai song cycle of the moon-bone. *Oceania*, 19, 16–50.
- Cahir, F., Clark, I., & Clarke, P. A. (2018). *Aboriginal biocultural knowledge in south-eastern Australia: Perspectives of early colonists*. Victoria, Australia: CSIRO Publishing.
- Cairns, H. C., & Harney, B. Y. (2003). *Dark sparklers*. Merimbula, NSW: H. C. Cairns.
- Clarke, P. A. (1999). Waiyungari and his relationship to the Aboriginal mythology of the Lower Murray, South Australia. *Records of the South Australian Museum*, 321, 51–67.
- Clarke, P. A. (2009). An overview of Australian Aboriginal ethnoastronomy. *Archaeoastronomy*, 21, 39–58.

The Planets in Aboriginal Australia

- Clarke, P. A. (2014). The Aboriginal Australian cosmic landscape, Part 1: The ethnobotany of the Skyworld. *Journal of Astronomical History and Heritage*, 17(3), 307–335.
- Clarkson, C., Jacobs, Z., Marwick, B., Fullagar, R., Wallis, L., Smith, M., . . . Pardoe, C. (2017). Human occupation of northern Australia by 65,000 years ago. *Nature*, 547, 306–310.
- Cockburn, R. (1984). *What's in a name? Nomenclature of South Australia* (rev. ed.). Adelaide, Australia: Ferguson. (Original work published 1908.)
- Eseli, P. (1998). *Eseli's notebook: Translated from Kala Lagaw Ya into English, edited and annotated by Anna Shnukal and Rod Mitchell, with Yuriko Nagata*. Brisbane, Aboriginal and Torres Strait Islander Studies Unit, University of Queensland.
- Fraser, J. (1888). *The Aborigines of Australia: Their ethnic position and relations*. London, U.K.: Victoria Philosophical Institute.
- Fraser, A. (1901). Jupiter: An Aboriginal star myth. *Science of Man*, 4(1), 8–9.
- Fredrick, S. (2008). *The sky of knowledge—A study of the ethnoastronomy of the Aboriginal people of Australia* (MPhil thesis). University of Leicester.
- Fuller, R. S. (2015). *The astronomy of the Kamilaroi and Euahlayi peoples and their neighbours* (MPhil thesis). Macquarie University.
- Fuller, R. S., Norris, R. P., & Trudgett, M. (2014). The astronomy of the Kamilaroi people and their neighbours. *Australian Aboriginal Studies*, 2014(2), 3–27.
- Gantevoort, M., Hamacher, D. W., & Lischick, S. (2016). Reconstructing the star knowledge of Aboriginal Tasmanians. *Journal of Astronomical History and Heritage*, 19(3), 327–347.
- Green, J. (2010). *Central and Eastern Anmatyerr to English dictionary*. Alice Springs, Australia: IAD Press.
- Guedes, C. B., Hamacher, D. W., Barsa, J., Passi, S., & Tapim, A. (2017). Death and Maier: Meteors and mortuary rites in the eastern Torres Strait. *Australian Journal of Indigenous Issues*. (Manuscript under review.)
- Haddon, A. C. (1912). *Reports of the Cambridge Anthropological Expedition to Torres Straits, Vol. IV: Arts and crafts*. Cambridge, U.K.: Cambridge University Press.
- Hamacher, D. W. (2012). *On the astronomical knowledge and traditions of Aboriginal Australians* (Doctoral dissertation). Macquarie University.
- Hamacher, D. W. (2013a). Aurorae in Australian Aboriginal traditions. *Journal of Astronomical History and Heritage*, 16(2), 207–219.

The Planets in Aboriginal Australia

Hamacher, D. W. (2013b). Recorded accounts of meteoritic events in the oral traditions of Indigenous Australians. *Archaeoastronomy*, 25, 99–111.

Hamacher, D. W. (2014). Are supernovae recorded in Indigenous astronomical traditions? *Journal of Astronomical History and Heritage*, 7(2), 161–170.

Hamacher, D. W. (2015). Knowledge collected through ongoing ethnographic work with Meriam communities (2015–2018). Australian Research Council Project DE140101600 and Monash Human Research Ethics Committee Project HC15035 (Unpublished manuscript).

Hamacher, D. W. (2018). **Observations of red-giant variable stars by Aboriginal Australians.** *The Australian Journal of Anthropology*, 29(1), 89–107.

Hamacher, D. W., Barsa, J., Passi, S., & Tapim, A. (2017). Indigenous use of stellar scintillation to predict weather and seasonal change. *The Australian Journal of Anthropology*. (Manuscript under review.)

Hamacher, D. W., & Frew, D. J. (2010). An Aboriginal record of the Great Eruption of Eta Carinae. *Journal of Astronomical History and Heritage*, 133, 220–234.

Hamacher, D. W., & Goldsmith, J. (2013). Aboriginal oral traditions of Australian impact craters. *Journal of Astronomical History and Heritage*, 163, 295–311.

Hamacher, D. W., & Norris, R. P. (2009). Australian Aboriginal geomythology: Eyewitness accounts of cosmic impacts? *Archaeoastronomy*, 22, 60–93.

Hamacher, D. W., & Norris, R. P. (2010). Meteors in Australian Aboriginal Dreamings. *WGN-Journal of the IMO*, 383, 87–98.

Hamacher, D. W., & Norris, R. P. (2011a). Bridging the gap through Australian Aboriginal astronomy. In C. L. N. Ruggles (Ed.), *Archaeoastronomy & ethnoastronomy: Building bridges between cultures* (pp. 282–290). Cambridge, U.K.: Cambridge University Press.

Hamacher, D. W., & Norris, R. P. (2011b). Comets in Australian Aboriginal astronomy. *Journal of Astronomical History and Heritage*, 14(1), 31–40.

Hamacher, D. W., & Norris, R. P. (2011c). Eclipses in Australian Aboriginal astronomy. *Journal of Astronomical History and Heritage*, 142, 103–114.

Hulley, C. E. (1996). *Dreamtime moon: Aboriginal myths of the moon*. Sydney, Australia: Reed Books.

Isaacs, J. (1980). *Australian dreaming: 40,000 years of Aboriginal history*. Sydney, Australia: Lansdowne Press.

Johnson, D. D. (1998). *The night skies of Aboriginal Australia—A noctuary*. Sydney, Australia: University of Sydney Press.

The Planets in Aboriginal Australia

Leaman, T. M. (2012). Orientations of crescent-shaped “boomerang” motifs in Aboriginal rock art in the Sydney Basin Region. Department of Physics and Astronomy Summer Vacation Scholarship, Macquarie University. (Unpublished manuscript)

Leaman, T. M., & Hamacher, D. W. (2014). Aboriginal astronomical traditions from Ooldea, South Australia, part 1: Nyeeruna and the Orion story. *Journal of Astronomical History and Heritage*, 172, 180–194.

Mathews, J., & Dixon, L. (1975). Language elicitation and cultural discussions from western NSW. AIATSIS Library, 003783-003796, collection MATHEWS_J20.

Mathews, R. H. (1904). Ethnological notes on the Aboriginal tribes of NSW and Victoria. *Proceedings of the Royal Society of New South Wales*, 10, 203–381.

McConnell, P., & Thieberger, N. (2001). *State of Indigenous languages in Australia—2001*. Australia State of the Environment Second Technical Paper Series Natural and Cultural Heritage. Canberra, Australia: Department of the Environment and Heritage.

Milligan, J. (1859). On the dialects and language of the Aboriginal tribes of Tasmania, and on their manners and customs. *Papers and Proceedings of the Royal Society of Tasmania*, 3, 239–282.

Mountford, C. P. (1958). *The Tiwi—Their art, myth, and ceremony*. London, U.K.: Phoenix House.

Mountford, C. P. (1976). *Nomads of the Australian desert*. Adelaide, Australia: Rigby.

Norris, R. P. (2016). Dawes Review 5—Australian Aboriginal astronomy and navigation. *Publications of the Astronomical Society of Australia*, 33, e039.

Norris, R. P., & Norris, P. M. (2009). *Emu dreaming: An introduction to Australian Aboriginal astronomy*. Sydney, Australia: Emu Dreaming Press.

Norris, R. P., Norris, P. M., Hamacher, D. W., & Abrahams, R. (2013). Wurdi Youang—An Australian Aboriginal stone arrangement with possible solar indications. *Rock Art Research*, 30(1), 55–65.

Parker, K. L. (1898). *More Australian legendary tales, collected from various tribes*. London, U.K.: D. Nutt.

Parker, K. L. (1905). *The Euahlayi tribe: A study of Aboriginal life in Australia*. London, U.K.: Archibald Constable.

Reed, A. W. (1965). *Myths and legends of Australia*. Sydney, Australia: Reed New Holland.

Reed, A. W. (1993). *Aboriginal myths, legends & fables*. Sydney, Australia: Reed New Holland.

The Planets in Aboriginal Australia

Ridley, W. (1875). *Kamilaroi and other Australian Languages*. Sydney, Australia: Thomas Richards.

Robinson, G. A., & Plomley, N. J. B. (2008). *Friendly mission: The Tasmanian journals and papers of George Augustus Robinson, 1829–1834* (2nd ed.). Hobart, Australia: Tasmanian Historical Research Association.

Spencer, B., & Gillen, F. J. (1927). *The Arunta—A study of a Stone Age people*. London, U.K.: McMillan.

Stanbridge, W. E. (1861). Some particulars of the general characteristics, astronomy, and mythology of the tribes in the central part of Victoria, Southern Australia. *Transactions of the Ethnological Society of London*, 1, 286–304.

Thornton, W. (2007). *Tnorala—Baby falling* [Film]. Alice Springs, Australia: Central Australian Aboriginal Media Association.

Tindale, N. B. (1983). Celestial lore of some Australian aboriginal tribes. *Archaeoastronomy*, 12–13, 258–379.

White, C. (1904, December 20). The story of the blacks. XLV. A chapter of beliefs. *The Register*, p. 9.

Duane W. Hamacher

Monash Indigenous Studies Centre Monash University

Kirsten Banks

School of Physics University of South Wales

