

JOURNEY TO DARK SKY ECO

VIA THE SOLAR SYSTEM DRIVE

*Connecting with Country,
the Cosmos & The Dark Emu in the Sky*



WELCOME TO THE JOURNEY

The Solar System Drive: Connecting Country and the Cosmos

“Our country and solar system are a place and a living dynamic story all at the same time.”

The Solar System Drive (SSD) is the World’s Largest Virtual Solar System Drive — an innovative educational and tourism initiative right here in New South Wales, Australia. Formally opened in 2008, it features scaled 3D billboards of the Sun and planets positioned along five scenic routes that converge at the Anglo-Australian Telescope (AAT) dome at Siding Spring Observatory, the heart of Australia’s first International Dark Sky Park near Coonabarabran.

The billboards are precisely 38 million times smaller than reality, so the two-hour drive from Pluto to the Sun gives you a visceral sense of our solar system’s immense scale within the Milky Way. The entire network spans over 600 kilometres of bitumen road across a vast area of approximately 20,000 square miles (50,000 sq km) of beautiful Central West and Northwest Slopes country.

On your way to Dark Sky Eco Retreat and the Emu Hive farm (located as we like to say, in the Asteroid Belt, between Jupiter and Mars!), you will start spotting the billboards — beginning with Pluto on the outer edges. We encourage you to find every planet, stop for photos and document your cosmic journey. It turns the drive from a mere transit into a memorable, educational adventure — more than a destination, a true journey to and from your holiday.



THE FIVE SCENIC ROUTES

The SSD has five main branches, all leading to the AAT Sun. Choose your path or combine them for the full experience:

From the North (Queensland): via Moree & Narrabri. **Pluto** - Bellata, **Neptune** - Narrabri South on the Newell Hwy, **Uranus** - Pilliga Newell Hwy, **Saturn** - Oxley/Newell Hwy Coonabarabran, **Jupiter** - Homeleigh Drive Coonabarabran.

From the East (Tamworth & New England): **Pluto** - Westdale, **Neptune** - Oxley Highway Gunnedah, **Saturn** - Oxley/Newell Hwy, **Jupiter** - Homeleigh Drive Coonabarabran.

From Sydney & Central Coast (Hunter/Merriwa): via Jerrys Plains, **Pluto** - Merriwa, **Neptune** - Binnia St Coolah, **Uranus** - Weetaliba, **Saturn** - Warrumbungles Way, **Jupiter** - Homeleigh Drive Coonabarabran.

From Sydney & South Coast (Blue Mountains/Mudgee): via Mudgee, **Pluto** - Gulgong/Birriwa, **Neptune** - Dunedoo, **Uranus** - Mollyan, **Saturn** - Jack Halls Creek Newell Hwy, **Jupiter** - Homeleigh Drive Coonabarabran.

From the South (Dubbo & Central West): **Neptune** - Gilgandra, **Uranus** - Tooraweenah Newell Hwy, **Saturn** - Jack Halls Creek Newell Hwy, **Jupiter** - Homeleigh Drive Coonabarabran.

All routes have the distinctive dark billboards as shown in this guide.

SPOT THE PLANETS — YOUR COSMIC CHECKLIST

PLUTO — The Dwarf Planet at the Edge of the Solar System



Locations (multi-billboard outer planet): Merriwa (Hunter route), Moree (North), Dubbo (South), Birriwa/Gulgong (Mudgee route), Tamworth (East). Search Google Maps: "Pluto Solar System Drive [town]".

Type: Dwarf planet (reclassified as such in 2006)

Size: 2,376 km diameter (only 2/3rds the size of our Moon)

Distance: 39.5 AU (1 AU is the distance of the Sun to the Earth)

Orbit: 248 Earth years

Discovered: 1930 by Clyde Tombaugh

Visited: New Horizons flyby 14 July 2015 (revealed heart-shaped Sputnik Planitia, possible subsurface ocean, 5 moons incl Charon).

Fun Fact: Pluto is so small and distant that sunlight takes 5.5 hours to reach it. Its largest moon Charon is half its size — they dance around a common centre of gravity outside both bodies.

Area Vibes: At Merriwa opposite the sale yards by the river (~800 people, est. 1830s) on Gamilaraay lands — important trade & ceremony country. Fuel, toilets, and good cafes. Coolah Tops nearby for mountain lore (Butheroe people, King Togie stories).

NEPTUNE — The Windy Ice Giant 1 hour drive to Coonabarabran



Locations: Dunedoo (Sydney & Central Coast routes), Gunnedah (Tamworth route), Narrabri South Newell Hwy Pilliga (Queensland route), Gilgandra (Dubbo route), Coolah Binnia St (Sydney & Sth Coast routes).

Type: Ice giant

Size: 49,244 km diameter

Distance: 30.1 AU

Orbit: 165 Earth years

Discovered: 1846 (predicted mathematically by Adams & Le Verrier, observed by Galle)

Visited: Voyager 2 flyby 1989 (Great Dark Spot, fastest winds in solar system ~2,400 km/h, Triton moon orbits backwards).

Fun Fact: Neptune was the first planet discovered by mathematical prediction rather than direct observation and has the strongest winds in the solar system — supersonic!

Area Vibes: Gunnedah, home of the legendary Red Chief (Gambu Ganuurru), a warrior leader of the late 1700s whose story of strategy, defence of his people and law reform is told in Ion Idriess's classic. Warriors used stars for night guidance in battle and hunt.

URANUS — The Tilted Ice Giant around 40 minutes to Coonabarabran



Locations: Approaching Rocky Glenn B56 Oxley Hwy (Tamworth, Gunnedah routes), Warrumbungles Way Weetaliba (Hunter, Central Coast & Sydney routes), Pilliga Newell Hwy (Queensland, Narrabri), Tooraweenah 4 corners, Newell Hwy (Dubbo route just before Hickeys Falls Yowie country), Mollyan on Coonabarabran Rd (Sydney & Sth Coast routes).

Type: Ice giant

Size: 50,724 km diameter

Distance: 19.2 AU

Orbit: 84 Earth years

Discovered: 1781 by William Herschel (first planet found with telescope)

Visited: Voyager 2 flyby 1986 (pale blue, extreme axial tilt of 98° likely from ancient giant impact).

Fun Fact: Uranus is the only planet that “rolls” on its side. Its 27 moons are named after Shakespearean characters. It has faint rings and extreme seasons lasting 21 years each!

Area Vibes: Coolah & Coolah Tops — Kamilaroi Mountain country with spiritual significance. King Togee (Butheroe clan leader, mid-1800s) formed alliances with settlers; his people mourned death by vanishing into bush for three years.

SATURN — The Jewel of the Solar System just 15 minutes to Coonabarabran



Locations: Past Binnaway on the Warrumbungles Way approaching Coonabarabran (Central Coast, Hunter routes), On the Newell Hwy approaching Coonabarabran (Tamworth, Narrabri and Queensland routes), On the Newell Hwy at Jack Halls Creek approaching Coonabarabran (Dubbo, Sydney routes).

Type: Gas giant

Size: 120,536 km diameter

Distance: 9.5 AU

Orbit: 29.5 Earth years

Known since ancient times

Visited: Pioneer 11 (1979), Voyager 1 (1980), Voyager 2 (1981), Cassini-Huygens (1997–2017 — orbited, landed on Titan, revealed hexagonal north pole storm, and flew through Enceladus water plumes).

Fun Fact: Saturn is the least dense planet — it would float on water! Its magnificent rings are made of ice and rock, some as small as a grain of sand, others as big as a house. The Cassini mission ended in a fiery “Grand Finale” dive into the atmosphere in 2017.

Area Vibes: Excitement as you approach Coonabarabran Australia’s Astronomy Capital and First Dark Sky Park.

JUPITER — The King of Planets & Guardian of the Asteroid Belt



Location: Timor Rd at Homeleigh Dr
Coonabarabran outskirts for all routes.

Type: Gas giant

Size: 139,820 km diameter (largest planet, 11x Earth)

Distance: 5.2 AU

Orbit: 11.86 Earth years

Known since ancient times

Visited: Pioneer 10 (1973), Pioneer 11 (1974), Voyager 1 & 2 (1979), Galileo (1995–2003 orbiter), Juno (2016–present revealed Great Red Spot depth, polar cyclones, water on Europa).

Fun Fact: Jupiter has at least 95 moons! Its Great Red Spot is a storm larger than Earth that has raged for at least 400 years. It acts as a “cosmic vacuum cleaner” protecting inner planets from asteroids. **Dark Sky Eco is in the Asteroid Belt just “beyond” Jupiter**, your cosmic home base!

Area Vibes: Pilliga & Warrumbungle Mountains, volcanic peaks woven into creation stories and songlines representing ancestral beings. Seasonal camps, ceremonies, sky observation.

MARS — The Red Planet (Gateway to the Inner Solar System)



Location: Approaching Siding Spring turn off on Timor Rd
Coonabarabran on all routes located on the left or South of the road.

Type: Terrestrial (rocky)

Size: 6,779 km diameter

Distance: 1.52 AU

Orbit: 687 Earth days (1.88 years)

Known since ancient times

Visited by dozens of spacecrafts: Mariner 9 (1971 first orbiter), Viking 1 & 2 (1976 landers), Spirit & Opportunity rovers (2004–2018), Curiosity (2012–present), Perseverance (2021–present, collecting samples for return to Earth), plus orbiters from many nations.

Fun Fact: Mars has the tallest mountain in the solar system — Olympus Mons (22 km high, 3x Everest). It has two tiny moons, Phobos and Deimos, and evidence of ancient rivers and lakes. Humans may walk here in the 2030s!

Area Vibes: Warrumbungle transition zone — from Jupiter’s protection into the inner system. The volcanic landscape echoes Mars’ own geology.

THE INNER PLANETS & OUR SUN

EARTH & THE MOON — Our Beautiful Blue Home (and its Loyal Companion)



Location: Near Siding Spring Observatory, Coonabarabran (final approach on all routes).

Type: Terrestrial planet with one natural satellite.

Size: Earth 12,742 km diameter; Moon 3,475 km (1/4 Earth's size).

Distance: 1 AU (Earth from Sun); Moon ~384,400 km from Earth.

Orbit: Earth 365.25 days; Moon 27.3 days (sidereal month).

Discovered: Known since prehistory / ancient times.

Visited: Apollo 11 (1969 first crewed Moon landing), 12 Apollo missions total, numerous orbiters and landers (Lunar Reconnaissance Orbiter, Chang'e 4 far-side lander), ISS for continuous low Earth orbit is a crewed spacecraft providing Earth observations and conducting various experiments. We often see it from our Dark Sky Hill Observatory.

Fun Fact: Earth is the only planet in the solar system with liquid water oceans on its surface and the only one known to harbour life. The Moon stabilises Earth's axial tilt at 23.5°, preventing wild climate swings over geological time. It is the only planet whose English name does not come from a Roman or Greek god.

VENUS — The Morning/Evening Star, Earth's Twin



Location: Approaching Siding Spring Observatory.

Type: Terrestrial (rocky) planet

Size: 12,104 km diameter (almost Earth-sized)

Distance: 0.72 AU

Orbit: 225 Earth days (retrograde rotation – spins backwards)

Discovered: Known since ancient times as the Morning Star (Phosphorus) and Evening Star (Hesperus)

Visited: Magellan (1990–1994 radar-mapped 98% of surface), Venus Express (ESA 2005–2014), Akatsuki (JAXA 2015–present), Pioneer Venus (1978), multiple Soviet Venera landers (some survived minutes on the hellish surface), upcoming NASA DAVINCI and VERITAS missions.

Fun Fact: Venus is the hottest planet in the solar system with surface temperatures around 460°C – hot enough to melt lead – due to a runaway greenhouse effect from its thick CO₂ atmosphere. A single day on Venus (243 Earth days) is longer than its year (225 Earth days). It rotates on its axis in the opposite direction to most planets.

Area Vibes: Visible as the brightest “star” in the Warrumbungle skies at dawn or dusk. Kamilaroi sky

knowledge includes Venus in seasonal and navigational stories. The clear, dark skies of the region make it an ideal place to observe this brilliant planet, connecting modern astronomy with ancient Indigenous observations that stretch back millennia

MERCURY — The Swiftest Messenger



Location: Very close to the AAT dome / Siding Spring Observatory (final billboard before the Sun on all routes).

Type: Terrestrial (rocky) planet

Size: 4,879 km diameter (smallest planet, only slightly larger than Earth's Moon)

Distance: 0.39 AU

Orbit: 88 Earth days (3:2 spin-orbit resonance – Mercury rotates three times for every two orbits)

Discovered: Known since ancient times (earliest recorded observations ~14th century BC)

Visited: Mariner 10 (1974–1975) — first flybys, mapped ~45% of the surface. MESSENGER (2011–2015) — first orbiter, discovered water ice in polar craters. BepiColombo (ESA/JAXA, launched 2018, scheduled arrival November 2026 — delayed from original plan due to thruster issue).

Fun Fact: Mercury experiences the most extreme temperature swings: from -180°C at night to 430°C during the day. It has the largest iron core relative to its size of any planet (about 85% of its mass is iron). Despite being closest to the Sun, it is not the hottest planet, that title belongs to Venus. Mercury is shrinking as its core cools and is heavily cratered.

Area Vibes: The final planet before reaching the Sun at Siding Spring. Its swift 88-day orbit earned it the name of the Roman messenger god. In the pristine dark skies above the Warrumbungles, Mercury can be seen low on the horizon at dawn or dusk – a fitting “messenger” bringing us to the heart of the Solar System Drive and the Anglo-Australian Telescope.

THE SUN (AAT Dome at Siding Spring Observatory) Our Life- Giving Star



Location: Siding Spring Observatory, Coonabarabran

Type: G-type main-sequence star (yellow dwarf)

Size: 1.39 million km diameter (109 times Earth's diameter)

Distance: Centre of our Solar System (0 AU reference)

“Age/Orbit”: Solar System formed ~4.6 billion years ago; Sun orbits the Milky Way's centre once every ~225–250 million years (galactic year)

Discovered: Known since prehistory; scientific understanding advanced by Copernicus (heliocentric model), Galileo (sunspots and telescopic observations), and modern helioseismology.

Visited/Probed: SOHO (1995–present – studies solar interior and space weather), Parker Solar Probe (2018–present – closest approach 6.9 million km / 0.046 AU, “touching” the Sun), Solar Orbiter (ESA), numerous other missions studying solar wind, flares, and coronal mass ejections.

Fun Fact: The Sun contains 99.86% of all the mass in our solar system. Its core reaches about 15 million °C where nuclear fusion turns hydrogen into helium, releasing the energy that powers all life on Earth through photosynthesis. In about 5 billion years it will expand into a red giant, engulfing Mercury, Venus, and possibly Earth. For the Solar System Drive, the Anglo-Australian Telescope dome, at 37 metres in diameter, represents our Sun — the life-giving star — at the end of this scaled journey.

Area Vibes: This is the heart of the Solar System Drive and Australia's first International Dark Sky Park. The Warrumbungle Mountains and Pilliga region have been places of sky observation and ceremony for Kamilaroi people for tens of thousands of years. The Emu in the Sky dark constellation stretches across the Milky Way directly above Dark Sky Eco Retreat at The Emu Hive and over the AAT.

Here, modern astronomy meets ancient Indigenous knowledge – a true bridge between the oldest and newest ways of reading the stars. Welcome to the centre of it all.



At the Sun — the Anglo-Australian Telescope — you have completed your scaled journey through the solar system. The dome represents our Sun with all the roadside planets scaled out in distance and size from this point. Here, modern astronomy and dark sky seeking enthusiasts meet under the darkest skies in Australia.

The Emu in the Sky constellation stretches across the Milky Way above us in the cooler months and Orion during the warmer months welcoming you to your ultimate skywatching destination.

WELCOME TO DARK SKY ECO RETREAT



Your Lodges at The Emu Hive — In the Asteroid Belt Between Jupiter & Mars

You have travelled the Solar System Drive — from the frozen edge of Pluto, past the 2 blue giants, Ringed Saturn and the biggest of all - Jupiter, now you arrive at **Dark Sky Eco Retreat at The Emu Hive**, nestled in the Asteroid Belt of this scaled model settle in and become deeply relaxed.

Here, the ancient, scarred trees, the heritage cave with its fish and goanna rock art, the hidden aquifers that respond to water divining, and the black panthers that still roam the forests, all speak of a living, sentient Country. The Emu in the Sky watches over us in the cooler months, just as the real Emus on the property greet you at dawn.

During your stay, join us for Emu safaris, water divining, scarred tree tours, and night sky experiences under some of the darkest skies on Earth. Slow down. Listen deeply. Let the land and the stars speak to you in their own language.

Once you are settled in and rested, you can continue your journey to the Sun at the AAT at leisure.

We are honoured to share this place with you. May your journey here — and your time with us — be filled with wonder and the deep peace that comes from being in right relationship with Country and Cosmos and our Emus.

Dark Sky Eco Retreat

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Safe travels along the Drive. We can't wait to welcome you at the Emu Hive.