

A large, green dinosaur sculpture stands in a dark, open landscape under a starry night sky. The Milky Way galaxy is visible, arching across the upper right portion of the frame. The dinosaur is positioned in the lower half of the image, facing right. The ground is dark and textured, possibly gravel or dirt. The overall scene is a blend of natural beauty and prehistoric art.

The Jump-Up Dark-Sky Sanctuary

Australian Age of Dinosaurs
Museum of Natural History

Annual Report 2019/20

Night sky by torchlight.
 Photo Dr Matt White

Site information

Designation type	International Dark-Sky Sanctuary
Designation date	27 April 2019
Site name	The Jump-Up Dark-Sky Sanctuary
Site contact (primary)	Naomi Miles business@aaod.com.au +61 447 010 969
Site contact (secondary)	Trish Sloan collection@aaod.com.au +61 447 016 410

The Jump-Up visitor statistics (1 July to 30 June)

	2017/2018	2018/2019	2019/2020
Permanent Jump-Up population	1	1	1
Visitors to The Jump-Up	33,544	36,029	25,475

	2017/2018	2018/2019	2019/2020
Online visitors to the Museum's Dark-Sky page	NA	329	1,755
Average time on the Dark-Sky page (minutes)	NA	2:06	2:20

Measurements

Comparative sky-quality distribution across The Jump-Up, using averaged data.

Table 1 Dinosaur Canyon (SQM 1.0).

	Period	20 to 22.5 MPSAS monthly average	20 to 22.5 MPSAS standard deviation	Average temperature (°C)
2019	Jul	21.63	0.58	13.6
	Aug	21.70	0.63	13.5
	Sep	21.75	0.67	18.3
	Oct	21.73	0.62	20.8
	Nov	21.70	0.68	23.8
	Dec	21.80	0.64	26.3
2020	Jan	21.74	0.70	25.6
	Feb	21.76	0.62	24.8
	Mar	21.71	0.52	23.2
	Apr	21.54	0.52	21.1
	May	21.62	0.57	13.5

Table 2 Jump-Up base (SQM 2.0).

	Period	20 to 22.5 MPSAS monthly average	20 to 22.5 MPSAS standard deviation	Average temperature (°C)
2019	Jul	21.59	0.59	13.5
	Aug	21.79	0.59	13.7
	Sep	21.71	0.65	18.6
	Oct	21.68	0.89	20.8
	Nov	21.66	0.64	25.1
	Dec	21.73	0.59	26.8
2020	Jan	21.69	0.69	26.4
	Feb	21.72	0.61	25.7
	Mar	21.71	0.52	23.2
	Apr	21.54	0.51	21.4
	May	21.62	0.56	14.6

Note Data beyond May 2020 is still being collected and collated.

Introduction

Since The Jump-Up was designated an International Dark-Sky Sanctuary on 27 April 2019 the Australian Age of Dinosaurs Museum (the Museum) has continued its enthusiastic commitment to the long-term conservation of the night sky. The promotion of dark-sky conservation and education is gradually becoming embedded in the Museum’s existing programs and future plans. This is evidenced in the Museum’s adherence to the Lighting Management Plan for all existing and future buildings, funding and construction of the Gondwana Stars Observatory and promotions via signage, social media and advertising.

From March 2020 the Museum’s planned programs and activities, including its capital building projects, were put on hold as a result of COVID-19-related closures and restrictions. These closures have reduced the Museum’s expected visitation by 84% and significantly impacted its ability to progress with public programs. Despite this set back, the Museum has continued to collect night-sky data, affirming the sky above The Jump-Up remains pristine and free from light pollution. In addition, the Museum’s delivery of a purpose-built Gondwana Stars Observatory to view the night sky and conduct night talks is on track for delivery in April 2021.

This report briefly summaries the activities undertaken by the Museum since The Jump-Up was designated an International Dark-Sky Sanctuary, under the following sections: measuring the night sky; conserving the night sky; outreach, funding, commercial endeavours, promotions and media relations; and engagement with the International Dark-Sky Association.

Measuring the night sky

Was sky-quality data taken in the past year?

Yes. Four permanent sky-quality meters are situated at two locations on The Jump-Up. SQM 1.0 and its back-up 1.1 are located at Dinosaur Canyon and SQM 2.0 and its back-up 2.1 are located at the base of The Jump-Up at the Star Gallery.

In *Table 1* and *2* the monthly data from July 2019 to May 2020 was filtered to include only measurements from 20 MPSAS to 22.5 magnitudes per square arcsecond (MPSAS). Despite being located 3km away from each other, both SQMs present similar data as summarised in *Table 3*. This sky-quality distribution shows an average reading of 21.69 to 21.70 MPSAS and a standard deviation of 0.59 to 0.61 indicating that around 39% of recorded measurements are between 21.08 MPSAS and 22.31 MPSAS. The average temperature for the darkest night skies on The Jump-Up is around 20°C. The Jump-Up Night-Sky Brightness of 21.69 MPSAS at the zenith is stable and consistent and routinely satisfies the 21.5 MPSAS in the visual band threshold for International Dark-Sky Sanctuaries.

Table 3 Summary of sky-quality distribution across The Jump-Up (based on Tables 1 and 2).

Period	Dinosaur Canyon (SQM 1.0)			The Jump-Up base (SQM 2.0)		
	20 to 22.5 MPSAS monthly average	20 to 22.5 MPSAS standard deviation	Average temperature (°C)	20 to 22.5 MPSAS monthly average	20 to 22.5 MPSAS standard deviation	Average temperature (°C)
July 2019 to May 2020	21.70	0.61	20.4	21.69	0.59	20.9

Did sky brightness increase over the previous year?

No. The recorded sky brightness is on par with previously recorded and reported data outlined in the Museum’s International Dark-Sky Sanctuary application. The exceptional sky quality on The Jump-Up is best demonstrated in the data available in *Tables 4 to 7* and *Graphs 1 to 20*.

Is a permanently mounted sky monitor installed, or are there plans to install one?

The Museum has installed four permanent sky-quality meters at two sites across The Jump-Up. An additional two permanent sky-quality meters have been set up on the far side of The Jump-Up to ensure the entire site (1,800 hectares) is monitored. Each location has a battery-powered and solar-powered SQM meter set up side by side to ensure the integrity of the information collected.

Dinosaur Canyon SQM 1.0 and 1.1 (-22.481956, 143.171739)

Tables 4 and 5 demonstrate the monthly average MPSAS, standard deviation, monthly number of readings greater than 21.5 MPSAS from 9pm to 4am as well as the total number of records over the entire month exceeding 21.5 and 21.75 MPSAS.

Table 4 Dinosaur Canyon (SQM 1.0).

Period	MPSAS 9pm to 4am monthly average	9pm to 4am standard deviation monthly average	Monthly no. readings 21.5 to 21.74 MPSAS	Monthly no. readings ≥ 21.75 MPSAS	% monthly readings 21.5 to 21.74 MPSAS	% monthly readings ≥ 21.75 MPSAS	
2019	Jul	19.93	1.16	461	347	35	26
	Aug	20.13	0.97	646	550	48	41
	Sep	20.28	0.87	655	629	51	49
	Oct	20.48	0.77	700	634	53	48
	Nov	20.58	1.18	670	542	52	42
	Dec	20.68	0.70	728	596	55	45
2020	Jan	20.30	2.30	720	674	54	51
	Feb	20.69	0.84	700	615	56	49
	Mar	20.68	0.66	788	662	59	50
	Apr	20.41	0.65	618	428	48	33
	May	20.20	1.04	539	418	40	31

Table 5 Dinosaur Canyon (SQM 1.1).

Period	MPSAS 9pm to 4am monthly average	9pm to 4am standard deviation monthly average	Monthly no. readings 21.5 to 21.74 MPSAS	Monthly no. readings ≥ 21.75 MPSAS	% monthly readings 21.5 to 21.74 MPSAS	% monthly readings ≥ 21.75 MPSAS	
2019	Jul	19.81	1.18	443	323	33	24
	Aug	19.89	1.03	577	454	43	34
	Sep	19.98	0.98	635	565	49	44
	Oct	20.18	0.86	661	520	50	39
	Nov	20.28	1.31	567	454	44	35
	Dec	20.45	0.73	648	430	49	32
2020	Jan	NA	NA	NA	NA	NA	NA
	Feb	NA	NA	NA	NA	NA	NA
	Mar	NA	NA	NA	NA	NA	NA
	Apr	NA	NA	NA	NA	NA	NA
	May	NA	NA	NA	NA	NA	NA

The Jump-Up base SQM 2.0 and 2.1 (-22.463273, 143.193474)

Tables 6 and 7 demonstrate the monthly average MPSAS, standard deviation, monthly number of readings greater than 21.5 MPSAS from 9pm to 4am as well as the total number of records over the entire month exceeding 21.5 and 21.75 MPSAS.

Table 6 The Jump-Up base (SQM 2.0).

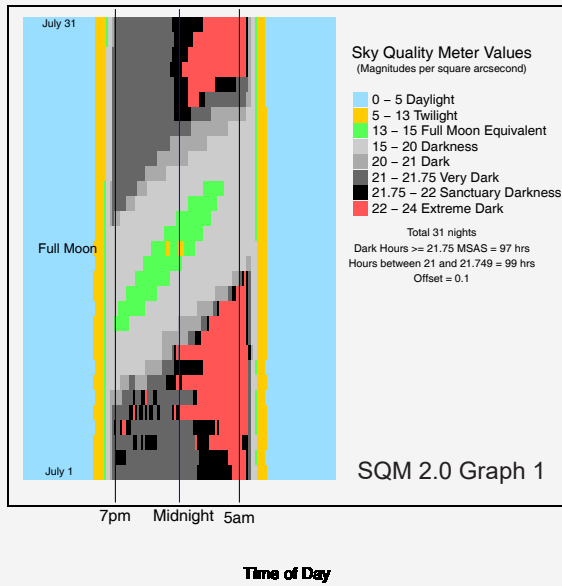
Period	MPSAS 9pm to 4am monthly average	9pm to 4am standard deviation monthly average	Monthly no. readings 21.5 to 21.74 MPSAS	Monthly no. readings ≥ 21.75 MPSAS	% monthly readings 21.5 to 21.74 MPSAS	% monthly readings ≥ 21.75 MPSAS	
2019	Jul	19.93	1.08	474	361	36	27
	Aug	20.08	0.95	611	515	46	39
	Sep	20.23	0.84	648	612	50	47
	Oct	20.42	0.83	692	619	52	46
	Nov	20.54	0.87	636	490	49	38
	Dec	20.58	0.68	709	527	53	40
2020	Jan	20.09	2.58	703	635	53	48
	Feb	20.64	0.86	691	574	55	46
	Mar	20.60	0.72	788	655	59	49
	Apr	20.33	0.70	635	422	49	33
	May	20.13	1.11	558	423	42	32

Table 7 The Jump-Up base (SQM 2.1).

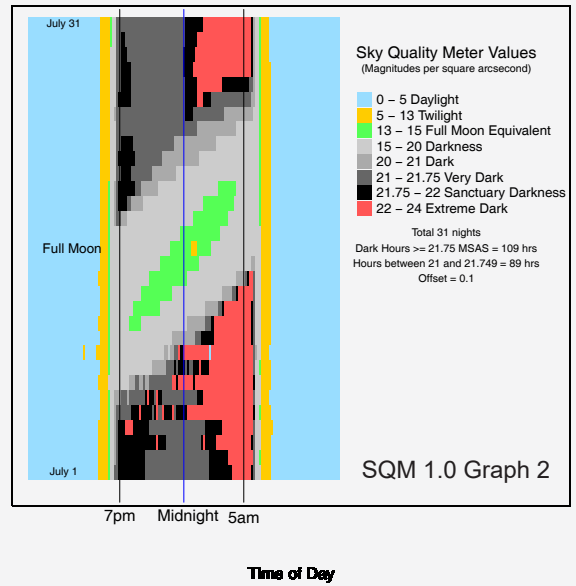
Period	MPSAS 9pm to 4am monthly average	9pm to 4am standard deviation monthly average	Monthly no. readings 21.5 to 21.74 MPSAS	Monthly no. readings ≥ 21.75 MPSAS	% monthly readings 21.5 to 21.74 MPSAS	% monthly readings ≥ 21.75 MPSAS	
2019	Jul	19.86	1.12	452	323	34	24
	Aug	19.90	10.5	549	428	41	32
	Sep	20.06	0.97	630	575	49	45
	Oct	20.07	1.23	685	603	51	45
	Nov	19.97	1.91	623	514	48	40
	Dec	20.49	0.91	704	574	53	43
2020	Jan	19.54	3.13	669	619	50	46
	Feb	20.46	1.23	688	575	55	46
	Mar	20.55	0.80	764	573	57	43
	Apr	20.32	0.70	626	367	49	28
	May	20.06	1.12	532	403	40	30

Comparative monthly sky-darkness graphs based on a full day/night cycle from 2.0 The Jump-Up base and SQM 1.0 Dinosaur Canyon.
 July 2019

**Sky Darkness Plot July 1 to July 31, 2019
 Base 1**

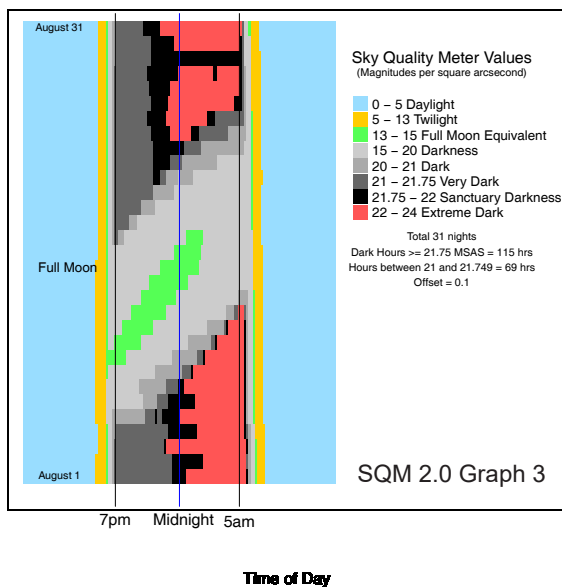


**Sky Darkness Plot July 1 to July 31, 2019
 Dinosaur Canyon SQM1**

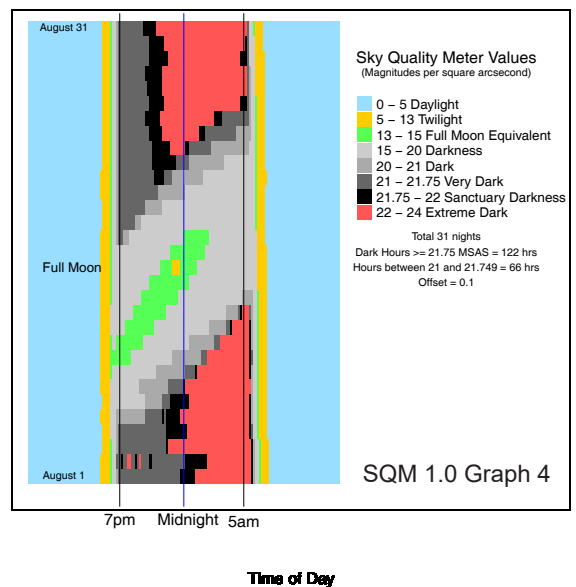


August 2019

**Sky Darkness Plot August 1 to August 31, 2019
 Base 1**

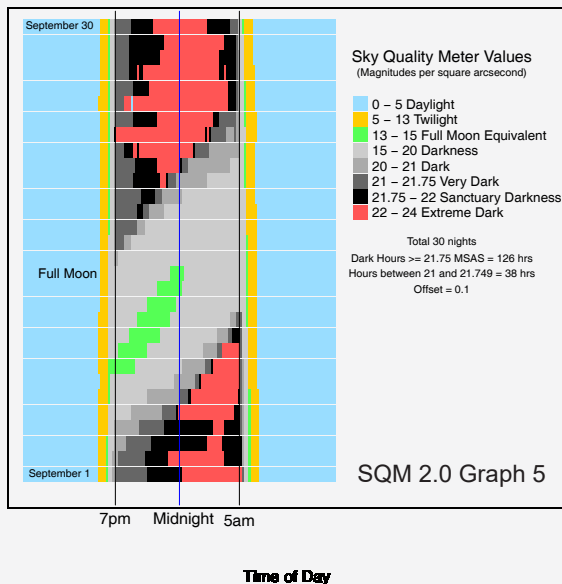


**Sky Darkness Plot August 1 to August 31, 2019
 Dinosaur Canyon SQM1**

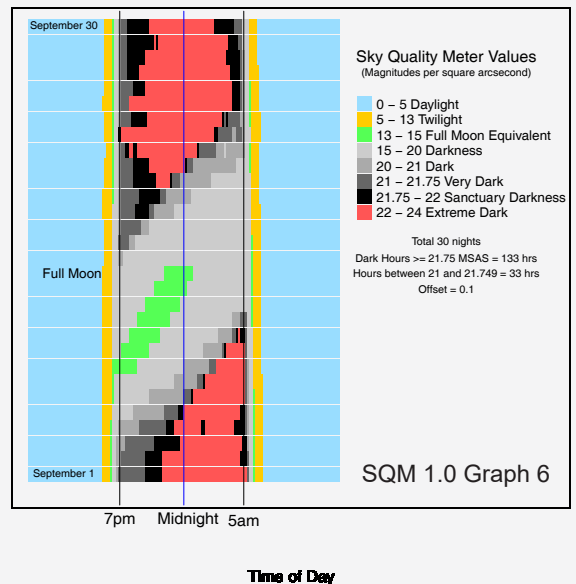


September 2019

**Sky Darkness Plot September 1 to September 30, 2019
 Base 1**

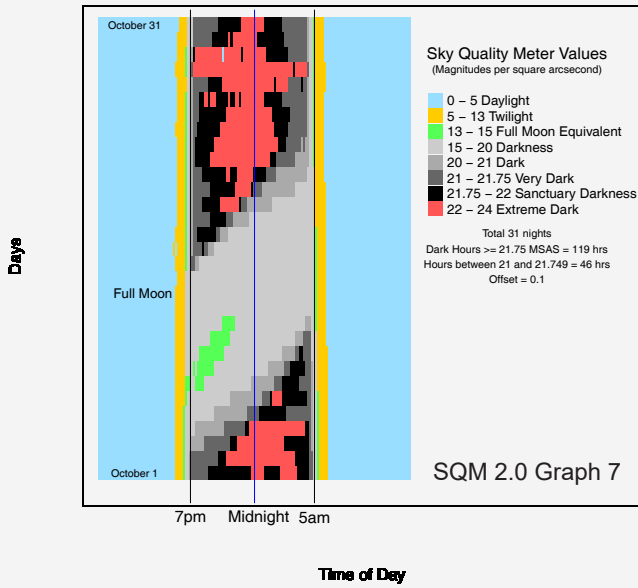


**Sky Darkness Plot September 1 to September 30, 2019
 Dinosaur Canyon SQM1**

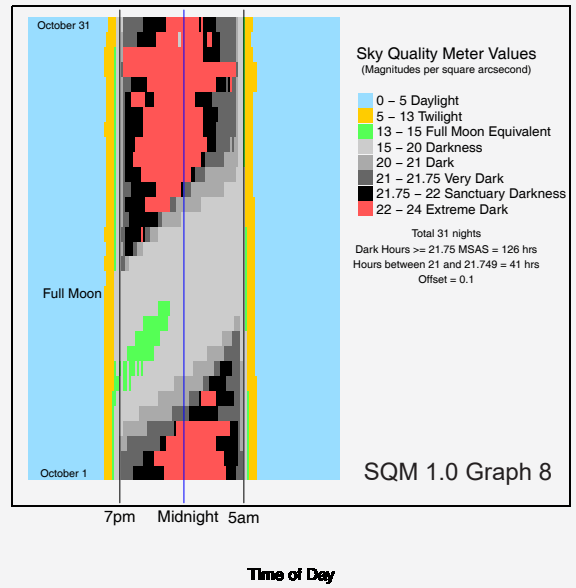


October 2019

Sky Darkness Plot October 1 to October 31, 2019
Base 1

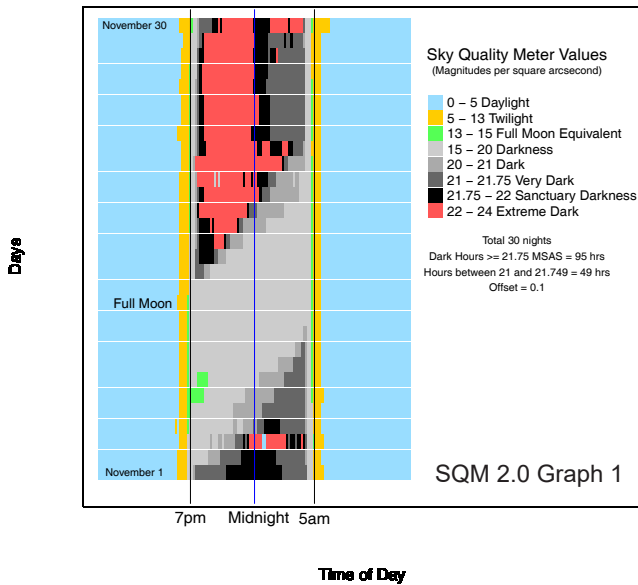


Sky Darkness Plot October 1 to October 31, 2019
Dinosaur Canyon SQM1

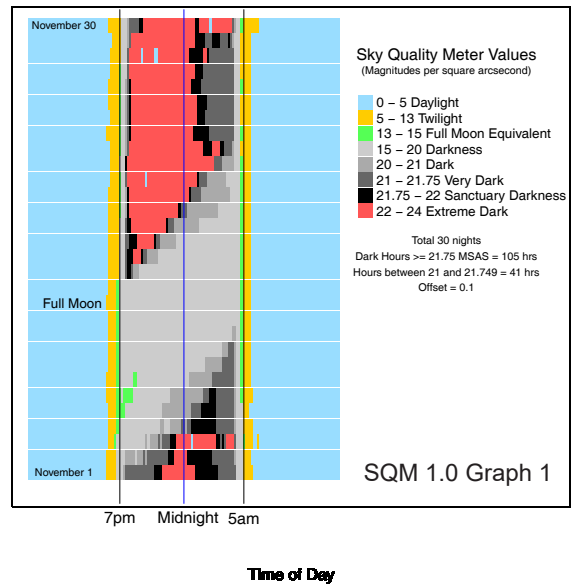


November 2019

Sky Darkness Plot November 1 to November 30, 2019
Base 1

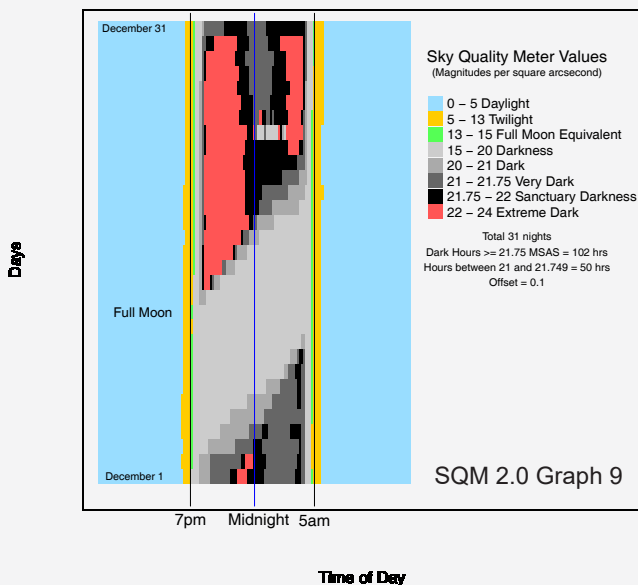


Sky Darkness Plot November 1 to November 30, 2019
Dinosaur Canyon SQM1

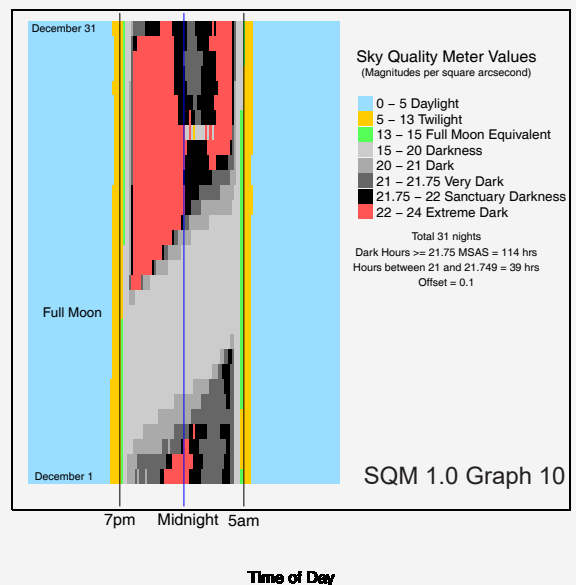


December 2019

Sky Darkness Plot December 1 to December 31, 2019
Base 1

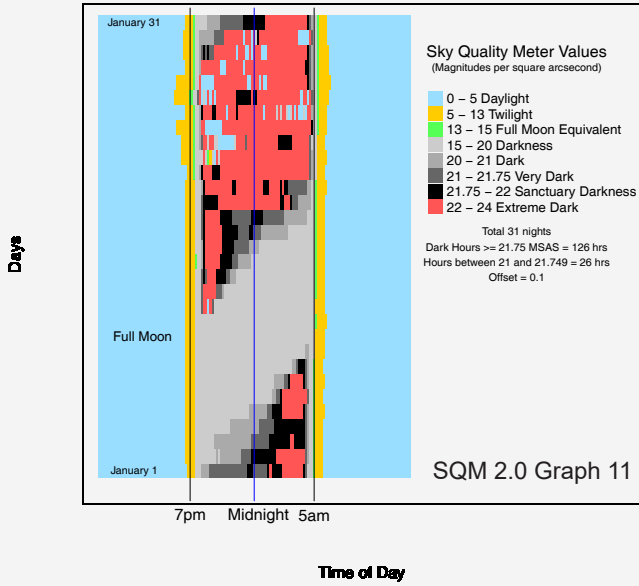


Sky Darkness Plot December 1 to December 31, 2019
Dinosaur Canyon SQM1

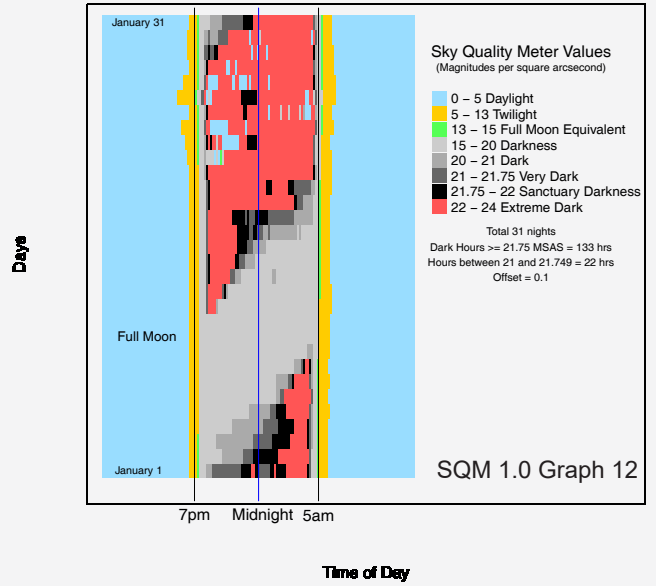


January 2020

Sky Darkness Plot January 1 to January 31, 2020
Base 1

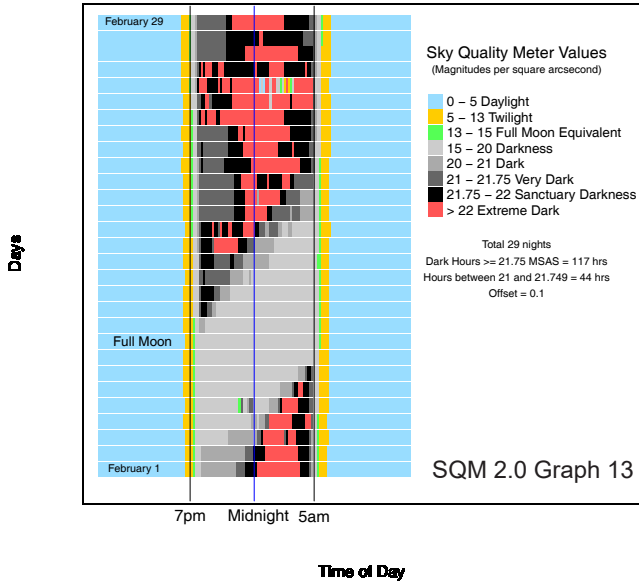


Sky Darkness Plot January 1 to January 31, 2020
Dinosaur Canyon SQM1

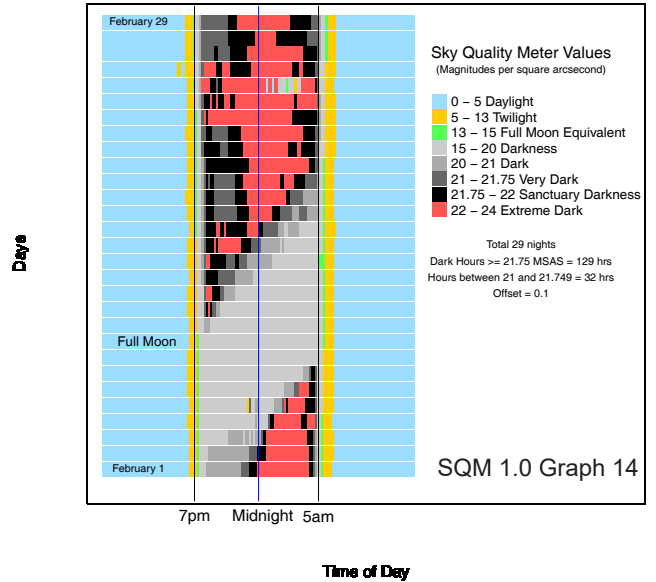


February 2020

Sky Darkness Plot February 1 to February 29, 2020
Base 1

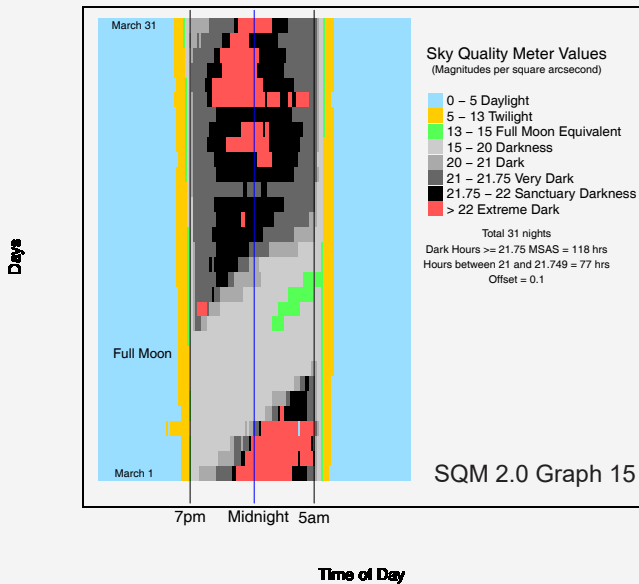


Sky Darkness Plot February 1 to February 29, 2020
Dinosaur Canyon SQM1

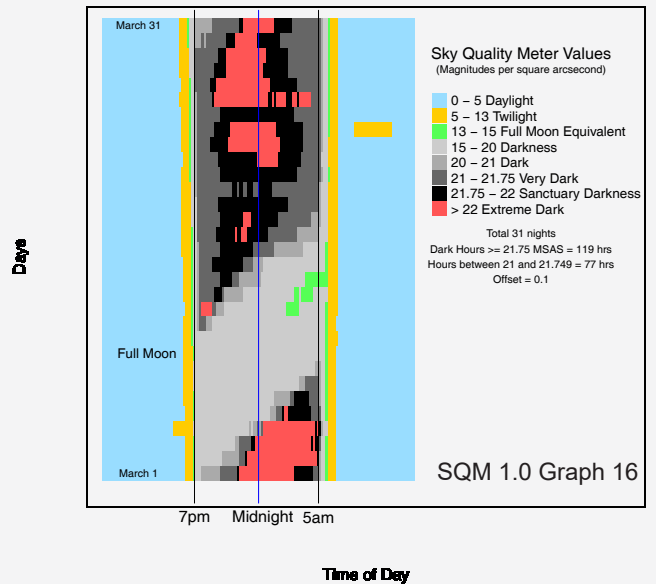


March 2020

Sky Darkness Plot March 1 to March 31, 2020
Base 1

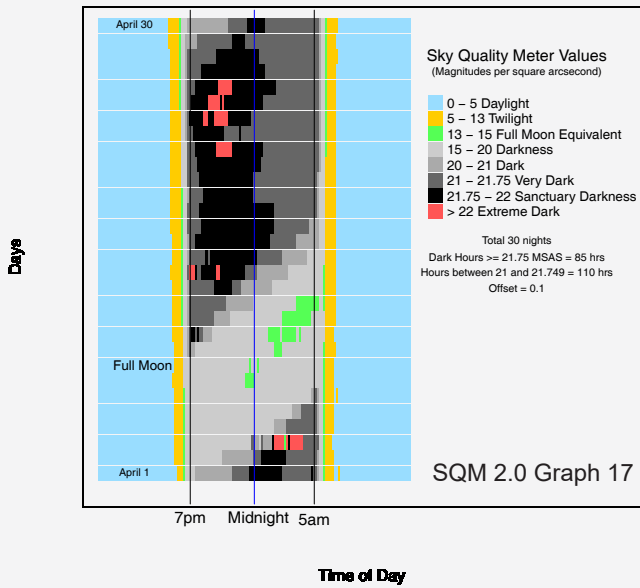


Sky Darkness Plot March 1 to March 31, 2020
Dinosaur Canyon SQM1

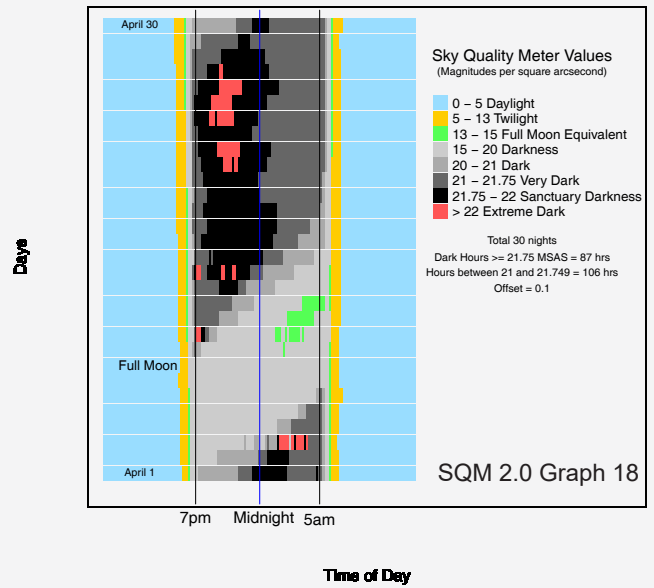


April 2020

**Sky Darkness Plot April 1 to April 30, 2020
Base 1**

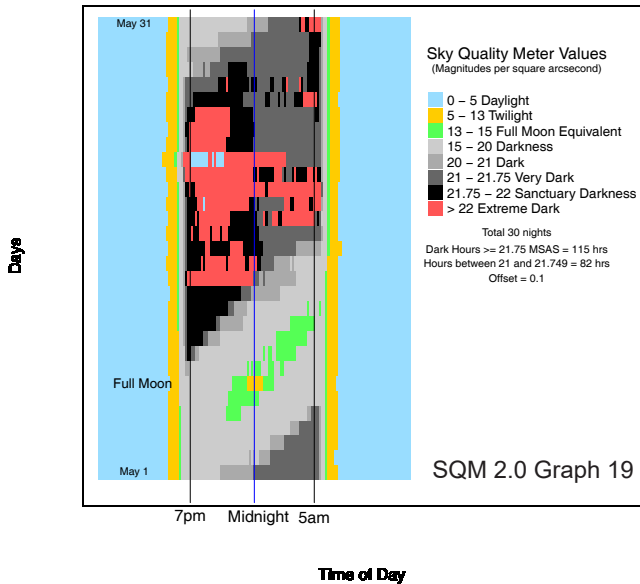


**Sky Darkness Plot April 1 to April 30, 2020
Dinosaur Canyon SQM1**

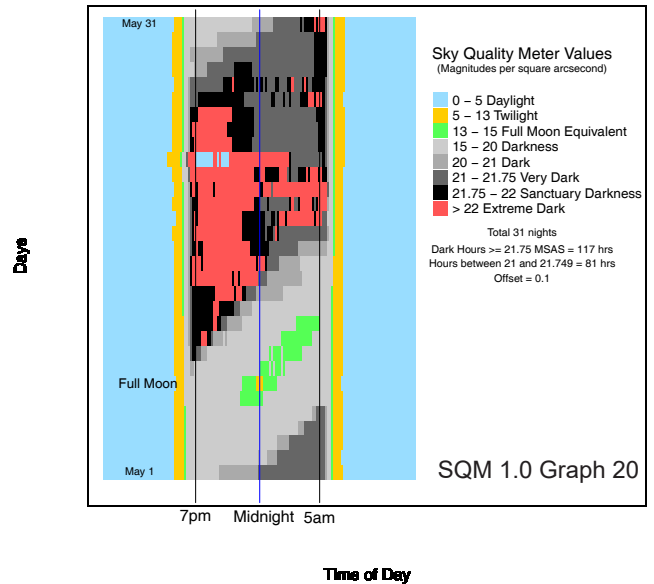


May 2020

**Sky Darkness Plot May 1 to May 31, 2020
Base 1**



**Sky Darkness Plot May 1 to May 31, 2020
Dinosaur Canyon SQM1**



Grant Salmond setting up the 22" Dobsonian telescope that will be located at the Gondwana Stars Observatory.

Conserving the night sky

What percentage of your site's lighting is in compliance with its Lighting Management Plan?

In accordance with the Museum's Lighting Management Plan (LMP), all fluorescent lighting tubes have been replaced with low-temperature LED lights (under 3,000K). The three non-complying external light fittings (outlined in the Museum's application) at Maloney Lodge were replaced in early 2019 with 3,000 kelvin, fluorescent LED lights. All new lighting on site has complied with the Museum's LMP and The Jump-Up Dark-Sky Sanctuary is 100% compliant with IDA regulations. To further ensure compliance is met, all rooms at Maloney Lodge include a guest compendium that includes the Museum's LMP and lighting curfew.

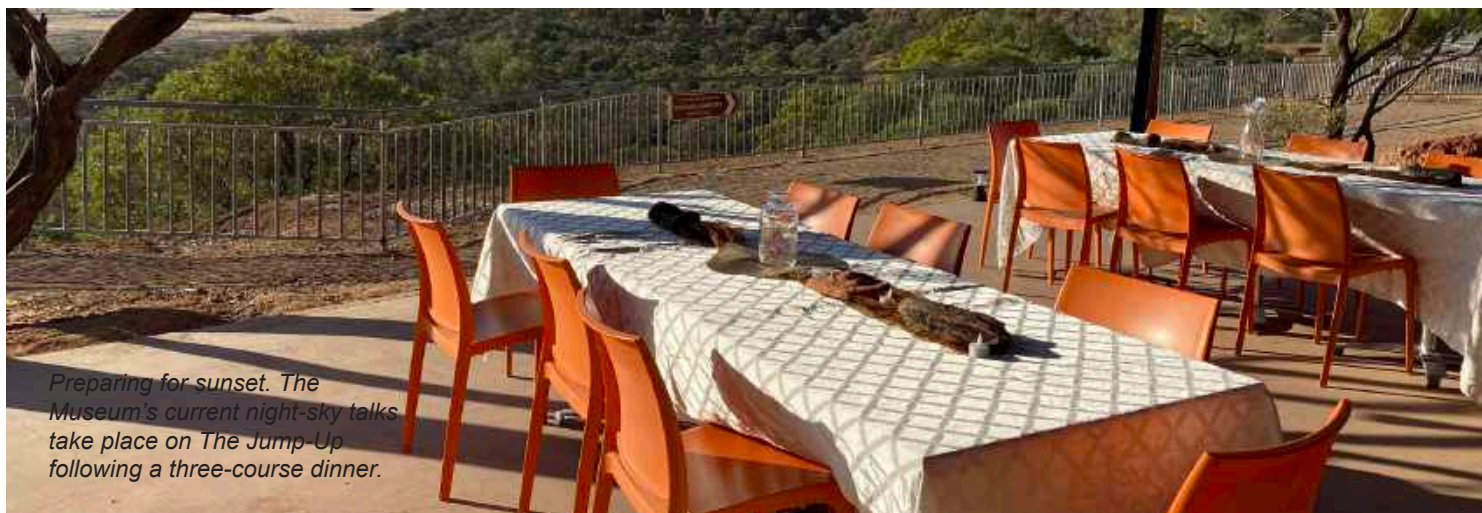
Were any new lighting projects completed this year? If so, please describe.

In early 2020 Maloney Lodge was extended to include seven new rooms, undercover parking and an additional communal kitchen. Outdoor lighting will include LED wall down lights (36W) at 240 lumens and 3,000 kelvins, as used previously, to replace existing light fittings. A revised lighting inventory will be included in the next annual report.

Outreach

How many outreach programs were offered this year? Please describe and include photos if possible.

Despite the Museum's visitation decrease of 84% as a result of COVID-19-related closures and restrictions, the Museum hosted 25 night-sky talks during its wholesale three-course dinner events for 631 visitors during 2019/2020. Unfortunately, from March to June 2020 72 pre-booked wholesale tours were cancelled. These cancellations consisted of 2,099 visitors with a combined expected revenue of \$129,009.



Preparing for sunset. The Museum's current night-sky talks take place on The Jump-Up following a three-course dinner.

Were any new outreach programs started this year? If so, are they complete or ongoing?

Prior to the COVID-19 closure the Museum was on track to open the Gondwana Stars Observatory to the public from August 2020. This attraction has been designed to cater for up to 20 people per tour. It will be possible to host two groups of 20 people per night by staggering them an hour apart. The Gondwana Stars Observatory will be supported by an after-dinner sound-and-light show and the whole experience will run for approximately three hours. The Gondwana Stars Observatory and dark-sky tours will now commence from April 2021.

Commercial endeavours

Were any new grants awarded to the Place this year?

In late June 2019 the Queensland Government officially awarded the Australian Age of Dinosaurs Museum a share in the \$36 million Growing Tourism Infrastructure Fund to deliver the Dynamic Destination project: to build the Gondwana Stars Observatory and *March of Titanosaurs* exhibition.

The Gondwana Stars Observatory is situated approximately 50m southwest of Dinosaur Canyon Outpost. It has been designed to showcase and protect the spectacular night skies of Outback Queensland for future generations to enjoy. Its design is in keeping with the Museum's visual brand and values, incorporating the red-rock and rust themes of other public infrastructure on The Jump-Up. The building is made of concrete tilt panels that assume the texture and colours of a meteorite in the middle of a simulated impact crater, reflecting the bolide impacts that have caused world extinction events throughout deep time. The Gondwana Stars Observatory has been costed at \$780,000.

The Gondwana Stars Observatory will include concrete viewing decks and seating, large telescopes and a storage room. Rather than fixed telescopes with a fold-back roof, like conventional observatories, the Gondwana Stars Observatory will have large portable telescopes that can be wheeled into a covered storage area following night entertainment

sessions. As of September 2020 all that remains to be completed of the Gondwana Stars Observatory is the set up of the telescope mounting infrastructure, the outfitting of the AV room and the installation of the strip lighting around the walkways and seating.



Left to right: Concept artwork of the finished Gondwana Stars Observatory and a drone photo of the Gondwana Stars Observatory as of September 2020.

Do you have any data on the economic benefits of the International Dark Sky Place designation?

Due to COVID-19-related closures and the subsequent delay in capital construction to facilitate the viewing of the night sky for the public, the economic benefit of The Jump-Up's designation as an International Dark-Sky Sanctuary has not been fully realised yet. However, once the Gondwana Stars Observatory is complete and operational the economic benefits will be easier to quantify. These benefits include the

- creation of an additional six FTE employees to operate the current capital projects including the Gondwana Stars Observatory
- increase of overnight visitation and expenditure through destination packaging with other regional attractions to better appeal to the burgeoning international tourism market and
- expansion of the Museum's tourism offering and natural-history exhibitions to create a more comprehensive visitor experience.

The completion of the project will also affect the subsequent success of the Museum of Natural History, as the project's purpose is to increase overnight visitor numbers and expenditure across Outback Queensland in the next five years, particularly during summer months. Many regional businesses, including the Museum, will become more profitable or sustainable and this in turn will encourage further tourism-related investment in the region. This project is about developing a destination brand in Outback Queensland focused on palaeo-tourism and the emerging astro-tourism markets.

Promotions and media relations

Any new media coverage you would like us to know about?

The Jump-Up received excellent regional and national coverage following the announcement of its International Dark-Sky Sanctuary designation. This coverage has ranged from radio, TV, internet outlets and print media. The Museum has maintained a consistent social media presence highlighting the positive effects of dark skies and the ways to prevent light pollution. Signs have been installed at the base of The Jump-Up to inform visitors of its dark-sky accreditation.

Media

19 May 2019 – Reaching for the stars, *Sunday Mail* (print media)

19 May 2019 – [Winton QLD has been named stargazing capital](#), *The Tourism News* (internet outlet)

21 May 2019 – [Winton declared Australia's first Dark Sky Sanctuary as astro-tourism grows](#), *ABC* (radio)

- 14 June 2019 – [AAOD becomes Australia's first International Dark-Sky Sanctuary](#), *The Winton Herald* (print media)
- 12 July 2019 – [The Best Places for Stargazing Around Australia](#), *Concrete Playground* (internet outlet)
- 3-4 August 2019 – Reach for the Stars, *Courier Mail* (print media)
- 23 May 2020 – [Qld Dinosaur Park and dark sky sanctuary prepares to open](#), *Sky News* (TV)
- 19 June 2020 – [Light pollution to be mapped during winter solstice on Sunday](#), *Queensland Country Life* (internet outlet)

Facebook

Date	Topic	Engagement
17 April 2020	Southern Cross interpretation	107
27 April 2020	Indigenous cultures and the night sky	106
24 May 2020	What is an International Dark-Sky Sanctuary?	244
16 May 2020	Celebrating the International Day of Light	26
23 May 2020	Importance of dark skies	71
28 May 2020	Lights off for the Bogong moths	99
1 June 2020	Join us for a Guinness world record	117
6 June 2020	The problem with light pollution – economic and environmental	33
12 June 2020	The problem with light pollution – connection	30
19 June 2020	It's Earth Day! Is your home lighting nature, neighbour and night-sky friendly?	30
21 June 2020	Don't forget that today we aim to beat the Guinness World Record by learning about light pollution	119
02 June 2020	Waffle and Guffaw present Australia's first International Dark-Sky Sanctuary!	153
09 September 2020	Captured at night	130

A selection of the media and Facebook posts list above have also been included in Appendix A.

Any engagement with local governments, community organisations, or private landowners in the past year to report?

The Museum was awarded an outstanding achievement in the category of "Sustainability: Organisations with Paid Staff" for its project "Turning out the lights: Australia's first International Dark-Sky Sanctuary" in the 2019 Gallery and Museum Achievement Awards (GAMAA).

Museums & Galleries Queensland (M&G Qld) Executive Director, Rebekah Butler, said, "The Australian Age of Dinosaurs staff and volunteers are to be congratulated for their tremendous achievements in compiling and adopting their formalised Lighting Management Plan and for being designated Australia's first International Dark-Sky Sanctuary. The Museum has demonstrated leadership through its conservation strategies, educational programs and guided tours. These initiatives have created a better understanding of the benefits of truly dark skies and are ensuring continued public engagement with this very remote Museum and region."

In addition, on 2 November the Outback Queensland Tourism awards were held in the Museum's hometown of Winton. It was here that the Museum received the inaugural Best Outback Eco Project award for its dark-sky conservation. To secure this award the Museum carried out night-sky assessments for three years, implemented a Museum-wide Lighting Management Plan and invested in dark-sky friendly lighting solutions.



The Museum team collecting the Best Outback Eco project award for its dark-sky conservation.

Engagement with the International Dark-Sky Association

Did the Place work with the International Dark-Sky Association in an additional capacity?

The Museum participated in the Guinness World Record attempt, hosted by the Australasian Dark Sky Alliance, to achieve the largest number of people completing an online lesson about light pollution, to beat a previously held Guinness World Record. The Museum assisted with this attempt by promoting the event on its social media channels, and via its staff and member newsletters. The Australasian Dark Sky Alliance broke the world record, with 4,283 taking part in the session.

Discussion

While COVID-19-related closures and restrictions have seen the Museum's visitation drop, the Museum has received significant local and national support, including significant financial support, to share the night sky with others through the construction of the Gondwana Stars Observatory. The delay in this construction has not stopped the Museum from night-sky talks during its wholesale three-course dinner events on The Jump-Up, but following the construction of the Gondwana Stars Observatory, from 1 April 2021, interpretative tours of The Jump-Up night sky will be regularly available to the public.

The exceptional sky quality on The Jump-Up remains consistent as evidenced in the data displayed in Graphs 1 to 20 and Tables 1 to 7. Further SQM reporting on the far side of The Jump-Up has also commenced to ensure the data remains consistent across the entire 1,800-hectare site.



Naomi Miles (Business Development Manager)
Australian Age of Dinosaurs

Winton Queensland
30 September 2020

Outback dinosaur town set for stargazer tourism boom



LOOKING GOOD: Winton's inclusion to the exclusive Dark-Sky Sanctuaries' club means big business for the tiny Outback town. Pictures: David Martinelli

Reaching for the sky

JESSICA MARSZALEK
STATE POLITICAL REPORTER

WINTON has been named Australia's top stargazing spot in a tourism coup set to draw amateur astronomers from across the world.

The Outback town joins nine other international Dark-Sky Sanctuaries chosen for their exceptional starry nights.

Premier Annastacia Palaszczuk said the award could help to generate millions of dollars in extra revenue for the state's Outback economy, which is home to the Australian Age of Dinosaurs Museum.

"This makes Winton Australia's first Dark-Sky Sanctuary," she said.

"Stargazing is a global industry and we know there's a growing demand for eco-tourism experiences worldwide.

"To have such strong recognition of the beauty of the Outback will help to grow tourism in the region."

Australian Age of Dinosaurs executive chairman

David Elliott said night quality measurements taken since 2016, as part of the accreditation, found an exceptional clear dark sky with no light pollution from human activity or urban centres.

"Visitors will soon discover what we locals have known for years - that our night sky has to be seen to be believed," he said.

Tourism Industry Development Minister Kate Jones said Winton's small population, low humidity and low light pollution made it the ideal location.

"And if the overseas experience in New Zealand is anything to go by, this certification from the International Dark Sky Association will be a winner not only for Winton but for Queensland," she said.

New Zealand has two Dark Sky sites, the first awarded to the Aoraki Mackenzie reserve in 2012.

From July 2015 to July 2016, Aoraki Mackenzie had more than a 40 per cent increase in visitor numbers with a large proportion explicitly coming to see the night sky. Other certified Dark Sky Sanctuaries are in South Africa, Chile, the United States and the Pitcairn Islands, in the southern Pacific Ocean. The Palaszczuk Government has named 2019 as the Year of Outback Tourism, with a \$3 million campaign selling the allure of heading west.



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AAOD becomes Australia's first International Dark-Sky Sanctuary

In late April the site of the Australian Age of Dinosaurs Museum, The Jump-Up, was formally designated Australia's first International Dark-Sky Sanctuary (IDSS) and the tenth designated IDSS in the world by the International Dark-Sky Association (IDA).

Premier Annastacia Palaszczuk said the internationally-recognized award could help to generate millions of dollars in extra revenue for the Outback economy.

"This makes The Jump-Up and the Australian Age of Dinosaur Australia's first Dark Sky Sanctuary," she said. "There are only ten of these sanctuaries in the world so this is a huge coup for Outback Queensland. Stargazing is a global industry. And we know there's a growing demand for ecotourism experiences worldwide. To have such strong recognition of the beauty of the Outback will help to grow tourism in the region. This designation is great news – particularly given 2019 is our Year of Outback Tourism."

Tourism Industry Development Minister Kate Jones urged stargazers throughout the world to book a trip to the Outback. "The small population

of the nearest town Winton, low humidity and low light pollution make The Jump-Up the ideal location to stargaze," she said. "And if the overseas experience in New Zealand is anything to go by, this designation from the International Dark-Sky Association will be a winner not only for Winton but for Queensland."

The Museum has been taking sky-quality measurements of sky brightness since 2016 and proven beyond a doubt that The Jump-Up night skies are exceptionally clear and dark with no light pollution from human activity or urban centres. In fact, filtered measurements from November 2018 suggest that nearly 70% of recorded measurements were between 21.33 mpsas and 21.99 mpsas – making the Museum site one of the darkest in the world.

Australian Age of Dinosaurs Executive Chairman David Elliott said "this is a great win for Winton and visitors will soon discover what we locals have known for years that our night sky has to be seen to be believed".

In time the Museum will offer unique astronomy tour experiences to the visiting public and professional equipment with associated toilet and accommodation facilities to university students and professional and amateur astronomers who are looking for the night-sky attributes of a designated International Dark-Sky Sanctuary.

INSIGHT LIFE SENTENCE

Brilliant night skies and historic digs will leave you starstruck in Winton

REACH FOR THE STARS

LEISA SCOTT

One of the simple joys of hitting the road and heading to the Outback is gazing into the carnival of stars in the night sky. Simple, yet mind-blowing. Just lie back and watch the cosmic mix of dust and gas and stars twinkle and flicker on the inky canvas and ponder life, the universe and everything.

The wide, open sky just outside Winton, 1300km northwest of Brisbane, is perfect for stargazing. But for a twist, wander along the main drag, Elderslie St, turn on to Cobb Lane, step beyond the corrugated iron doors and enter the 101-year-old Royal Theatre, one of the few original open-air cinemas remaining in the country.

This little piece of history has spluttered and stopped and started like an old film over the past few decades but it is being revitalised by a small group of enthusiasts, led by Luke Miller, 37. Every Wednesday between April and October, Miller pops on the popcorn machine, powers up the 16mm and 35mm projectors and invites locals and tourists to relive the wonder of watching an old-time movie under the stars in canvas seats.

Actually, they're made of a handy PVC material now, a gift last year from the Winton Splendid Outback Film Festival, held in Winton every winter. Winton is becoming a popular place for filmmaking with movies such as *The Proposition*, *Mystery Road* and *Goldstone* making the



DIG THIS: (Clockwise from above) The Australian Age of Dinosaurs Museum outside Winton offers life-size dinosaur replicas; an open-air shuttle to a dinosaur gorge, and a prep-a-dino experience. **Pictures:** Mark Cranitch



most of the vast plains, majestic jump-ups (mesas) and rugged beauty of the region.

You won't see too many modern films at the Royal, though. The budget of the newly formed Winton Movies Inc doesn't run to paying for screening rights so it's all about nostalgia – and the crowd loves it.

Miller starts the night with some advertising for local stores and businesses straight from the 1960s, using a carbon arc projector that is such old technology, the 19th century fathers of film, the Lumiere brothers, would have known how to operate it. Miller not only sets up the welding rods for the carbon arc but manually changes the slides and admits he gets it wrong at times.

"I can't see the screen and when I put them in they have to be around the wrong

way and upside down to be able to project on to the screen," says Miller, who moved to Winton in January last year. "Sometimes I mess up. I tell the audience to yell out or boo or cheer if it's wrong. It's a lot of fun."

At interval, everyone is invited into the command centre to see the equipment and learn how it works. The entrance is via a small room bedecked with film posters from the '50s and '60s, classics such as Marilyn Monroe in *Some Like it Hot*, and Paul Newman in *Hud*, also known as "The man with the Barbed-Wire Soul."

Roller skates are dotted about; up the front, near the screen is a tiny rink, put in to try to boost ailing numbers in the 1970s after television started to bite.

With everyone back in their seats and snuggled under blankets, Miller cranks up

the 16mm and puts on some Cinetone News, maybe some Bugs Bunny cartoon and follows it with a feature film on the 35mm. Perhaps a bit of Three Stooges, for \$8 for adults and \$5 for kids.

"We recreate coming to the cinema the 1960s," says Miller. "I could see the magic in it. It's living history. I think the charm of Winton, why tourists come out here."

Come spring, tourists will be arriving in droves – some with thunderboxes in tow. The Australian Dunny Derby is on again, a highlight of the five-day Outback Festival that starts on Tuesday September 24, a hilarious spectacle as wildly decorated loos are pushed and pulled through obstacles by teams. Or watch those vultures for the title of strong man and woman, farming equipment and push four-wheel drives, while strong kids toss their swags. There'll be music, bush poetry, a three-course meal under the stars prepared by chef Matt Golinski and a Grand Parade.

Motel vacancies will be scarce in Winton of 870 but Club Paterson Tent is a great alternative, with tents and bathroom facilities set up at St Patrick's Catholic School in Oondooroo St. On the same street you'll find the Winton Club, the place the first board meeting of Qantas was held in 1921. There's more history at the Waltzing Matilda Cafe, a celebration of Australia's unofficial anthem which was written in the 1890s by Andrew Barton "Banjo" Paterson and Christina Macpherson. If it's

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upside down, his include had them all ducking fo with no brains – using what I could've done if half a brain – true?

*Roberto married Car... and they had du...

The Steering Wheel

Night-time access opportunities for visitors

The Museum has two night-time access opportunities for visitors. These are:

1. The Star Gallery (available now!)

Location: At the base of The Jump-Up on a 80m x 14m bitumen pad (refer to map below). Access is via Dinosaur Drive.

Facilities: Planned extensions to the site include toilets, water station, signage, concrete seating and rubbish bins (maintained by the Museum), though camping will remain prohibited. Signage at the site will include dark-sky information and Dark-Sky Sanctuary signage.

Access hours: This area is free and accessible to visitors 24 hours a day, year-round.

Supervision: This is an unsupervised area used at the discretion of visitors (no permission needed)

2. Gondwana Stars Observatory (open 2020)

Location: Adjacent to Dinosaur Canyon Outpost. Access is via Dinosaur Drive and Britton Way.

Facilities: The future Gondwana Stars Observatory will include precast concrete-panel walls, a raised concrete viewing deck, telescope mounting infrastructure, angled concrete seating, equipment storage room and disabled-access ramps. The earthworks around the observatory will include meteorite-crater landscaping and concrete simulated meteorite obtrusions, 250m safety balustrading along the cliff edge at Dinosaur Canyon for night visitation safety, 250m disabled-access footpath and lighting, and external concrete seating along the footpath. Completion is set for 2020.

Access hours: The observatory will be accessible by interpretive guided tours only.

Supervision: This is a supervised area with trained Museum Tour Guides.

In the event of an extreme natural disaster, such as fire or flood events, access to the Museum and night-time access areas may be closed by the Winton Shire Council. Notification of access closures will appear on the Museum's social media pages, website and via signage on Dinosaur Drive.



Our guiding values: Shared curiosity, Passionate customer focus, Fair dinkum integrity, Dynamic evolution.

THE JUMP-UP IS
AUSTRALIA'S FIRST

INTERNATIONAL DARK-SKY SANCTUARY

On 27 April the Museum site, The Jump-Up, was designated Australia's first International Dark-Sky Sanctuary by the International Dark-Sky Association.

Since 2016 Grant Salmond and Kate Louis have collected and collated night-sky brightness readings using a Unihedron hand-held Sky Quality Meter and later using two stationary Unihedron Sky Quality Meters (SQM) at sites across the Museum. The data collected overwhelmingly demonstrated that the night sky above The Jump-Up is exceptionally dark.

In fact, 40% of The Jump-Up's average monthly sky-quality measurements have equalled or exceeded 21.5 magnitude per square arcsecond (mpsas), and from February 2018 to November 2018 over 60 nights were recorded with an average

Looking towards The Jump-Up, with the Museum's iconic Elliot sign in the foreground. PHOTO GRANT SALMOND



measurement greater than 21.75 mpsas. The Jump-Up rates between a class 1 to 2 on the Bortle scale and achieves a typical luminance of below 0.2 millicandela per square metre (mcd/m²). Night-sky brightness readings of 21.5 mpsas or greater on The Jump-Up are common and in complete agreement with visual observations.

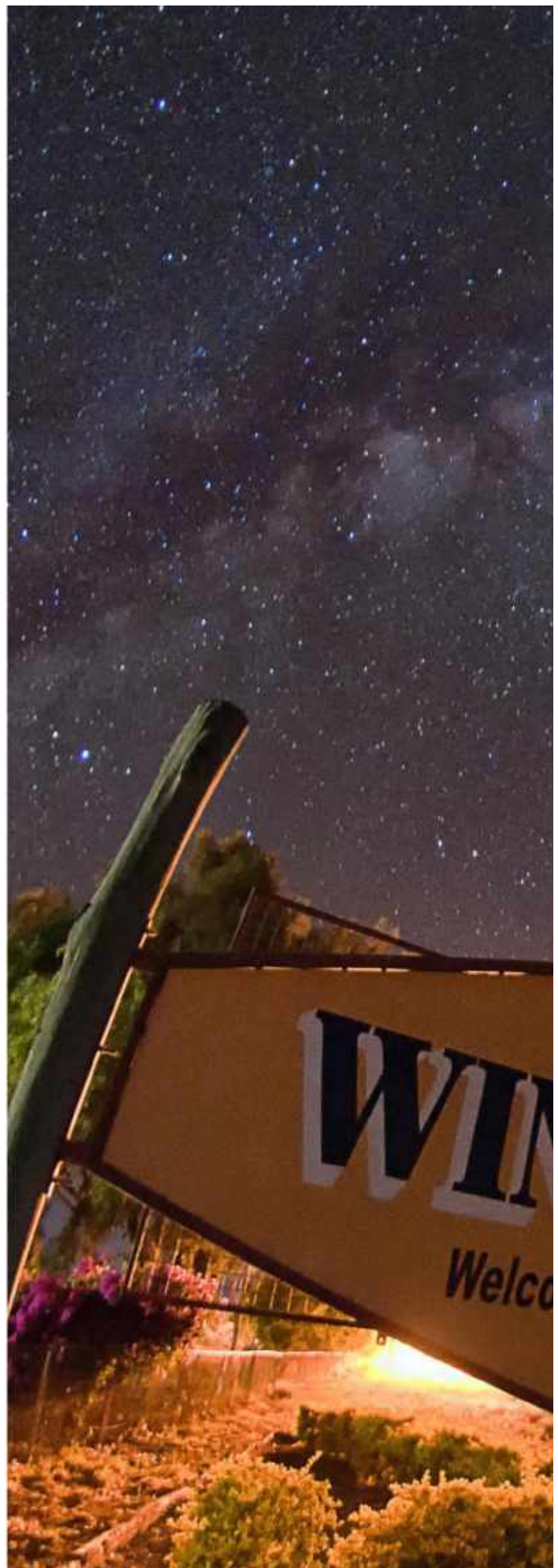
International Dark-Sky Places Program Manager Adam Dalton calculated that from November 2018 approximately 70% of recorded measurements on The Jump-Up were between 21.33 mpsas and 21.99 mpsas – making the Museum site home to one of the darkest night skies in the world.

Through the compilation and adoption of a formalised Lighting Management Plan the Museum has committed to the long-term integrity and protection of the dark skies above The Jump-Up. To this end, a public night-sky viewing area, The Star Gallery, has been made available to visitors year-round and the recently funded Gondwana Stars Observatory will be developed. The Museum will continue to develop relevant tours and educational programs focused on understanding the benefits of truly dark skies to the environment and our own well-being.

A big thank you to Grant and Kate for their enthusiasm and commitment to the exceptionally dark skies above The Jump-Up

To read the Museum's application to the International Dark-Sky Association, click [here](#).

Even on the outskirts of the Winton township the night sky is exceptionally clear and bright. PHOTO STEVE LIPPIS





Australian Age of Dinosaurs, Facebook, 23 May 2019

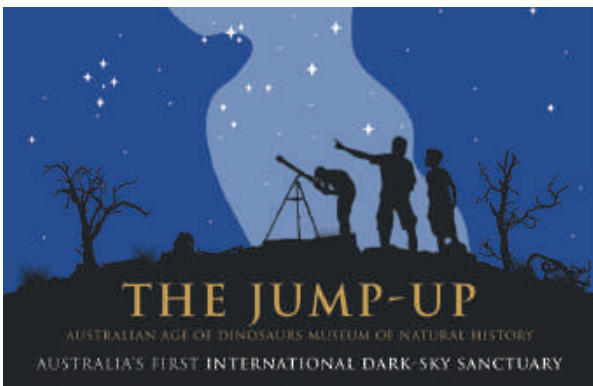


The Best Places for Stargazing Around Australia, Facebook, 5 August 2019

Dark-sky signage at the base of The Jump-Up, close to the Star Gallery.



Dark-sky signage in the Laboratory



Dark-sky magnet available at the Museum.

WHAT IS LIGHT POLLUTION?

Light pollution is excessive, misdirected or obtrusive artificial (usually outdoor) light. This inappropriate or excessive use of artificial light can have serious environmental consequences for humans, safety, wildlife and our climate.

TYPES OF LIGHT POLLUTION

LIGHT TRESPASS
Light falling where it is not intended or needed.

SKYGLOW
Brightening of the night sky over inhabited areas.

GLARE
Excessive brightness that causes visual discomfort.

LIGHT CLUTTER
Bright, confusing and excessive groupings of light sources.

While artificial lights disrupt the natural day-night pattern there are practical solutions everyone can implement, to combat light pollution.

4 WAYS YOU CAN MAKE A DIFFERENCE

- 1. INSTALL** lighting only when and where it is needed.
- 2. USE** energy-saving features such as dimmers and motion sensors on outdoor lights.
- 3. SHIELD** your lighting so light shines down, not up.
- 4. EDUCATE** your friends and colleagues about the importance of good lighting for our health, economy and environment.

WITHOUT THE DARKNESS, WE WOULD NEVER SEE THE STARS.

Australian Age of Dinosaurs Museum of Natural History
australianageofdinosaurs.com

Dark-sky bookmark given to all visitors purchasing books at the Museum.

THE JUMP-UP AUSTRALIAN AGE OF DINOSAURS MUSEUM OF NATURAL HISTORY AUSTRALIA'S FIRST INTERNATIONAL DARK-SKY SANCTUARY

The planet is full of diverse and delicate fauna and flora, and our planet's biodiversity is under threat. The Australian Age of Dinosaurs Museum of Natural History is proud to be a member of the International Dark-Sky Association (IDA) and to have been designated as an International Dark-Sky Sanctuary. The Sanctuary's commitment to protecting dark skies is a key part of our mission to provide a world-class visitor experience. A world-class visitor experience is a key part of our mission to provide a world-class visitor experience. A world-class visitor experience is a key part of our mission to provide a world-class visitor experience.

The Museum is an advocate for and promotes dark sky conservation and education, offering free access to the Star Gallery and the Star Gallery. The Museum is an advocate for and promotes dark sky conservation and education, offering free access to the Star Gallery and the Star Gallery.

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