



INTERNATIONAL DARK-SKY ASSOCIATION
3223 N First Ave - Tucson Arizona 85719-520-293-3198 - www.darksky.org

*TO PRESERVE AND PROTECT THE NIGHTTIME ENVIRONMENT AND OUR HERITAGE OF DARK SKIES THROUGH
QUALITY OUTDOOR LIGHTING*



**International Dark-Sky Association
Dark Sky Places Program Annual Report**

OCTOBER 2017

Aoraki Mackenzie International Dark Sky Reserve

2016-2017 Report

Aoraki Mackenzie International Dark Sky Reserve - 2016 - 2017

The 2016-17 year has seen new opportunities develop and existing ones strengthen. A growing number of businesses within the Aoraki Mackenzie International Dark Sky Reserve now specialise in astronomy related services or offer them alongside their traditional business. A new example this year is the astronomy tour offered by Tekapo Springs.

The AMIDSR Board have worked to develop astronomy training sessions for owners and staff to ensure a quality product is presented across the reserve.

Development with Tekapo township continues with new buildings establishing in the extended lake-front commercial area. Plans are being prepared for an International Astronomy Centre to compliment astronomy night time tours.

Twizel township is seeing growth in its residential areas bringing some concerns about street lighting bollards. This is a result of problems with an earlier design of the bollards and is being worked through with the Mackenzie District Council and their lighting suppliers. A new full cut-off amber bollard has been developed.

International visitor numbers continue to grow strongly in the Mackenzie region with a July to June 2017 increase of 16% for guest nights. This interest in the Mackenzie region has been recognised by China Southern Air with a significant commitment and contribution to research work at the Mt John Canterbury University Observatory and to visitor infrastructure in Tekapo.

The 2017 biennial Starlight Festival will take place in the Mt Cook Village in October. Big Sky Stargazing who are based in Mt Cook have built a new facility at the Mt Cook aerodrome to support their star gazing tours. This facility will be operational in time for the Festival.

The festival this year features three notable speakers: **Dr Natalie Batalha**, NASA Ames Research Center; **Sze-leung Cheung**, IAU International Outreach Coordinator; **Kevin Govender**, IAU Office of Astronomy for Development.

AMIDSR Board, September 2017



General

Aoraki Mackenzie International Dark Sky Reserve Website: www.darkskyreserve.org.nz/

The AMIDSR Board has been registered as a charitable entity, No. CC50892, with the Charities Services, part of the NZ Department of Internal Affairs, and legislated by the Charities Act 2005.

The third Annual General Meeting and two ordinary meetings of the Management Board of the AMIDSR were held. Terms of duty on the Board are limited to three years with the opportunity for one repeat term. Two new board members were elected with their terms starting on the 1st January 2017.

Margaret Austin has retired from the Board but has a role as an advisor to the Board for World Heritage matters.

Management Board of the Aoraki Mackenzie International Dark Sky Reserve - 2017

Name	Affiliation	Place of Residence
Alan Gilmore	Manager of the Reserve; AMIDSR Board Secretary	Lake Tekapo
Dr Gary Steel*	Tourism Sector, Lincoln University	Christchurch
Prof John Hearnshaw	Royal Astronomical Society of New Zealand (Immediate Past President), University of Canterbury, Chair of AMIDSR Board	Christchurch
Assoc Prof Karen Pollard	Director of Mt John Observatory, University of Canterbury	Christchurch
Cr Anne Munro	Mackenzie District Council	Lake Tekapo
Sally Jones	Department of Conservation	Twizel
Joy Paterson*	Canterbury Aoraki Conservation Board & Local Community, Mackenzie	Twizel
Bruce Mincham	Local community, AMIDSR treasurer	Twizel
Steve Butler	International Dark-Sky Association	Invercargill
Kirsty Phillips	Tourism sector, Ngai Tahu Tourism	Christchurch
Kaye Paardekooper	Mt Cook Lakeside Retreat	Lake Pukaki
Rebecca Greatrex**	Science Technical Writer	Geraldine
Snow (Gavin) Loxton**	Farmer, resident	Mackenzie Basin

* Joy Paterson resigned her position with the AMIDSR in August 2017 at the AGM and Dr Gary Steel from after the Starlight Festival in October.

** Rebecca Greatrex and Snow Loxton were nominated for membership of the board at the AGM.

Chairperson's report 2016 - 2017

The Aoraki Mackenzie International Dark Sky Reserve is now five years old, and has reached an age of maturity. Its success has been shown by the ever increasing numbers of tourists coming to the Mackenzie Basin to see the stars, and the fact that by and large our skies continue to be exceptionally dark and free of light pollution by international standards.

The region, which includes Tekapo, Lake Pukaki, Aoraki/Mt Cook and Twizel, recorded New Zealand's highest percentage increase in guest nights for the year to January (13.8 per cent) and February (13.6 per cent) 2016 with 35000 more visitors than the year before.

The majority of these visitors are from overseas, estimated at 72 per cent. Approximately two million tourists pass through the Mackenzie each year and at least 10 per cent of these come explicitly for stargazing activities. There has also been a growth in the opportunities for guided night tours. Previously one company, Earth & Sky, had a monopoly of the stargazing for tourists in Tekapo. In early 2017 Tekapo Springs launched Tekapo Stargazing in

competition with Earth & Sky. In addition Big Sky Stargazing is continuing at Mt Cook and Lakeland Explorer in Twizel has started offering stargazing tours.

A number of accommodation providers also have telescopes and encourage stargazing and astronomy tours. These include the Mt Cook Lakeside Retreat (with the Pukaki Observatory), Lakestone Lodge at Lake Pukaki and SkyScape at Twizel. No doubt more will follow.

Interest in the International Dark Sky Reserve was spurred by the announcement from the New Zealand Transport Agency (NZTA) early in 2017 that state highways 8 through the Mackenzie and 80 (to Mt Cook village from Lake Pukaki) are to be designated as the Starlight Highway. Once this new name becomes better known and signed, there is likely to be a further increase in astro-tourism numbers. More hotels and accommodation providers in the region are urgently needed; two luxury hotels are currently planned for Tekapo in the next few years.

The Board of the Aoraki Mackenzie International Dark Sky Reserve welcomes the creation of an International Dark Sky Sanctuary on Great Barrier Island recognized by IDA. AMIDSR sent two representatives (Steve Butler and Margaret Austin) to the launch of the Great Barrier Sanctuary in August. The Board have also invited the main organizers of the GBI International Dark Sky Sanctuary to make a presentation at the forthcoming Starlight Festival at Aoraki/Mt Cook in October. The chair of AMIDSR (John Hearnshaw) will visit GBI in December. We therefore are developing a close relationship with the only other Dark Sky Place at present in New Zealand.

In September 2016, AMIDSR organized a Public Forum in Tekapo. This consisted of a panel of four experts giving short talks on dark sky protection, astro-tourism and related topics. They were MP Jacqui Dean, Steve Butler, Graeme Murray (Earth & Sky) and John Hearnshaw, with Margaret Austin as MC. The evening was attended by about 120 people, mainly local residents of Mackenzie District. We are grateful to Peppers Bluewater Resort in Tekapo for providing the venue and for catering for everyone with eats, drinks and nibbles. Earth & Sky brought some portable telescopes for stargazing at the conclusion of the event.

As mentioned, the Starlight Festival to be held 13-15 October 2017, will be the major outreach event for the Aoraki Mackenzie International Dark Sky Reserve. This will be held at the Hermitage Hotel at Aoraki/Mt Cook. Three keynote international speakers have been invited, namely Dr Natalie Batalha from NASA Ames, California who will talk about 'A Planet for Goldilocks' and the Kepler mission to find Earth-like extrasolar planets, Kevin Govender, IAU Office of Astronomy for Development, Cape Town, who will talk on 'Astronomy for Humankind' and Sze-leung Cheung, IAU Office for Astronomy Outreach, Tokyo, who will talk about 'the Threat of LEDs for astronomy and how to build a dark-sky-friendly future'. Another major theme of this, our third Starlight Festival in the Reserve since 2013, will be astrophotography. The work of nine talented New Zealand astro-photographers will be showcased at the Festival.

AMIDSR continues to maintain a close relationship with the Astronomy and World Heritage Initiative (AWHI) established by the IAU and ICOMOS in association with the World heritage Committee. The AWHI has appointed people as National Focal Points in many countries to coordinate activities in connection with astronomy and World Heritage. John Hearnshaw became NFP for New Zealand in 2016. AWHI chair Prof Clive Ruggles in the UK along with Michel Cotte in France have issued a second edition of their Thematic Study Heritage Sites of Astronomy and Archaeoastronomy in the context of the UNESCO World Heritage Convention, published electronically in June 2017.

The Aoraki Mackenzie International Dark Sky Reserve features prominently in this volume. Michel Cotte discusses AMIDSR in relation to the adjoining Te Wahi Pounamu, which is a World Heritage site: "The brief description of the site (i.e. Te Wahi Pounamu) and the text justify the criteria: they accurately describe the remarkable diversity of mountain landscapes, natural features for geology, biodiversity, etc. However, they do not mention dark-sky quality. Yet in the adjacent District of Mackenzie and Tekapo Lake in the north-eastern part of the natural park, we can observe the sky with exceptional visual atmospheric quality. The district offers today one of the world's most highly rated Dark Sky Reserves. The district is under collective rules that strictly control all artificial lighting, in a durable perspective and giving an absolute priority to dark-sky conservation. For us, it makes sense to propose an extension of the already listed mountain park to the Mackenzie District and Tekapo Lake, with the addition of Dark Sky value to the others, e.g. to reinforce criterion (vii) [of the World Heritage Convention] ('monument of nature')."

https://www3.ocarinabooks.com/downloads/ocarinabooks.com/heritage-of-astronomy_thematic-study_2ndedition.pdf C Ruggles and M Cotte, page 13, 2017).

John Hearnshaw
Chair of the Aoraki Mackenzie International Dark Sky Reserve Board
August 2017

Aoraki Mackenzie International Dark Sky Reserve:

No new territory was added to the Reserve this year.

The AMIDSR has continued to be popular with New Zealand and international visitors, especially from China. Several other communities around New Zealand enquired as to either extending the AMIDSR or to launch new IDA applications for their own areas.

Lighting:

Some issues arose during the year.

Streetlight bollards in new residential areas were reported as being very bright and glary. The particular bollards were installed without blackened louvers to limit light spill at and above the horizontal. The blackening process has previously caused problems through failure of the coatings. These bollards should not have been installed.

A new design of these bollards incorporates a single large amber LED set high in the lamp cap providing a very good full-cutoff lamp. It is hoped that this type of light, developed by Spunlight for the Windsor Urban/Betacom designs in consultation with John Hearnshaw, will become standard.



White Louvers instead of black



New design - no louvers



New design - amber LED

Self Illuminated signs

Two illuminated signs were reported to the AMIDSR. Both are in Twizel, one is a modified existing sign and the other is a new sign.

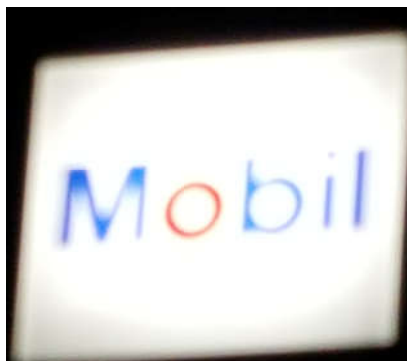
The first sign is for a petrol (gas) station. Their original sign was predominantly yellow and red and didn't create an issue. A change of ownership and brand has resulted in a much whiter and bluer sign which is left on at night.

The second sign is a very blue/white motel sign.

Both businesses will be approached to help modify their signage by agreement, and new restrictions on illuminated signs will be part of the AMIDSR submissions to the District Plan.



Original brand - warm



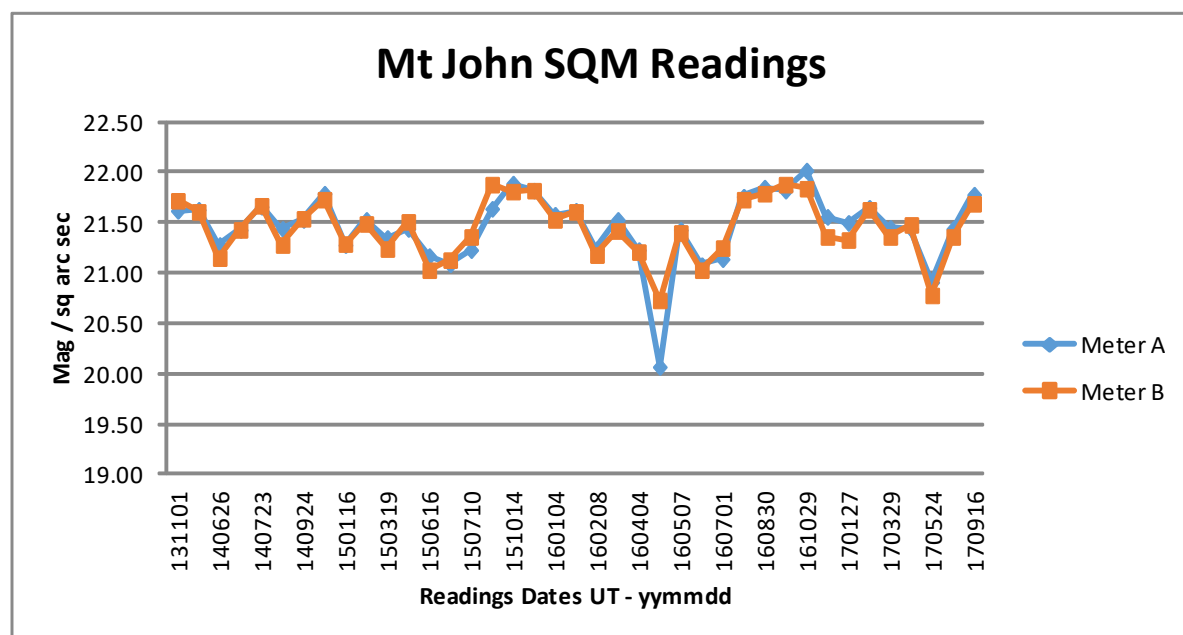
New brand - blue white



New sign - blue white

Sky Quality readings

Two hand held SQM meters were used at the Mt John Observatory by Alan Gilmore near new moon during Near Earth Object programmes. The average of five readings for each meter was recorded.



Mt John SQM Readings

UT Date	UT Time	Meter A	Meter B	Notes
131101	1203	21.62	21.72	
140128	1253	21.63	21.61	
140626	1206	21.28	21.15	
140628	1142	21.43	21.43	
140723	1414	21.66	21.67	
140818	1043	21.44	21.28	
140924	1430	21.53	21.54	
141215	1143	21.79	21.73	
150116	1255	21.28	21.29	
150217	1430	21.53	21.49	
150319	937	21.35	21.24	
150519	1044	21.44	21.51	
150616	1132	21.17	21.03	
150622	1409	21.09	21.13	Snow over region
150710	950	21.23	21.36	
150907	1250	21.64	21.88	
151014	1125	21.89	21.81	
151109	1152	21.82	21.82	
160104	1230	21.58	21.53	
160203	1103	21.62	21.61	
160208	1151	21.24	21.18	Inc Canopus?
160310	1521	21.53	21.42	
160404	1319	21.23	21.21	
160505	1517	20.07	20.73	Sky looks bright
160507	904	21.43	21.40	
160601	1302	21.08	21.03	Snow over region
160701	1057	21.14	21.25	
160731	1242	21.76	21.73	
160830	1133	21.85	21.79	
161030	1515	21.82	21.88	
161029	1357	22.02	21.84	
161229	1413	21.56	21.36	

Mt John SQM Readings (Continued)

UT Date	UT Time	Meter A	Meter B	Notes
170127	1149	21.50	21.33	
170222	1340	21.65	21.63	
170329	858	21.45	21.36	
170422	947	21.44	21.48	
170524	1421	20.91	20.78	Sky looks bright
170625	1312	21.44	21.36	
170916	1408	21.78	21.69	

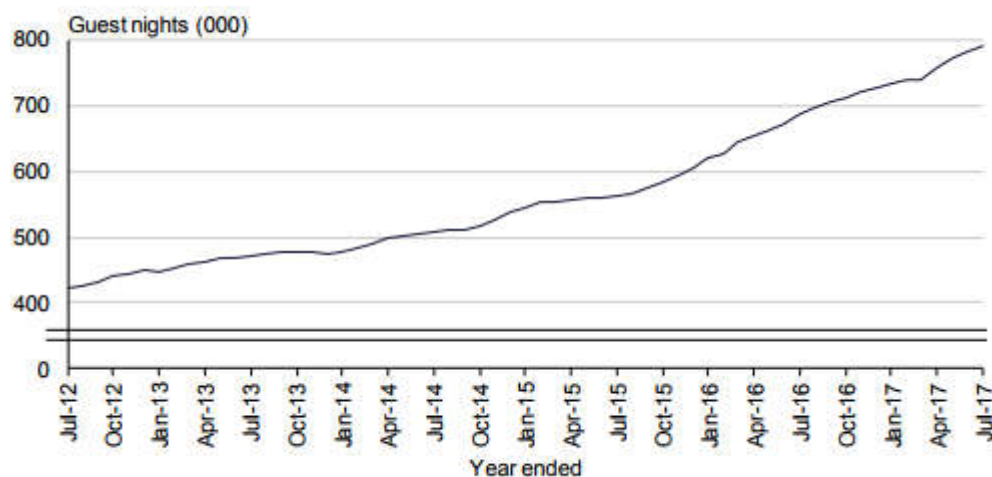
Two Sqm meters were purchased during the year to establish a monitoring record for the Twizel Township.

SQM Readings from Twizel

Date	Time	Location	SQM reading	Cloud	Moon
07.01.2017	02:30	Back yard, no lights visible	21.25	Clear	no moon
27.01.2017	23:04	Pukaki Airport, no lights visible	21.48	Clear	no moon
27.01.2017	23:14	Manmade Hill, lights of town below	21.50	Clear	no moon
26.02.2017	21:45	Pukaki Airport, no lights visible	20.68	Clear	no moon
26.02.2017	21:58	Manmade Hill, lights of town below	21.07	Clear	no moon
30.04.2017	20:41	Pukaki Airport, no lights visible	21.03	2/8	no moon
30.04.2017	20:55	Manmade Hill, lights of town below	20.99	2/8	no moon
25.07.2017	21:50	Pukaki Airport, no lights visible	20.73	Clear	no moon
25.07.2017	22:00	Manmade Hill, lights of town below	20.84	Clear	no moon

Tourism and development

Mackenzie RTO Area Annual Guest Nights



Source: Stats NZ

In July 2017, compared with July 2016, there was an increase of 16.0 percent in total guest nights for the Mackenzie Regional Tourism Organisation (RTO) area. Hotels had the largest increase, followed by motels. Holiday parks had the only decrease.

For the year ended July 2017, compared with the previous July year, total guest nights for the Mackenzie RTO area increased 15.0 percent.

Chart and figures from: *Statistics New Zealand (2017).*

Commercial Accommodation Monitor: July 2017- Mackenzie.

Wellington: Statistics New Zealand

www.mbie.govt.nz/info-services/sectors-industries/tourism/tourism-research-data/commercial-accommodation-monitor/current-month-rto-reports/south-island-regional-reports/mackenzie.pdf

Tekapo Lakefront Development

A new village green complete with playground and picnic facilities, more focus on the lake and better pedestrian access to the foreshore are the central design features of new plans for the Tekapo town centre. The first new business to open is a supermarket.



Starlight Highway Tourist Drive

People travelling through the Mackenzie District will be doing so on the Starlight Highway. A proposal to re-name the stretches of highway connecting Fairlie to Mt Cook the 'Starlight Highway' has been given the green light by the New Zealand Transport Agency (NZTA). The decision was expected to add to the district's reputation as an astro-tourism mecca.

www.stuff.co.nz/travel/news/87379832/starlight-highway-name-change-confirmed-for-mackenzie

Mt John University Observatory **Research**

Research at the University of Canterbury Mt John Observatory continues on the same lines as in previous reports. The 1.8-metre MOA telescope is successfully finding gravitational microlensing events. See <http://www.phys.canterbury.ac.nz/moa/>

The 60-cm Boller & Chivens ('B&C') telescope is used by the MOA consortium through the winter months for follow-up photometry of microlensing events with a three-CCD camera for simultaneous photometry in three spectral bands. The B&C is used by Earth& Sky over the summer months to show visitors southern objects, mostly the globular cluster 47 Tucanae.

The 60-cm Optical Craftmen ('OC') telescope continues to be operated robotically by the American Association of Variable Star Observers. The CCD photometer can be alternated with a small fibre-fed spectrograph.

The 1-metre McLellan telescope is used with the Hercules spectrograph mostly for Prof Karen Pollard's astroseismology MUSICIAN programme but occasionally by visiting observers for eclipsing binary research. A PhD student in Canterbury University's Electrical and Electronic Engineering Department used the telescope with high-speed cameras for image analysis. Gilmore and Kilmartin continue their programme of astrometry of near-Earth objects (NEOs), producing several thousand astrometric positions of NEOs, other asteroid and comets.

Community and Media Relations

During a ceremony at the Tekapo observatory on Friday, China Southern Airlines was announced as an official partner of the University of Canterbury facility. While the exact value of the three-year deal remains unclear, it is expected to boost research facilities and opportunities at the observatory.

www.stuff.co.nz/timaru-herald/news/91768119/Chinese-airline-invests-in-Tekapo-observatory-and-tourism

Mackenzie District Council Mayor Graham Smith welcomed the partnership.

"China Southern Airlines is showing a real commitment in this partnership to enhance the visitor experience at Tekapo."

UC Vice-Chancellor Dr Rod Carr says he hopes the partnership with China Southern Airlines is a sign of strong ties between the two countries.

"China is the largest and fastest growing international market for student recruitment at UC, so strengthening relationships with key organisations there will support that growth and provide students with employment opportunities."

Christchurch Airport Chief Executive Malcolm Johns says the sponsorship demonstrates the warm relationship between Asia's largest airline and the South Island.

“China Southern Airlines showed confidence in starting its direct services to Christchurch. It saw such great uptake in the first year, the airline increased the number of flights and has quickly shown its willingness to be right alongside the South Island. This sponsorship is a direct show of support for an area Chinese visitors love to visit.”

China Southern Airlines Australasian Managing Director Louis Lu says the airline is delighted to sponsor the Mt John Observatory.

“This is a great opportunity to support the University of Canterbury and Mt John Observatory. We all share an interest in discovering more about the amazing space that is the sky. China Southern explores it from an aviation perspective, the team at UC and the observatory research its secrets and showcase the amazing stargazing opportunities it offers. This is a meaningful partnership which benefits both the tourism and the scientific worlds.”

www.canterbury.ac.nz/news/2017/university-of-canterbury-flies-high-in-stellar-new-partnership-with-china-southern-airlines.html

Media and Internet Coverage

Tekapo Village

One of the biggest airlines in the world, China Southern Airlines, will boost funding for tourism infrastructure in Tekapo under a new agreement, worth hundreds of thousands of dollars, to partner with Mt John Observatory. The partnership will support tourism in Tekapo, with 10 per cent of the agreement's funding provided to the Mackenzie District Council for tourism infrastructure in the tourist hot spot.

www.stuff.co.nz/timaru-herald/news/91768119/Chinese-airline-invests-in-Tekapo-observatory-and-tourism

Tekapo's Earth and Sky plans new astronomy centre - Friday, 11 November 2016

New Zealand's world-class astro-tourism product has announced plans to build a new International Astronomy Centre.

Earth & Sky Limited Partnership, a joint venture between Earth & Sky and Ngāi Tahu Tourism, has welcomed today's announcement from Prime Minister John Key that the Ministry of Business, Innovation and Employment (MBIE) will co-fund the construction of an International Astronomy Centre on the shores of Lake Tekapo, through its Tourism Growth Partnership.

The new state-of-the-art facility will add to the existing astro-tourism experiences currently on offer through Earth & Sky and will provide a new day-time astronomy experience. The Tourism Growth Partnership will provide \$3 million in funding, and an extra \$7 million will be raised by the partners.

Aoraki Mackenzie, in the central South Island, is a gold-rated dark sky reserve, in recognition of the quality of the almost light-pollution-free skies of the region. An area devoid of urban light creates an incredible example of some of the clearest skies in the world allowing stars to burn brighter than you have ever seen them.

The dark sky reserve includes the Mackenzie Basin, Aoraki Mt Cook National Park, Lakes Tekapo and Pukaki, and the alpine villages of Tekapo, Twizel and Mt Cook. The 4367 sq km area is bounded by a spectacular alpine landscape with the Southern Alps in the west, and the Two Thumb Range in the east.

Earth & Sky Limited Partnership Chairman Graham Kennedy says the facility will be designed as an iconic building of significance, themed around astronomy.

“Lake Tekapo is already considered among the best locations in the world for stargazing,” says Mr Kennedy.

“An International Astronomy Centre alongside the University of Canterbury Mount John Observatory will draw more visitors to our country and to the South Island, offering a unique year-round attraction that they can enjoy during the day or at night.

“Between 1.5 to 2 million people travel through Lake Tekapo every year, but until now our night-time attraction has been limited to only those people staying in the area overnight. By adding a daytime option, more people will now be able to enjoy the Earth & Sky experience.”

The visitor experience at the new ‘Window to the Universe’ Centre will include virtual reality and an interactive science and education area. In this space, visitors will be able to learn about the founders of astronomy in New Zealand and discover how early Polynesian and Māori people used celestial navigation. They will also be able to dine at the café/restaurant or enjoy a drink in the Star Bar, all while enjoying the stunning Tekapo landscape both day and night.

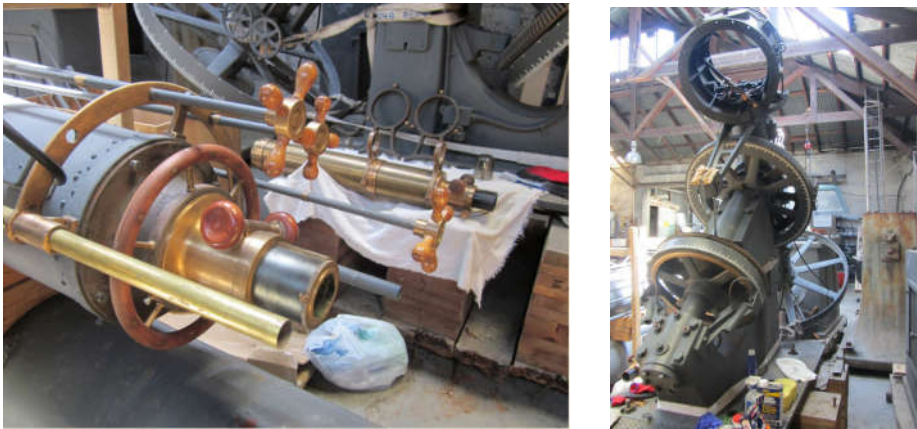
In September, Ngāi Tahu Tourism announced it was entering a 50/50 joint venture with Earth & Sky. Ngāi Tahu Tourism Chief Executive Quinton Hall says the new facility will have a positive impact on the regional economy while also supporting the aspirations of the iwi.

“The International Astronomy Centre will be nationally and globally recognised for the unique experience it offers, so we look forward to seeing this project come to life over the next two to four years,” says Mr Hall.

“Tourism is one of New Zealand’s biggest export industries, and we would like to acknowledge MBIE for its support and vision for this project and the benefits it will bring to all of Aotearoa.”

The Tourism Growth Partnership funding will be used to construct and fit-out the building, which will also showcase a 125-year-old Brashear Telescope and other historic astronomy equipment.

<http://media.newzealand.com/en/news/tekapos-earth-and-sky-announce-state-of-the-art-f/>



The Brashear Telescope in storage awaiting restoration.

Submissions

Two submissions were prepared during the year. The first was to the Draft Aoraki Mt Cook National Park Plan. The second was to the Draft Mackenzie District Plan. Both submissions were based on updating requirements for lighting in the respective areas of the AMIDSR.

The two plans will be released for public submissions during the following year and the AMIDSR will take the opportunity to again make submissions.

Starlight Festival 2017

The Third International Starlight Festival will be held at the Hermitage, Mt Cook over three days in 2017, 13-15 October.

The Festival will celebrate the Aoraki Mackenzie International Dark Sky Reserve (www.darkskyreserve.org.nz) whose mission is to encourage and protect dark skies free of light pollution in the Mackenzie, and to promote star gazing and astro-tourism. We do this by organizing a Starlight Festival every second year for the benefit of the public and international tourists. Astro-tourism in the Mackenzie at Tekapo and Mt Cook is now one of New Zealand's biggest tourist attractions, with about 200,000 people coming to Tekapo annually, many from Asia and Europe, to see the stars.

The 2017 Festival will be our third, after very successful events in 2013 in Tekapo and 2015 at Twizel. The Festival will be a mixture of events including lectures, workshops, exhibitions, videos and documentaries, planetarium shows and of course, star-gazing.

We have engaged three world-class speakers to come to Mt Cook for the Festival. They are:

- Dr Natalie Batalha NASA Ames space scientist, Moffett Field (near San Francisco), California. (Time Magazine in April 2017 named her as one of the 100 most influential people on the planet). She will talk about 'A Planet for Goldilocks' and the search for habitable Earth-like planets
- Kevin Govender, Director of the Office of Astronomy for Development of the International Astronomical Union, based in Cape Town, South Africa. He will talk about 'Astronomy for Humankind'.
- Sze-leung Cheung, Director of the Office of Astronomy Outreach of the International Astronomical Union, based in Tokyo, Japan. He will talk about 'The threat of LEDs to astronomy and how to build a dark-sky-friendly future'.

All three are outstanding speakers, and Sze-leung Cheung is fluent in Chinese as well as English, so can give his talk in both languages to attract overseas tourists.

More details on the Third Starlight Festival and our keynote speakers are at www.starlightfestival.org.nz.

Mark Gee from Wellington will show some of his stunning night-sky time-lapse animations and on the morning of Oct 14 will conduct an astro-photography workshop for everyone wanting to learn these techniques.

Steve Chadwick from Palmerston North will show his amazing night sky animations and photography, as will also the renowned Fairlie and Tekapo astrophotographer, Fraser Gunn.

There is also an astro-photography exhibition with nine of New Zealand's top astro-photographers exhibiting their images.

The Festival features videos, exhibitions, workshops, planetarium shows and stargazing (at the new Mt Cook Observatory) over three days, 13-15 October.

Pukaki Observatory at the Mt Cook Lakeside Retreat (at the southern end of Lake Pukaki) will host a special stargazing and wine-tasting evening on Sunday October 15 with hosts Kaye and Like Paardekooper and astrophotographer Mark Gee.



*On-line ticket
sales now open!*

International
keynote speakers,
workshops,
videos,
exhibitions,
astrophotography,
stargazing,
planetarium
shows

The Aoraki Mackenzie Starlight Festival

Celebrate New Zealand's International Dark Sky Reserve



Photo: Mark Gee

**The Hermitage, Mt Cook
13-15 October 2017**

VENUES: THE HERMITAGE HILLARY ALPINE CENTRE (Mt Cook),
MT JOHN OBSERVATORY (Tekapo)
PUKAKI OBSERVATORY (Mt Cook Lakeside Retreat)

www.starlightfestival.org.nz



Keynote speakers

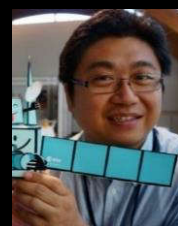
Dr Natalie Batalha
NASA, USA



Kevin Govender
IAU, Cape Town



Sze-Leung Cheung
IAU, Tokyo



THE AORAKI MACKENZIE STARLIGHT FESTIVAL

CELEBRATE NEW ZEALAND'S INTERNATIONAL DARK SKY RESERVE

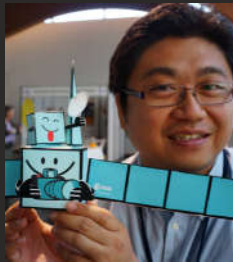


Photo: Mark Gee

THE HERMITAGE, AORAKI/MT COOK | 13-15 OCTOBER 2017



Kevin Govender
(Cape Town)



Sze-leung Cheung
(Tokyo)



Natalie Batalha,
NASA, California

Hear NASA scientist, Dr Natalie Batalha on the search for life on other worlds. Learn about Astronomy for Humankind from South African astronomer Kevin Govender, who is promoting astronomy for developing countries. Hear about the dangers of light pollution and the benefits of dark skies from international astronomy outreach director, Sze-leung Cheung, who will speak in both English and Chinese. Visit Hillary Alpine Centre and planetarium at Mt Cook, and Mt John Observatory at Tekapo. Exhibitions, workshops and stargazing.

**VENUES: THE HERMITAGE HILLARY ALPINE CENTRE (Mt Cook)
MT JOHN OBSERVATORY (Tekapo) | PUKAKI OBSERVATORY (Mt Cook Lakeside Retreat)**

www.starlightfestival.org.nz |  www.facebook.com/AorakiMackenzieStarlightFestival/



NGĀI TAHU Tourism





Operations report from Earth and Sky Limited, Tekapo

Earth & Sky Limited Partnership, a joint venture between Earth & Sky and Ngāi Tahu Tourism, is building an international astronomy centre on the shores of Lake Tekapo.

With astounding and unobstructed lake views, this will be a building of significance. Earth & Sky is globally-recognised for astro-tourism, and the facility will add to the existing astro-tourism attraction, providing an exciting new day-time astronomy experience.

The paid daytime experience is designed to be year round and all weather, and to complement the existing night-time stargazing and observatory tours experience that Earth & Sky offers.

One of the core highlights is a fully functioning 125-year-old Brashear Telescope that stands at 5.4 metres tall and requires an observatory dome. The dome will clearly identify the building as a public astronomy centre and will highlight the importance of dark sky reserve tourism to the town, sending a clear visual signal that Tekapo is one of the premier locations on the planet to view the night sky.

The new interactive experience will be designed to inspire and educate visitors about the night sky. It will be immersive and interactive, providing the opportunity for multi-sensory interactions to help visitors to understand the scale of the universe, the wonder of its creation from both a scientific and cultural perspective, and the wonder of some of our most recent discoveries. We are working closely with the University of Canterbury on the scientific content.

Our goal is to connect visitors to the place and its people as well as to our experience and to our team, and as such we will look to be authentically local in our storytelling. There will be a strong cultural component to the experience which we are working closely with local Rūnanga in terms of content.

As an active supporter of the Aoraki Mackenzie International Dark Sky Reserve, we will be working hard to minimise potential light pollution from the new building. This includes compliant exterior lighting, having a solid ceiling (no skylights) and looking at low level interior lighting.

We are aiming to be open to the public from January 2019

www.earthandsky.co.nz/



The Mt Cook Lakeside Retreat is now an establish and well regarded accommodation and observing business on the side of Lake Pukaki. The Retreat has an exclusive observatory for guests, equipped with a six-inch refractor telescope. You can also enjoy refreshments and nibbles in the adjoining wine cellar.

Several media articles have praised the retreat while the Mt Cook Lakeside Retreat won the 2016 Tripadvisor Travellers Choice Awards. Qualmark awarded Mt Cook Lakeside Retreat, NZ Luxury Lodge status. "Qualmark® assigns an official classification for accommodations in New Zealand. This Luxury Lodge property has been awarded the Qualmark® Luxury Lodge classification, and is displayed on this page as 5.0 stars."

www.expedia.com.au/Pukaki-Hotels-Mt-Cook-Lakeside-Retreat.h6953169.Hotel-Information?brandcid=blog.chasing-southern-lights-new-zealand.standardarticle.010916

In addition to running their own business, Luke and Kay Paardekooper have been assisting others and were integral in a "Bubbles and Inspiration" astronomy introduction night with former Mt John Superintendent Alan Gilmore. This was held in association with local community group, Twizel Promotions and Development Association. There were approx 80 attendees from local Twizel, Tekapo and Mt Cook area. The session was well received.

www.mtcookretreat.nz/stargazing.html





SkyScape is the latest star gazing experience to be established within the Aoraki Mackenzie International Dark Sky Reserve. Perched on the slopes of the Ben Ohau Range, SkyScape boasts panoramic views of the Mackenzie Country and a unique experience of sleeping under the stars, in a bedroom built predominately of glass. SkyScape is nestled within native scrub, in a private, isolated location on Omahau Hill Station, Twizel.

SkyScape's development began 5 years ago and opened on the 1st of May 2017. July (69%) and August (84%) occupancy rates have well exceeded our expectations, with the majority coming from New Zealander. Winter has proved an ideal time to visit. The stars are out in the early evening, the central heating system has kept guests toasty and those brave enough to venture outside, to the luxury cedar bath tub, have been awestruck by the experience of lying under the milky way.

Not all guests have seen the stars, but all have left raving about their experience in nature. Clouds, moon, storms, rolling fog and snow have all put on a display that has captivated guests. We considered the slogan "We cannot guarantee a good nights sleep" as you never know what show Mother Nature may put on for you. For more information visit www.skyscape.co.nz



SOAK IN THE STARS

The ultimate in stellar relaxation, Tekapo Star Gazing is the only guided hot pools and star gazing experience in New Zealand. The tour operates from the renowned facilities of Tekapo Springs, combining the stunning Aoraki Mackenzie International Dark Sky Reserve with our soul-warming hot pools.

A two-hour experience, the first half of this guided indoor / outdoor tour introduces you to Tekapo's amazing night skies with a unique combination of astronomy and storytelling. The second half of the tour takes place in a 38-degree hot pool; relax on a floating hammock and feel like you're soaking in the stars as you explore the wonder of night skies. <http://tekapostargazing.co.nz/>



Lakeland explorer provide rental and supported cycling trips, scenic tours and stargazing.

The Southern night sky of Aoraki Mackenzie has been rightly designated an International Dark Sky Reserve. It is truly magnificent. The stars don't just shine, they blaze! Stargazing 2 hour night sky tour:

- Learn Southern stars & constellations
- Share national stories & Maori legend
- Enjoy the sound of silence under the stars
- Wonder at all you see from planet Earth
- Be amazed!

<http://lakelandexplorer.co.nz/stargazing/>

TANABATA STAR-PARTY

Price:
Adult: \$20
Child: \$5
(5-17yrs)

Date:
Saturday
29th
July

Location:
Cowan's
Observatory

**Shuttle
Departures:**
5:00pm
6:00pm
7:00pm

Departure from Earth & Sky office in Tekapo Village.
Tekapo is very cold in July but the winter sky is worth it!
Please make sure to bring lots of warm clothes and cozy blankets.

Book online or at Earth & Sky office! ☎ 03 680 6960 ✉ info@earthandsky.co.nz

www.earthandsky.co.nz

LAKE TEKAPO
EARTH & SKY
OBSERVATORY TOURS
NEW ZEALAND

What is TANABATA and QIXI?

Both the Chinese and Japanese festivals originate from the traditional Chinese legend of the Cowherd and the Weaving Girl. There are many variations of this tale, but it usually goes a little like this: There was a beautiful fairy who lived in the Celestial Heaven named Zhinu (represented by the star Vega), she wove beautiful clouds next to the banks of the Silver River (the Milky Way). She fell in love with a young Earthly cowherd Niulang (represented by the star Altair). They secretly married and had two young children. However, when the Queen Mother of the Western Skies discovered that Zhinu, her seventh daughter and an immortal, married a lowly human, she was enraged and sent Zhinu back to heaven, separating the two lovers. Zhinu wept so copiously that all the magpies in the world took pity on her and created a bridge of their wings across the Milky Way to reunite her with Niulang. Even the Empress took pity on her and allowed them to meet once a year on the evening of the seventh day of the seventh month. Variations of the story depict Zhinu as the daughter of the Jade Emperor rather than the Queen Mother and may have her weaving magical cloth, or even the Milky Way itself.

In Japan:
Tanabata Festival is also based on the story of the Cowherd and the Weaving Girl. The star Altair represents the cowherd prince named Hikoboshi and the star Vega represents the weaving princess named Orihime. In Japan, it is said that if it rains on the evening of the seventh, the magpies cannot bridge the Milky Way, and so the lovers cannot meet. For the sake of Orihime and Hikoboshi, people wish for good weather on this date and so there is a tradition of wish making during Tanabata. In Japan you will see colorful decorations around the streets and bamboo trees festooned with "tanzaku". Tanzaku are colourful strips of paper upon which people write their wishes.

In China:
Qixi Jie is celebrated on the seventh day of the seventh month according to the Chinese Lunar Calendar. This year it falls on August 28th. It is celebrated in the present day as a "Chinese Valentine's Day" by young couples.

THE YEAR OF THE ROOSTER

2017

新春快樂

EARTH & SKY
LAKE TEKAPO • NEW ZEALAND

HAPPY EASTER FROM EARTH & SKY

Book your stargazing and observatory tour online.
www.earthandsky.co.nz

Follow us on: f t i y

LAKE TEKAPO
EARTH & SKY
OBSERVATORY TOURS
NEW ZEALAND