



New Zealand Starlight Conference



Programme

Lake Tekapo

20 – 23 October 2024

Starlight Conference Organizing Committee

- John Hearnshaw Aoraki Mackenzie International Dark Sky Reserve board; chair of Starlight Conference Organizing Committee; Christchurch
- Nalayini Davies Royal Astronomical Society of New Zealand; DarkSky International; Auckland
- Margaret Austin Starlight Conference fund-raising; Christchurch
- Steve Butler Chair, Aoraki Mackenzie International Dark Sky Reserve board; Royal Astronomical Society of NZ, Dark Skies Group; Invercargill
- Bruce Mincham Aoraki Mackenzie International Dark Sky Reserve board; Starlight Conference treasurer; Twizel
- Karen Pollard University of Canterbury, director Mt John Observatory; Christchurch
- Adrien Vilquin Barrajon formerly Dark Sky Project, Lake Tekapo
- Ellen Cieraad Nelson Marlborough Institute of Technology; Department of Conservation, Nelson

Book display and sales

- Alan Gilmore Lake Tekapo
- Marie Connolly Akaroa
- Vickie Hearnshaw Christchurch

Sunday October 20

- 2:00 pm Registration Desk opens at the Dark Sky Project, 1 Motuariki Lane, Lake Tekapo. Collection of conference folders.
- 2:00 – 4:30 pm Optional visit to Mt John Observatory. Shuttle vehicles will take you there from the Dark Sky Project, only for those who booked a tour in advance.
- 5:50 pm All manuhiri (invited guests and participants) to assemble at the Dark Sky Project building. *Please be punctual!*
- 6:00 pm Opening of the Starlight Conference, Dark Sky Project, 1 Motuariki Lane, Lake Tekapo.
- Mihi whakatau (Māori welcome).
- Kapa haka performance (Thanks to Te Wera King and Te Rūnanga o Arowhenua).

Opening speeches by:

- Victoria Campbell, Manager of the Dark Sky Project, Ngai Tahu Tourism
- Professor John Hearnshaw, Chair of Starlight Conference Organizing Committee
- Mayor Anne Munro, Mackenzie District
- Miles Anderson, Member of Parliament for the Waitaki
- Duncan Hall, President of the Royal Astronomical Society of New Zealand
- Steve Butler, Chair of Aoraki Mackenzie International Dark Sky Reserve Board, Chair of the Dark Skies group of the Royal Astronomical Society of New Zealand

M/C: The Hon Margaret Austin

- 7:00 pm Blessing of the kai (drinks, eats and nibbles)
- First drink is free. Cash bar for second and further drinks.
- 8:00 pm Participants who want to dine at the Dark Sky Project restaurant are welcome to do so. **Advance bookings recommended. Please contact 03 974 0378.** The restaurant is now open to the public.

Monday October 21

Venue: Tekapo Community Hall, 6 Aorangi Crescent, Lake Tekapo.

Keynote invited speakers are indicated by (★)

Session 1: Dark sky places and the global scene

Chairperson: Nalayini Davies

9:00 Ruskin Hartley, Executive Director of DarkSky International, Tucson Arizona, USA (★)

The hidden costs of light: How preserving natural darkness protects our world.

9:30 Annika Jägerbrand, Gävle University, Gävle, Sweden

co-authors: Alp Durmus (Penn State University, USA) and Maria Nilsson Tengelin (RISE Research Institutes of Sweden, Borås, Sweden)

What to report in studies of anthropogenic light and light pollution

9:50 Ellen Cieraad, Nelson Marlborough Institute of Technology

co-author: Jeff Dalley (DOC)

Light vs. Dark: Navigating night sky perceptions in Aotearoa New Zealand

10:10 David Welch, IUCN Dark Skies Advisory group, Ottawa, Canada (pre-recorded talk)

Dark Sky Places of the World - how they vary and where they are

10:30 Morning tea/coffee break

Session 2: Lighting technology and dark skies

Chairperson: John Hearnshaw

11:00 Susan Mander, Massey University, Albany, Auckland and Auckland University of Technology (★)

Trends and Impacts of Outdoor Lighting

11:30 Abhishek Wali, Connetics, Christchurch

co-author: Brendan Hayman, Connetics

Road Lighting Design: Strategies for Minimizing Light Pollution and Ensuring Safety

11:45 Andrea Sosa, CURE - Universidad de la República, Montevideo, Uruguay

co-authors: Florencia Reichmann, Andrés Olivera, Susana Colmegna, Santiago Roland, Macarena Risso, Keving Mendoza, Fabiana Guadalupe, Camila Gianotti, Valentina Pezano (Universidad de la República), Mariana Pérez (ONG Ambá), Fefo Bouvier (professional astrophotographer) & Pablo Chavarría (UTAP - Intendencia de Montevideo)

Dark Sky Protection in Uruguay

12:00 Brian Boyle, Winterstellar Charitable Trust, Gibbston Highway, Queenstown, NZ

The Kawarau-Gibbston Dark Sky Park

12:15 Steve Butler, Chair of Aoraki Mackenzie International Dark Sky Reserve Board, chair of the Dark Skies group of the Royal Astronomical Society of New Zealand

Dark Skies by Design

12:30 Lunch break

Session 3: Light Pollution and Cultural Heritage

Chairperson: Margaret Austin

2:00 Joan Marie Galat, Author and freelance writer/editor, Edmonton, Alberta, Canada (★)

Dark Matters: Using Stories to Promote Dark Skies

2:30 Peter Swanton, Australian National University, Canberra

The Impacts of Light Pollution on Australian Indigenous Sky Knowledges

2:45 Victoria Campbell, Dark Sky Project, Ngai Tahu Tourism, Lake Tekapo

Matariki and Māori astronomical knowledge

3:00 Ladislaus Batinoluho, Dark-Sky Tanzania and Harrieth Mtae, the Open University of Tanzania, Dar es Salaam, Tanzania

Exploration of Astronomical Traditional Knowledge: a tool for promoting astro-tourism in Tanzania

3:15 Kyra Xavia, DarkSky International and Lightwise Guild, Dunedin, New Zealand (pre-recorded talk)

Embracing Darkness - The Benefits of Nocturnal Placemaking

3:30 Afternoon tea/coffee break

Session 4: Light Pollution Legislation; Light Pollution and the Environment

Chairperson: Karen Pollard

4:00 Yana Yakushina, University of Ghent, Ghent, Belgium (★)

Light Pollution Regulations and Where to Find Them

4:30 Christopher Martin, Vela Science, Christchurch, New Zealand

Dark Sky Laws and Regulations from Around the World: Best Practices

4:50 John Hearnshaw, Aoraki Mackenzie International Dark Sky Reserve and University of Canterbury, Christchurch, New Zealand

New Zealand needs national legislation for dark sky protection

5:05 Annette Lees, author and conservation strategist, Waitakere, Auckland, NZ

After Dark: A cultural and natural history of night in Aotearoa

5:25 Charlotte Harding: Wairarapa International Dark Sky Reserve, Carterton, NZ

Reflections on the journey - Wairarapa Dark Sky Reserve Association

5:35: End of session 4

Tuesday October 22

Venue: Tekapo Community Hall, 6 Aorangi Crescent, Lake Tekapo.

Session 5: Light pollution as a global environmental issue (part 1);

Astrotourism (part 1)

Chairperson: Steve Butler

9:00 Annika Jägerbrand, Gävle University, Gävle, Sweden (★)

Outdoor Lighting and Sustainability: Ecological Impacts and Future Directions

9:30 Nalayini Davies, Royal Astronomical Society of NZ; DarkSky International

Lessons learned from New Zealand and paths forward for NZ and other countries

9:50 Laetitia Jacobs, Department of Tourism, Pretoria, South Africa

A strategy for the stars- A tourism response to sustainable development, community and preserving our Dark Night Sky

10:05 Shu An Hsu, Taiwan Ocean Wayfinding Association, Lake Tekapo, NZ

co-authors: Paichi Pat Shein (National Sun Yat-sen University, Taiwan)
and Chien Wen Chen (National Taiwan Ocean University)

The Dark-Sky Movement in Taiwan: Preserving the Starry Night across Diverse Landscapes and Cultures

10:20 Axiou Lin, Taiwan Dark Sky Association, Taipei, Taiwan

An alternative for dark skies in the AI era

10:35 Morning tea/coffee break

**Session 6: Light pollution as a global environmental issue (part 2);
Astrotourism and Dark Sky Places in New Zealand (part 2)**

Chairperson: Nalayini Davies

- 11:00 Johan Eklöf, EnviroPlanning, Ulricehamn, near Gothenburg, Sweden (★)
Bats, insects, and light pollution - How we slowly kill the night
- 11:30 Alasdair Burns, Twinkle Dark Sky Tours, Rakiura Stewart Island, NZ
Five years of the Rakiura International Dark Sky Sanctuary
- 11:50 Leslie van Gelder, Chair, Tāhuna Glenorchy Dark Sky Sanctuary, Glenorchy, Central Otago, New Zealand
co-author: Corrine Davis (Tāhuna Glenorchy Dark Sky Sanctuary)
Tāhuna Glenorchy Dark Sky Sanctuary Mīharo: Dark Sky Places, Wonder and the Creative Arts
- 12:05 The Hon Matt Doocey, National MP for Waimakariri, NZ Minister for Tourism and Hospitality
New Zealand's Dark Sky Stewardship and the Value of Dark Skies for New Zealand Tourism
- 12:20 Nicky McArthur, Kaikōura Dark Sky Trust, Kaikōura
Kaikōura - a four year journey to DarkSky International Sanctuary Accreditation
- 12:35 Lunch break

Session 7: Light pollution as a global environmental issue (part 3)

Chairperson: Ellen Cieraad

- 2:00 Bridgette Farnworth, Nelson Marlborough Institute of Technology, Nelson (★)
co-author: Ellen Cieraad (NMIT)
The ecological impact of light at night in New Zealand: a decade of data
- 2:30 Elizabeth Atchoi, Institute of Marine Sciences - OKEANOS, University of the Azores, Portugal
co-authors: Mindaugas Mitkus (Institute of Biosciences, Life Sciences Center, Vilnius University, Vilnius, Lithuania), Joël Bried (Institute of Marine Sciences - OKEANOS, University of the Azores, Portugal), Manuela Juliano (Institute of Marine Sciences - OKEANOS, University of the Azores), Tânia Pipa (Sociedade para o estudo e proteção das aves, SPEA), Azucena Martin (Sociedade para o estudo e proteção das aves, SPEA), Airam Rodríguez (Departamento de Ecología Evolutiva, Museo Nacional de Ciencias Naturales, MNCN, CSIC, Madrid, Spain).
Advances in the research on the interplay between seabird vision and artificial light
- 2:50 Cesar San Miguel, Australian Department of Climate Change, Energy, the Environment and Water, Canberra, Australia
co-authors: Karen Arthur (DCCEEW, Canberra), Narelle Montgomery (DCCEEW) and Kelly Pendoley (Australasian Dark Sky Alliance, Pendoley Environmental Pty Ltd, Perth, WA)
Improving light pollution management for wildlife
- 3:10 Robert Dick, IUCN Dark Skies Advisory Group, Ottawa, Canada
co-author: David Welch, IUCN Dark Skies Advisory Group, Ottawa, Canada
The World at Night: a new report from the International Union for Conservation of Nature
- 3:25 Ping Lei, Melbourne, Australia
Dancing lights: the role of firefly conservation in reducing light pollution
- 3:35 Afternoon tea/coffee break

Session 8: Astrophotography and astroaesthetics; Astrotourism (part 3)

Chairperson: John Hearnshaw

- 4:00 Steve Chadwick, Massey University, Palmerston North, New Zealand (★)
Beauty in the Stars: a journey through the cosmos
- 4:30 Jianfeng (Jeff) Dai, Chongqing, China
Capture the Wonder of the sky
- 4:50 Hidehiko Agata, National Astronomical Observatory of Japan, Mitaka, Tokyo, Japan
The emotion “Awe” and the effect of the starry sky
- 5:05 Amie Young, Destination Development Manager, Great South, Invercargill, NZ
Dark skies in Murihiku, Southland
- 5:20 Louise Beer, Louise Beer, writer, curator and artist, London and Margate, UK
(pre-recorded talk)
The Transparency of Night.
- 5:35 Close of session 8
- 7:00 Starlight Conference Banquet, Mackenzie Room, Peppers Bluewater Resort, Lake Tekapo (main highway)
For those who have purchased tickets.
After-dinner speaker: Marie Connolly, author of *Dark Sky*, a Nellie Prayne murder mystery novel set at Mt John Observatory

Wednesday October 23

Venue: Tekapo Community Hall, 6 Aorangi Crescent, Lake Tekapo.

Session 9: Light pollution and human health (part 1); Astrotourism (part 4)

Chairperson: Ellen Cieraad

9:00 Mario Motta, former trustee American Medical Association, Boston, Mass., USA (★)

Medical effects of light pollution

9:30 Bryan Boulanger, Ohio Northern University, Ada, Ohio, USA

Restoring Natural Nightscapes – Lessons Learned from Supporting Partner Initiatives over the past 10 Years.

9:50 Lin Mei, Shenzhen Astronomical Observatory, Shenzhen, China

Xichong Dark Sky Community – the experience and achievements

10:10 Mohammad Saleh Timar, editor of *Nojum Magazine*, Tehran, Iran (pre-recorded talk)

Charting Astro-tourism Trails across Iran's Desert Belt: Stargazing under Majestic Desert Skies

10:30 Morning tea/coffee break

Session 10: Light pollution, human health (part 2); Astrotourism (part 5)

Chairperson: Karen Pollard

11:00 Philippa Gander, Massey University, Palmerston North, New Zealand (★)

Light Pollution and Human Health

11:30 Alexander Tups, Centre for Neuroendocrinology and Brain Health Research Centre, Department of Physiology, School of Biomedical Sciences, University of Otago, Dunedin, New Zealand

The importance of maintaining a healthy circadian rhythm for metabolic health, immunity and behaviour

11:50 Luca Devescovi, Akaroa Stargazing, Akaroa, Banks Peninsula, New Zealand

From Akaroa to the Stars: Engaging the Public with Astronomy and Dark Sky Preservation

12:05 Kaye Paardekooper, Mt Cook Lakeside Retreat, Lake Pukaki, South Canterbury, New Zealand

Astro tourism, how to develop a world class sustainable astrotourism venture

12:20 Aryush Aravind, high school student from Irvine, California

Dark Skies for All

12:35 Lunch break

Session 11: Satellite constellations and astronomy; Dark sky places of the world

Chairperson: Steve Butler

- 2:00 Connie Walker, NOIRLab and International Astron. Union, Center for Protection of Dark & Quiet Skies (CPS), Tucson, Arizona, USA (★)
Protecting observatory sites from the growing satellite constellation interference - the IAU CPS
- 2:30 Michele Bannister, University of Canterbury, Christchurch, New Zealand
Satellite impacts on southern skies: a journey in observations and policy
- 2:50 Karen Pollard, University of Canterbury, Christchurch, New Zealand
Astrophysics Research from an International Dark Sky Reserve
- 3:05 Benyan Jiang, Guangzhou University, China
co-authors: Shuyi Jian (Guangzhou University), Jianchuan Zheng (Shenzhen Astronomical Observatory) and Jianjun Li (Guangzhou University)
Light pollution and radiation distance in urban ecological space during the Guangzhou International Light Festival.
- 3:20 Gareth Davies, DarkSky International and Dark Sky Network New Zealand, Auckland, NZ
Effective path to International Dark Sky Places certification
- 3:35 Afternoon tea/coffee break

Session 12: Astrotourism (part 6)

Chairperson: Adrien Vilquin Barrajon

- 4:00 Carol Redford, Astrotourism WA, Perth, Western Australia (★)
Astrotourism Towns: Leveraging Dark Sky Tourism and Total Solar Eclipses to Reduce Light Pollution
- 4:30 Darius Singh, Blue Phoenix Group (Fiji) Pte Ltd, Dreketi, Vanua Levu, Fiji
Gaia (Earth) Estate - Fiji's 1st Dark Sky Project
- 4:45 Koki Sawada, Wakayama University, Wakayama, Japan
co-authors: Tatsuki Yonezawa (Kimino Town Misato Astronomical Observatory) and Masami Okyudo (Nara Prefectural University)
Revisiting the relation between the establishment of public astronomical observatory and national policy in Japan
- 5:00 Warren Hurley, Dunedin Astronomical Society, Dunedin, New Zealand
A new astronomy outreach tool
- 5:15 Lydia Stoddart, Mackenzie Tourism, Christchurch, New Zealand
The Aoraki Mackenzie Dark Sky Story
- 5:30 John Hearnshaw, AMIDSR and University of Canterbury, Christchurch, NZ
Closing remarks
- 5:35 Close of the Starlight Conference

Poster papers

1. Annika Jägerbrand, Gävle University, Gävle, Sweden, and Andreas Brutemark, Biotopia, Uppsala, Sweden and Petter Andersson, Calluna AB, Nacka, Sweden

Assessing the use of environmental lighting zones for the protection of aquatic nature conservation areas.
2. Annika Jägerbrand, Gävle University, Gävle, Sweden

co-author: Maria Nilsson Tengelin (Department of Measurement Science and Technology, RISE Research Institutes of Sweden, Borås)
Origins and ecological relevance of international obtrusive light threshold
3. Mo Wang and Benyan Jiang, Guangzhou University, Guangzhou, Guangdong, China

Analysis of Light Pollution Characteristics in Marine Nature Reserves of the Pearl River Delta Region
4. Warren Hurley, Dunedin Astronomical Society, Dunedin, NZ

Experiencing awe
5. Ellen Cieraad and Bridgette Farnworth, Nelson Marlborough Institute of Technology

Piercing the dark sky cloak - the expansion of light pollution in Aotearoa New Zealand
6. Evelien Castrop, Emily Strange, Henrik Barmentlo and Peter van Bodegom, Leiden University, the Netherlands

The effect of light pollution on the functioning of wild plants
7. Andy Davey, Winterstellar Charitable Trust, Alexandra, Central Otago, NZ

The unique skies of Otago
8. Ralph Bradley, Wai-iti Dark Sky Park, Nelson and Jeremy Taylor

The Wai-iti Dark Sky Park

New Zealand Starlight Conference sponsors

We are grateful to the sponsors of the New Zealand Starlight Conference who have helped make this event possible and who shared our vision 'Towards the first dark sky nation'.



The International Dark Sky Association,
Tucson, AZ, USA



Fairlie Bakehouse,
Fairlie (courtesy of Franz Lieber)



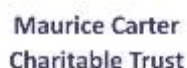
The Isaac Conservation and Wildlife Trust,
Christchurch



University of Canterbury, School of Physical and Chemical Sciences



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