



## Dark Sky Symposium

**Venue: Ballarat Municipal Observatory and Museum**

**Monday 2<sup>nd</sup> April 2018 (Added to the NACAA Event)**

### Program

**9:00 -9:15 Reception**

**9:15 - 9:30 Welcome Dr Russell Cockman President IDAVic and Chair**

**9:30 - 10:00 Planetary Illuminations Marnie Ogg**

#### Abstract

For the past 11 years, Marnie has been masterminding Fred Watson Tours, a travel company dedicated to bring science and tourism together. With her partner, astronomer, Fred Watson Marnie has taken over 600 people to see observatories, the Aurora Borealis and other wonderful corners of the globe. During her travels she has come to realise something so special and unique to Australia, she helped create a designated park to it: Darkness. During this fully illustrated talk, Marnie reflects on Australia's First Dark Sky Park in the Warrumbungles and other successful night sky ventures around the world and discusses ways you too can help preserve the night sky.



**10:00-10:30 Dimming Sydney's sky: early efforts to fight light pollution in the city**

**Dr Nick Lomb**

#### Abstract

Sydney Observatory's fight against light pollution began in April 1994 when the floodlighting of the concrete sides of the nearby aap building was switched on. The 190-metre tall skyscraper was just 500 metres away from the Observatory and its light was a serious disruption to public evening viewing sessions. In this talk Nick, the former curator at Sydney Observatory, tells of battles over this building and over other buildings that caused similar concern in subsequent years. With assistance from the like-minded members of the Sydney Outdoor Lighting Improvement Society (SOLIS), some notable successes were achieved.



After obtaining a PhD in astronomy from the University of Sydney, Nick joined Sydney Observatory as a research astronomer. A few years later when the Observatory came under the auspices of the Museum of Applied Arts and Sciences, he was appointed as Curator of Astronomy. Trying to preserve the environment of the Observatory from increasingly bright city lights gradually assumed an increasingly important part of his role. Nick left the Observatory in 2009, after 30 years there, to move to Melbourne. He now researches the history of Australian astronomy as well as continuing to prepare the annual Australasian Sky Guide.

**10:30 - 11:00 Morning tea**

### **11:00 - 11:15 Case Study - Ongoing Awareness Campaign and Ballarat Sky Quality Survey Judith Bailey**

Abstract

Over a number of years light pollution levels have been measured in a number of locations around Ballarat. Some of the positive gains from the considerably long campaign on the light pollution issue have resulted in increased Community awareness and generational long term achievements.



Judith Bailey Joined the Ballarat Astronomical Society in 1985 and the ASV in 1995 and is currently the Manager of the Ballarat Observatory and has had an interest in Light pollution issues since 1988. Working with the late Geoff Dudley (ASV) a Sky Quality Meter was used to start a Survey of lighting levels around Ballarat.

**11:15 – 12:00pm Workshop**

**'How to influence government', 'How to get the dark sky message to the public', 'Next Steps'.**

### **12:00 - 12:30 Melbourne Light Pollution - What of the Future? Dr Barry Clark**

Abstract

Artificial skyglow brightness measured in the northern suburbs of Melbourne is well below exponential growth predictions made two decades ago. Regardless, deep-sky observers keep complaining that nebulae are still getting harder to see. The most plausible explanation is that the overall correlated colour temperature of lighting is rising as a result of the widespread adoption of LEDs that rely on blue-stimulated fluorescence. For a given photopic level of skyglow, visibility of faint low-contrast celestial objects will be most affected by artificial skyglow with a high correlated colour temperature, ie blue-rich skyglow.

It is mainstream science that the blue content of ambient artificial light at night carries health risks for humans and is a major biodiversity threat. Some sections of the community are campaigning for change but the majority appears to be unaware and unconcerned. Blue light emission at night should be reduced greatly. It would be helpful for indoor lighting in daylight hours to be bright and blue-rich, and at night, dimmer and blue-poor. Reduced lighting at night is more likely to result in crime reduction than crime increase.



Barry Clark joined the Astronomical Society of Victoria in 1955 and is an honorary life member. His research career in defence science and technology (1959-1996) was in the fields of optics and vision. He was the founding Director of the ASV's Outdoor Lighting Improvement Section nearly two decades ago.

### **12:30-13:30pm Lunch**

### **13:30-14:00 Measuring the Night Sky Brightness and Instructional Kit on Light Pollution Mike Chapman**

#### Abstract

To amateur astronomers, light pollution is something that is obvious. To others light pollution is a concept that comes with many loaded ideas and issues. To understand and work with controlling light pollution we need to quantify what light pollution is and when light does become pollution. To this end during the International Year of Light, a number of academic organisations researching in light banded together to produce an educational kit on light pollution. This kit involves a number of activities to teach and inform on aspects of light pollution. Whilst primarily designed for middle school students it is equally suitable for the general public and anyone else for that matter.

The pervasive problem of light pollution is that it is wide spread, light pollution follows urban development. Whilst some dark sky locations and astronomical observatories have programs to measure light pollution for the majority of amateurs that live in towns and cities their answer to light pollution is to attempt to restrict it. A number of citizen science programs exist to monitor light pollution - Australia is poorly represented in these efforts. The importance of this data is that it can be used to correlate satellite data and images from the International Space Station and used to formulate policy on lighting issues. A short review of these programs and how to participate will be presented.



Michael is a long time amateur astronomer. He has a long time association with the Sydney City Skywatchers and has been awarded Life Membership of the association. He also is a founding member of Sydney Outdoor Lighting Improvement Society (SOLIS). His interest in astronomy led to involvement in challenging issues with lighting and is a recent graduate from Sydney University with a Masters in Architectural Studies (Illumination Design) and is pursuing further research in light pollution.

## 14:00-14:30 The Aoraki Mackenzie International Dark Sky Reserve Professor John Hearnshaw

### Abstract

The Aoraki Mackenzie International Dark Sky Reserve (AMIDSR) is the world's largest dark sky reserve at 367 sq km. It is in the central South Island of New Zealand and was created in 2012 with accreditation from the International Dark Sky Association. It was the first IDSR in the southern hemisphere, the first in the world to be accorded gold tier status and the third in the world to be recognized. I will describe the creation of the reserve, its management, its activities and the strong impetus to astro-tourism it has provided. About 200,000 tourists a year now to see the pristine starlit skies of the Mackenzie District.



John Hearnshaw was born in Wellington in 1946, with an English father and Aussie mother, but I grew up in the NW of England from 1948 after my father got a job there after the war. My education was in the UK where I lived for 19 years, but after graduating from Cambridge with a science degree in 1967, I did a PhD in astronomy at the Australian National University in Canberra from January 1968. I married Vickie, a Kiwi girl, in the middle of my doctoral work in December 1969 (we met in Panama when I sailed on a P&O liner from the UK in 1967). After finishing a doctoral thesis I had two short research fellowships, the first at the Paris Observatory (1972-74) and the second one at Harvard and the Smithsonian Institution in Cambridge, Mass (1974-76). In 1976 I returned to New Zealand to a lecturing position at the University of Canterbury. I was promoted to a professorship at Canterbury in 1995 and eventually retired in 2014 after 38 years. For 25 of those years I served as director of Mt John Observatory at Lake Tekapo, in three different periods. I

spent a lot of time developing new instruments to use at Mt John and training graduate students in astronomy (PhD and MSc). During my time at Canterbury I wrote six books on astronomy, most of them on the history of stellar astrophysics in the last 200 years. I have also been active working for the International Astronomical Union (and still am); the IAU is the society for professional astronomers with about 12000 members world-wide. From 2003 to 2012 I chaired the IAU Program Group for the World-wide Development of Astronomy, a job that entailed travelling to developing countries to give lectures, to advise on teaching astronomy and to promote research collaborations. My travels took me to Mongolia, Cuba, Venezuela, Uzbekistan, Tajikistan, Mauritius, Fiji, North Korea, Uruguay, Paraguay, Trinidad and Tobago and Thailand.

## 14:30- 15:00pm The River Murray Dark Sky Reserve (RMDSR) Andrew Cool

The scientific data acquired in the last 18 months at the River Murray Dark Sky Reserve (RMDSR) and about the project generally. Andrew with the RMDSR team has made extensive SQM readings in the RMDSR and modeled atmospheric and cloud conditions with all-sky cameras in the region. He has extensive experience in this field working for DSTO. RMDSR are awaiting a decision from IDA for accreditation for the RMDSR - hopefully Gold standard.



Andrew Cool has worked for the Defence Science & Technology Group at Edinburgh Adelaide for 30 years, in the field of Ionospheric Physics as it pertains to the JORN Over the Horizon Radars. For the past 7 years he has run several airglow cameras systems to photograph Atmospheric Gravity Waves in the Ionosphere, the movement of which can be correlated to disturbances in the Ionosphere.

He led the DST team that conducted a Site Seeing Survey for DARPA's 3.5metre Space Surveillance Telescope at the Harold E. Holt Naval Communications Base at Exmouth in WA in 2013. More recently Andrew commissioned a 20" Officina Stellare telescope at DST Edinburgh that will be part of the Falcon Telescope Network. Andrew is co-author of a paper in Nature on Light Pollution, has published on airglow research, and

along with other Australians is listed as a co-author on a paper detailing the Paris Observatory collaboration to observe the occultation of the TNO Chariklo with its twin ring system. Andrew has run The Heights Observatory in Adelaide since 2007, where he mentors High School students in astronomy and astrophotography. He is also known as the man behind the SkippySky Astronomy weather forecast website.

Since late 2016, Andrew has been involved in setting up the River Murray Dark Sky Reserve, providing advice on astronomy, guiding the collection of SQM data across a 2000sqkm area, and producing software to analyse the data.

Andrew is a Member of the Astronomical Society of Australia and a Fellow of the Royal Astronomical Society.

## 15:00 – 15.05pm Closing Remarks Dr Russell Cockman

## 15:05pm Afternoon Tea