mnassa
Monthly Notes of the Astronomical Society of Southern Africa
Vol 71 Nos 9 & 10 October 2012

ASSA Symposium 2012

The ASSA Symposium was held in the 1896 Building and the Auditorium at the South African Astronomical Observatory in Cape Town from Friday 12, to Sunday 14 October 2012.

The theme of the symposium, "Looking back, looking forward", reflected the significance of 2012. On the one hand, organised amateur astronomy in South Africa turns 100 this year, which was duly celebrated at the symposium. On the other hand, the decision to host the major part of the Square Kilometre Array in Africa promises a bright future for astronomy on the continent. So the symposium focussed on past and future of astronomy alike.

Friday 12 October

LRGB Astrophotography Processing Workshop

Dale Liebenberg presented this workshop in the 1896 Building at SAAO in two parts, separated by a lunch break. The morning session was on Data Processing, in which Dale discussed and demonstrated the typical workflow in processing a RGB raw image from sub frames. This covered; dark, bias and flat-field calibration, dithering and alignment (registration), normalisation, data rejection, group combine, deconvolution and RGB combination.

The afternoon session, titled Image Processing**,** was a hands-on workshop with attendees participating on their laptops using Adobe Photoshop CS 4 or later. Data was provided and the topics included; file formats and bit depth, importing raw data and data conversion, working with layers and layer masks, non-linear stretching, noise reduction, colour manipulation, sharpening, finishing and other tools used in astro-image processing.

After the workshop was completed, delegates paid a visit to the Iziko Museum in Queen Victoria Street in Cape Town and were also treated to a show in the Iziko Planetarium.

The remainder of the Symposium took place in the SAAO Auditorium. Video


Delegates admire the projector at the Iziko Planetarium.

transcripts of the above mentioned workshop and these talks were compiled by Auke Slotegraaf and uploaded to YouTube and can be accessed at http://symposium2012.assa.saao.ac.za/programme/

Saturday 13 October 2012

Morning Session. Chair: Lia Labuschagne (Cape Centre of ASSA)

(09:00): **Brief introductory remarks** by Chairperson.

(09:05): **General welcome** by Ian Glass, president of ASSA.

(09:15-09:55): **Justin Jonas.** SKA and Rhodes University.
The Square Kilometre Array: Africa has been selected to host the mid-frequency dish array of the SKA, which will be one of the largest scientific infrastructures in the world. This presentation gave and overview of the activities of the SKA South Africa project, including preparation of the site proposal, the design and implementation of the MeerKAT, the Human Capital Development Programme, the African VLBI Network, and the C-BASS and PAPER experiments.

(09:55-10:40): **Jasper Horrell**. **Interesting Technical Aspects of the SKA**: This talk was partly a tutorial in nature and also focused on some of the technical challenges that radio astronomy and the SKA brings. We looked at parts of the signal chain for a radio telescope array, how this links to optical telescopes, and focused on imaging challenges in particular. Also addressed were some of the computing/data rate issues that accompany the new instruments.

(10:40-11:10): **Maciej Soltynski.** ASSA Scholarship Convenor.
Galaxy Clusters: Galaxy clusters are the largest known gravitationally-bound objects in the universe and form the densest part of the large-scale structure of the universe. Their nature and formation were discussed, as well as how observations involving galaxy clusters have already, and will in the future, contribute to our understanding of dark energy.

(11:30-12:00): **Dale Liebenberg.** Port Elizabeth.
Astrophotography from a backyard observatory: Since the late 1990s, digital photography and advances in telescope

technology and associated software have allowed amateurs to not only take visually pleasing images of space, but also contribute to science. This talk gave a general overview of what is now possible for amateurs to achieve. Based on the Dale's own experience, topics included data capturing, image processing and typical hardware requirements.

(12:00-12:30): **Auke Slotegraaf**. Somerset West. Chairman, ASSA Deep-sky Section.

Some open clusters I didn't discover: Open clusters are an important species of galactic inhabitants. Their study sheds light on fundamental galactic properties and gives insights into stellar evolution. Before they can be studied, however, they need to be discovered. This talk briefly outlined this identification process, and described the contributions made by amateur astronomers in compiling a more complete census of galactic open clusters.

(12:30-13:00): **Willie Koorts**. SAAO Cape Town.

Geared to turn Photons into Paper: When visiting the Sutherland Observatory one is astounded by the sheer number of domes and hosted experiments populating the plateau today. The three domes present during the official opening of the Observatory on 15 March 1973 have since grown to 20. Although the number of hosted experiments have only increased from two to six, they got much more sophisticated. This talk, richly illustrated by photographs, was a follow-up of a recent *MNASSA* article (Vol. 71, nos 5&6, June 2012, p.120). It gave and overview of the facilities on the Sutherland hilltop today, including the Sutherland Visitors' Centre.

Afternoon session. Chair: Logan Govender (Chair, Durban Centre of ASSA)

(14:00-14:30): **Barbara Cunow**. Pretoria Centre.

Doing astrophotography with a DSLR on a tripod: Barbara presented images of the night sky taken with a modified DSLR on a tripod in urban regions in both the southern and the northern hemispheres. Her images obtained so far included all 88 constellations, all 110 Messier objects and a number of NGC and IC objects down to about 10th magnitude. Each picture is a

Attentive audience listening to a presentation, with Auke Slotegraaf in the back (with the hat) videoing proceedings! These videos are available on the ASSA website.

combination of a large number of short exposures, and she showed the procedures used for taking and processing the individual images and how the light pollution contribution is removed from the data. This project is an example of what can be achieved in astrophotography with minimum equipment from an urban site. The techniques presented are an effective tool to get people interested in the subject no matter where they are.

(14:30-15:00): **Johann Swanepoel**. Garden Route Centre.

The shaping and testing of two 20-inch optical telescope mirrors: The purpose of the presentation was to share Johann's experiences and knowledge gained in the making of two 20-inch F/4.3 telescope mirrors. It covered details of a versatile machine which he built for the grinding, polishing and figuring of the mirrors. It further included details of the various full and sub-diameter tools he made and used. An explanation was presented on the optical testing methods used throughout the figuring process, including an improved application of the Foucault test and the corresponding digital data reduction techniques.

(15:00-15:25): **Allen Versveld.** Pretoria Centre.

Astronomy Online: Astronomy outreach is understood to be vitally important, both to inspire future astronomers and as a popular and accessible means to offer a scientific perspective to the general public. The various incarnations of the Internet offer a range of new opportunities to conduct this outreach, letting us reach larger and more diverse audiences than ever before. The online astronomy space is currently dominated by American voices, but there is still plenty scope for local writers to speak to South Africans about our unique skies, our vibrant amateur astronomy community and big astronomy projects in Southern Africa.

(15:25-15:50): **Neville Young**. Pretoria Centre.

Lessons Learned in Outreach: In his 25 years of active involvement in the Pretoria Centre of ASSA, Neville have thoroughly enjoyed interfacing with scholars and the general public. This interaction has led to an understanding of what the public wants to know and how to explain astronomy concepts to them. Capturing the attention of students with breath-taking views through the telescope and quoting huge numbers no doubt impresses, but leaving the students with a genuine understanding that they can take away with them and use as a base towards a further appreciation of astronomy and science requires particular techniques. He used his experience to develop models which effectively replace 30 minutes of words and much confusing arm waving. This talk presented the lessons learned which form the basis of his approach to outreach.

(15:50-16:05): **HJ van Heerden**. University of the Free State.

ASSA's contribution to Bloemfontein's Two Observatories' Project: Bloemfon-

tein's Two Observatories Project was launched in 2011 by the Physics Department at the UFS in close collaboration with ASSA Bloemfontein and the Free State Department of Economic Development, Tourism and Environmental Affairs (DETEA). The aim of the project is to preserve Bloemfontein's two observatories, namely, the Boyden Observatory and the Lamont Hussey Observatory, and to develop these facilities for academic, public and educational use. The last 20 years have seen a rapid revival of astronomy in Bloemfontein. Boyden Observatory was upgraded in several different phases, and included the refurbishment of the Boyden 60-inch telescope. An active astrophysics research group was established at the UFS. At this time, a long-held dream to establish a planetarium in Bloemfontein is about to be fulfilled at the old observatory on Naval Hill. This talk outlined the involvement of ASSA in public and educational events, including astronomy fairs and other outreach events, renovation and improvements of old telescopes, and finally, in historical research.

Chatting and meeting old friends over a cup of coffee.

(16:30-17:00): **Keith Gottschalk**. Cape Centre, UWC.
Astronaissance – Communicating Astronomy and Space to the African Imagination: Astronaissance neatly conceptualizes the crossover between the African Renaissance, the revival of Astronomy in Africa, and the rise of Astronautics and cognate space sciences . Story-telling, painting, engraving, writing, and above all, viewing the heavens above, have always been amongst the strategies for communicating this excitement and wonder. Today the Internet, learned societies, media, and public outreach projects are crucial when, for the first time ever, a majority of Africa's people now live under the light-polluted skies of our continent's towns and cities. Space-related products and services are woven into the fabric of our daily life as never before. Policy-makers and allocators of resources need to see as essential to their strategy communicating to Africa's citizens, voters, and taxpayers, the necessity of Astronomy, Astronautics, and the other space sciences.

(17:00-17:45): **John Menzies**. SAAO.
Extrasolar Planets: Over 800 extrasolar planets (planets associated with stars other than the Sun) have been discovered by a variety of methods. This talk

gave an outline of the different detection methods, concentrating on those techniques employed by several different programmes at Sutherland.

(17:45-18:05): **Magda Streicher.** Polokwane.

Collection of Pencil Sketches of Astronomers: Twenty-three original pencil sketches of astronomers who have left their mark in astronomical history, were hand-drawn for Magda by Kathryn van Schalkwyk to be used in her recent book. A brief remark were made about every figure. These included people such as Barnard, Bennett, Herschel, Abell, Overbeek, Messier, Farell, etc. During the proceedings, Magda presented this collection to the President of ASSA, Ian Glass, as a contribution to the Observatory Library.

Past ASSA president, Magda Streicher (right), presented current ASSA president, Dr Ian Glass, with a copy of her book for the SAAO library.

Evening session.

(20:00-20:45): **Ian Glass. President of ASSA.**

Public talk: Nicolas-Louis de La Caille at the Cape: In 1751-53 Nicolas-Louis de La Caille of the Royal Academy of Sciences in Paris was the first important scientist to visit the Cape. At the age of 39 he came to the Cape and built an observatory close to Rogge Bay, near the present-day Strand- and Heerengracht streets. From this he surveyed the southern sky through a telescope: the first systematic survey made in either hemisphere. He named fourteen new constellations after the scientific instruments of the time, except for one, Mensa or Table Mountain. Other scientists in France had just found that the Earth is not round, but is flattened towards the North Pole. La Caille decided to measure its shape in the south by means of astronomical observations and a ground-based survey from Cape Town to the Piketberg. He was astonished to find that the planet seemed to be slightly pear-shaped. La Caille kept a most interesting journal of his stay at the Cape containing, besides scientific notes, many comments on the colonists, the natural surroundings and other matters. His precise writing avoided the sensationalism of earlier visitors.

This talk was followed by telescope viewing and a tour of Observatory, McClean telescope and Astronomical Museum until about 21:30.

Sunday 14 October 2012

Morning session. **Chair: Case Rijsdijk (Chairman, Garden Route Centre and Editor of MNASSA).**

(09:00-09:30): **Chris de Coning**. Historical Section, ASSA.

Cape Astronomical Association: Origins of ASSA: The Cape Astronomical Association was formed 100 years ago, in October 1912. As far as we know, this was the first astronomical association in South Africa. The initiative resulted from public interest in astronomy after the re-appearance of Halley's comet the previous year. From the beginning, the society was a close co-operation between amateur and professional astronomers. In fact, the founding meeting held by amateurs, was postponed in order to invite professional astronomers to join. SS Hough, Astronomer Royal at the Cape of Good Hope, became the first Honorary President. Ten years later this association gave rise to the Astronomical Society of South Africa (ASSA). The talk also discussed the ASSA archives housed in Cape Town.

(09:30-10:00): **Anthony Lelliott**. Wits University.

Astronomy and the School Curriculum in South Africa: The presentation provided an analysis of the current South African school curriculum in terms of astronomy content. When the curriculum was revised in the 1990s and early 2000s, astronomy was moved from the geography curriculum into the natural sciences. At the primary and junior secondary school level, basic astronomy content is relatively well covered in terms of the solar system and 'space science', with relatively little reference to current issues that occupy astronomers and cosmologists. Further there is a paucity of astronomy in the FET level of schooling (grades 10-12) so that there is no sequence of conceptual development of astronomical topics from upper primary school to matric level. The presentation considered the issues raised by Adams and Slater (2000), Sadler (2001) and Pasachoff (2001, 2002) in the USA, regarding the sort of astronomy that should be taught at school and early tertiary level. In view of the positioning of South Africa as an astronomy 'hub', the consequences of the current status of astronomy in the school curriculum were discussed, and recommendations for its development made.

(10:00-10:30): **Case Rijsdijk**. Chairman Garden Route Centre and Editor, *MNASSA.*

Analogies in Astronomy and Physics: Both astronomy and physics often have to deal complex concepts and one way to address this problem is by using analogies. However, many of these frequently require a high level of prior knowledge, reducing, or even nullifying, the analogy's effectiveness. In addition it needs to be understood that any analogy serves a limited purpose: it cannot

be extended beyond its intended objective. This talk used some well-known, not so well-known and new analogies in astronomy and physics, using usually understood prior knowledge.

(10:30-11:00): **Lia Labuschagne.** Chair, Cape Centre.
Talking about astronomy in the Internet era: In a world where busy people complain about information overload, it is a challenge to communicate effectively about any topic – and that includes science in general and astronomy in particular. People's communication needs, habits and preferences are changing rapidly – and at the same time there is a constant flow of useful data and interesting information about astronomy from a myriad of sources. Lia looked at the context of communicating about science and touch on some of the ways in which we can ensure that our communication is interactive, integrative and imaginative. She also touched on the potential of e.g. social media and mobile technologies to integrate with more traditional channels of communication and outreach.

(11:30-12:15): **Reneé Kraan-Korteweg.** Professor of Astronomy, UCT.
Large MeerKAT Survey Proposals: MeerKAT is South Africa's SKA precursor telescope and will consist of 64 SKA-ready radio dishes. This array of telescopes is currently under construction near Carnarvon in the Northern Cape and is expected to start full scientific operations in 2016. After a few words on the main science goals of the SKA, Reneé presented an overview of the large legacy survey projects that have been defined for MeerKAT, and gave more details on the ones that are UCT-led. This included some of the observations that have been performed to-date with KAT-7, the MeerKAT technology demonstrator.

(12:15-13:00): **David Buckley**. Southern African Large Telescope.
What's Up with SALT? This talk gave a review of SALT, the issues that were dealt with in getting it going, the first science results and the future possibilities.

Afternoon session. Chair: Maciej Soltynski, ASSA Scholarship Convenor.

(14:00-14:45): **Bruce Bassett.** African Institute of Mathematical Sciences, Muizenberg.
Observational Cosmology: a 30 year window. Bruce reviewed the amazing progress that has been made in observational cosmology over the past 15 years, discussed the big open questions and looked forward to the incredible changes that we can expect in the next 15 years.

(14:45-15:15): **Berto Monard**. Klein Karoo Observatory.
Observing programmes at the Bronberg and Kein Karoo Observatories: Two observatories and their environment were

presented and the observing instrumentation discussed. A brief introduction to variable stars and differential photometry were given. Five major observing programmes were described, observing results shown and merits discussed. Berto's presentation was richly illustrated with photographs and diagrams.

(15:15-15:45): **Greg Roberts**. Country member, Pinelands.

Tracking Space Debris-including Spy Satellites: Space debris is becoming an ever-increasing threat to artificial earth satellites. This talk described the amateur contribution to detecting such debris and outlined the various techniques used and results achieved.

(15:45-16:15): Nicola Loaring. SAAO.

The SAAO Outreach Programme: Nicola presented an overview of the outreach programme at SAAO. She outlined the aims of the programme and briefly summarised the initiatives used by the SAAO to reach learners, educators and the general public. She examined the scale of the programme and mentioned a few recent highlights, along with exciting future opportunities.

After these, the Symposium was closed by the President of ASSA, Ian Glass. ☆