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Cover : Comet C/2023 A3 (Tsuchinshan-ATLAS) by Angus Burns from the top of Muller's Pass outside Newcastle on 24 October 2024. Image taken with a Canon 60Da camera on a Redcat 51 telescope, 85 x 10 seconds exposures at ISO1600. The comet was magnitude 4.5 at the time. A full report will appear in a future issue of MNASSA



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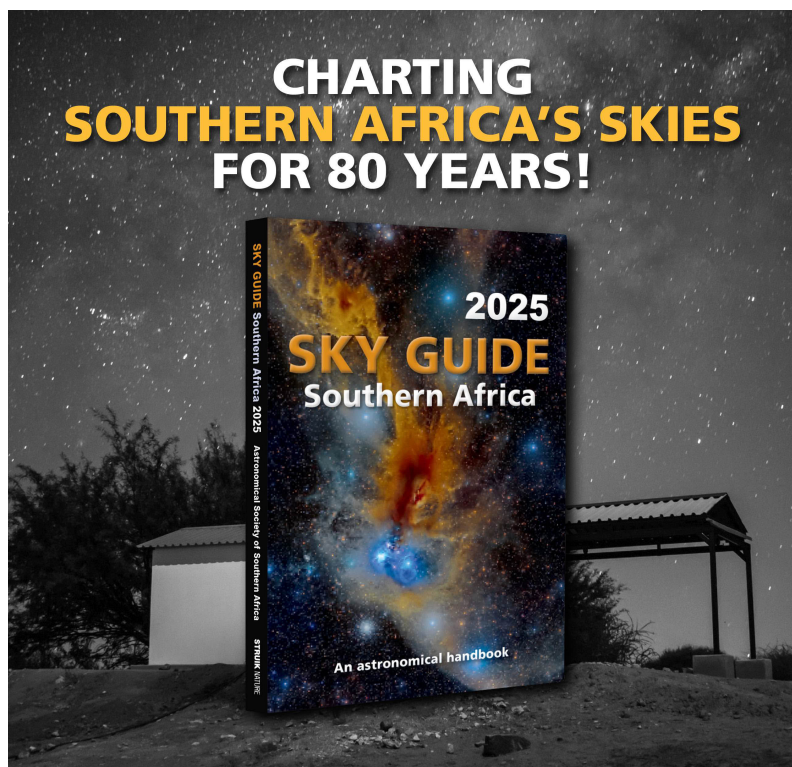
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MNASSA Editorship

Mr Willie Koorts has been appointed Editor of *MNASSA* from this issue onwards. Willie has since 2006 been Assistant Editor and has been distributing each issue as well as placing it on the *MNASSA* web page and making individual pdfs of each article for submission to NASA-ADS. We welcome him and thank him for his willingness to take on this additional task for the Society.

He succeeds Mr Case Rijdsdijk who has ably edited the journal since 2011.

ASSA News: 2025 *Sky Guide* Published



ASSA is pleased to announce that the 2025 *Sky Guide Southern Africa* has now been published. The Editor notes “We’ve enhanced the popular monthly section by adding a dozen more full-page photographs, and we’ve expanded our descriptions of twilight and midnight phenomena. The celestial almanac lists observable events each month, while a separate ephemeris covers more technical details.

ASSA News: ASSA 2024 Astrophotography Competition results

This competition commenced in a bit of a rush, in order to meet editorial deadlines for the *Sky Guide 2025*. Nonetheless, despite the limited timeframe, 47 entries covering a variety of subjects were received from 13 contestants across Southern Africa.

All entries, complete with technical information, are available to view on our Flickr channel at <https://www.flickr.com/photos/astrosocsa/albums/72177720320214354/>. The top entries will be featured in the *Sky Guide 2025*.

The standard of submissions was generally very high, exhibiting a great deal of effort and dedication. Judging was consequently rather difficult. Among the aspects taken into account were technical excellence (pinpoint stars, dynamic range, subtle detail, colour balance, etc.) and ultimately visual appeal. Some contestants submitted several entries. For fairness, the final selection was therefore restricted to the best photo from each contestant.

It was noted that relatively modest equipment was employed by the contestants. Similarly, most image processing was achieved through readily available free or relatively low-cost software. This highlights the fact that, although the sky is literally the limit when it comes to astrophotography equipment, the real results come from dedicated effort. The learning curve is steep and the hours of exertion are long, but the rewards are great.

We are extremely grateful to our sponsors Celestron and Skywatcher, represented by G&L Agencies <https://www.glagencies.co.za>, for their generous support which made this competition possible.

Congratulations to the winners, may your new equipment help you to achieve even greater results!

	Winner	Subject	Prize	Value
1 st	John Lindsay-Smith	IC 2944 Running Chicken Nebula and NGC 3766 Pearl Cluster	Celestron 91519 Advanced VX EQ Mount	R38K
2 nd	Raoul Coetzee	NGC 3372 Eta Carinae Nebula	Skywatcher Quattro P150 Newtonian	R17K
3 rd	Gerald DeBeer	M16 Eagle Nebula	Celestron 22087 SLT 90MAK	R16K

Our thanks to all of the contestants. Commiserations to those who were edged out of the running; may your continued efforts bring you fulfilment now and success in future.

Honourable mention	Subject
Tiaan Niemand	Rho Ophiuchi cloud complex
Truhan Pretorius	Large Magellanic Cloud irregular galaxy
Peter Dunsby	The Dragon's Egg nebula NGC 6164
Wayne Hall	NGC 4038/NGC 4039 Antennae galaxies
Yolanda Combrink	Moon mosaic comprising 8 panels

Keep a lookout for the 2025 AP Challenge. We plan to liaise with G&L Agencies early in the new year and hope to announce the Challenge around March 2025, providing more time to spread the word and prepare entries. Expect the rivalry to be intense.

Those who are contemplating getting into this rewarding activity are encouraged to get involved. Most ASSA centres have knowledgeable people with expertise in this domain, who would be happy to advise. If you are not near a major centre, you can join as a Country Member. Find out how to join ASSA at:

<https://assa.saao.ac.za/about/membership/>



Fig 1: John Lindsay-Smith, winner of the first prize of a Celestron 91519 Advanced VX EQ Mount for his image IC 2944 Running Chicken Nebula and NGC 3766 Pearl Cluster.



Fig 2: Raoul Coetzee, winner of the second prize of a Skywatcher Quattro P150 Newtonian for his image of NGC 3372 – the Eta Carinae Nebula.



Fig 3: Gerald de Beer, winner of the third prize of a Celestron 22087 SLT 90MAK for his image of M16 – the Eagle Nebula.

First light for the ASSA-GMN Outreach Project

Tim Cooper, Director, Comet, Asteroid and Meteor Section

Introduction

The Global Meteor Network (GMN) was first established in 2018 (Vida et al 2021) under the slogan ‘*No meteor unobserved*’, with the aim of providing long-term characterisation of the radiants, flux, and size distribution of annual meteor showers and outbursts of optically detectable meteors. The network uses low-light video cameras that anyone can install and operate to monitor the night sky. A self-build option is also available too, for those that want to build their own camera. Since inception, the network has grown to over 1000 cameras across the globe. However, the southern hemisphere remains under-represented, and in particular a gap exists at longitudes corresponding to southern Africa. During the past months several cameras were brought online at two schools in the Western Cape, which are now helping to fill the gap in coverage from southern Africa.

Birth of the ASSA GMN Outreach Project

In January 2022, Denis Vida, founder of the Global Meteor Network, asked for expressions of interest for a project to increase GMN coverage, in particular increasing youth participation in STEAM education. An early stated objective was funding cameras for schools in the Global South to help improve coverage in the southern hemisphere. With this in mind, Tim Cooper, Comet Asteroid and Meteor Section Director expressed interest on behalf of ASSA in participating in the project. He joined a Project Team which is led by Radim Stano, and which comprises members from several countries around the globe.

The project officially took on the title ‘*Global Meteor Network Outreach Project*’ and the Project Team started to develop its infrastructure, including a website and tutorial materials, all of which are available for download from the website. Radim wrote the Tasks, Games and Competitions document, introducing real problems and tasks for learners to solve, along with suggested competitions and games, all related to the camera operations and designed to teach learners about astronomy and meteor science. Tim wrote the tutorial on Meteor science, and Mary McIntyre added the tutorial on Introduction to optics and telescopes. Mary also wrote the tutorial on Navigating the night sky, to which Tim added the section for the southern hemisphere. Tim is currently writing the section on *Introduction to Astronomy*.

On 15 May 2023, Tim gave the monthly talk to the Hermanus Astronomy Centre, titled ‘*Meteors*’, explaining what meteors are, where they come from and how to observe them. This included the monitoring of meteors by low-light video techniques and Tim

mentioned the GMN Outreach Project and its objectives. Following Tim's talk, Pierre de Villiers, Director Outreach Section joined the local organizing team, as well as the Global Meteor Network Outreach Project Team. Pierre identified the first schools to work with, Touwsrivier Primêreskool and Laingsburg High School, following which we eagerly awaited the arrival of the equipment to install at the schools. With all arrangements now in place, the project was listed also on the ASSA webpage as the ASSA GMN Outreach Project, linking to the Global Meteor Network Outreach Project page.

Equipment setup and commissioning

The first equipment was shipped to South Africa during the second half of 2023, including four complete sets each comprising a low-light camera, Raspberry Pi computer, and attendant power supplies and POE injectors. Tim packed two sets into each of two boxes, labelled one for each school, and sent these down to Pierre (Fig 1). On 16 January 2024, soon after the schools had reopened for the new year, we held a kick-off meeting with the two schools, when everyone introduced themselves and we familiarized everyone with the equipment and objectives of the project.



Fig 1: Box packed with two sets of cameras, Raspberry Pi computers and power supplies, ready for delivery to Laingsburg High School. An identical plug-and-play kit was delivered to Touwsrivier Primêreskool.



Fig 2: Pierre de Villiers handing over the cameras and computers to Mr Louw, Headmaster, Touwsrivier Primêreskool. Looking on at centre is Clemence Thomas, teacher, and who started a Maths and Science Club, and learners from the school.

Pierre travelled to Touwsrivier, where he supervised installation of cameras ZA0006 and ZA0007 on 18 March (Fig 2), followed by cameras ZA0008 and ZA0009 at Laingsburg

on 19 March (Fig 3). With the cameras installed, there followed a delay before we could connect everything to the internet, as we needed to get the Western Cape Education Department to assist with IT issues at the schools. We were assisted in this regard by Derick Booysen of the WCED, and with Derick's help Radim was able to remotely format the Raspberry Pi computers and connect them to the GMN server. Touwsrivier Primêreskool has contributed to the pipeline since 7 August and Laingsburg High School since 2 September 2024.



Fig 3: Pierre de Villiers handing over the cameras and computers to Riaan Cornelison, Headmaster of Laingsburg High School. At left is Ms Mandie Bouwer, maths and science teacher, and looking on are learners from the school.

Results so far and the way forwards

Both schools are now online and capturing data on a nightly basis. On 18 September Tim presented an overview to the schools of the first results, explaining what the cameras are seeing each night, which includes not only meteors, but also aircraft trails, birds, bats, insects, clouds, and many artificial satellites! The software filters out most of these, leaving the meteors to be added to the processing pipeline. A selection of a few early captures from each of the four cameras is shown in Fig 4. On 9 October Radim gave a presentation to the schools in which he described how to work with data, and how the schools can access and work with the tutorial materials online, including Tasks, games and competitions.

The four cameras are pointed so that their fields of view overlap at an altitude of around 90km above Earth's surface. All meteors detected by the software are measured to determine brightness, altitudes at which ablation starts and ends, coordinates of start and end points, and meteor paths are extended backwards to determine meteor shower association. The same meteors detected using two or more cameras can be triangulated to determine orbital parameters, which is useful when linking meteor showers or bright fireballs to specific cometary or asteroidal parents. In the case where bright fireballs may have deposited meteorites on the ground, these triangulations can be used to determine fall locations.

The annual report for the GMN for 2023 (Roggemans et al 2024) mentions 200 meteor orbits determined from South Africa last year. It is hoped that with the successful

commissioning of the four new cameras, the two schools will contribute to a significant increase in the number of determined orbits. To this end we have also repositioned camera ZA000A operated by amateur astronomer Louw Ferreira, so that it too can increase the number of meteors detected by two or more cameras and become involved in orbit determination.



Fig 4: Selection of a few meteors captured by each camera in the first nights of operation. Top panels are from cameras ZA0006 and ZA0007 at Touwsrivier Primêreskool. Bottom panels are from cameras ZA0008 and ZA0009 at Laingsburg High School.

We are currently discussing options to expand the coverage to other schools, and how to encourage greater participation from the learners. Hopefully, as their interest grows, learners will start to participate in the study of meteors and astronomy, and contribute to the discovery of new meteor showers, their parent comets and asteroids, and the location of meteorites from detected bright fireballs.

Useful links

Global Meteor Network :

<https://globalmeteornetwork.org/>

Global Meteor Network Outreach Project :

<https://globalmeteornetwork.org/outreach/>

GMN camera wiki page (with links to build your own camera) :
https://globalmeteornetwork.org/wiki/index.php?title=Main_Page

GMN camera status page for South Africa :
<https://globalmeteornetwork.org/weblog/ZA/index.html>

Acknowledgements

We express our grateful appreciation for the cameras and Raspberry Pi computers which were kindly sponsored by a private individual and completed by Istrastream in Croatia. We would like to thank Derick Booysen, Western Cape Education Department, for assistance in connecting the cameras to the internet.

References

Roggemans, P., Campbell-Burns, P., Kalina, M., McIntyre, M., Scott, J., Šegon, D., Stano, R., and Vida, D. (2024), *Global Meteor Network report 2023, eMetN Meteor Journal, Vol. 9*, pp56-89, see page 73.

Vida, D., Šegon, D., Gural, P., Brown, P., McIntyre, M., Dijkema, T-J., Pavletić, L., Kukić, P., Mazur, M., Eschman, P., Roggemans, P., Merlak, A., and Zubović, D. (2021), *The Global Meteor Network - Methodology and First Results*,
<https://doi.org/10.48550/arXiv.2107.12335>

Recent Southern African Fireball Observations Events # 484-494

Tim Cooper, Director, Comet, Asteroid and Meteor Section

This article continues the sequential numbering of reported fireball sightings from southern Africa. By definition, a fireball is any meteor event with brightness equal to or greater than visual magnitude (m_v) -4. The following events were reported to the author and details are reproduced as given by the observer [any comments by the author are given in brackets]. Where the report originated from the American Meteor Society Fireball page, the corresponding AMS event number is given. All times were converted to UT unless stated, and all coordinates are for epoch J2000.0. Solar longitudes for dates and times of events were calculated using SollongCalc. Descent angles, if given, are in degrees, with directly upwards = 0°, horizontally left to right = 90°, directly downwards = 180° and horizontally right to left = 270°. Azimuth angles are reckoned from north = 0° through east = 90°.

Event 484 – 2024 July 16 – Gqeberha, Eastern Cape

Captured by Louw Ferreira on GMN camera ZA000A at 17h52m43s, solar longitude 114.3°, very bright meteor with at least two flares in brightness. The capture software did not determine the astrometry, probably due to the brightness obscuring stars in the vicinity of the end point. From a screen grab shown in Figure 1, the start and end points were approximately RA/Decl. 12h57, -51.2° to 12h22, -27.3°. The path traced backwards is 16° and 25° distant respectively from the Piscis Austrinus and Southern delta-Aquariid radiants, and the fireball was probably sporadic.



Fig 1: Event 484 captured by Louw Ferreira on 16 July 2024. Below centre is Crux, with the Pointers, alpha and beta Centauri above left.

Event 485 – 2024 July 29 – Rooihuiskraal, Gauteng

Observed by Jatin Mistry at around 16h10, solar longitude 126.7°, while driving on the N1 freeway in direction 30°, looked towards the right and saw a bright red object with a white 'tail of smoke', duration 2-3 seconds. From a sketch provided the object descended with angle 225° from az/alt 75°, 10° [just above Altair] towards Sagitta. The fireball was sporadic.

Event 486 – 2024 July 29 – De Voetpadkloof Resort, nr Middelburg, Mpumalanga

Observed by Annika Erwee at 18h30, solar longitude 126.8°, duration 3-4 seconds, colour yellowish white with bright orange tail and said to be as bright as the full-Moon [which was not visible at the time]. Path from az/alt 9°, 26° to 360°, 5°, and there is a strong probability the meteor was alpha-Capricornid. AMS Event 3766-2024.

Event 487 – 2024 August 6 – Hillcrest, KwaZulu-Natal

Observed by Glen Combe at 20h48, solar longitude 134.5°, duration 1-2 seconds, orange fireball, $m_v = -7$. Path from az/alt 241°, 37° to 267°, 19°, that is RA/Decl. 15h34, -39° to 14h54, -12°, and the fireball was sporadic. AMS Event 4060-2024.

Event 488 – 2024 August 11 – Gqeberha, Eastern Cape

Captured by Louw Ferreira on GMN camera ZA000A at 19h56m42s, solar longitude 139.3°, sky was covered with thin cloud, which was illuminated by the 42% Moon, magnitude -9.6, altitude 23° in azimuth 261°, which made astrometry difficult. Best approximation of path from RA/Decl. 16h29, -77.6° to 03h42, -85.3°. Screen grab shown as Figure 2. Although some distance from the radiant, the fireball may have been kappa-Cygnid.



Fig 2: Event 488 captured by Louw Ferreira on 11 August 2024. The waxing crescent moon is at the right edge. The bright star at bottom is alpha Centauri, at top right is Antares and the brighter stars in the constellation Ara are above centre.

Event 489 – 2024 August 25 – various, Western Cape, Eastern Cape, Southern Free State

A bright bolide was observed during daylight at 06h51, solar longitude 152.23°. More than 130 eyewitness reports were received, including visual observations and sounds heard. The impactor probably entered the atmosphere to the WSW of Mossel Bay, where it passed almost directly overhead and heading in direction 75°. Visual observations were received from as far west as Ceres in the Western Cape and as far north as Petrusburg in the southern Free State. Footage was obtained from four videos, three taken using cellular phones, and one from a fixed security camera. A screen grab from the video taken at St Francis Bay is shown as Figure 3 and shows well the appearance of the bolide, which was seen to fragment into several pieces, and

fragments were found on the ground as meteorites. There were no reports of persistent trains or meteoric smoke. Sounds were heard mainly concentrated close to the ground track, the most distant being about 70km from the trajectory of the meteor, and ranged from sounds like explosions and thunderclaps, to rumbling which continued in some cases for up to 2-3 minutes. One video was obtained in which the explosion can be heard, followed by rumbling which continues beyond 36 seconds when the clip ends. Some reported tremors, buildings shaking, and windows and roofs rattling. The explosion was captured by US Government sensors and was posted to the CNEOS Fireball and Bolide Data webpage. The explosion occurred at 06h50m49s at latitude 33.6°S, longitude 24.5°E, altitude 38.2km over the mountains to the east of Baviaanskloof. The velocity of the impactor was 20.1 km/s, and calculated impact energy was equivalent to 92 tonnes TNT. A full report based on all the eyewitness accounts is in preparation and will be published separately in *MNASSA*.



Fig 3: Event 489, screen grab from a video of the bright daytime bolide on 25 August 2024, captured from St Francis Bay and reproduced with permission.

Event 490 – 2024 September 7 – Randburg and Alberton, Gauteng

Observed by Travis Meadows from Randburg at 16h58, solar longitude 165.2°, duration 1-2 seconds, bright blue colour. Brightness said to exceed the Moon, then an 18%

crescent, magnitude -8, altitude 35° in azimuth 269°, and the size appeared to be large. Path from az/alt 94°, 80° to 93°, 20°, that is RA/Decl. 18h44, -26° to 22h53, -12°. No sounds, fragmentation or terminal flash observed.

Observed by Tiaan Niemand and his father from Alberton, while at the braai fire father saw it first and Tiaan saw it as it was fading out. From a rough sketch provided path from RA/Decl. 21h00, -42° to 23h30, -37°.

The event was sporadic. AMS Event 5048-2024.

Event 491 – 2024 September 8 – Hartebeespoort, North-West

Captured by Paul Ludick on GMS camera ZA0005 at 21h15m46s, solar longitude 166.4°. duration 2.1 seconds, path from az/alt 158.69°, 51.81° to 130.25°, 25.26°, that is RA/Decl. 21h28m10s, +10°13' to 19h12m04s, +19°56'. Screen grab shown as Figure 4. The path is consistent with an Anthelion meteor.



Fig 4: Event 491 captured by Paul Ludick on 8 September 2024. The streak above the fireball is an artifact, and the bright star above that is Altair.

Event 492 – 2024 September 18 – Centurion, Gauteng

Observed by Derek Meise at just after 21h00, solar longitude 176.1°, said he 'heard a rumbling sound like an aircraft' and looking through a [north-facing] window saw a bright fireball which exploded at the end of its path. Duration was 2-3 seconds, and green and blue colours were observed. From an image provided of the view, path from

approximately az/alt 50° , 18° to 310° , 15° , that is RA, Decl. 02h20, $+24^\circ$ to 19h00, $+26^\circ$. The event was sporadic.

Event 493 – 2024 September 18 – Roodepoort, Gauteng

Observed by Claus Dittmer at 22h54, solar longitude 176.2° , while driving on Ontdekkers Road, Roodepoort, duration 3-4 seconds, bright white tinged with blue at its brightest, becoming white as it faded, estimated $m_v = -9$, not as bright as the then near-full Moon which was at altitude 60° in azimuth 355° . Path from az/alt 350° , 50° to 277° , 35° , that is RA/Decl. 00h15, $+14^\circ$ to 20h57, -10° , and the event was sporadic. AMS Event 5297-2024.

Event 494 – 2024 October 5 – Leeuwenboschfontein Observatory, Western Cape

Observed at 18h35 (solar longitude 192.67°) by all guests attending the observatory's open evening and including Marius Reitz and Eddy Nijeboer; from a report by Marius, bright white meteor appeared as a 'thick line', duration 5 seconds, increasing in brightness to slightly brighter than Venus, then visible at 9° altitude in azimuth 256° , not as bright as the Moon, then a 7% illuminated crescent, magnitude -6 at similar altitude in azimuth 253° , so $m_v \sim -5$. Path from Achernar passing through the tail of Scorpius, crossing Shaula (λ Sco) and ending in a bright ball quarter distance from λ Sco to η Oph, that is RA/Decl. 01h38, -57° to 17h27, -32° , path length 79° and the fireball was possibly a Southern Taurid. No disintegration or persistent train observed, and no sounds heard.

Part of the path was captured at 18h35m23s on GMN camera ZA0007 operated by Touwsrivier Primary School. Screen grab from the video is shown as Figure 5.



Fig 5: Event 494 on 5 October 2024 captured on GMN camera ZA0007 operated by Touwsrivier Primary School. The constellation of Apus is visible to the left of the fireball, which crosses Triangulum Australis and exits the field of view just above alpha Centauri.

Acknowledgments

Thanks to Bob Lunsford for forwarding fireballs reported to the AMS website. Solar longitudes were calculated from the SollongCalc app by Kristina Veljkovic (Department of Probability and Statistics, Faculty of Mathematics, University of Belgrade, Belgrade, Serbia), accessed through the IMO webpage at <https://www.imo.net/resources/solar-longitude-tables/>. Data for Event 489 courtesy of CNEOS, Fireballs Detected by US Government Sensors at <https://cneos.jpl.nasa.gov/fireballs/>.

Obituary: Clifford Robert George Turk (1932-2024)



Cliff Turk, a stalwart of the Astronomical Society of Southern Africa, passed away on 13 September at the age of 92.

He was born on 7 May 1932 in Romford, Essex, UK, and went to school there. He had hoped to study engineering in the company of his early friends, some of whom he knew over their whole lives, but the death of his father at the early age of 49 put an end to this plan.

Cliff lived through the Second World War and entered the British Armed Forces at the age of 17. He was in the Infantry and excelled in target marksmanship and was a team member for seven years. He was sent to Germany in the Army of Occupation and grew to love that country. He also served in Trieste. Many years later he received a special “Her Majesty’s Armed Forces Veteran” badge which he wore with pride.

Cliff had many interests. Apart from astronomy and lifesaving he belonged to the Bognor Regis and Chichester Motoring Clubs. He became involved in rallying and took part in events all around the UK.

In 1967 he came to Cape Town. Here he worked for the United Building Society which later became part of ABSA Bank. He married Margaret Millar, a physiotherapist, who he had met while hiking. There are two children of their marriage, Chris and Sandra. They lived in Pinelands in 1969 and remained there for nearly 50 years. He enjoyed woodwork and made most of the cupboards in the family home himself. On retirement he ran a handyman business for a number of years from his own well-equipped workshop.

His daughter Sandra writes: “He could also cook and clean which I guess he learned in the army ... oh and sew too! I think the ballet moms were gobsmacked to find out that it was my Dad (and not my Mom) that sewed my first ballet competition skirt! He also made the curtains in the house!”

For a while he ran his own business, Selsey Estates, named after the area in the very south of England where his mother lived. Incidentally, this is also where the well-known broadcaster Patrick Moore had his observatory and Cliff was well acquainted with him. He told a story of dropping in on him late one night, the front door of his house being open, and Patrick calling to him from his observatory to come in and make himself at home.

Following the death of Margaret in 2019 he eventually found the family house in Pinelands too much to look after and went to stay with his daughter and son in law in Bergvliet. Here he had the company of three grandchildren.

Cliff's interest in astronomy started at the time of the wartime Blitz when much of the country was blacked out and the sky was quite dark. He joined the Astronomical Society of Southern Africa in 1970 and eventually became one of its stalwarts. He was President in 1986-87, Treasurer in 2003-10, Business Manager in 1996-2009 and an Honorary Member from 2001. He received the Long Service Award in 2000, and the President's Award in 2006. Being Business Manager was an onerous task especially in the early years of the printed *Sky Guide* when he managed the distribution to the bookshops and the billing as its circulation grew. He was a passionate defender of dark skies and was Director of the Dark Sky Section of ASSA.

He was very keen to increase public knowledge and appreciation of astronomy and managed the public Open Nights at the SAAO, giving lectures and showing people objects through the telescopes. He lectured at the Cape Town Planetarium also. In 2001 he wrote the *Sasol First Field Guide to Skywatching of Southern Africa*, published by Struik and reprinted several times. He went on trips in Africa and overseas to watch eclipses.

He had his own observatory at home in Pinelands and built his own telescope. He was for many years one of the partners of the Cederberg Observatory and put much effort into various improvements there.

He was the Scoutmaster of the 2nd Pinelands Scout Troup and ran the Astronomy Base for the Senior Scout Adventure in the Cederberg and elsewhere from the 1990s until just a few years ago.

He died peacefully in Bergvliet on 13 September 2024. A memorial service was held at St Stephen's Church, Pinelands on 18 October.

(ISG)

Colloquia

Colloquia and Seminars (now Webinars) form an important part of a research facility, often as a sort of pre-publication discussion or a discussion of an individual's current research, and as such it is virtually impossible to "publish" this material. However by recording the topics discussed in the form below does indicate to those, who are unable to attend, what current trends are and who has visited to do research: it keeps everyone 'in the loop' so to speak. A spin-off from the Covid-19 pandemic is that Colloquia and Seminars are often Hybrid sessions, these days streamed on YouTube, with the advantage that they can be viewed at any time afterwards on the South African Astronomical Observatory YouTube channel:

<https://www.youtube.com/@saltsaao>

These were uploaded recently:

https://www.youtube.com/watch?v=qUgSeNlCM_M

Date: 12 September 2024

Speaker: Dr Satish Sonkamble

Title: Multi-wavelength approach of AGN Feedback at low redshift

Abstract: AGN feedback plays a critical role in regulating the thermodynamical properties of galaxy groups and clusters, significantly affecting their evolution. In this talk, I will explore mechanical mode AGN feedback through X-ray cavities and the role of cold and shock fronts. X-ray and radio observations of galaxy groups and clusters reveal cavities inflated by AGN jets, which act as channels for the transfer of mechanical energy into the ICM, preventing runaway cooling. I will discuss how the mechanical mode of AGN feedback, characterized by radio jets and outflows, leads to heating, turbulence, and the uplift of cold gas. The interaction of AGN feedback with the ICM also gives rise to shock fronts, which further contributes to the heating and stabilization of cluster cores. In addition to X-ray and radio observations, multi-wavelength data from MUSE and ALMA, which provide crucial insights into the cold molecular gas and star formation in the central regions of galaxy clusters. ALMA observations probe cold gas reservoirs, allowing us to trace the complex interplay between AGN activity and

star formation. I will highlight recent results, such as the detection of H α filaments and molecular gas, and discuss how these structures are influenced by AGN-driven feedback processes. This talk aims to provide a comprehensive understanding of the multi-phase feedback processes in galaxy groups and clusters, emphasizing the importance of combining X-ray, radio, optical, and other observations to reveal the full impact of AGN on their host environments.

<https://www.youtube.com/watch?v=Z7e1-EscAT0>

Date: 10 October 2024

Speaker: Dr Michael Janssen, Assistant professor, Radboud university. The project scientist of the Africa Millimetre Telescope and a member of the EHT science board.

Title: The Event Horizon Telescope and Africa Millimetre Telescope: Latest results and future plans

Abstract: The Event Horizon Telescope (EHT) is a very long baseline interferometry (VLBI) array used to image black holes by combining millimeter/submillimeter radio observatories into an Earth-sized virtual telescope. I will review the latest findings of the EHT, which also includes non-horizon science on jets of active galactic nuclei.

I will then give an outlook for the future of the EHT and millimetre VLBI in general, in terms of science, hardware, and software. I will focus on the Africa Millimetre Telescope (AMT), which will be the first mm-wave telescope in Africa. The AMT is planned to be built in Namibia and to be operational in 2028. The AMT and further EHT upgrades will facilitate improved tests of GR, plasma, accretion, and jet physics. Next to EHT science, I will describe the AMT's single-dish science program comprising black hole monitoring, astrochemistry, and rapid response to transients.

https://www.youtube.com/watch?v=aRGNqAeJ_28&t

Date: 17 October 2024

Speaker: Astronomer Jeffrey Bennett (Ph.D., University of Colorado) has devoted his career to math and science education and outreach, and has taught at every level from preschool through graduate school. He is the lead author of best-selling college textbooks in astronomy, astrobiology, mathematics, and statistics; of critically acclaimed books for educators and the public on topics including Einstein's theory of relativity, the search for extraterrestrial life, global warming, and math and science teaching; and of 7 award-winning science books for children, all of which have been selected for the Story Time From Space program, in which books are launched to the International Space Station and read aloud by astronauts. Other career highlights include serving two years as a visiting senior scientist at NASA headquarters, proposing

and co-leading development of the Colorado Scale Model Solar System on the CU-Boulder campus and the Voyage Scale Model Solar System on the National Mall in Washington, D.C., creating the free Totality app for learning about solar eclipses, and creating a free online digital textbook for middle school Earth and Space Science. Among other awards, he is a recipient of the American Institute of Physics Science Communication Award and, most recently, the 2023 Klopsteg Memorial Award for education from the American Association of Physics Teachers.

Title: Pathway to a Post-Global Warming Future — Teaching a Scary Topic with Inspiration, Not (Only) Fear

Abstract: Many people, and especially young people, express despair when it comes to the topic of climate change, which is unsurprising given that the media often portrays our climate future as a choice between bleak and bleaker. But it doesn't have to be that way, because if we understand the science behind global warming, then we can also see pathways to its solution. In this presentation, I'll show you how I try to approach the topic "with inspiration, not (only) fear," by providing simple ways to discuss global warming science, consequences, and solutions – and how these solutions could lead to a "post-global warming" future in which today's young people will someday be able to speak of the threat of global warming in the past tense. I'll focus in particular on the role that astronomy plays in our understanding of global warming, and on why this gives astronomers a unique opportunity to educate the public about this critical topic. I'll also briefly discuss the Totality app and book (see bigkidscience.com/eclipse) in preparation for the 2030 southern Africa eclipse.

The **Astronomical Society of Southern Africa** (ASSA) was formed in 1922 by the amalgamation of the Cape Astronomical Association (founded 1912) and the Johannesburg Astronomical Association (founded 1918). It is a body consisting of both amateur and professional astronomers.

Publications: The Society publishes its electronic journal, the *Monthly Notes of the Astronomical Society of Southern Africa* (MNASSA) bi-monthly, the annual *Sky Guide Southern Africa*.

Membership: Membership of the Society is open to all. Potential members should consult the Society's web page : <https://assa.saao.ac.za> for details. Joining is possible via one of the local Centres or as a Country Member.

Local Centres: Local Centres of the Society exist at Bloemfontein, Cape Town, Durban, Hermanus, Johannesburg, Pretoria and the Garden Route Centre; membership of any of these Centres automatically confers membership of the Society.

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