

# SALT

## Newsletter

**December 2022**

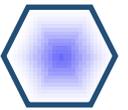


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Editor: Anja C. Schröder

Cover image: SALT by night. -- *Credit:* Steven Potter



## Letter from the Head of Astro Ops



Dear SALT Community,

It was really great to see so many of you again in November at the 2-day hybrid SALT Workshop – and exciting to see also so many new faces! So much has happened since we last saw each other, we were really long overdue for a nice big catch-up. Ros gives an excellent summary of the workshop below. From my side, a huge thank you to everyone, participants and organisers, for making it such a success – you all rock! 😊 And if the workshop sparked your interest to find out what science our SALT users have been doing with our awesome telescope, in addition to reading this issue's science highlights, please join us in Poland 1 - 3 June 2023 for a SALT science conference – for more information, see the announcement below or visit the conference website: [salt2023.pl](http://salt2023.pl)

Talking about how nice it is seeing people again in person, did you know that the first in-person SALT Board meeting since November 2019 was also held here, in Cape Town, during the two days following the SALT Workshop! If you want to know more (and see for yourself how some of us just keep on getting younger), I wrote a brief summary below.

You might also have heard by now that the instrument previously known as NIR now finally has its official name: NIRWALS. Moses explains the name below and gives a fantastic update, so I won't steal his thunder. Just to summarise that we're hoping to finish on-sky commissioning in early March, and we would encourage you to consider applying again for NIRWALS observations in the upcoming 2023-1 semester – the call for proposals should be issued on Friday. These observations would again be on a shared-risk basis.

Now, there are two articles in particular I want to draw your attention to.

Firstly, the fate of the RSS Fabry-Pérot system on SALT is actually in your hands. The refurbishment project has not progressed very much since our last update, and we think it's time to re-evaluate the community's interest in this niche mode, particularly since we will be commissioning two slitmask IFUs for RSS in the next few months, which will enable some (most?) of the science we would do with FP. Please see Liz' article below explaining everything.

The second article is calling the formation of a SALT users group, and we would like at least one interested volunteer from every partner, if possible. If you like inventing cool acronyms, some help would also be welcome in that department... ;)

Finally – this newsletter is really full of articles and news and I can't possibly highlight everything, so please just read on. Just before I sign off, I just want to share some bittersweet news: Liz Naluminsa, our Fabry-Pérot postdoc, is moving this week back to Uganda, her home country, to take up a faculty position at Makerere University. Congratulations Liz! Good luck



with the next stage of your astronomy career and enjoy! It's been awesome having you in the team and we'll definitely miss you!

The summer holidays are around the corner here in South Africa and we'll soon be winding down. If you celebrate Christmas, have a wonderful Merry Christmas! And even if you don't, wishing you the best in 2023 and that Santa brings you lots of awesome SALT observations, so that we break the publication record again next year! ;)

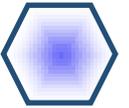
Clear skies and stay safe!

Encarni

### **Announcing: Call for Proposals**

The SALT Call for Proposals for semester 2023-1 (1 April – 31 October 2023) will be issued in the next few days. We would like to encourage PIs to consider easing their Moon brightness requirements, as we have been receiving less proposals requesting brighter Moon conditions and the bright queue is sparse, while the competition for dark time is extremely high.

This call will again include NIRWALS on a shared-risk basis.



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## SCIENCE HIGHLIGHT

### SALT and JWST observations of Supernova 2021aefx

by Saurabh Jha (Rutgers University, USA)

SALT excels at studying the transient Universe. Its queue-scheduled, priority-based observations allow for unique data on things that go boom in the night. SALT has made an especially significant contribution to spectroscopy of extragalactic transients like supernovae, providing classifications of new objects and a detailed look into these explosions.

Type Ia supernovae (SNe Ia) are especially interesting to study. They played a starring role in the discovery that the expansion of the Universe is accelerating, driven by dark energy. SNe Ia in the smooth Hubble flow are a key part of the local cosmological distance ladder used to measure the Hubble constant. Surprisingly, despite the utility of SNe Ia as cosmological distance indicators, we still lack a comprehensive understanding of their progenitor systems and explosion physics.

Spectroscopy of nearby SNe Ia can address this glaring hole in our knowledge. As the supernova ejecta expand and dilute, the observed spectrum samples different regions, allowing us to "scan" through the explosion debris, learning about its composition, temperature, density, and kinematics. The most nearby supernovae are especially valuable: they are bright enough that telescopes like SALT can observe them for months to years.

SN 2021aefx in NGC 1566 was discovered by the DLT40 survey that uses a network of telescopes around the world to find nearby ( $d < 40$  Mpc) supernovae soon after they explode. The Rutgers supernova group works closely with DLT40, aiming to get SALT spectroscopy quickly for new discoveries. In this case, SN 2021aefx provided a surprise: though later spectroscopic data showed it to be a normal type Ia supernova, our first SALT spectrum was exceptional. The Si II feature that is a hallmark of SNe Ia appeared in this spectrum at the unprecedentedly high ejecta velocity of over 30,000 km/s (over 20% faster than the previous record holder). This shows that our spectrum is probing the extreme outer layers of explosion in a novel way. Figure 1 shows this spectrum and the rapid evolution of the spectrum over the next few days. Rapid cadence, queue-scheduled observations with SALT are crucial to capture these changes. The early time photometric behavior of SN 2021aefx was also quite interesting, as detailed in a paper led by U. Arizona postdoc Griffin Hosseinzadeh (Hosseinzadeh et al. 2022; see also Ashall et al. 2022).

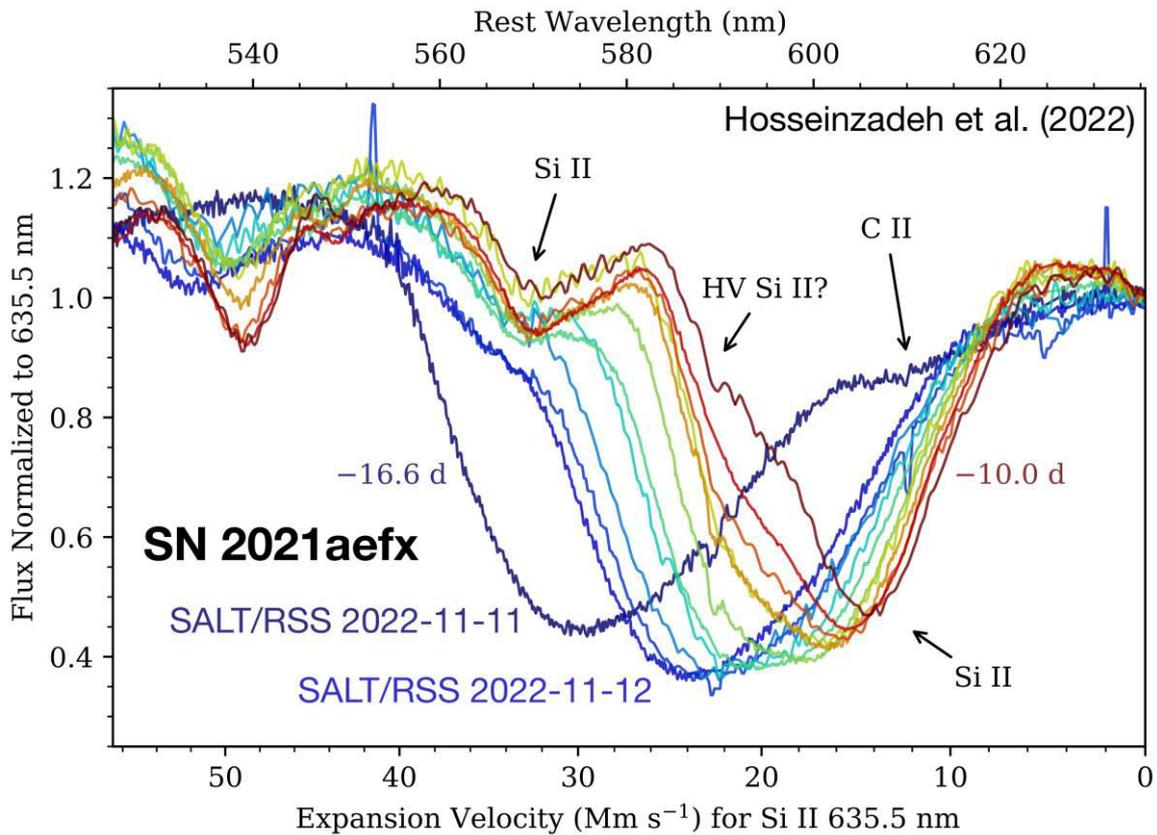


Figure 1. Optical spectra of SN 2021aefx soon after explosion. The early SALT spectra show an unprecedentedly high expansion velocity and a rapid evolution of the Si II line profile. Figure adapted from Hosseinzadeh et al. (2022).

At later times, a few months after maximum light, the ejecta become dilute enough to be optically thin and the supernova enters the nebular phase, with spectra dominated by forbidden emission lines. For SNe Ia, lines from iron group elements (e.g., iron, cobalt, nickel) are prominent. To learn more about the composition and structure of the SN Ia ejecta, we have begun a programme to obtain near-infrared and mid-infrared nebular spectra of white dwarf supernovae using JWST's NIRSpec and MIRI (programme 2072, PI: Jha). Our first target was SN 2021aefx and our first JWST data were taken on August 11. SALT again played an important role, providing the optical spectrum that we joined to the JWST spectra, yielding the first ever nebular spectrum of a type Ia supernova completely covering 0.4 to 14 microns wavelength (Figure 2). Our paper describing this spectrum was led by Rutgers PhD student Lindsey Kwok (Kwok et al. 2022).

Note the excellent correspondence between the red end of the SALT optical spectrum with the JWST NIRSpec data. The JWST MIRI data show emission lines from argon (an "intermediate-mass" element) that are broader than the lines from iron-group elements. This is a hallmark of a detonation (supersonic) explosion, where density-dependent nuclear burning leads to stratified ejecta abundances. The clear, unambiguous lines of nickel emission must arise from stable nickel-58, rather than radioactive nickel-56 which has decayed to cobalt-56 and iron-56 at these late epochs. A high abundance of stable nickel implies high-density nuclear fusion, favouring a high mass (e.g., near Chandrasekhar-mass) white dwarf progenitor.

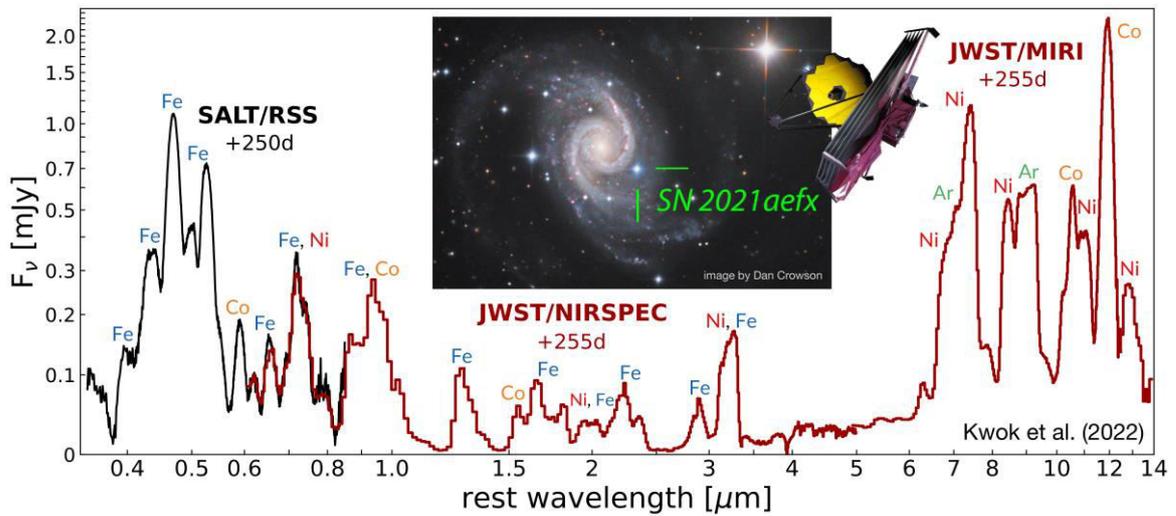
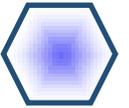


Figure 2. SALT+ JWST combined nebular spectrum of SN 2021aefx taken in August 2022. Numerous forbidden emission lines are identified. The inset image of the supernova is by Dan Crowson. Figure adapted from Kwok et al. (2022).

Our JWST program has just started, with another epoch of observations of SN 2021aefx scheduled for 5 December, and eight more white dwarf supernovae to be observed over Cycles 1, 2, and 3. Detailed modelling combining the JWST infrared data with SALT optical data will allow us to better understand the astrophysics of SNe Ia from this large sample.

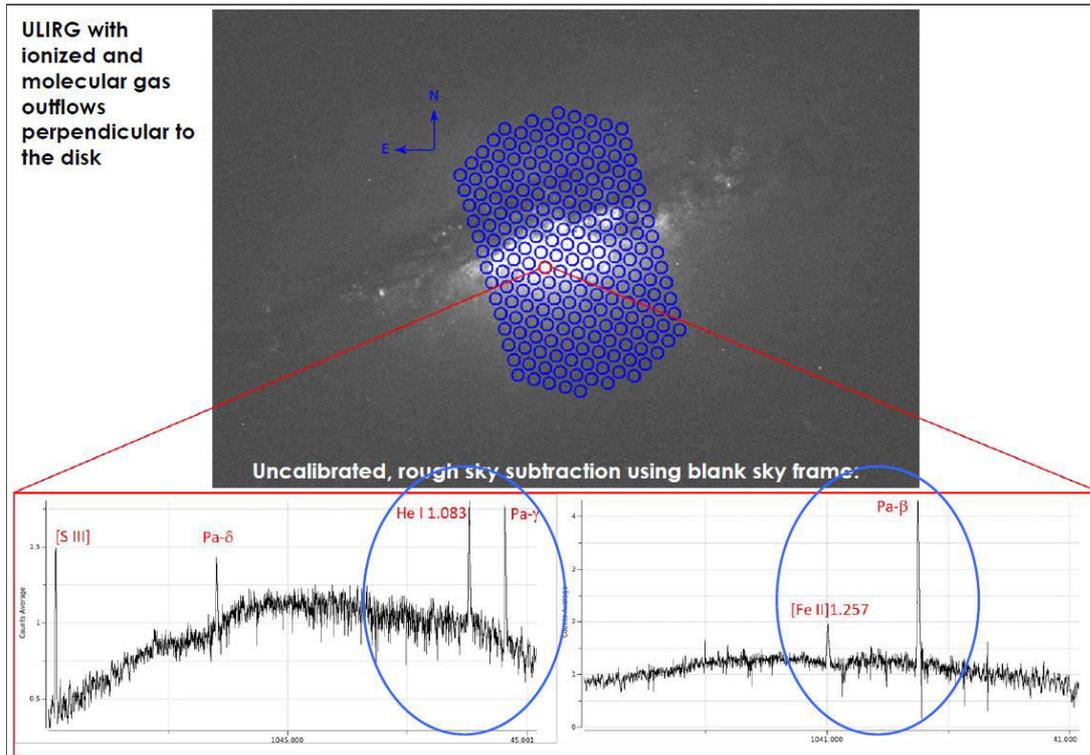
**Published as Kwok et al. (2022), ApJ Letters (submitted),  
<https://arxiv.org/abs/2211.00038>**



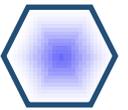
## NIRWALS aka NIR spectrograph

After the successful First Light of the near-infrared instrument (now officially called NIRWALS: Near Infrared Washburn Astronomical Laboratories Spectrograph) in July 2022, the instrument enclosure was warmed up and intense work continued at the telescope to prepare for on-sky commissioning. A new atmospheric dispersion corrector was installed on the telescope. New components were added to the existing calibration system to enable calibration of near-infrared data. Both of these are working well. A lot of software work associated with the new components, instrument operation and proposal submission was also done. The first light data was analysed to identify any potential problems, to help with the development of the data reduction pipeline and to get ready for on-sky commissioning.

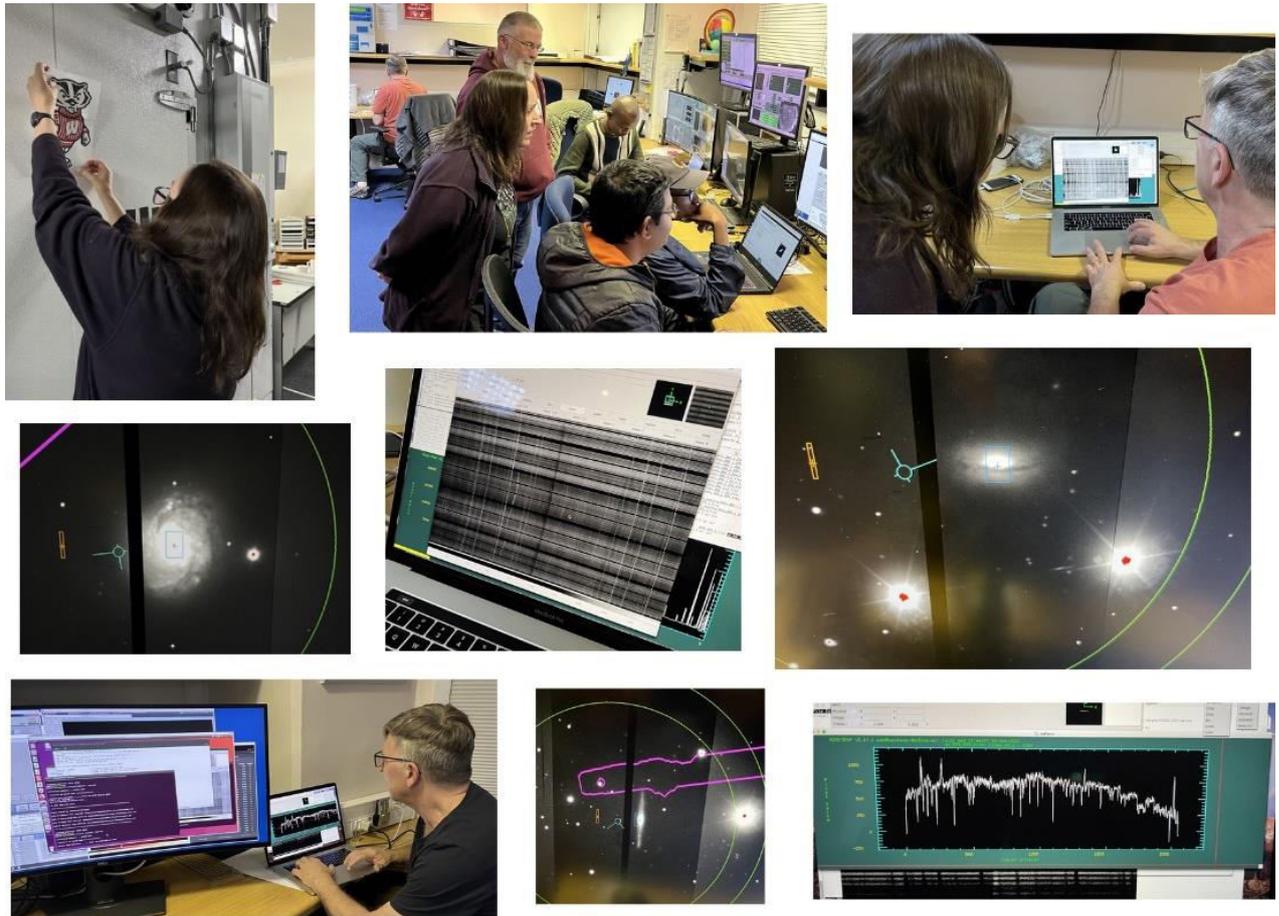
Various members of the University of Wisconsin (UW) team travelled to South Africa for the different stages of commissioning. The first stage consisted of modifications to NIRWALS and the fibre instrument feed (FIF). The SALT Technical Operations team was given some training on various aspects of maintaining the instrument. Optical integration with First Light was part of the second stage. The next stage of commissioning (late October) consisted of the on-sky commissioning, and it was exciting to finally get to take astronomical observations with NIRWALS. We successfully observed various objects from stars to galaxies: testing how observations would be done, the performance of the instrument and various telescope subsystems and software. An example of some of the exciting data we took is shown below, where we observed an ultra-luminous infrared galaxy (ULIRG) and managed to detect various emission lines in it. We have also used the data to test and improve different aspects of the data reduction pipeline.



Top: NIRWALS IFU footprint overlaid over a ULIRG that was observed during commissioning. Bottom: Examples of spectra from one of the fibres taken at different grating settings. These are as yet uncalibrated, though an observation of the sky was subtracted from the target. - Credit: Marsha Wolf.



The on-sky commissioning data is currently being processed and analysed. It is also used to tune various aspects of the data processing and data reduction, such as the non-linearity corrections, dark corrections, or how to deal with the degraded detector pixels. While this goes on, SALT Tech Ops are improving the glycol cooling system that is used to keep the instrument at operating temperature and to ensure that NIRWALS is not adversely affected by electricity outages. The software teams are improving the software that will be used to operate the instrument. These and other efforts are being done in preparation for the final phase of on-sky commissioning, which will happen in early 2023. So, watch this space for more exciting news!



Some commissioning photos, by Lisa Crause.

*Moses Mogotsi.—*



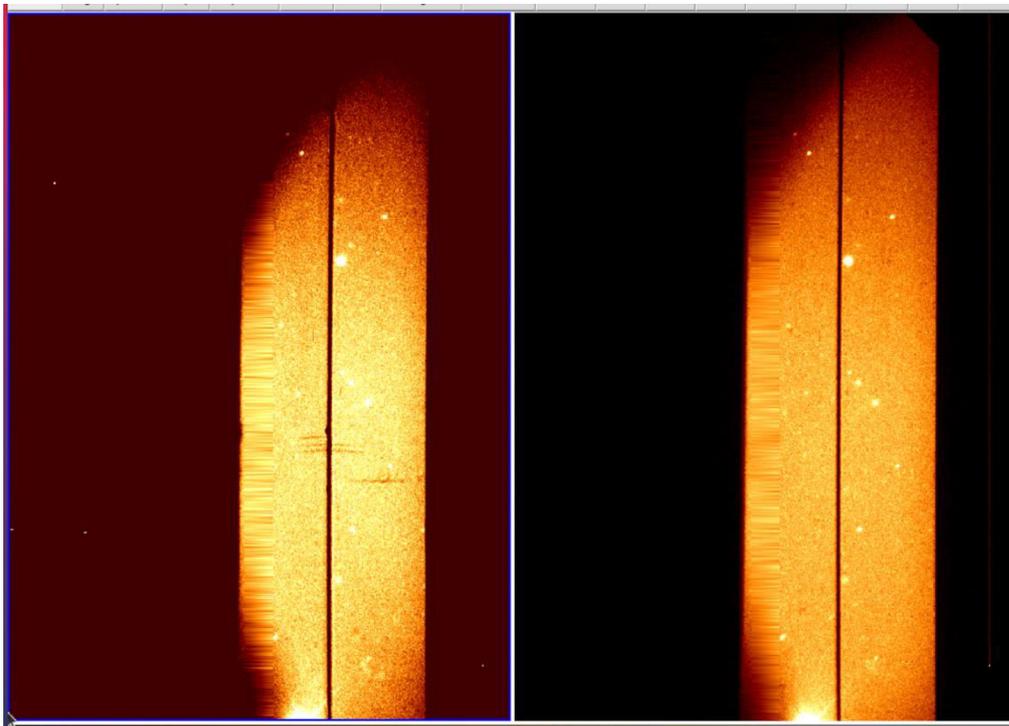
## RSS news

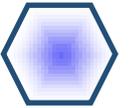
### RSS longslits

As part of our long-term project to replace the full suite of RSS longslits, four sample slit-masks were procured from two South Africa-based precision engineering firms in November 2022. Each company manufactured two slit-masks to replicate our existing 1.5" x 8' longslit. From preliminary measurements in the lab, slit straightness, reflectivity and flatness were similar to or better than our existing slit.

The samples were taken up to Sutherland and installed on SALT for testing on 30 November 2022. During the course of the day and night, several arcs, flats and slit view images were made using the four sample longslits, alongside our existing 1.5" slit for comparison. From this data it was immediately obvious that there was a range of quality in the slit-masks. The reflectivity of all four slit-masks was good, but unfortunately all of them showed some imperfections in flat-field images, and none of them were fully 8' in length. Therefore, we decided not to immediately replace our existing 1.5" longslit with one of the new samples, though one of them is of good quality. The figure below shows comparison slit view images with our existing slit (left) and one of the new sample slits (right).

We are currently discussing the results internally and planning the next steps in this project.





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## RSS upgrades

The new RSS PG0700 grating was successfully installed and aligned in November 2022. Testing and early science data look good, and the grating is now fully available for all users. The PG0300 grating has been permanently replaced by PG0700. If there are any questions about utilising this new grating for your science, please don't hesitate to contact the SALT team.

A four-week period of major RSS optics upgrades has been pencilled in for March 2023. RSS will be offline for this period, but HRS and SALTICAM will be on-sky for the duration of the upgrades. The major task will be the replacement of the RSS key optics (doublet and triplet), which will take up a majority of the downtime. Minor tasks include upgrading the leak detection system and making measurements of various parts of the RSS system, not to mention several collimator checks and pre- and post-lift general engineering (baseline and commissioning) tests – certainly enough to keep SALT operations busy!

We will include all the details of this project in the next newsletter, so watch this space!

*Lee Townsend.--*



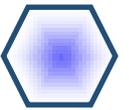
### FP update

Unfortunately, we have some bad news: the Fabry-Pérot refurbishment project is currently on hold until the SALT board has decided whether it is worth continuing. This is due to technical issues that have resulted in extremely long delays. Since our last update to the community (September 2021), there has been little progress on the project: the new coating design was deposited on test substrates, with the preliminary lab tests showing it to be within specifications, but the effective finesse for both LR and MR test substrates was higher than that of the old system. However, the size of the substrates used (25 mm) is much smaller than that of our etalons (150 mm). Given the significant difference in size, the expected uniformity of the coating thickness (a critical measurement) could not be determined with high confidence. We await further tests from our vendor before we can move to the next step, which is depositing the coatings on the actual etalons. The process has been slow, and is not expected to pick up speed. At this rate, we would expect the etalons to be completed by early 2024, although there are no givens.

Since it has been such a long time since the FP refurbishment project was approved by the Board, we should determine whether the FP mode on RSS is still as relevant now as it was when the project first began five years ago. The involvement of the community will enable us to gauge the merit of moving ahead with the project. To this end, we have prepared a **questionnaire for the SALT community** to register their interest in the FP mode and their thoughts on the project. Please let us know in some detail what science you would plan to carry out, so that we can consolidate the science case. You can find the questionnaire at <https://forms.gle/23nPoAaE71BZ95EP7>. Your feedback will enable us to make the important decision as to whether to invest further in the FP refurbishment project, or redirect those resources. The questionnaire will remain open for responses until **6 January 2023**.

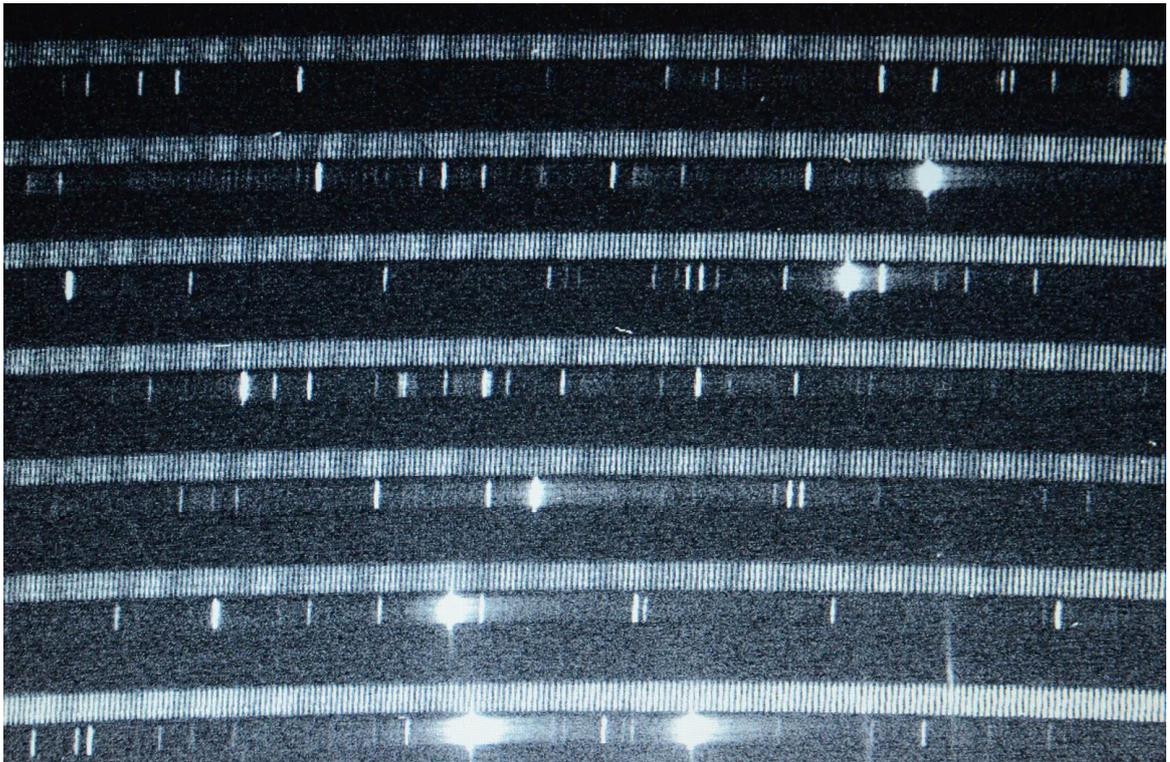
For context, the FP project involves obtaining new coatings for the LR and MR etalons, sealed etalon housings, sturdier mounts, remotely operable controllers, new calibration software and a complete data reduction pipeline. The main part of this project is getting the fresh coatings (with a new multi-layer coating design) which will be followed by the rest of the improvements. As mentioned above, the coating design has been tested on small substrates and the spectral resolution is within spec. However, phase changes (due to the intrinsic design of the coatings) are still prominent at key wavelengths, and these can amplify any surface defects or non-uniformity in the coating thickness. We are currently awaiting further tests to determine the coating uniformity over a wider area – this is a characteristic of the coating chamber. We anticipate that these results will be available in about two months from now. If there is positive feedback from the community and the board decides to go ahead with the project, we would then place a final order to have the coatings deposited on the etalons. Factoring in the long waiting times, we anticipate this step to take up to a year. The etalons will then be shipped to us to undergo acceptance tests in the laboratory before installation at the telescope.

*Liz Naluminsa.--*



## LFC update

The last major shipment for the laser frequency comb (LFC) for the HRS has arrived in South Africa after a several-week voyage, and the associated paperwork is being attended to by our forwarding agent. All of the other components are already waiting in the lab in Cape Town and the large parts that were to be machined in the SAAO workshop have been completed. Work is underway on the power supplies and other electronics units to be built at SALT, now that the NIR-related activity at the telescope is settling down. The main laser for the LFC that required warranty repairs in the UK has now arrived back in Cape Town, after being fixed and having passed the relevant performance tests. At this stage, we anticipate having the Heriot Watt team travel to South Africa in January or February 2023 to test various components in the lab and then return in April to begin the integration of the comb at SALT. The precision radial velocity (PRV) pipeline development is moving forward in parallel, with most of the basic data reduction tools for the High-Stability (HS) mode now having been produced. The next step is to develop the precision wavelength calibration tools for data obtained with the HS mode's simultaneous thorium-argon feed. Then, once the comb is available, the HS pipeline will be extended to deal with data taken with comb light directed into the calibration fibre.



Seven orders in the HRS Red channel demonstrate the superiority of the LFC features (upper trace) over those from a ThAr arc (lower traces).

*Lisa Crause.--*



### What's next for SALT?

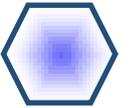
The SALT Scientific and Technical Committee (STC) has motivated for a comprehensive re-design of the top end of the telescope, as we see this as a highly strategic way forward for SALT. An outline for a pre-study to scope out such a project was presented at the November Board meeting and approval was granted to undertake this study over the next six months.

The existing payload is extremely limiting, in terms of current and future instrument possibilities. Space constraints, inaccessibility and outdated hardware plague this critical volume and fundamentally impact SALT's ability to deliver high impact science. Investing here would benefit all aspects of the telescope: 1) improving and maintaining the spherical aberration corrector (SAC) throughput would enhance the performance of all of the instruments, 2) fully stabilising the focal plane (with a wavefront sensor for closed-loop control of tip/tilt and focus) would streamline observations, improving both operational efficiency and data quality, 3) having the space to include a dichroic beam-splitter inside the payload would enable RSS and NIRWALS to do simultaneous integral field spectroscopy from 350 nm to 1.7 microns, and 4) this approach would offer forward-looking capacity for future instrument development. Addressing our current inability to maintain the SAC should be the highest priority, but there are numerous examples of sub-systems that could be greatly improved if we had the opportunity to design and build what we now know would be fit-for-purpose. Various maintenance challenges could also be retired with appropriately designed interfaces and the constraints associated with the existing system are only compounded whenever we are forced to shoehorn in new requirements to meet SALT's evolving needs.

Thinking expansively about the possibilities available to us at this point would be a great way to engage our user community, while also serving as a wonderful team-building exercise for SALT Operations. We welcome any and all suggestions from all quarters – no idea is too crazy at this point (e.g., what if we fibre-fed the RSS, so that it could go in the spectrometer room, instead of consuming the precious real estate up at prime focus?!), everything is up for grabs while we brainstorm the many possibilities! Feel free to **email the STC chair** ([lisa@salt.ac.za](mailto:lisa@salt.ac.za)) with any thoughts you and/or your colleagues may have about this.

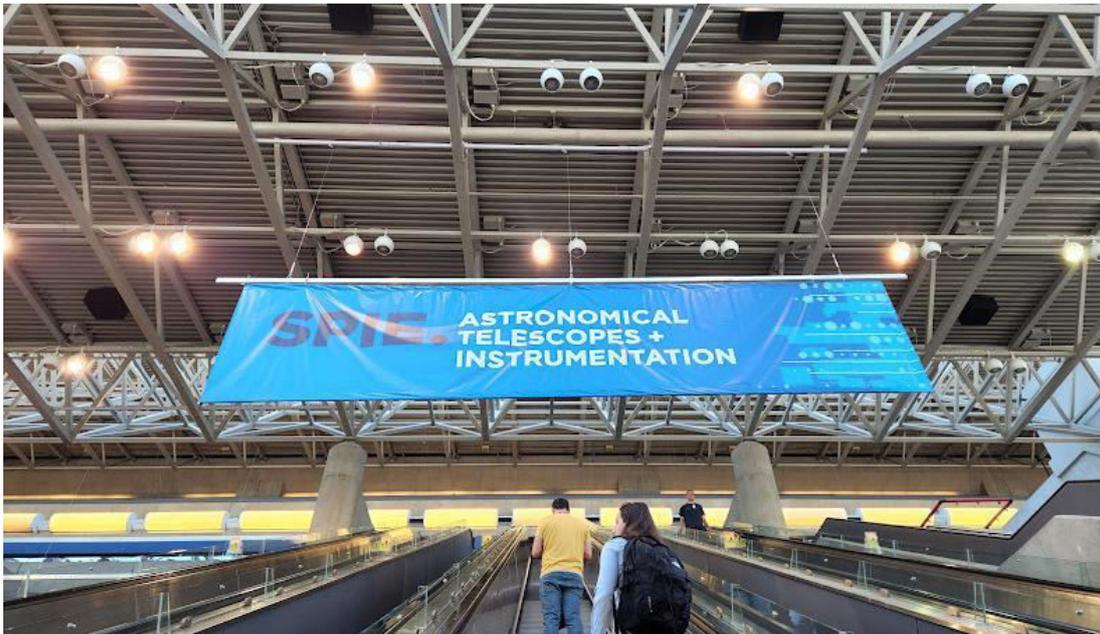
Also remember to keep an eye on the new SALT blog for updates about ongoing developments: <https://salthappenings.blogspot.com>.

*Lisa Crause.--*



## SPIE Conference reports

Every other year, SALT team members travel to the SPIE conference on *Astronomical Telescopes and Instrumentation* to talk about their latest work and to exchange news with other observatories staff. The 2022 conference took place from 17 - 22 July in Montréal, Canada. This year, seven of the Cape Town team attended the conference, some presented below with a short note.



**Christian Hettlage**, software engineer:

My talk was about SALT getting a new Web Manager, replacing the old PHP-based tool with software that is cleanly separated into a frontend and a backend. Angular is used for the frontend, and the backend is realised as a REST-ful API implemented with FastAPI. Access to this API is also possible via a Python library, PyAstroSALT. This is complemented by imephu, a Python library for generating SALT finder charts. Care is taken to include automated tests of the software which use real data, without compromising confidentiality.



**Melanie Saayman**, optical engineer:

This was my first SPIE Astronomical Telescopes + Instrumentation conference, and I found it extremely interesting, stimulating, and useful. There were several interesting conference sessions happening simultaneously in multiple locations. One of the highlights for me was the JWST plenary session – only a few days after the exciting release of the first scientific images. The exhibition was great and provided an excellent opportunity to meet suppliers and discuss technical capabilities.



*Melanie with Deon and Janus*



**Encarni Romero Colmenero**, Head of Astro Ops:

This was the first time I'd travelled abroad since the onset of the Covid-19 pandemic!

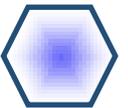
As always, the SPIE had multiple talks running simultaneously, and the SPIE app was essential to be able to plan your meetings and get you from one place to the next in time! It's a great way to catch up with what other telescopes and instrument groups are doing, catch up with other people in the field, find out what new techniques or materials are out there, etc. It's a busy time and it's always difficult to choose which presentations to attend – but really worth it.

I presented two talks: the first one was mine, on Astronomy Operations with SALT, discussing statistics of over 11 years of SALT operations (we've been in regular operations since 2011 – doesn't time fly!). Two days later, I became tall and blonde (at least in my imagination) and became Paul Rabe, head of SALT Technical Operations, to deliver his presentation on resource planning and collaboration during Covid-19 (because Paul's visa did not arrive in time and he couldn't make the trip). His presentation was followed by a discussion session on remote work challenges, which was awesome – I really hope the organizers find more time for discussions in future meetings!

On a personal note, besides a really fascinating conference, Montréal in July was gorgeous and I loved every second of it.



Conference in the times of Covid-19. -- Credit: Kathryn Rosie



**Kathryn Rosie**, mechanical engineer:

Key activities and takeaways for me as a first time SPIE attendee and someone who is still trying to find my feet in the vast optical world: Many of the more in-depth discussions were at a level of complexity which required a bit more background in the field. It was useful for me to use these talks to become aware of general concepts, as opposed to absorbing the specifics of what was presented. e.g., adaptive optics, large mirror kinematic supports, micro-fibre positioning systems.



The highlight of the visit was the hands down 1-day "Cryo-vacuum design for ground based astronomy" course presented by a recent ESO retiree. Pretty much my job description! Reviewing the course material with my more experienced colleagues, the estimate is that this is worth approximately 3 - 4 years of in-depth design experience. Other highlights included the exhibitor meetings, where I had the opportunity to talk through intended designs and upcoming procurements directly with technical and sales personnel – probably also worth about six weeks of e-mails and Zoom meetings. The general exhibition features were great, being able to closely inspect display items that can be incorporated in future designs: CCDs, small precision actuated mechanisms, mirror support actuators, etc.

All in all it was a wonderful opportunity; I'm very grateful to have been afforded the experience.



**Janus Brink**, software engineer:

I presented a paper on the upgrades to SALT that was required to support our new NIRWALS instrument. This included a new Atmospheric Dispersion Compensator (with new coatings that include support for the NIR waveband out to 1.7 um), moving baffle and pupil mask. Changes to the Fibre Instrument Feed were also required to accommodate the NIR Integral Field Unit (IFU) fibre bundles. A new NIR-specific light source assembly for the calibration system was also added. Numerous changes to the control system software were also implemented to improve tracking and telecentricity as needed for the fibre-fed NIRWALS spectrograph.

**Lisa Crause**, SALT Observatory scientist:

My first encounter with these SPIE conferences was in Marseilles in 2008 and I've been a devoted fan ever since. It's the ideal way to keep in touch with like-minded people from all around the world, to get updates on all the major projects underway (both for new telescopes and instruments), as well as to connect with vendors in the exhibition hall - while having the opportunity to play with all the amazing new devices/tools/materials they have on display. It's always exciting to see the progress being made on countless scientific and technical fronts, but at this meeting it was a particular privilege to hear all about the JWST directly from those that had literally just brought this most spectacular of observatories to light. I presented a paper on the development of a laser frequency comb for SALT's HRS (see the LFC article above for more details) and enjoyed connecting with others involved in similar efforts around the world during our poster session. The 2020 conference that was meant to be in Yokohama ended up being online, so we now have to wait for June 2024 to get to Japan for the next one!



*SALT team members.-*



### SALT Workshop report

14 – 15 November 2022 at SAAO, Cape Town

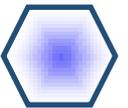
The SALT Astro-Ops team recently hosted a two-day workshop at the South African Astronomical Observatory in Cape Town as well as online, giving an overview of the telescope, recent news and tools available for preparing for observations and making use of the data. The talks covered updates on new and upcoming instrumentation, tips and tricks, the proposal tools, data reduction processes and pipelines, the SALT data archive, how to use particular RSS modes such as polarimetry and multi-object spectroscopy, and photometry of solar system targets. Just over 50 people attended in person and about 40 people joined the Zoom sessions online.

Huge thanks to the SAAO staff and Astro-Ops team, who all contributed to the content and running of the workshop, as well as to Matt Hilton and Anja Genade for presenting on how they use SALT for their work and making their expertise available to others, and to Sabyasachi Chattopadhyay, Marsha Wolf and Lisa Crause for the latest on instrumentation efforts. Since SALT observing time is also available through the [ORP](#) (OPTICON RadioNet Pilot) programme, thank you also to Elme Breedt for her introduction into this programme and the application process.

The talk slides are all available for download from the [Programme page](#) on our website ([www.saltworkshop2022.salt.ac.za](http://www.saltworkshop2022.salt.ac.za)) and the Zoom recordings are available [here](#).



Group photo. -- Credit: Lusanda Tamesi from African Science Stars



Astro-Ops team, from left to right (by heads): Daniël, Encarni, Christian, Moses, Chaka, Liz, Xola, Nhlavu, Enrico, Ros, Alexei, Solohery . -- Credit: Lusanda Tamesi from African Science Stars



Left: Lessons in Kung Fu? Coffee time, and Kathryn presenting her workshop.

Below: Lisa and Encarni giving their presentations.



Lunch time on the terrace of the auditorium.



*Ros Skelton.--*



## SALT Board meeting

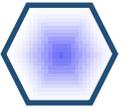
The SALT Board meeting #52 was held in person at the SAAO on 16 – 17 November, right on the heels of the SALT workshop. This was the first time the Board had met in person since November 2019 in Pune, India, and it was great seeing everyone in 3D again! Unfortunately, three Board members were unable to make the trip due to other commitments: Matt Bershadly from the University of Wisconsin–Madison, Mike Shara from AMNH, and Somak Raychaudhury from IUCAA. Somak and Matt managed to join via zoom despite starting at 15:30 local time for Somak and 4am for Matt – that’s dedication!

During this meeting, we officially welcomed three new Board members from South Africa: Vanessa McBride, who is the Deputy Director of the OAD, head of research at the SAAO and an associate professor at UCT and who replaces Shazrene Mohamed; and two new members: Itumeleng Monageng, who holds an SAAO and UCT joint appointment, and Sharmila Goedhart, Head of Science Operations at SAAO, the South African Radio Astronomical Observatory.

The Board meeting itself lasted two days, and discussions ranged from operations to finances to science and science engagement, as you would expect. And of course, since “she” couldn’t travel to Cape Town to meet everyone, SALT was delighted to see many of the Board members making the special effort to visit “her” in person at the end of their stay. ;)



Group photo, in person and online.



There may be a couple of outcomes that may interest SALT users: firstly, the RSS Fabry-Pérot upgrade is currently on hold, pending a review of whether it is worthwhile to continue with this project – please see Liz Naluminsa’s article above for more information. Secondly, the Board approved the scoping of a possible “top-end re-design”! There should be many potential benefits to taking a long-hard look at the way we operate and how we can optimise things -- and I can’t wait to find out what we can do! For a closer look at what this might mean, please read Lisa’s article. And finally, we are looking for volunteers to form a SALT users group! If you are interested in participating, please also see the relevant article below for more information.

The next Board meeting will be held at the end of May in Poland, followed by a “Science Highlights from SALT” conference in Warsaw, Poland, on 1 - 3 June 2023: see the announcement below.

Hopefully we’ll see you all there!



Petri addresses the board and guests at the meeting’s dinner at Simon’s. – Credits: Phil Charles

*Encarni Romero Colmenero.--*



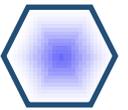
### SALT strategic plan

The SALT Board and SAAO are preparing an updated SALT Strategic Plan to guide the development of hardware, software, observing procedures, and so on for SALT over the next 5 to 10 years.

The previous strategic plan from 2018 (available at <https://www.salt.ac.za/2018/10/15/salt-strategic-plan/>) has been extremely effective in guiding SALT development. Many of the projects proposed therein are either in operation currently (for example a new RSS guider), or in various stages of implementation, such as the new near-infrared spectrograph, currently undergoing science commissioning, and a Laser Frequency Comb for HRS, which is in construction. Other suggested projects have been successfully studied, e.g., the SALT mini-tracker feasibility study project, or are in active development stage, e.g., the MaxE project aka RSS Dual, for a new high-efficiency full optical wavelength range mode for RSS serving transient science needs, which will reach the PDR-stage in early 2023.

Our goal is to finalise this new SALT Strategic Plan by mid-2023, with inputs and discussion preceding it in the early parts of the coming year. Thus, input from the SALT community would be very much welcomed; please feel free **to send your comments** to [salt-strategy@salt.ac.za](mailto:salt-strategy@salt.ac.za).

*Petri Väisänen, Jack Hughes.—*



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## Calling for volunteer SALT Users!

After 11 years of regular operations, SALT has reached a high-enough level of maturity and productivity to warrant the creation of a SALT users group. The main goals would be to provide a forum for users (both newbies and veterans) to raise/discuss issues, while also providing us, the Ops team, with suggestions, advice and more regular feedback on our performance, e.g., with proposal tools, pipelines etc.

So, we are calling on interested SALT users to volunteer to become part of this group!

The Terms of Reference are still to be defined, but ideally we would like at least one representative from each partner. And we also need to find a suitable acronym! Here are some crazy suggestions to get the acronym juices going:

- ❖ SMUG – SALT’s Magnificent Users Group
- ❖ SCU – SALT Committee of Users
- ❖ ICSU – International Committee of SALT Users
- ❖ SNUG – SALT New Users Group
- ❖ SUAC – SALT Users Advisory Committee

If you are interested in participating, please get in touch directly with me ([erc@salt.ac.za](mailto:erc@salt.ac.za)).

Thank you for considering it!

*Encarni Romero Colmenero.--*



## Upcoming SALT Science Conference

Warsaw, Poland in June 2023

We are pleased to invite the SALT community to join us for a conference **Science Highlights from SALT**, to be held in Warsaw, Poland, from 1 - 3 June 2023. The conference aims to present the main achievements enabled by SALT and to look forward to the most (and potentially) promising fields for SALT Science. We hope that this meeting will provide an opportunity for the present and future SALT users to discuss scientific highlights, upcoming projects as well as strategic plans for the future, and to promote close working relationships between scientists from different partner institutions and with different professional experience. The conference is organized by the Polish SALT Telescope Foundation and the Nicolaus Copernicus Astronomical Center of the Polish Academy of Sciences.

To find more details and to register please go to the conference website at <https://salt2023.pl/>.

We encourage you to register as soon as possible, since the attendance at the workshop will be limited to 80 participants. If you wish to make an oral presentation, you must submit your title and abstract **by 31 January 2023**, and we shall inform speakers soon after 15 February. If you apply for financial support (which is limited) the deadline is also 31 January 2023.

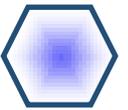
We look forward to you participation!

On behalf of the SOC and LOC,  
Joanna Mikołajewska & Marek Sarna



The Nicolaus Copernicus Astronomical Center in Warsaw, Poland.

*Ros Skelton.—*



## **MEET THE TEAM: Tasheen Naicker**

Senior Mechanical Engineer

Hello everyone,

I was born and raised, in Gauteng Province. On a smallholding “plot” of 5 acres. I remember those days fondly, playing with the neighbourhood kids, until it got dark and we couldn’t see the cricket ball anymore. After school, I studied at Wits University, completing a BSc in Aeronautical Engineering in 2006. I am still very passionate about Aerospace, but mostly from an engineering perspective, suffice to say – I don’t yearn to go up in small planes etc. I have subsequently worked at three companies before joining SALT – namely Denel Dynamics, Carl Zeiss Optronics (it is now Hensoldt Optronics) and most recently at Reutech Radar Systems. I have mostly worked as a design engineer at all those companies, and have been exposed to amazing systems and systems engineering at each of those companies. I joined SALT under a year ago, so I am still a “newbie” with a lot to learn.



On a more personal note – I now live with my young family, in Stellenbosch. My kids are 5 and 7 at the moment and all I want for them is a better world that they can inherit from “us”. I think exploration of the universe with a big telescope is quite a cool thing, and I look forward to learning as much as possible and contributing positively where I can.

Cheers, Tasheen



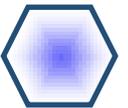


# SALT SCIENCE PAPERS

August 2022 – November 2022

Below is the list of SALT publications since our last newsletter (for our full list of publications, please visit <http://astronomers.salt.ac.za/data/publications/>). We encourage SALT users to inform us of any papers making use of SALT data, and to double check the link above after publication.

- Rea, N., Coti Zelati, F., Dehman, C., et al. 11/2022: Constraining the Nature of the 18 min Periodic Radio Transient GLEAM-X J162759.5-523504.3 via Multiwavelength Observations and Magneto-thermal Simulations, ApJ 940, 72 -- <https://ui.adsabs.harvard.edu/abs/2022ApJ...940...72R>
- Aydi, E., Sokolovsky, K. V., Bright, J. S., et al. 11/2022: The 2019 Outburst of the 2005 Classical Nova V1047 Cen: A Record Breaking Dwarf Nova Outburst or a New Phenomenon?, ApJ 939, 6 -- <https://ui.adsabs.harvard.edu/abs/2022ApJ...939....6A>
- Prince, R., Zajaček, M., Czerny, B., et al. 11/2022: Wavelength-resolved reverberation mapping of quasar CTS C30.10: Dissecting Mg II and Fe II emission regions, A&A 667, A42 -- <https://ui.adsabs.harvard.edu/abs/2022A&A...667A..42P>
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- Chojnowski, S. D., Hubrig, S., Labadie-Bartz, J., et al. 10/2022: Trumpler 16-26: a new centrifugal magnetosphere star discovered via SDSS/APOGEE H-band spectroscopy, MNRAS 516, 2812 -- <https://ui.adsabs.harvard.edu/abs/2022MNRAS.516.2812C>
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- Chené, A.-N., Mahy, L., Gosset, E., et al. 10/2022: WR 63: a multiple system (O+O) + WR?, MNRAS 516, 1022 -- <https://ui.adsabs.harvard.edu/abs/2022MNRAS.516.1022C>
- Snowdon, E. J., Scott, L. J. A., Jeffery, C. S., & Woolf, V. M. 10/2022: Spectroscopic analysis of BPS CS 22940-0009: connecting evolved helium stars, MNRAS 516, 794 -- <https://ui.adsabs.harvard.edu/abs/2022MNRAS.516..794S>
- Pennock, C. M., van Loon, J. T., Anih, J. O., et al. 10/2022: The VMC survey - XLIX. Discovery of a population of quasars dominated by nuclear dust emission behind the Magellanic Clouds, MNRAS 515, 6046 -- <https://ui.adsabs.harvard.edu/abs/2022MNRAS.515.6046P>
- He, C., Sun, W., Li, C., et al. 10/2022: The Role of Binarity and Stellar Rotation in the Split Main Sequence of NGC 2422, ApJ 938, 42 -- <https://ui.adsabs.harvard.edu/abs/2022ApJ...938...42H>
- Linzer, N. B., Goulding, A. D., Greene, J. E., & Hickox, R. C. 10/2022: Spectropolarimetric Measurements of Hidden Broad Lines in Nearby Megamaser Galaxies: A Lack of Clear Evidence for a Correlation between Black Hole Masses and Virial Products, ApJ 937, 65 -- <https://ui.adsabs.harvard.edu/abs/2022ApJ...937...65L>
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- Sebastian, D., Swayne, M. I., Maxted, P. F. L., et al. 09/2022: The EBLM project - IX. Five fully convective M-dwarfs, precisely measured with CHEOPS and TESS light curves, MNRAS.tmp -- <https://ui.adsabs.harvard.edu/abs/2022MNRAS.tmp.2392S>
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- Kniazev, A. V. 09/2022: Pipeline Reduction of Long-Slit Spectra Obtained with the SALT Telescope, AstBu 77, 334 -- <https://ui.adsabs.harvard.edu/abs/2022AstBu..77..334K>
- Kwok, L. A., Williamson, M., Jha, S. W., et al. 09/2022: Ultraviolet Spectroscopy and TARDIS Models of the Broad-lined Type Ic Supernova 2014ad, ApJ 937, 40 -- <https://ui.adsabs.harvard.edu/abs/2022ApJ...937...40K>
- Lennon, D. J., Dufton, P. L., Villaseñor, J. I., et al. 09/2022: The VLT-FLAMES survey of massive stars. NGC 2004#115: A triple system hosting a possible short period B+BH binary, A&A 665, A180 -- <https://ui.adsabs.harvard.edu/abs/2022A&A...665A.180L>
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- Hosseinzadeh, G., Kilpatrick, C. D., Dong, Y., et al. 08/2022: Weak Mass Loss from the Red Supergiant Progenitor of the Type II SN 2021yja, ApJ 935, 31 -- <https://ui.adsabs.harvard.edu/abs/2022ApJ...935...31H>
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- Modiano, D., Wijnands, R., Buckley, D. A. H., et al. 08/2022: TUVO-21acq: A new cataclysmic variable discovered through a UV outburst, A&A 664, A165 -- <https://ui.adsabs.harvard.edu/abs/2022A&A...664A.165M>
- Mahy, L., Sana, H., Shenar, T., et al. 08/2022: Identifying quiescent compact objects in massive Galactic single-lined spectroscopic binaries, A&A 664, A159 -- <https://ui.adsabs.harvard.edu/abs/2022A&A...664A.159M>

*... and a  
Merry Christmas to all!*