SALT NEWSLETTER

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Southern African Large Telescope,
Sutherland, South Africa
Cover Image: Chantal Fourie

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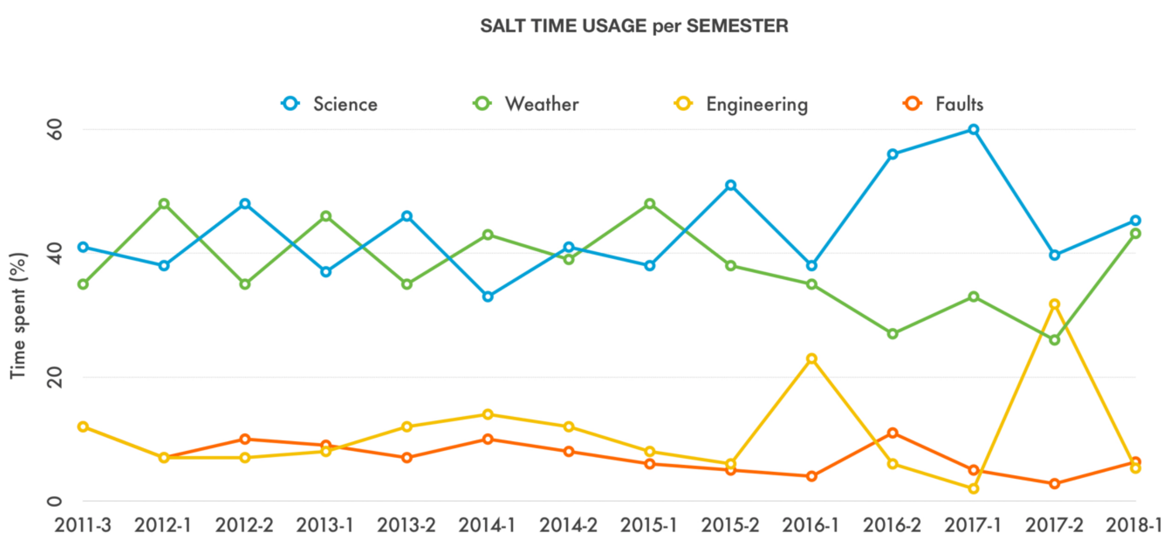
Contributors to this issue: Encarni Romero Colmenero, Rosalind Skelton, Michael Feast, Christian Hettlage, Moses Mogotsi, Meridith Joyce, Lisa Crause, Stephen Hulme, Thea Koen (editor).

LETTER FROM THE HEAD OF ASTRO OPS

Dear SALT community –

It was really great to meet so many of you at the SALT Conference in November in Pretoria, to finally put a face to those names we see at the telescope and to hear of your upcoming results and improvement ideas. For those of you who missed the conference, we have included a summary article in this newsletter. From my side, a huge thank you to all of the organisers, and especially to Ros and Nazli, for a really awesome conference - it was a lot of work and they made it look so easy!
And a heartfelt thank you also to all of you who publish your SALT data! This year we've all done really well again: by the end of November we'd counted 47 refereed papers and with one month to go, we're hopeful we'll match or even surpass our previous record (49 papers last year!). As always, the number of publications is a telescope's most important measure of success, so please keep it up! And please let us know how we can help to make things easier for you by answering our upcoming survey, which should be arriving at an inbox near you in the next couple of days.



As you can see in the figure above, this year we seem to have "run out" of the extra good weather and we're back to our more regular weather patterns - this is great news for us in Cape Town, as we finally get to enjoy decent showers, but not so awesome for astronomy! Luckily, in April we replaced our old RSS guider with a more sensitive, two-probe guidance system that now corrects for rho drift and helps us maintain focus.

This new system had a few teething problems and it's still undergoing commissioning, but it should allow us to be more efficient and to take better RSS data to boot. We are already able to guide on fainter stars and MOS acquisition is a breeze, so perhaps even our RSS overheads will come down in the near future. Watch this space!

"Her Royal Spectrographness" (aka HRS) also gave us a few extra gray hairs this year and had to have major surgery twice, but happily she is now back in working order - Lisa's article below gives all the gory details.

On a personal note, it's been a great year - but very busy! We've also welcomed a few new people into the SALT Ops family and, in fact, we've just advertised on AAS Job Register for a new SALT Astronomer to look after the SALT pipeline, with deadline 12 January! You can find more details here: https://jobregister.aas.org/ad/27588feb

And to finish off, a reminder that the call for proposals for semester 2019-1 is now open and we're looking forward to lots of exciting proposals from everyone.

Happy holidays!
Encarni

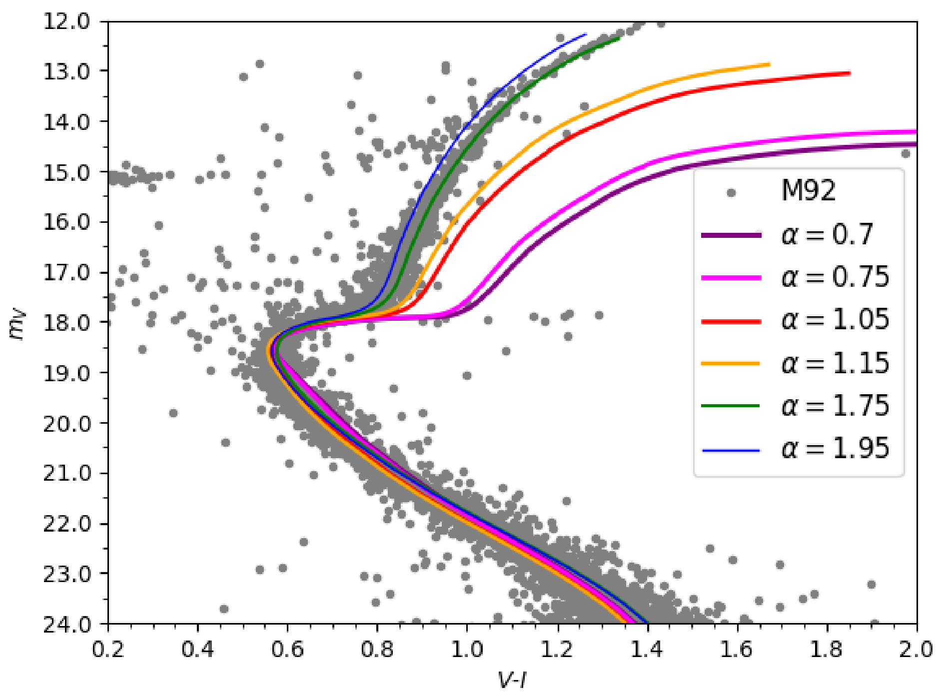
SCIENCE HIGHLIGHT

Calibrating fundamental stellar models with SALT

By Meridith Joyce

Because astronomers can't visit stars directly, we rely heavily on theoretical models and statistics to learn about their fundamental properties. Isochrones---from "iso," meaning "same," and "chronos," meaning "time"---are a type of theoretical model used to infer the ages of stars and stellar populations. These models are built from sets of stellar tracks, calculations that tell us about changes in a star's temperature, brightness, radius, composition, and internal structure over time. We generate these models using software that combines the best data and computational methods available across many subfields of astronomy and nuclear physics into programs called Stellar Structure and Evolution Codes, or SSECs.

Isochrones and stellar tracks are widely used in astrophysics to help determine stellar ages, distances, and---if we're very precise---some of the physics taking place inside the stellar interior. Although we have a long-standing and reliable mathematical framework underpinning stellar evolution models, our theoretical knowledge is still incomplete. To fill in these gaps in our understanding, we must constrain the uncertain physics assumed in our models using direct observations of stars.



One piece of the puzzle that we must infer indirectly is the nature of convection zones beneath the surfaces of stars. In particular, we are interested in their size, depth, and the efficiency of energy transport taking place inside them, as these features can have far-reaching evolutionary implications that allow us to constrain stellar ages.

Convective physics is handled in SSECs using a prescription called the Mixing Length Theory (MLT). The mixing length, typically denoted by "alpha," is a parameter that represents the efficiency of convection. Because we cannot measure alpha directly, it is typically estimated by minimizing differences between the modelled and measured values of the solar radius, luminosity, and the abundances of various elements on the surface. Historically, we have relied upon the Sun exclusively for these calibrations, because it is the only star for which we have precise enough observational constraints.

While the Sun is a powerful and important laboratory for constraining convective mixing, the value of alpha obtained this way may not translate appropriately to models of other stars. Because the mixing length will be optimized specifically for solar conditions, theoretical models of stars with highly non-solar properties---such as stars with drastically different sizes or chemical compositions---can quickly become unreliable.

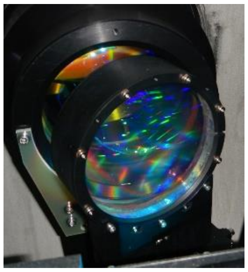
In fact, current research suggests that the reliance on the solar convection model can lead to dangerous estimation errors in the derivation of fundamental properties. With the increased availability of high-precision observational data from instruments like SALT, however, we have recently become able to calibrate SSECs using direct, empirical measurements of stars other than the Sun. Recent research using such methods has demonstrated the importance of checking our work in this way, finding, in particular, that the solar prescription for convective mixing is very ineffective in models of stars with low metallicity (stars with a lower proportion of elements heavier than Helium compared to the Sun).

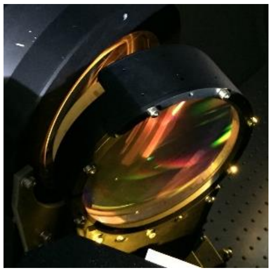
Among recent successful candidates for empirical mixing length calibrations are metal-poor subgiant star HD 140283 (Creevey et al., 2015; 2017; Joyce and Chaboyer, 2018a) and Alpha Centauri A and B (Joyce and Chaboyer, 2018b). In all cases, non-solar mixing length values were derived for these stars, a result which has emphasized the importance of moving away from the solar prescription and our ability to perform these calculations in a more physically-grounded way.

With the help of high-resolution spectroscopy (HRS) from SALT and preliminary medium-resolution spectroscopy from SAAO's 1.9m telescope, we have since identified and observed hundreds of additional low-metallicity candidate stars that we can use to calculate convective mixing length values for non-solar stars spanning a variety of stellar evolutionary phases.

SALT HRS will be critical in studying further the relationships between stellar mass, metallicity, and mixing length. An understanding of these relationships, supported by direct observational data, will contribute to the development of more sophisticated stellar tracks and isochrones, thus improving our estimates of many fundamental properties of stars.

HRS WORK IN 2018

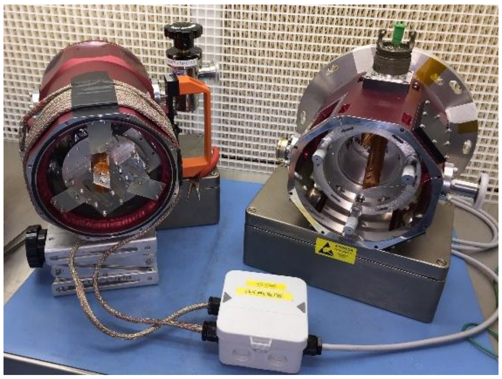




Our ordinarily well-behaved High-Resolution Spectrograph (HRS) commanded a fair amount of attention through the year. The action began with SALT purchasing a custom-built Iodine gas absorption cell from exoplanet guru Paul Butler in January. Testing of the cell was done during a 2-week engineering campaign in May, a time in which Paul became closely acquainted with SALT, as well as a broad selection of South African red wine. In addition to adapting his highly-specialised precision radial velocity data-reduction pipeline to accommodate HRS spectra, Paul also regaled the Tech Ops team with a fascinating talk about the art of exoplanet hunting. While not spectacular, the early results obtained with the new cell (RMS velocities of 3-7m/s for a selection of extremely stable bright stars) were certainly encouraging and work is currently in progress to streamline this mode for active service.

The guiding principle for the HRS is to do as little as possible to the instrument. But during July the two cryostats began showing signs of needing maintenance (for the first time in almost four years) as both cameras struggled to hold vacuum and maintain their cryogenic operating temperatures. Downtime was scheduled for the next dark week, to limit the impact of taking the instrument offline. The Red and Blue cameras were then warmed up and the dewars painstakingly detached from the instrument's 4-m long stainless-steel vacuum tank. Safely bundled into their huge Pelican packing cases, the effectively-priceless cargo was driven to the SAAO's CCD lab in Cape Town.

The aim was simply to extract the various charcoal getters from the two dewars and then to vacuum-bake them at high temperature to recharge them. We also decided to bake the ion pumps that help to maintain the vacuum integrity of the cryostats. So, after leak-testing the dewars with Helium using a residual gas analyser (and not finding any leaks), we split the cryostats open to access the charcoal getters.

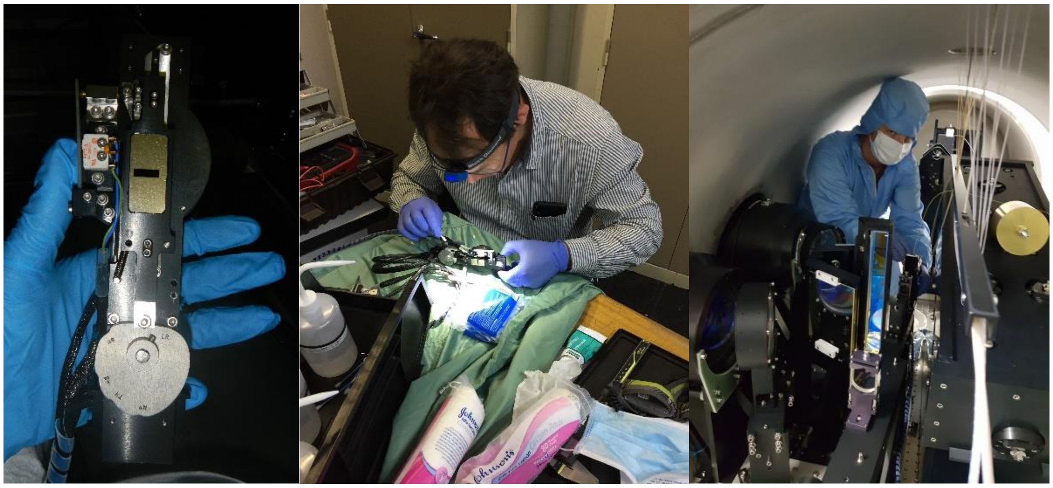


The ion pumps yielded their own surprises, in the form of vast amounts of metallic “sand” that poured out of each of them as soon as they were removed from the cryostats! We were not anticipating this, and neither were the ion pump manufacturers. Interestingly though, this phenomenon was not news to the company's technical specialists – apparently this is normal behaviour for ion pumps running at the sorts of pressures our cryostats live at. After some nerve-wracking work to remove the offending particles from the cryostats, we proceeded to bake the charcoal and replace both ion pumps. The re-assembled dewars were then vacuum-baked as well before being driven back to SALT and re-installed on the tank.

The Blue camera went back exactly as it should have, but the Red proved problematic. Design issues with the copper cold-finger assembly on the Red dewar make it vulnerable to misalignment of the detector. To our dismay, frames taken once the system was back at its operating temp of -120 C revealed a tilted CCD. A portable clean-tent was set up in the spectrometer room beneath the telescope and used for the open-cryostat surgery required to re-align the chip. Our first attempt halved the problem and so a second iteration was needed. Fortunately, this final tweak could be done with the Red camera still connected to the tank, avoiding some of the risk associated with removing and re-attaching the camera. The impact on science was limited as much of the work was done during dark time (that’s mostly spent on RSS targets) and Sutherland also experienced a fair amount of bad winter weather over the two weeks that the HRS was offline.

After a couple of months of stable operation following all these violent interventions, we noticed that the mode selector – one of just four moving parts inside the vacuum tank – seemed to be moving slower than it should. Various non-invasive tests confirmed that this mechanism (which drives a mask with a slot up and down in order to select the relevant pair of fibres for the required HRS mode) needed attention. This meant having to open the vacuum tank, something that we avoid at all costs. This was last done back in 2014, but we had no choice. The good news though is that opening the tank affords us a great opportunity to train new staff, as well as to commune with the spectrograph's spectacularly beautiful optics!

The mode selector had to be removed from the tank for a proper inspection, which revealed that the vacuum grease on the bearing rails had become quite sticky. The old grease was cleaned off and a minute amount of fresh vacuum grease was applied. The mechanism was put through its paces to ensure that all was behaving as it should before it was re-installed.



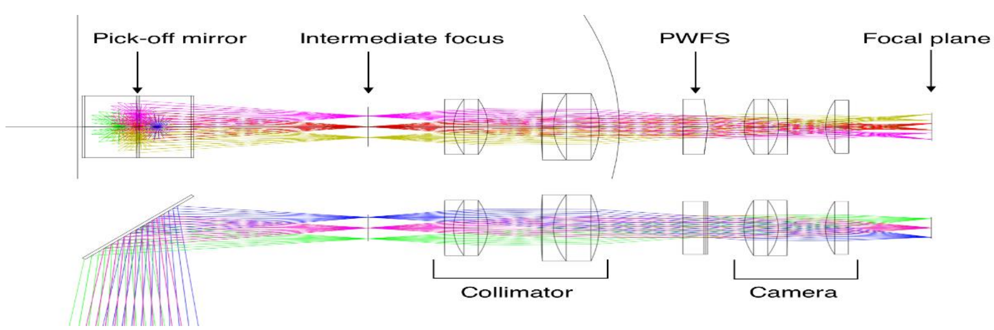
The Iodine cell work done on the High-Stability (HS) bench earlier in the year had slightly disrupted the incredibly sensitive alignment of the HS mode's fibre double-scrambler. Having the tank open provided a great opportunity to re-align those optics as one can then inject light into the system from both ends. It is always possible to send light down from telescope's calibration system in the payload to the input side of the double-scrambler, but being able to also shine light in from the spectrograph side is key. The latter provides a fixed target to aim for when adjusting the various stages at the input end of the two fibres. In comparing sets of before/after measurements we established that the throughput of the HS mode fibres increased by a factor of three as a result of this re-alignment, restoring the performance to its normal level.

We hope to have the new housing and temperature control system for the Iodine cell completed early in the new year. Work is also underway with simultaneous-ThAr specialist Arpita Roy to determine the internal stability of the instrument. Once we know exactly what the HS mode is currently capable of, we will be better placed to decide how best to proceed as we seek to develop exoplanet science at SALT.

RSS GUIDER

After more than a decade of service, the RSS guidance system was replaced by a new modular, removable system. The upgraded RSS Guider, also known as the Prime Focus Guidance System (PFGS), was installed during the March/April shutdown. The replacement of the RSS Guider was necessary to enable instrument focus and rho-rotation feedback, allow offsets of 0.05" precision, and increase the number of usable guide stars. Spares were also no longer available for the previous guidance camera. With the replacement camera and direct imaging, guidance on 16th magnitude stars can easily be achieved, where the usable limit was previously 14th magnitude.

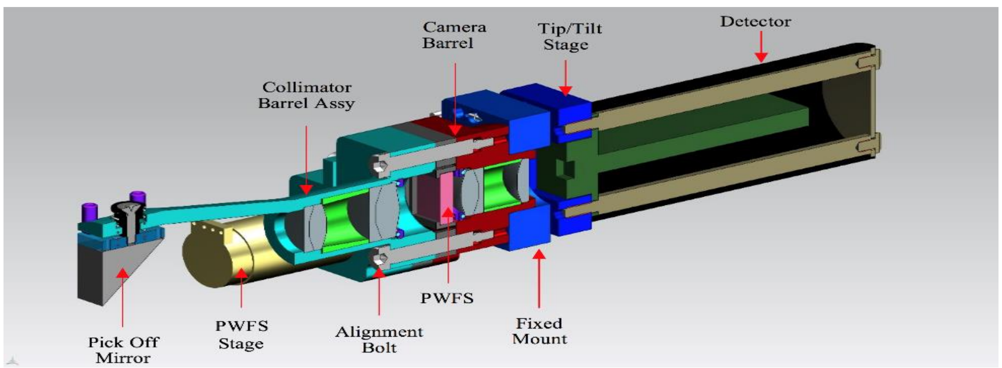
The guider module is mounted to the RSS, just before its focal plane and allows selecting two guide-stars within the 10 arc-minute telescope field of view. The optical design uses off-the-shelf optics to re-image a 24 x 24 arc-second portion of the telescope focal plane onto a small, un-cooled, integrated detector. A moveable, custom 14 mm square pyramid wavefront sensor at the intermediate pupil allows focus detection by splitting the beam – creating two images of the guide-star at the detector.



Each detector along with accompanying optics is mounted on two off-the-shelf precision linear stages from MISUMI Corporation and can be positioned to within 2.5 μm via small NEMA 11 stepper motors and linear grating encoders from MicroE Systems. Two of these probes were created for the guider, each of which patrols one half of the field. The PFGS is kinematically mounted and can be removed for maintenance.

A dedicated National Instruments CompactRIO running a real-time Linux operating system controls and manages all aspects of the guider's operation. Closed-loop motion control of the stepper motor stages allows accurate, reliable and safe operation. The system is integrated with the rest of the telescope control system via NATS middleware.

Commissioning results confirmed that the system meets specification with probes positioned to better than 10 μm (0.05 arc-seconds on sky). Closed-loop guidance achieved stabilisation of the focal plane to within ± 0.13 arc-seconds RMS in translation, ± 16 μm RMS in focus and ± 300 μrad RMS in rotation. The PFGS allows translation, rotation, and focus stabilisation of the RSS focus plane to be achieved.



CALL FOR PROPOSALS

It's that time of the year again... On 15 December we released the call for proposals for semester 2019-1. The semester will run from 1 May to 31 October.

The call document is available from: http://astronomers.salt.ac.za/proposals/
You may find all the software required for planning and submitting your proposal at http://astronomers.salt.ac.za/software/.

We recommend that you use the latest version of the software, as listed in the call document.

The phase 1 deadline will be on 1 February at 18:00 SAST (16:00 UT). The phase 2 deadline will be on 12 April 2019 at 18:00 SAST (16:00 UT).

If you have any questions regarding the submission process, you should contact salthelp@salt.ac.za - we are always glad to help!

40 YEARS OF SERVICE: FRED MARANG

By Prof Michael Feast

Fred Marang was a key staff member of the SAAO in my time. He was the first person to be a full-time night assistant. Until he came, visiting observers, of which we had a steady stream, were just helped for the first night's observing. It was not long before visitors were sending compliments to us about the help he had given them. Then quite soon Fred was filling a real need by making observations himself. In this way he made a contribution to the direct scientific output of the SAAO and his name became known internationally.

It all began when he simply knocked at the main door of the Observatory in Cape Town and asked if there was a job going in Sutherland. His wife came from there and they wanted to move back. Whoever opened the door must have been very impressed, for this was a very unusual way to apply for a job with us. Soon we were talking about his current job. He was working in a TV factory switching on TV sets as they came off the assembly line to check whether they worked and if not trying to fix them. That sounded promising and so he came to us.

Fred's contributions to SAAO in all the years that followed have been very great. These contributions have been made in Fred's quiet, calm and helpful way, which has meant so much to me and to all of us.

- It's worth noting that Fred has been coauthor of 111 refereed papers, and has achieved an h-index of 41.
- A special tribute video can be viewed here: https://bit.ly/2BmsInm

SALT CONFERENCE 2018

The third SALT science meeting “Advances with SALT” took place from the 14th – 16th November at the headquarters of South Africa's National Research Foundation. There were 80 attendees, representing many of the SALT partners, with participants from 5 continents converging in Pretoria to discuss all things SALT-related. Approximately 50 of the attendees were from South African institutes, representing five different universities, two national facilities, the Department of Science and Technology, NRF and of course the SALT team. It was very useful for those of us working at SALT to meet our colleagues from around the world, and we especially enjoyed putting faces to the names we regularly come across in observing proposals, on time allocation committees and the SALT board.

The themes of the conference were broad, covering the full range of science undertaken by SALT, as well as operational aspects, current and planned instrumentation, and ideas for the future. The talks provided an excellent overview of the exciting science currently being done with SALT data, from asteroid trails to blazars, distant cluster galaxies to binary stars. A number of new directions where there is potential for big impact were highlighted: exoplanet research, the near infrared capabilities expected in 2020, multi-messenger astronomy, and automated transient follow up. Successful recent observations carried out simultaneously with SALT, MeerKAT, MeerLICHT and other telescopes on the SAAO plateau were highlighted, showcasing the exciting new multi-wavelength and multi-instrument options now available. In addition to the talks and excellent posters, we held "unconference" sessions in the afternoons, allowing for more discussion and interaction. These were particularly useful for the operations team to provide advice and updates, get feedback and hear ideas. We hope fruitful scientific discussions kindled fresh collaborations and sparked new interests!

We'd particularly like to thank the NRF for hosting the conference and for their financial support. We were able to cover some of the costs for a number of students and postdocs, both local and international, which greatly contributed to the atmosphere and success of the meeting. Thanks very much to everyone who helped organise the event, particularly Nazli and Ros, the support staff in Pretoria and the rest of the LOC. Thanks also to those who led discussion sessions and presented their work, and to everyone who joined us for making it an enjoyable and productive meeting!

NEW STAFF

We'd like to introduce two new astronomers on the SALT Astro Ops team: Moses Mogotsi, who started on 1 October, and Danièl Groenewald, who started on 1 November.

Moses' research is on galaxy formation and the processes affecting gas and star formation in galaxies, as you'll learn more about in 'Meet the Team' below. He'll be working on the new near-infrared spectrograph (NIR) in future.

Danièl's PhD research centred on the evolution of brightest cluster galaxies. Her focus shifted to polarimetry of transient objects during her first postdoc, and as a SALT astronomer she will continue to develop SALT's polarimetry tools and provide support to other polarimetry users.

Additionally, we welcome 3 new members to the Tech Ops team:

- Richard Banda started as a SALT mechatronics engineer in Sutherland, on May 1.
- Alrin Christians (who returns to SALT after 11 years away) started as a SALT Draughtsperson in Sutherland June 1.
- Mark Wichman started in Sutherland as a SALT software engineer as of July 1.

MEET THE TEAM: MOSES MOGOTSI

How did you become an astronomer?

I grew up in the rural North-West in Bethanie, the closest town was Brits. As far as I can remember I've always been fascinated by nature, technology, the universe and how everything around me works. This made me want to be some kind of scientist. Astronomy was one of my favourite topics, and my increasing interest in it was fuelled by stargazing, watching TV shows like Star Trek and grabbing whatever books I could find on the subject. I joined and played a major part in the Astronomy Society (Astrosoc) at Rhodes University during my undergrad. I then did my postgrad (via NASSP) at UCT.

What do you most love about Astronomy?

The sense of exploration and wonder when observing objects that very few (if any) people have ever seen and looking at them in ways that no one else has ever done before. I also love figuring out how the pieces of the universe come together and work to produce objects like the planets and spectacular galaxies that we observe today. Galaxy evolution, star formation, astrochemistry and planet formation are the key astronomy areas that interest me.

What is your research on?

I study star formation, the baryon cycle (motion of gas into, within and out of galaxies) and galaxy evolution. I use different telescopes to observe galaxies at different wavelengths to study how gas flows into galaxies, fuels star formation and how the star formation influences the evolution of galaxies and their gas.

SALT SCIENCE PAPERS

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.

- Aartsen, et al. and IceCube Collaboration. 2018/07. Multimessenger observations of a flaring blazar coincident with high-energy neutrino. *Science,* 361, 1378. https://ui.adsabs.harvard.edu/#abs/2018Sci...361.1378I/abstract

- Baglio, M. C., Russell, D. M., et al. 2018/11. A Wildly Flickering Jet in the Black Hole X-Ray Binary MAXI J1535–571. *AJ*, 867, 114. http://adsabs.harvard.edu/abs/2018ApJ...867..114B

- Cracco, V., Orio, M., Ciroi, S., et al. 2018/08. Supersoft X-Ray Sources Identified with Be Binaries in the Magellanic Clouds. *AJ,* 862, 167. http://adsabs.harvard.edu/abs/2018ApJ...862..167C

- Dutta, R., Srianand, R., Gupta, N. 2018/11. Prevalence of neutral gas in centres of merging galaxies. *MNRAS*, 480, 947. http://adsabs.harvard.edu/abs/2018MNRAS.480..947D

- Dye, S., Furlanetto, C., Dunne, L., et al. 2018/06. Modelling high-resolution ALMA observations of strongly lensed highly star-forming galaxies detected by Herschel. *MNRAS*, 476, 4383. http://adsabs.harvard.edu/abs/2018MNRAS.476.4383D

- Foley, R. J., Scolnic, D., Rest, A., et al. 2018/03. The Foundation Supernova Survey: motivation, design, implementation, and first data release. *MNRAS,* 475, 193. http://adsabs.harvard.edu/abs/2018MNRAS.475..193F

- Fullard, A. G., Hoffman, J. L., DeKlotz, S., et al. 2018/05. Spectropolarimetry of the WR + O Binary WR42. *RNAAS,* 2, 37. http://adsabs.harvard.edu/abs/2018RNAAS...2b..37F

- Glikman, E., Lacy, M., LaMassa, S., et al. 2018/07. Luminous WISE-selected Obscured, Unobscured, and Red Quasars in Stripe 82. *AJ*, 861, 37. http://adsabs.harvard.edu/abs/2018ApJ...861...37G

- González-Galán, A., Oskinova, L. M., Popov, S. B., et al. 2018/04. A multiwavelength study of SXP 1062, the long-period X-ray pulsar associated with a supernova remnant. *MNRAS*, 475, 2809. http://adsabs.harvard.edu/abs/2018MNRAS.475.2809G

- Grady, C. A., Brown, A., Welsh, B., et al. 2018/06. The Star-grazing Bodies in the HD 172555 System. *AJ*, 155, 242. http://adsabs.harvard.edu/abs/2018AJ....155..242G

- Gull, M., Frebel, A., Cain, M. G., et al. 2018/08. The R-Process Alliance: Discovery of the First Metal-poor Star with a Combined r- and s-process Element Signature. *AJ,* 862, 174. http://adsabs.harvard.edu/abs/2018ApJ...862..174G

- Hema, B. P., Pandey, G. and Srianand, R. 2018/09. High-resolution Spectroscopy of the Relatively Hydrogen-poor Metal-rich Giants in the Globular Cluster omega Centauri. *AJ*, 864, 121. http://adsabs.harvard.edu/abs/2018ApJ...864..121H

- Hilton R., Hasselfield, M., Sifon, C., et al. 2018/03. The Atacama Cosmology Telescope: The Two-season ACTPol Sunyaev–Zel'dovich Effect Selected Cluster Catalog. *AJ. Suppl.*, 235, 20. http://adsabs.harvard.edu/abs/2018ApJS..235...20H

- Holdsworth, D. L., Saio, H., Bowman, D. M., et al. 2018/05. Suppressed phase variations in a high amplitude rapidly oscillating Ap star pulsating in a distorted quadrupole mode. *MNRAS*, 476, 601. http://adsabs.harvard.edu/abs/2018MNRAS.476..601H

- Hood, C. E., Kannappan, S. J., Stark, D. V., et al. 2018/04. The Origin of Faint Tidal Features around Galaxies in the RESOLVE Survey. *AJ*, 857, 144. http://adsabs.harvard.edu/abs/2018ApJ...857..144H

- Hovey, L., Hughes, J.P., McCully, C., et al. 2018/08. Constraints on Cosmic-ray Acceleration Efficiency in Balmer Shocks of Two Young Type Ia Supernova Remnants in the Large Magellanic Cloud. *AJ,* 862, 148.
  http://adsabs.harvard.edu/abs/2018ApJ...862..148H

- Karim, M.T., Fox, A.J., Jenkins, E.B., et al. 2018/06. Probing the Southern Fermi Bubble in Ultraviolet Absorption Using Distant AGNs. *AJ,* 860, 98. http://adsabs.harvard.edu/abs/2018ApJ...860...98K

- Kilic, M., Hermes, J. J., Córsico, A. H., et al. 2018/09. A Refined Search for Pulsations in White Dwarf Companions to Millisecond Pulsars. *MNRAS,* 479, 1267. http://adsabs.harvard.edu/abs/2018MNRAS.479.1267K

- Kniazev, A. Y.; Egorova, E. S. and Pustilnik, S. A., 2018/09. Study of galaxies in the Eridanus void. Sample and oxygen abundances. *MNRAS,* 479, 3842. http://adsabs.harvard.edu/abs/2018MNRAS.479.3842K

- Kollatschny, W., Ochmann, M. W., Zetzl, M., et al. 2018/11. Broad-line region structure and line profile variations in the changing look AGN HE 1136-2304. *EDP Sciences*, 619, 168. http://adsabs.harvard.edu/abs/2018A%26A...619A.168K

- Iłkiewicz, K., Mikołajewska, J., Miszalski, B., et al. 2018/05. A D'-type symbiotic binary in the planetary nebula SMP LMC 88. *MNREAS,* 476, 2609. http://adsabs.harvard.edu/abs/2018MNRAS.476.2605I

- Maccarone, T. J., Nelson, T. J., Brown, P. J., et al. 2018/12. Unconventional origin of supersoft X-ray emission from a white dwarf binary. *Nature,* Dec, 179. http://adsabs.harvard.edu/doi/10.1038/s41550-018-0639-1

- Maxted, P. F. L. and Hutcheon, R. J. 2018/08. Discovery and characterisation of long-period eclipsing binary stars from Kepler K2 campaigns 1, 2, and 3. *AA,* 616, http://adsabs.harvard.edu/abs/2018A%26A...616A..38M

- Miszalski, B., Manick, R., Mikolajewska, J., et al. 2018/06. SALT HRS discovery of the binary nucleus of the Etched Hourglass Nebula MyCn 18. *PASA,* 35, 27. http://adsabs.harvard.edu/abs/2018PASA...35...27M

- O'Malley, E. M., Chaboyer, B., 2018/04. High resolution Spectroscopic Abundances of Red Giant Branch Stars in NGC 6584 and NGC 7099. *AJ*, 856, 130. http://adsabs.harvard.edu/abs/2018ApJ...856..130O

- Rafieferantsoa, M.; Andrianomena, S. and Davé, R. 2018/10. Predicting the neutral hydrogen content of galaxies from optical data using machine learning. *MNRAS,* 479, 4509. http://adsabs.harvard.edu/abs/2018MNRAS.479.4509R

- Reeve, D and Howarth, I.D., 2018/08. Are the O stars in WR+O binaries exceptionally rapid rotators? *MNRAS,* 478, 3133. http://adsabs.harvard.edu/abs/2018MNRAS.478.3133R

- Sako, M., Bassett, B., Becker, A. C., et al. 2018/06. The Data Release of the Sloan Digital Sky Survey-II Supernova Survey. *PASP,* 130. http://adsabs.harvard.edu/abs/2018PASP..130f4002S

- Shen, K. J., Boubert, D., Gänsicke, B. T., et al. 2018/09. Three Hypervelocity White Dwarfs in Gaia DR2: Evidence for Dynamically Driven Double-degenerate Double-detonation Type Ia Supernovae. *AJ*, 865, 15. http://adsabs.harvard.edu/abs/2018ApJ...865...15S

- Vaghmare, K., Barway, S., Väisänen, P., et al. 2018/11. A SALT spectral study of S0s hosting pseudobulges. *MNRAS*, 480, 4931. http://adsabs.harvard.edu/abs/2018MNRAS.480.4931V

- Vanbeveren, D., Mennekens, N., Shara, M. M., et al. 2018/07. Spin rates and spin evolution of O components in WR+O binaries. *AA*, 615, 65. http://adsabs.harvard.edu/abs/2018A%26A...615A..65V

- Vivek, M., Srianand, R., Dawson, K. S. 2018/12. Rapidly varying Mg II broad absorption line in SDSS J133356.02 + 001229.1. *MRRAS*, 481, 5570. http://adsabs.harvard.edu/abs/2018MNRAS.481.5570V

- Zemko, P., Ciroi, S., Orio, M., et al. 2018/11. Optical observations of `hot' novae returning to quiescence. *MNRAS*, 480, 4489. http://adsabs.harvard.edu/abs/2018MNRAS.480.4489Z