



SALT status updates

Dear SALT users,

Please find our first SALT status update for 2016 below.

TOPICS:

- ❖ Reminder of Phase-1 deadline for 2016-1: **Friday, Jan 29th**
- ❖ Updated PIPT manual
- ❖ Record breaking weather and seeing
- ❖ Polarimetry update
- ❖ Fabry-Pérot update
- ❖ Upgrade projects and 2015-2 targets
- ❖ Laser Frequency Comb update
- ❖ Press release: Brightest ever Supernova
- ❖ Science papers

REMINDER OF PHASE-1 DEADLINE FOR 2016-1

All PIs are reminded of the deadline at 18:00 SAST (16:00 UTC) this **Friday, Jan 29th**.

Please refer to the detailed information in the Call for Proposals:

<http://astronomers.salt.ac.za/proposals/>

UPDATED PIPT MANUAL

We are currently updating the PIPT manual. The new version so far covers the general proposal creation process as well as the various phase 1 forms. The manual is available both as html (<http://pysalt.salt.ac.za/pipt-manual/html/pipt-manual.html>) and pdf (<http://pysalt.salt.ac.za/pipt-manual/pdf/pipt-manual.pdf>).

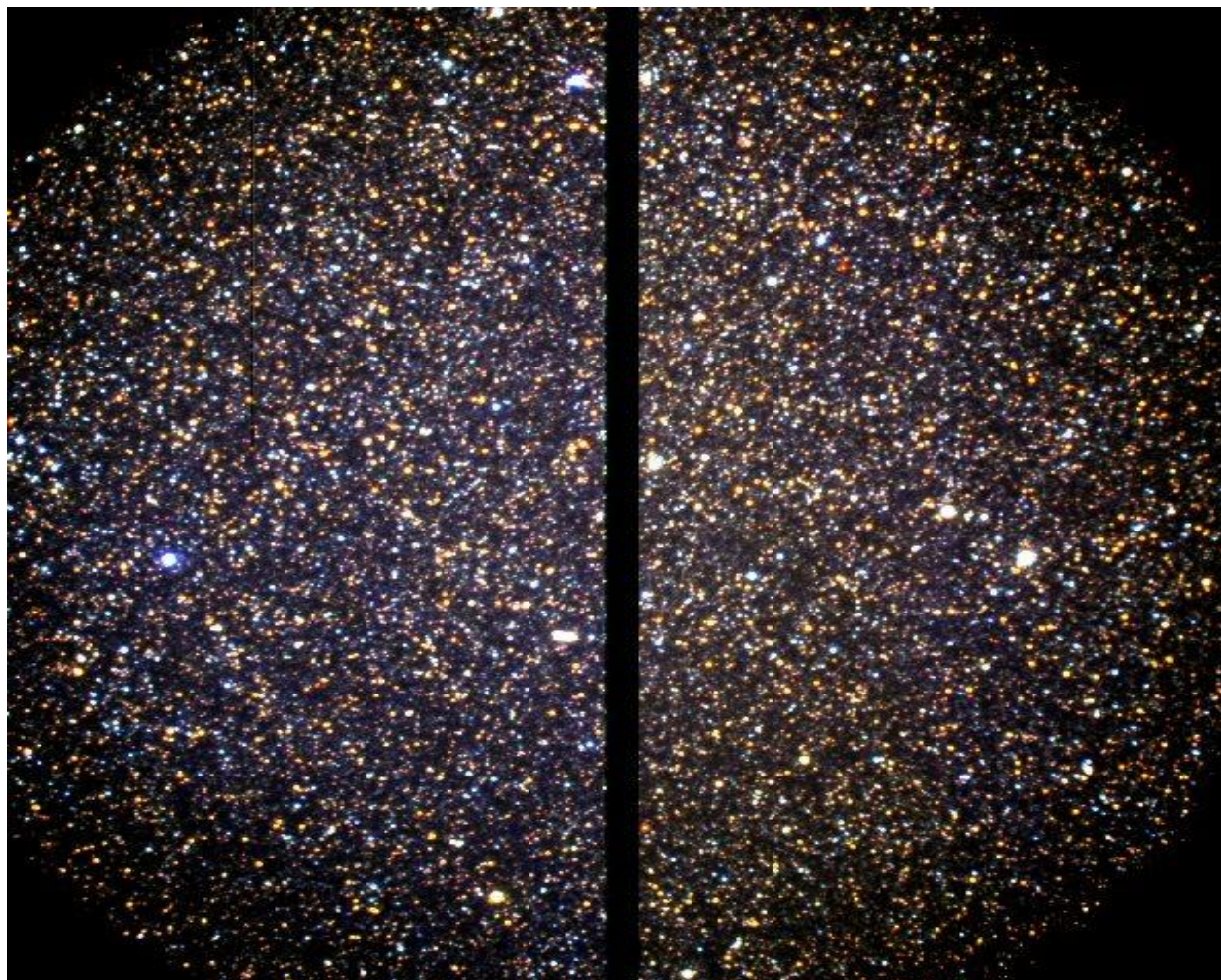


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RECORD BREAKING WEATHER AND SEEING

As much of South Africa is grappling with drought, November and December of 2015 saw extremely good weather in Sutherland, astronomically speaking. The weather downtime of 21% at SALT in the month of December was the lowest ever since SALT records began.

The seeing was also very good, the intrinsic V-band seeing at zenith occasionally staying sub-arcsec for hours at a time. The picture shows a field in the Large Magellanic Cloud taken during a SALTICAM science observation for Warner 2015-2-SCI-033. with approximately 1.2" sizes of stars on the detector. Three frames of 120s exposure time were combined for u', g', r' filters.





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The weather in January in contrast has not been very good. Nevertheless, at this point, with about 45% the semester 2015-2 behind us, nearly half of allocated P0-P1 time has been done, as well as about a third of all P2 time.

POLARIMETRY UPDATE

As described in the Call for Proposals, commissioning of the RSS Polarimetric modes has been progressing, and we accept proposals for 2016-1 for a limited mode: point-source or compact object targets for linear long-slit spectropolarimetry. PIs interested in other modes are encouraged to let salthelp know of their intentions for the purpose of prioritizing further commissioning.

However, we have recently uncovered a potential problem in the RSS detector (PDET) electronics making accurate polarimetric signal determination difficult below approximately 0.3% level. The problem is being investigated, and while we hope a solution is found before the start of 2016-1 Semester in May, users needing this accuracy should be aware of this potential limitation.

For now, we strongly recommend sticking with the Faint/Slow detector setting, and obtaining repeat measurements to assess systematic error.

FABRY-PEROT UPDATE

The dual-etalon High Resolution (HR) mode has been tested on-sky, but is still not in routine use due to instability in the relative alignment of the two etalons. We have now traced the drifts to changes with temperature. Further tests are underway, but unfortunately it is not clear at this stage when a successful fix will be ready. We sincerely apologise for the inconvenience to all PIs affected in the current semester. You may contact your liaison astronomer if you have other options for your blocks, rather than wait for the fix.



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Though we are hopeful, we cannot guarantee observations until commissioning is finalized. We will accept new FP/HR proposals for 2016-1, but the PIs should understand the uncertainty. In the Call for Proposals we suggest including a back-up plan, if possible. We will update the FP users and the TACs in late February during the technical reviews of proposals about the dual-etalon status.

As described in the Call of Proposals, the FP/LR and TF modes are in normal use, while MR is currently off-line and is not offered for 2016-1.

UPGRADE PROJECTS AND 2015-2 TARGETS

There are many ongoing technical upgrade projects at SALT. The most recent SALT schedule has the active primary mirror alignment system (SAMS) integration and testing happening March onwards, an RSS service with up to 4 weeks of telescope downtime in July/August during 2016-1, and a tracker upgrade during 2016-2. Especially exciting is to see what SAMS will do for SALT image quality.



Fig: Inductive edge sensor mounted to the underside of a SALT Primary Mirror segment



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The SAMS work does not involve significant telescope downtime, while we had originally scheduled a 4 week shutdown during the current 2015-2 semester. Since progress with science programs has also been good, it is possible that gaps will develop in the queue in March and April. We thus encourage users whose science allows it, to update lists of optional targets in a given time allocation for the latter half of 2015-2, or replace targets which have set with ones still visible.

LASER FREQUENCY COMB UPDATE

As reported in our previous status update and described in <http://www.salt.ac.za/news/laser-frequency-comb/> we will likely be doing HRS on-sky tests using a prototype laser frequency comb (LFC) in the middle of this year. These instruments provide an incredibly precise method to calibrate spectroscopy using tens of thousands of lines with well known wavelengths. While the test is mainly an engineering project, it may be possible to do some limited science observations. No separate proposals are called for this purpose, but anyone within the SALT collaboration with interest and ideas on how to make use of the capability on HRS in the short time period the LFC is available, is encouraged to contact us at salthelp@salt.ac.za, preferably by the end of February.

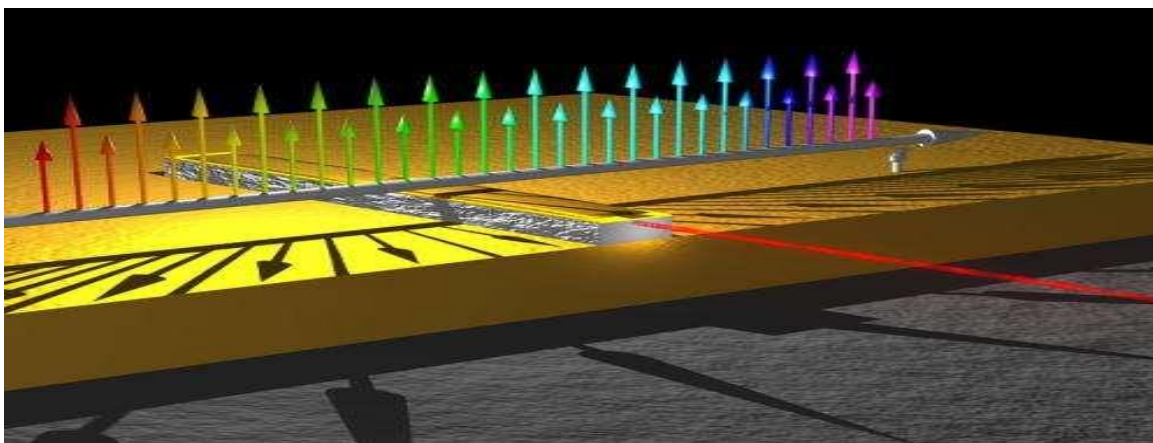


Fig: Cutting light with a comb. Credit: Andreas Hugi/ETH Zurich



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SALT HELPS TO UNVEIL A RECORD-BREAKING COSMIC BLAST

Saurabh Jha, from Rutgers University, obtained spectroscopic observations of ASASSN-15lh with SALT that led to it being identified as the most luminous supernova ever seen! At a redshift of $z = 0.2326$, ASASSN-15lh reached an absolute magnitude of $M_{u,AB} = -23.5 \pm 0.1$. The results were reported by Dong et al. in a recent Science paper, and the story has been mentioned in several major media outlets.



The image above is an artist's impression of ASASSN-15lh as it would appear from a planet located 10,000 light years away in the host galaxy of the supernova. (Credit: Beijing Planetarium / Jin Ma).

For further reading:

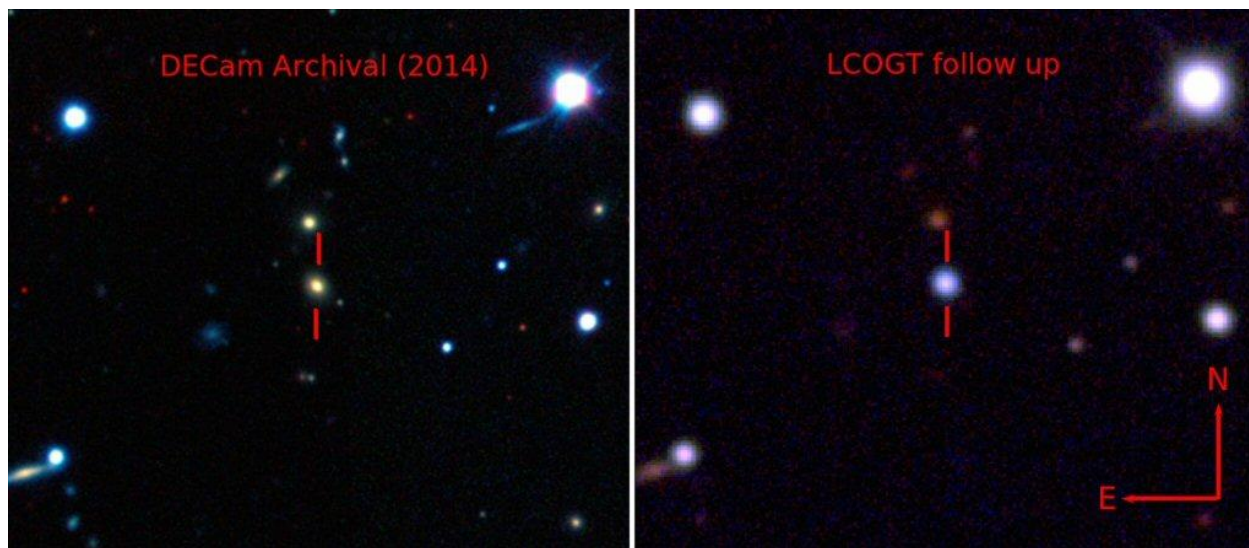


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Science paper: <http://science.sciencemag.org/content/351/6270/257>

Press Release: <http://www.salt.ac.za/news/record-breaking-cosmic-blast/>

LA Times article: <http://www.latimes.com/science/sciencenow/la-sci-sn-huge-supernova-20160114-story.html>



Images show the host galaxy before (Left) the explosion of ASASSN-15lh, and afterwards (Right) when the supernova actually outshines the whole host galaxy. (Credits: The Dark Energy Survey, B. Shappee and the ASAS-SN team).

[SCIENCE PAPERS](#)

The total number of refereed papers using SALT continued to climb, reaching 36 for the calendar year 2015. The full list is available at <http://astronomers.salt.ac.za/data/publications/>

We strongly encourage SALT users to inform us of their papers making use of any SALT data, and to please adhere to the Acknowledgements policy found under the link above. It will make keeping track of the papers much easier. The SALT Board has also



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requested that authors using SALT data make an effort to make the source of their data as visible in their papers, e.g. by mentioning SALT in the title, if appropriate, or in the abstract.

SALT papers found from ADS after the previous SALT update sent in late October are listed below. These articles include the first one which has used published HRS data.

- ❖ Kessler et al. describe the pipeline to search for transients in the Dark Energy Survey, some of which were confirmed with SALT.
<http://adsabs.harvard.edu/abs/2015AJ....150..172K>
- ❖ Ninan et al. present a detailed study on the outbursting protostar V899 Mon; the data used include the first HRS dataset to be published in a refereed paper.
<http://adsabs.harvard.edu/abs/2015ApJ...815....4N>
- ❖ Childress et al. measure the Nickel masses produced by type Ia Supernovae.
<http://adsabs.harvard.edu/abs/2015MNRAS.454.3816C>
- ❖ Gvaramadze et al. describe the evolution in spectra of a new massive star MN44 in the luminous blue variable phase between 2009 and 2015.
<http://adsabs.harvard.edu/abs/2015MNRAS.454.3710G>
- ❖ Chernyakova et al. and van Soelen et al have monitored the 2014 periastron phase of the binary system PSR B1259-63/LS 2883 using SALT data as well as SAO 1.9m and X-ray data.
<http://adsabs.harvard.edu/abs/2015MNRAS.454.1358C>,
<http://adsabs.harvard.edu/abs/2016MNRAS.455.3674V>



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- ❖ Kollatschny et al. use multi-wavelength data to study the peculiarities of the extremely X-ray weak quasar PG0043+039.
<http://adsabs.harvard.edu/abs/2016A%26A...585A..18K>
- ❖ Kangas et al. observed the bright type II supernova 2013fc in the circumnuclear ring of a luminous infrared galaxy and describe its origins.
<http://adsabs.harvard.edu/abs/2016MNRAS.456..323K>
- ❖ Miszalski et al. report the discovery of an eclipsing dwarf nova in the peculiar, bilobed nova shell Te 11.
<http://adsabs.harvard.edu/abs/2016MNRAS.456..633M>



Credit: Sutherland sunset by Dr Paul Kotze.