PUBLIC SURVEY STATUS REPORT
(101st OPC MEETING)

This report should be returned to the Observing Programmes Office of the European Southern Observatory (opo@eso.org) by Oct. 30, 2017. This report will be reviewed by the EST, OPC and Public Survey Panel.

PROPOSAL ESO No.: 177.A-3011
TITLE: VST ATLAS
PRINCIPAL INVESTIGATOR: T. Shanks

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1. Scientific Aims (brief description)

The main aim of the VST ATLAS is to make a survey of ~4700deg^2 in the Southern Hemisphere in the *ugriz* bands to the depth of SDSS. The ATLAS covers ~2200deg^2 in the North Galactic Cap between 10h<RA<15h30 and ~2500deg^2 in the South Galactic Cap between 21h30<RA<04h00. The main motivation for the survey is for cosmology. For example, there is the possibility of using the VST ATLAS UV coverage as the base for spectroscopic QSO redshift surveys out to z=2.2 in order to use QSO clustering to investigate primordial non-Gaussianity, the power-spectrum turnover and BAO measurements of the Dark Energy equation of state at z~1.5. 17 nights of pilot survey observations based on ATLAS data have already been carried out on the AAT 2-degree Field (2dF) facility and future AGN surveys from e-ROSITA and 4MOST will greatly benefit from these data. This quasar redshift survey has further demonstrated the power of combining ATLAS with WISE satellite data in the L(3.4micron) and M(4.6 micron) bands to increase the quasar sky density. ATLAS data can also be further combined with the VISTA Hemisphere Survey to produce *ugrizYJKLM* photo-z for galaxies out to z~1. Then cross-correlation of Luminous Red Galaxies with CMB fluctuations will test the evidence for an accelerating Universe via the Integrated Sachs Wolfe effect. Many other non-cosmological projects are clearly also feasible including the search for high redshift z>6 QSOs via optical dropout, the search for stellar streams and the search for local large scale structure including the Great Attractor. Indeed, our aim is that ATLAS becomes the equivalent of a Southern Sloan with similar scientific impact. ATLAS Data Release 3 (DR3) covering the period from 1/8/2011 - 30/9/2014 is available from the ESO archive.

The ATLAS area originally approved by the PSP is now complete. However, it was always envisaged that ATLAS would cover ~4700deg^2 by including the area at b>29deg and Dec<-20 in the NGC and the science case in the revised Survey Management Plan assumed this increased area. At its April 2014 meeting, the PSP gave approval to observe this extra area in the *iz* bands to take ATLAS to its full 4700deg^2 area. Chilean VST proposals (PI L Infante) were accepted by ESO in P95 +P96 to survey this extended area in the *ugr* bands. However, progress has been slow and **we now wish to request public survey time to complete *ugr* in this 745deg^2 area in an efficient and timely fashion. We thus request 78 h of VST dark time in each of P101, P102 for this purpose. Our minimum request is 35 h in each of P101, P102 to just complete the highest priority *u* band imaging in this area.**

2. Detailed progress report with respect to initial estimate from the Survey Management Plan.

2.1 Scientific Progress and Outlook

The VST ATLAS now has covered the equivalent of ~4000 deg^2 in *ugr* and ~4740deg^2 in *iz* between mid-August 2011 and June 2017 in Periods 87 - 99 (see status maps at http://astro.dur.ac.uk/Cosmology/vstatlas/). Apart from a handful of tiles being re-observed, all *ugr* tiles in the original ATLAS area of 4000deg^2 and all *iz* tiles in the full ATLAS area of ~4700deg^2 have been completed. The total number of tiles to cover the original ~4000deg^2 ATLAS area is 4276 (x5 bands). The extra NGC area in *iz* corresponds to 797 tiles taking the *iz* totals to 5073. Table 1 shows how these were completed in the last year by passband. Meanwhile CASU are up-to-date in their reduction of the ATLAS data.

Band	Completed	Failed	Scheduled
U	4276 (119)	0	0
G	4276 (68)	0	0
R	4276 (34)	0	0
I	5073 (166)	0	0
Z	5073 (151)	0	0

Table 1. Total number of VST ATLAS pointings completed up to June 2017. Scheduled means OB submitted. Number in brackets in the Completed column shows tiles completed in the last year.

As noted above, PSP at its 28-29/4/14 meeting recommended that we be allowed to extend the survey to its originally envisaged ~4700deg^2 by allowing us to survey the NGC area above galactic latitude b>29 and Dec<-20 in *iz*. Chilean proposals (PI L. Infante) to complete the survey of this extended area in *ugr* were accepted by the ESO TAC for P95 (095A-0561) and P96 (096.A-0921) but only 46 (*u*), 46 (*g*) and 86 (*r*) tiles out of 797 in each band were completed and it was decided to focus the Chilean proposals for P97 (097.A-0920), P99 (099.A-0029) and P100 (0100.A-0371) on completing the doubling of the *u* exposure to 4x60s in the rest of the VST ATLAS areas. To cover the remaining area would take 69h (*u*), 45h (*g*) and 42h (*r*) of VST time. In Section 5.2 below we make the case that this total of 156h of VST time should be completed as a public survey and approved by the OPC.

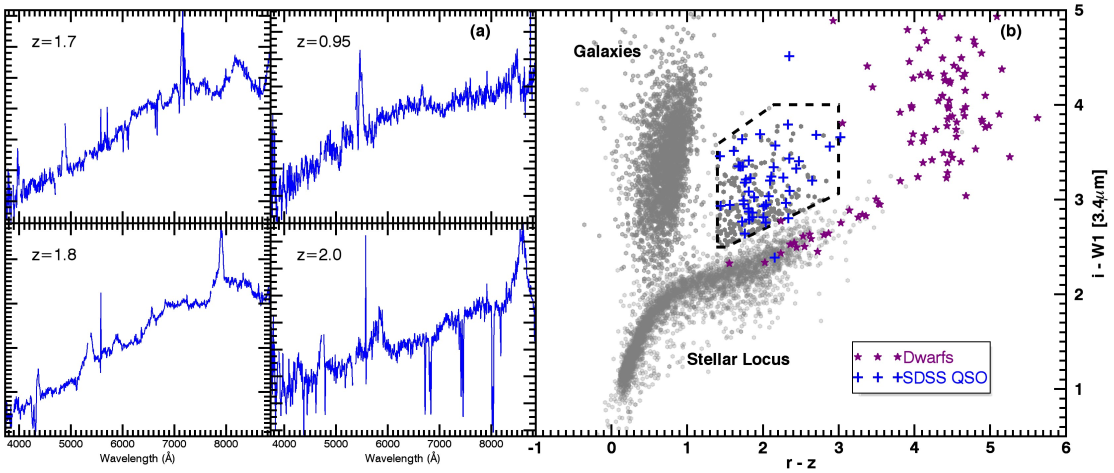
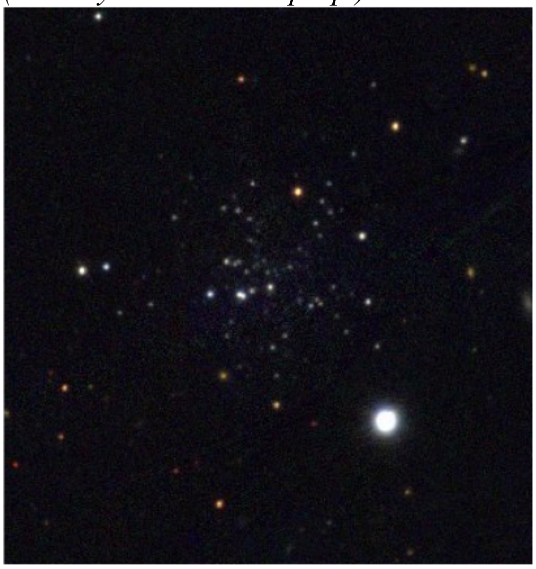


Fig. 1a. *4 examples of a new population of dust absorbed red quasars at z<2.5 selected from g-i:i-W1 by a combination of WISE and ATLAS. Spectra from AAT 2dF AAOmega (Chehade et al 2016).* **Fig. 1b.** *WISE and ATLAS r-z:i-W1 colour-colour plot shows high efficiency in isolating previously discovered SDSS 5<z<6 quasars (Findlay et al 2015 in prep.).*



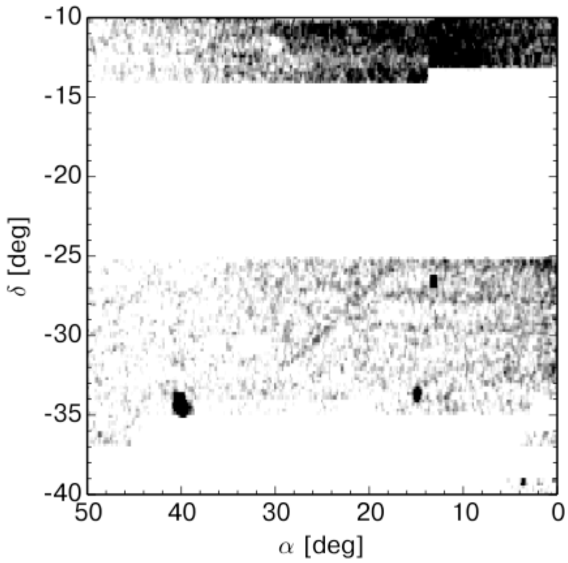


Fig. 2a *Discovery of the Crater Milky Way satellite in VST ATLAS survey data as shown here in a ~3x3arcmin true colour gri image (Belokurov et al, 2014).* **Fig. 2b** *The spatial density variation of stellar sources in the g- and r-bands which track the stellar locus of the stream colour magnitude diagram (Koposov et al, 2014).*

As examples of science highlights, in Fig 1a we show results from the 2QDES pilot survey where 10000 0.5<z<3.5 quasar redshifts were observed using the combination of ATLAS and WISE photometry (Chehade et al 2016). A population of obscured dusty quasars were also found, some examples of whose very red spectra are shown here. In Fig 1b a redder combination of ATLAS and WISE bands is used to select higher redshift 5<z<6 quasars and follow-up of these candidates is ongoing.

Another science highlight is that ATLAS is also proving ideal for searching for Milky Way satellites and stellar reams as shown by the discovery by Belokurov et al (2014) of the Crater dwarf galaxy, a new Milky Way satellite (see Fig. 2a) and a new stellar stream Koposov et al (2014) (see Fig. 2b). Torrealba et al (2016a,b) have found a further 3 dwarf satellite galaxies using ATLAS data.

A further science highlight is the discovery of four z>6 quasars by combining ATLAS and WISE photometry (Carnall et al 2015, Chehade et al 2017 in prep.). The quasars' VLT X-shooter spectra are shown in Fig. 3 were initially confirmed by observations using Magellan LDSS-3 (top 2) , Keck LRIS and NTT EFOSC2.

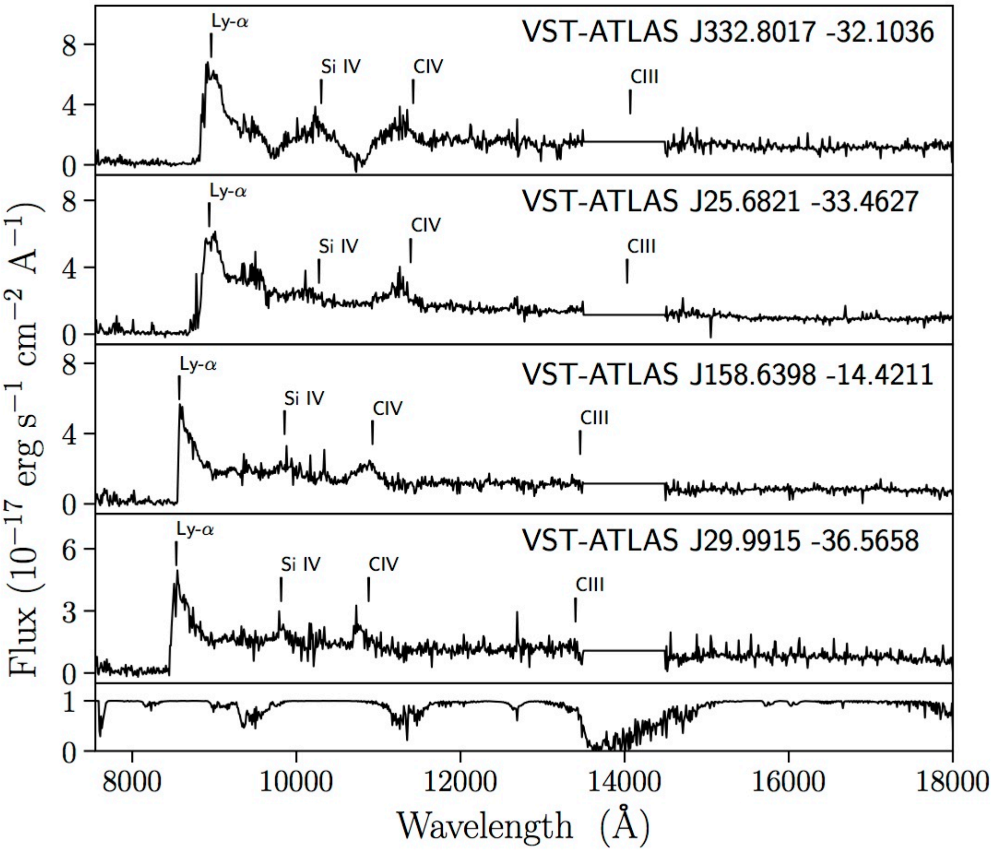


Fig. 3 Four z>6 quasars spectroscopically confirmed at Magellan(x2), Keck and NTT. The discovery of these quasars is described by Carnall et al (2015) and Chehade et al (2016 in prep.). Here, their VLT X-shooter spectra are shown plus the atmospheric transmission in the lowest panel.

We note that the GAMA, OzDES and 2dFLENS collaborations are also using imaging data from VST ATLAS. The 2dF galaxy redshift survey of the Cold Spot void (Mackenzie et al 2017) is also based on VST ATLAS imaging data.

The excellent seeing and wide area of VST ATLAS can be exploited by studies of galaxy-galaxy lensing. SDSS claimed significant results in this area and ATLAS seeing is some 50% better than theirs. The Bonn group (D Klaes et al) is re-reducing the ATLAS data for such lensing purposes.

The excellent seeing also means that ATLAS (+WISE) data can be used to detect "quad" gravitational lenses like those whose HST images are shown in Fig. 4 (Schechter et al 2017).

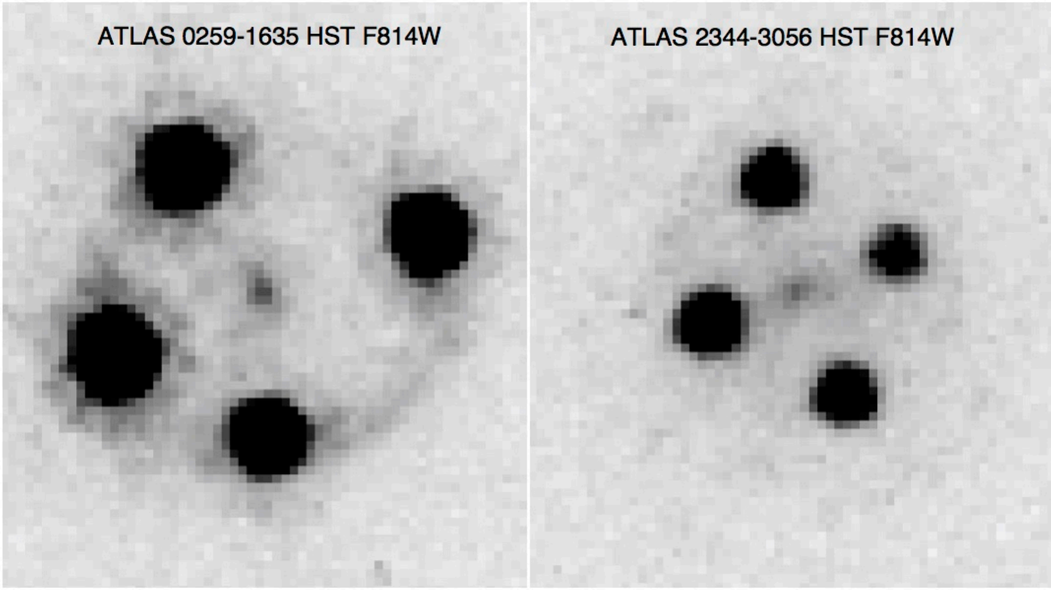


Fig. 4 HST WFC3 images of two quad lensed quasars found from analysis of WISE and ATLAS data (Schechter et al 2017).

2.2 Refereed Publications (accepted or in press)

”ATLAS lifts the Cup: Discovery of a New Milky Way satellite in Crater”, Belokurov, V.; Irwin, M. J.; Koposov, S. E.; Evans, N. W.; Gonzalez-Solares, E.; Metcalfe, N.; Shanks, T., 2014 MNRAS, 441, 2124.

“Discovery of a cold stellar stream in the ATLAS DR1 data”, Koposov, S. E.; Irwin, M. J.; Belokurov, V.; Gonzalez-Solares, E.; Kupcu Yoldas, A., Lewis, A., Metcalfe, N.; Shanks, T. 2014, MNRAS, 442, L85.

“The SAMI Galaxy Survey: instrument specification and target selection”, Bryant, J.J; Owers, M.S.; Robotham A.S.G.; Croom, S.M. et al 2015, MNRAS, 447, 2857.

“The VLT Survey Telescope ATLAS”, Shanks, T., Metcalfe, N., Chehade, B., Findlay, J. R., Irwin, M. J., Gonzalez-Solares, E., Lewis, J. R., Yoldas, A. K., Mann, R. G., Read, M.A., Sutorius, E. T. W., Voutsinas, S., 2015, MNRAS 451, 4238.

“Two bright z > 6 quasars from VST ATLAS and a new method of optical plus mid-infrared colour selection”, Carnall, A. C., Shanks, T., Chehade, B., Fumagalli, M., Rauch, M., Irwin, M. J., Gonzalez-Solares, E., Findlay, J. R., Metcalfe, N., 2015, MNRAS, 451, L16.

“The shell game: a panoramic view of Fornax”, Bate, N. F., McMonigal, B., Lewis, G. F., Irwin, M. J., Gonzalez-Solares, E., Shanks, T., Metcalfe, N., 2015, Monthly Notices of the Royal Astronomical Society, 453, 690.

"Digital Sky Surveys from the ground: Status and Perspectives", Shanks, T., 2016, In "The Universe of Digital Sky Surveys", Astrophysics and Space Science Proceedings, Vol. 42. Springer: Switzerland, p. 9

"The feeble giant. Discovery of a large and diffuse Milky Way dwarf galaxy in the constellation of Crater", Torrealba, G., Koposov, S. E., Belokurov, V., Irwin, M., 2016a, MNRAS, **459**, 2370

"The 2dF Quasar Dark Energy Survey Pilot – Small-Scale Quasar Clustering", Chehade, B., Shanks, T., Findlay, J., Metcalfe, N., Sawangwit, U., Irwin, M. J., Gonzalez-Solares, E, 2016 MNRAS **460**, 590.

"The 2-degree Field Lensing Survey: design and clustering measurements", Blake, C.; Amon, A.; Childress, M.; Erben, T; Glazebrook, K.; Harnois-Deraps, J.; Heymans, C., et al. 2017, MNRAS, **462**, 4240.

"At the survey limits: discovery of the Aquarius 2 dwarf galaxy in the VST ATLAS and the SDSS data", Torrealba, G.; Koposov, S. E.; Belokurov, V.; Irwin, M.; Collins, M.; Spencer, M.; Ibata, R.; Mateo, M.; Bonaca, A.; Jethwa, P. 2016b MNRAS, **463**, 712

``'The 2-degree Field Lensing Survey: photometric redshifts from a large new training sample to r < 19.5", Wolf, C.; Johnson, A. S.; Bilicki, M.; Blake, C.; Amon, A.; Erben, T.; Glazebrook, K.; Heymans, C.; Hildebrandt, H.; Joudaki, S. et al 2017, MNRAS, **466**, 1582.

"First lensed quasar system(s) from the VST-ATLAS survey: one quad and three nearly identical pairs", Schechter, P.L., Morgan, N.D, Chehade, B., Mecalfe, N., Shanks, T. and McDonald, M. , 2017, Astr. J. , **153**, 219.

"A fork in the Sagittarius trailing debris", Navarrete, C.; Belokurov, V.; Koposov, S. E.; Irwin, M.; Catelan, M.; Duffau, S.; Drake, A. J., 2017, MNRAS, **467**,1329.

"The SAMI Galaxy Survey: the cluster redshift survey, target selection and cluster properties", Owers, M. S.; Allen, J. T.; Baldry, I.; Bryant, J. J.; Cecil, G. N.; Cortese, L.; Croom, S. M.; Driver, S. P.; Fogarty, L. M. R.; Green, A. W.; et al 2017, MNRAS, **468**, 1824.

"A catalogue of white dwarf candidates in VST ATLAS", Fusillo, G. Pietro, N. Raddi, R., Gänsicke, B. T., Hermes, J. J., Pala, A.F., Fuchs, J. T., Chehade, B, Metcalfe, N., Shanks, T., 2017, MNRAS, **469**, 621

"Evidence of a primordial origin for the CMB Cold Spot", Mackenzie, R, Shanks, T., Bremer, M.N., Cai, Y-C, Gunawardhana, M..L.P., Kovacs, A., Norberg, P., Szapudi, I., MNRAS, 2017, **470**, 2328.

2.3. Other Publications (e.g. conference proceedings)

"VST ATLAS First Science Results", T Shanks, V Belokurov, B Chehade, SM Croom, JR Findlay, E Gonzalez-Solares, MJ Irwin, S Koposov, RG Mann, N Metcalfe, D Murphy, PR Norberg, MA Read, E Sutorius, G. Worseck, 2013, *ESO Messenger*, 154, 38.

We have also published online the presentations of the 3-day workshop "Exploiting the VST ATLAS… and its sister surveys" held at Durham University on 14-16 April, 2014. (see http://astro.dur.ac.uk/VSTWorkshop/programme.php)

2.4 Overall survey status: where does the survey stand scientifically compared to other survey projects, either ongoing or to be started in the near future?

VST ATLAS main competitors are PanSTARRS, DES and DECaLS. None of these surveys observe in the *u* band so ATLAS is unique in this respect. None of these surveys have or will have as good seeing as VST ATLAS (Shanks 2015) so ATLAS is also unique in this respect. The combination of excellent seeing and UV sensitivity means that ATLAS is ideal for UVX quasar surveys. This is particularly the case if the Chilean *u* extension is included which means, in the combined survey (4x60s in *u*), we can reach quasars down to a limit of $g=22.5$ where the sky density is ~130deg^{-2}. We are therefore currently exploring the possibility of complementing the eROSITA X-ray AGN survey with 4MOST spectroscopic follow-up using ATLAS optical identifications. T Shanks is now an eROSITA external collaborator to promote eROSITA–ATLAS collaboration. In P100 and P101 we applied for DEUCE (PI T Shanks), a further ATLAS *u* extension as a VST "filler" programme to cover 2800 deg^2 of the DES survey area to support eROSITA AGN follow-up.

2.5 Survey completion reached after six years of operations (starting date: Oct 2011). What has been achieved? How much of the survey has been completed?

The vast majority of ATLAS OBs have now been observed covering ~4000deg^2 in *ugr* and ~4700deg^2 in *iz*. Table 2 shows how the ATLAS OBs have been completed as a function of Period between P87 and P99. Only a few re-observations are still outstanding. The completion of the 5 bands of the main survey is depicted graphically in Fig. 5. We see that *iz* is complete over its full 4700deg^2 and *ugr* is also now complete over its original 4000deg^2 area. These survey areas were all completed by June 2017.

Public survey status request for NGC area at Dec<-20 in *ugr*. The parts of the ATLAS survey previously approved by the Public Surveys Panel have therefore been completed. As noted in Section 2.1 the NGC area at Dec<-20deg (marked in red in Fig. 6) although complete in *iz* , has virtually no coverage in *ugr*. The original plan was that this area be done in Chilean time with PI L. Infante. But in P95+P96 (095A-0561 and 096.A-0921) only ~12h out of 160h allocated was observed. In subsequent periods we therefore focused on completing the doubling of the ATLAS *u* exposure in the original 4000deg^{2} ATLAS *ugr* area. This latter project is still ongoing. So given the slow progress in completing NGC *ugr*, we believe that the only practical way to proceed is by re-instating the NGC Dec<-20 *ugr* survey as a public survey, as was originally envisaged. The motivation to complete the optical survey remains high given particularly the uniqueness of the ATLAS *u* coverage, combined with ATLAS excellent seeing, especially advantageous for point sources such as quasars. This makes ATLAS *u* a natural complement to the follow-up of the eROSITA-DE X-ray AGN survey and the targeting of the 4MOST quasar cosmology survey. Clearly it is most efficient in terms of telescope time to maintain the 2x120s *u* band exposures over this area, which is the combined *u* exposure from the ATLAS+Chilean *u* surveys over the 4000deg^{2} area. We would also maintain the 2x50s *g*-band and 2x45s *r*-band exposures, consistent with the rest of ATLAS. The usual ATLAS seeing and airmass constraints would still be applied. Including overheads, we are therefore requesting 156 h of VST dark time for this purpose. The survey will be ready early enough for eROSITA and 4MOST if completed over periods 101 and 102. We therefore request 78h in each of P101 and P102 to complete *ugr*, with *u* having the highest priority.

But if VST dark time is still at a premium, our *minimum* request is 35h in each of P101 and P102 to complete 2x120s *u* coverage in the ATLAS NGC at Dec<-20deg. In this case we should seek to use other surveys' (eg Pan-STARRS+DECALs+KABS) data in *gr* to complement ATLAS *u*, despite the danger of inconsistencies that this may cause. We require seeing of 1.4 arcsec FWHM in *u* and airmass<1.4 as usual.

Band	**P87 (A,B)**			**P88 (C)**			**P89 (D)**			**P90 (E)**		
	√	**X**	**?**	**√**	**X**	**?**	**√**	**X**	**?**	**√**	**X**	**?**
u	**442**	**0**	**0**	**1453**	**0**	**0**	**1157**	**0**	**0**	**73**	**0**	**0**
g	**442**	**0**	**0**	**1453**	**0**	**0**	**1157**	**0**	**0**	**73**	**0**	**0**
r	**442**	**0**	**0**	**1453**	**0**	**0**	**1157**	**0**	**0**	**73**	**0**	**0**
i	**425**	**0**	**0**	**1453**	**0**	**0**	**1157**	**0**	**0**	**73**	**0**	**0**
z	**425**	**0**	**0**	**1453**	**0**	**0**	**1157**	**0**	**0**	**73**	**0**	**0**
Band	**P91 (F,G)**			**P92 (H)**			**P93 (I,J)**			**P94 (K)**		
	√	**X**	**?**	**√**	**X**	**?**	**√**	**X**	**?**	**√**	**X**	**?**
u	**181**	**0**	**0**	**524**	**0**	**0**	**446**	**0**	**0**	**0**	**0**	**0**
g	**181**	**0**	**0**	**524**	**0**	**0**	**446**	**0**	**0**	**0**	**0**	**0**
r	**181**	**0**	**0**	**524**	**0**	**0**	**446**	**0**	**0**	**0**	**0**	**0**
i	**930**	**0**	**0**	**102**	**0**	**0**	**238**	**0**	**0**	**695**	**0**	**0**
z	**930**	**0**	**0**	**102**	**0**	**0**	**238**	**0**	**0**	**695**	**0**	**0**
Band	**P95 (L)**			**P97 (M)**			**P98 (N)**			**P99 (O)**		
	√	**X**	**?**	**√**	**X**	**?**	**√**	**X**	**?**	**√**	**X**	**?**
u	**(24)**	**0**	**0**	**(12)**	**0**	**0**	**(12)**	**0**	**0**	**(11)**	**0**	**2**
g	**(5)**	**0**	**0**	**(8)**	**0**	**0**	**(49)**	**0**	**0**	**(3)**	**0**	**0**
r	**(17)**	**0**	**0**	**(1)**	**0**	**0**	**(34)**	**0**	**0**	**(1)**	**0**	**1**
i	**(10)**	**0**	**0**	**(8)**	**0**	**0**	**(58)**	**0**	**0**	**0**	**0**	**3**
z	**(24)**	**0**	**0**	**(10)**	**0**	**0**	**(44)**	**0**	**0**	**0**	**0**	**4**

Table 2. VST ATLAS pointings by Period and bandpass. √ means completed, X means failed/rescheduled and ? means OB submitted but not completed. ( ) in P95-P99 means category D tiles submitted for re-observing,

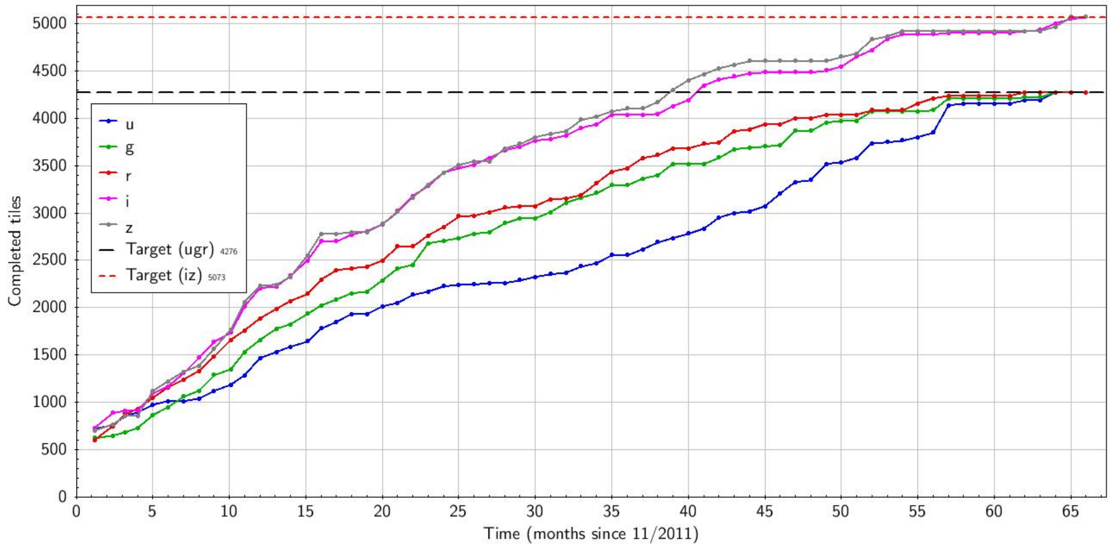


Fig. 5. Completed ATLAS tiles versus Months since the ATLAS survey started. 4276 represents the target number of tiles in the original survey and is the ugr target. 5073 represents the target number of tiles including the NGC extension and therefore represents the iz target.

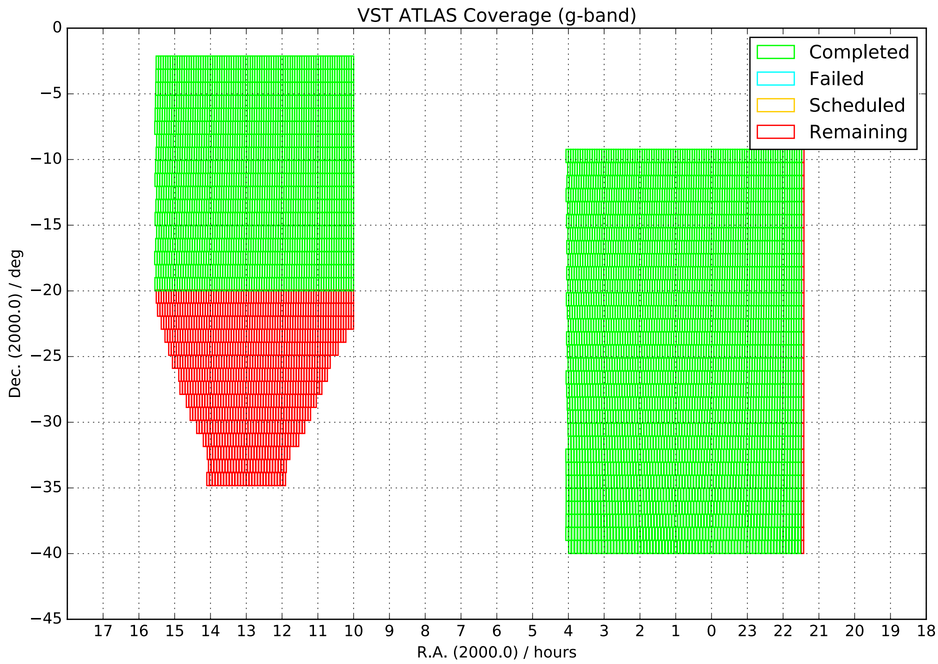


Fig. 6. The ATLAS survey areas marked in green are completed in ugriz. The area marked in red is complete in iz but has virtually no coverage in ugr. We are requesting that these NGC ugr tiles now be observed at high priority as a public survey to complete ATLAS fully.

3. Quality Control and Phase 3. The Phase 3 submission plan should be described here.

3.1 The PI should comment on the quality control and the science validation of the acquired data.

Quality control is ongoing at Cambridge, Durham and Edinburgh. Generally data quality is excellent. The most important way to validate the data is by using it for science projects and we have now carried out 17 nights of pilot observations for a proposed AAT 2dF quasar redshift survey called the 2dF QSO Dark Energy Survey (2QDES). VST ATLAS provided the imaging data base for these pilot observations between December 2011 and July 2013. We prepared ~200 sq deg of ATLAS imaging data using *u-g:g-r* and *g-r:r-i* colour-colour diagrams to select QSO candidates which were then observed ~330 at a time using 2dF. The observations realized ~10000 QSO redshifts. 2dF fibre observations are clearly quite demanding, even more so since we were pushing to a limit of g~22.5 for QSO identifications. The success of the observations confirm that the positions for faint stellar objects are good enough for them to be observed in 2.1 arcsecond diameter fibres over a 3 sq deg field simultaneously. It also confirms that the CASU photometry reaches the equivalent of *g*~22 in the *u*-band. The best rates we have achieved from ATLAS are QSO sky densities of 95deg^{-2} or about 300 per 2dF field (Chehade et al 2016). This is even before the inclusion of the ongoing Chilean *u* band extension (PI L. Infante) which doubles the *u* band exposure to 240s.

CASU have implemented an illumination correction that reduces centre to edge photometric offsets from ~0.25mag to ~0.01mag. This is now within the tolerance needed for projected galaxy and quasar clustering analyses.

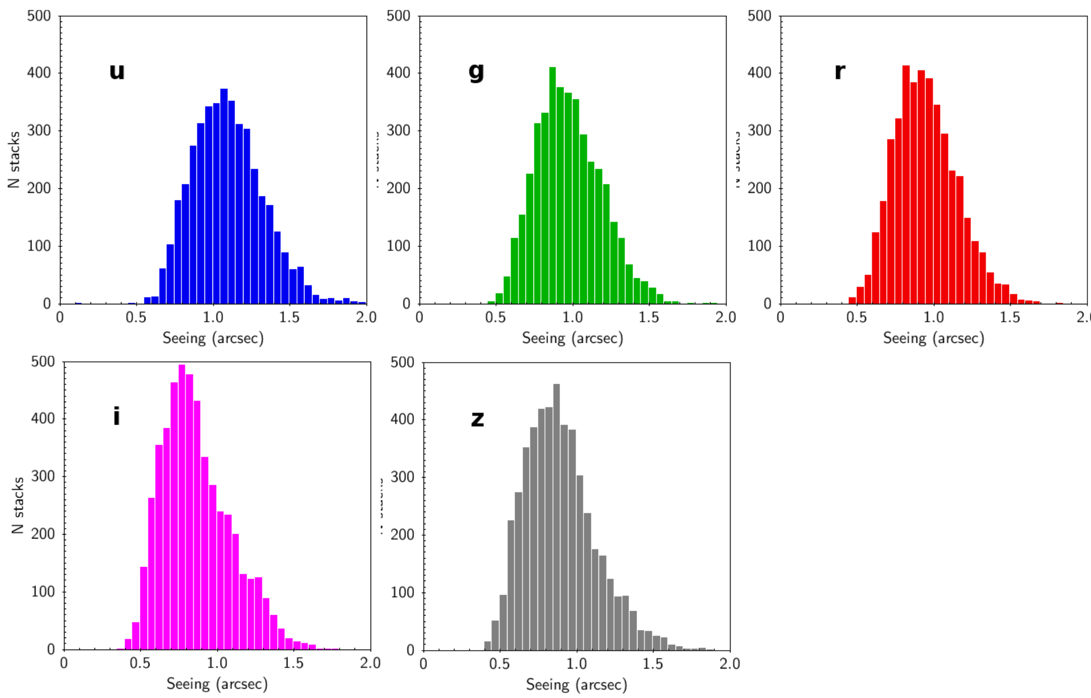


Fig. 7. Seeing (FWHM) distributions from ATLAS A, B grade stacks.

We also note that the ATLAS median seeings (see Fig. 7) in the *riz* bands are 0.90, 0.81 and 0.84 arcsec FWHM. In *u* and *g* the median seeings are 1.0 and 0.95 arcsec FWHM. These distributions are well within our <1.4arcsec specification and are significantly better than the SDSS equivalents. ATLAS median 5σ stellar AB magnitude limits are 22.0 in *u*, 23.1 in *g*, 22.67 in *r*, 22.0 in *i* and 20.87 in *z*, again well within specification. Full details of these and other survey characteristics are given in our DR3 release descriptions that accompany the data on the ESO SAF (or see `http://astro.dur.ac.uk/Cosmology/vstatlas`).

Currently we have calibrated magnitude zeropoints using APASS star magnitudes and these still show problems due to the need to extrapolate to *u* and *z* from APASS *gri* and due to some residual issues in the APASS *gri* photometry. With the completion of ATLAS, we are now in a better position to use the 2 arcmin overlaps between tiles to produce an improved calibration, because this method requires large contiguous areas.

3.2 The PI should describe here the current status of the Phase 3 submission for her/his survey project and specify how s/he wishes to structure the submission of data products during the year 2018. These plans will be reviewed and iterated with ESO to reach agreement. PIs should also include any relevant information for the scientific validation of the data products.

The Phase 3 submission plan remains the one described in Section 5 of the Revised ATLAS SMP. ATLAS Data Release 1 was rolled out in October 2013 based on the first year of data taken to 1/10/12. DR3 was released in November 2016 based on data taken in the period 1/8/11-1/10/14. DR4 in June 2018 is envisaged to be the final release. DR1, DR2 and DR3 are only flux calibrated on a nightly basis, whereas the aim for DR4 is to place the entire survey on a uniform photometric scale.

In addition to the DR1, DR2 DR3 catalogue releases indicated above, the ATLAS team also delivers the following core data products to the ESO SAF:

- astrometrically and photometrically calibrated images, along with their respective weight maps, in all of the project-relevant filters are provided on a per pointing basis.
- source catalogues based on individual bands. Associated source catalogues linking the parameters of individual objects across all of the observed filter bands are provided on a pointing by pointing basis.
- these survey products are supported and characterized by additional "meta" information providing a full description sufficient for their full scientific exploitation.
- For DR2 and DR3 we also provided *ugriz* bandmerged catalogues sourced from WFAU.

Further access to the ATLAS data is available at the Cambridge Astronomical Surveys Unit database (http://casu.ast.cam.ac.uk/surveys-projects/vst) and at the Edinburgh Wide Field Astronomy Unit archive at http://surveys.roe.ac.k/osa.

Year(*)	Year/ Data volume acquired (since 01.10. 2015)	Percentage reduced data/year (since 01.10.2015)	Percentage of data (images/source lists) submitted /year (since 01.10.2015)	Percentage of catalogs submitted /year (since 01.10.2015)
10.2015-10.2016	2.7Tb	100%	0%	0%
10.2016-10.2017	~1Tb	100%	0%	0%

4. **The PIs of the VST public surveys are requested to review the observations that were assigned a Quality Control grade "D". Please report what fraction of the D-classified OBs must be repeated to attain their scientific goals and include an assessment of the time required to repeat these OBs.**

We have assessed the ~30 D grade OBs observed since October 2016 and 20 need to be re-done to satisfy our survey's scientific goals, because the Image Quality, ellipticity or seeing was usually outside specification. We therefore request 3h in total to take into account the increased overhead in observing 20 single fields.

As part of the efforts to provide a global ATLAS calibration, we have also found several concatenations of 17 fields affected by cloud as indicated by an erroneous zeropoint. This means that the magnitude limit on these fields is too bright and frequently out of specification. We therefore propose that these fields should be re-observed. We estimate that ~10 concatenations are in this category. We therefore ask for a further 10h of VST time to re-observe these fields. The time should be split equally between dark and grey/bright conditions. The total extra time requested is therefore 13h dark+gray/bright time for re-observing both the D grade OBs and the cloud affected concatenations.