European Organisation for Astronomical Research in the Southern Hemisphere
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Cycle: P115
Type: Normal
Status: Valid
Printed: 26 Sep 2024

APPLICATION FOR OBSERVING TIME

115.28GR

IMPORTANT NOTICE

By submitting this proposal, the PI takes full responsibility for the content of the proposal, in particular with regard to the names of CoIs and the agreement to act according to the ESO policy and regulations, should observing time be granted.

Spectroscopic Confirmation of the Stellar Magellanic Stream

ABSTRACT

Using recently available public data releases from the DELVE and VHS surveys, we have discovered the signature of a stellar stream in the distant Galactic halo that is consistent with the long predicted stellar counterpart of the gaseous Magellanic Stream. In this programme we propose to obtain moderate resolution spectroscopy with XSHOOTER of 69 of these candidates in order to measure their radial velocities and metallicities. These measurements will confirm their potential association to the Magellanic Clouds, and in that way solve a problem that has remained open for several decades. Confirmation of a stellar counterpart of the gaseous Magellanic Stream would finally confirm its origin through tidal forces between the Clouds themselves, and contribute to better measurements of the masses of these satellites and their interaction history.

SCIENTIFIC KEYWORDS

Galaxy: halo, galaxies: Magellanic Clouds, cosmology: dark matter, stars: kinematics and dynamics, Galaxy: evolution

RUNS

Run	Period	Instrument	Tel. Setup	Constraints	Mode	Type	Propr. Time	Time Constr.	Req. Time
115.28GR.001 • Run 1	115	XSHOOTER	UT3	FLI: 50% • Turb.: 70% • pwv: 30.0mm • Sky: Variable, thin cirrus	SM	Normal	12m	✕	32h00m

AWARDED AND FUTURE TIME REQUESTS

Time already awarded to this project

- none -

Future time requests to complete this project

- none -

Special Remarks

n/a

DESCRIPTION OF THE PROPOSED PROGRAMME

A- Scientific Rationale

The accretion of smaller galaxies into larger ones is a fundamental pillar of the current model of cosmological structure formation. Yet, arguably the closest example we have of such an event is far from being well understood: despite their proximity and the widespread interest from various perspectives, the interaction between the Magellanic Clouds (MCs) and the Milky Way (MW) remains an open problem. One of the most elusive questions is the origin of the stream of neutral atomic hydrogen (HI) that trails behind the MCs for over 150° across the Southern Sky. The search for a stellar counterpart of this gaseous Magellanic Stream (MagS) has been an intensively sought-after goal for decades, with null results until very recently. In addition, it is expected from standard theory that a satellite like the Large Magellanic Cloud (LMC) should generate a density wake due to the direct gravitational scattering of MW particles which in turn pull back on the satellite (i.e., dynamical friction). The detection and characterization of such a stellar and dark matter wake trailing the LMC across the MW halo would precisely constrain the LMC's dark mass (currently debated to a factor of 10 at least), providing a new observational test to current cosmology.

Despite extensive observations and simulations of the gaseous MagS, its origin has remained enigmatic since its discovery. In particular, the relative contribution from two major formation processes —tidal disruption and ram pressure stripping— remains uncertain. Originally, the most common scenarios had to do with the action of MW tidal forces during previous pericentric passages (e.g., Gardiner & Noguchi 1996). But tidal forces remove both gas and stars equally well, and no signs of a stellar stream could be found, which suggests that the processes responsible for the gas removal may be of hydrodynamic nature rather than related to gravitational tides.

Clearly, a key source of uncertainty was the detailed past orbit of the MCs about the MW. Relatively recently, however, high-precision proper motions for the MCs from the Hubble Space Telescope (Kallivayalil et al. 2006; 2013) convincingly made the case that they are likely on their first infall towards the MW (Besla et al. 2007). This unexpected finding would rule out the conventional picture in which the MagS results from the action of tidal forces exerted by the MW. Using updated models with the new proper-motion data, Besla et al. (2010,2012) found that the gaseous MagS owes its origin to the action of LMC tides stripping material from the SMC before the MCs have been accreted by the Galaxy. Still, the dominant mechanism that removes material from the MCs is still a subject of debate, with stellar outflows (Nidever et al. 2008) and ram pressure stripping (Mastropietro et al. 2005) being possible explanations.

Distinguishing between these formation scenarios is therefore fundamental for an accurate understanding of the orbital and interaction histories of the MCs. In particular, the detection of stellar debris in the MagS would prove conclusively that the Stream is in fact a tidal feature, ruling out models based on hydrodynamic processes. In the last few years, there have been two major advances in this area. First, selecting K giants from a crossmatch between Gaia and WISE photometry, Conroy et al. (2021) were able to efficiently separate stars and background galaxies down to very faint magnitudes, which allowed them to find compelling evidence for a distant halo overdensity consistent with the predicted LMC dynamical-friction wake. Second, Chandra et al. (2023) used that same optical-near IR color-color selection to spectroscopically follow up the Conroy et al. (2023) sample of K giants, finding a sample of 13 stars beyond 50 kpc that have radial velocities (RVs), proper motions, metallicities, and sky location that, they argue convincingly, are consistent with a stellar counterpart of the gaseous MagS.

<u>THIS PROGRAMME:</u> **The aim of this proposal is to take advantage of the successful optical-near IR, color-color based halo K-giant selection of Conroy et al. (2021) and Chandra et al. (2023), in order to uncover the stellar Magellanic Stream with significantly higher statistical confidence than the 13 stars of Chandra et al. (2023).** We have found strong preliminary evidence of a stellar Magellanic Stream (see Figure 1, paper in preparation) by combining recently available public surveys of the Southern sky that allowed us to select halo K-giants down to ~ 3 magnitudes deeper than what Conroy et al. (2021) and Chandra et al. (2923) were able to do with Gaia and WISE. In order to confirm its reality, we need to check (1) whether the RVs of our candidate MagS stars follow the RV gradient that the gaseous MagS shows across the sky, and (2) whether they have metallicities consistent with having been stripped from the Magellanic Clouds.

B- Immediate Objective

The goal of this proposal is therefore to obtain spectroscopic follow-up of our candidate Magellanic Stream halo K-giants, in order to measure their RVs and metallicities. This will unambiguously show whether or not these stars could have had an origin in the Magellanic Clouds, and thus potentially solve a problem that has remained open for the last several decades.

Our candidate stellar Magellanic Stream, where we take our targets from, has been identified in the following way. A catalog of K giants was constructed by using photometry from the second data release of the DECam Local

Volume Exploration Survey (DELVE), which was combined with near-infrared K-band photometry from ESO's 5th data release of the VISTA Hemisphere Survey (VHS) through a nearest neighbor crossmatch with 1 arcsec tolerance. **Both surveys provide overlapping coverage of the entire Southern hemisphere sky, and their depth enables the selection of K giants at 3 magnitudes deeper than similar methods utilizing a combination of WISE and Gaia bands.**

From this crossmatch, K giants were selected by first removing extended objects using the DELVE $extended-class$ flag for the g and i bands. K giants were then selected in the g - i vs i - Ks space, where, as shown in Figure 1, the red giant branch separates from the main sequence, which includes the main contaminant in this temperature range (3000 - 5000 K), namely, foreground dwarf stars. The region of the color-color space used for the selection of K giants is shown in grey.

Candidate Magellanic Stream stars were then selected based on the CMD. A feature in the CMD corresponding to the RGB tip of the Magellanic Clouds was first identified, indicating a similar population at a similar distance that dominated that region of the CMD. Stars that match these criteria were selected by identifying K giants that lie between the bounds of a 10 Gyr isochrone with [M/H] = -0.9 dex placed between 40 - 80 kpc. Thus, stars matching that population in the specified heliocentric distance range were selected, as shown by the grey region in the CMD.

Strikingly, the sky distribution of the selected sources reveals a clear overdensity of stars trailing the Clouds, closely resembling the H1 distribution of the Magellanic Stream. This distribution also clearly includes stars in the LMC and SMC halos, in the Magellanic Bridge, as well as several field stars and clusters. To mitigate this contamination, stars within the main body of the observed stream were selected based on their on-sky coordinates, as indicated by the grey area shown.

Finally, this selection was bright enough that most stars are present in the Gaia catalog, allowing the removal of obvious foreground objects by applying the following criteria for A-tier sources: ruwe ¡ 1.4; parallax ¡ 0.1 mas; pmra,pmdec ¡ 0.1 mas/yr. For B-tier sources, the proper motion requirements were omitted, as sources with parallax ¡ 0.1 mas tend to have unreliable proper motions.

Figures

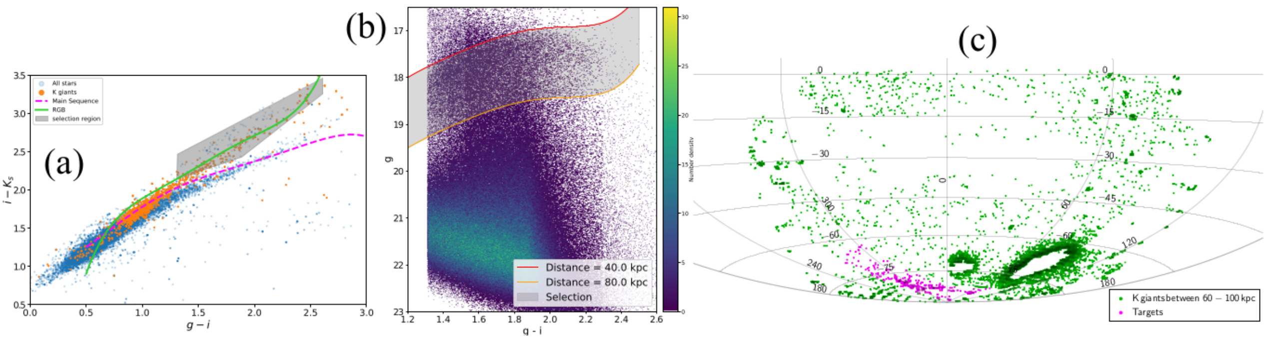

Fig.1 (left) Optical-near IR color-color diagram from DELVE plus VHS data, showing the initial step in the K-giant selection, as in Conroy et al. (2921). (Middle) CMD of color-color selected stars, showing the RGB K-giant selection based on isochrone distances. (Right) Sky depiction of selected giants, showing that Magellanic Cloud stars are clearly identified, and the extended overdensity that would correspond to the Magellanic stellar stream.

References

• Besla, G., et al. (2010), ApJL, 721, L97 • Besla et al. (2007), ApJ, 668, 949 • Chandra, V., et al. (2023), ApJ, 956, 110 • Conroy, C., et al. (2021), Nature, 592, 534 • Kallivayalil et al. (2013), ApJ, 764, 161 • Gardiner, L., & Noguchi, M (1996), MNRAS, 278, 191 • Weinberg, M. D (1998), MNRAS, 299, 499

TARGETS

Name	RA	Dec	Coord	Runs	Comment
Gaia DR3 6359762966604077696 G=17.641	19:33:36.640	-81:34:17.522	J2000	1	
Gaia DR3 6361119312980980736 G=17.897	19:10:05.865	-79:36:24.402	J2000	1	
Gaia DR3 6347527120173761152 G=18.187	20:05:46.821	-82:21:39.176	J2000	1	
Gaia DR3 6367912752949133568 G=18.189	19:44:24.586	-73:33:59.031	J2000	1	
Gaia DR3 6351027209282179584 G=17.781	23:12:53.704	-81:05:15.751	J2000	1	
Gaia DR3 6361055579961734016 G=18.213	18:58:25.701	-80:20:36.617	J2000	1	
Gaia DR3 6360646458556949504 G=18.213	18:39:29.602	-80:49:11.317	J2000	1	
Gaia DR3 6414991366949015424 G=18.97	19:00:10.797	-74:08:24.952	J2000	1	
Gaia DR3 6360172843923087744 G=18.212	19:32:43.733	-80:12:08.008	J2000	1	
Gaia DR3 6368001950829484544 G=18.14	19:58:58.792	-73:17:25.234	J2000	1	
Gaia DR3 6348128003277870976 G=17.447	20:35:01.460	-83:02:56.406	J2000	1	
Gaia DR3 6348206961956838656 G=18.228	20:32:26.703	-82:30:39.052	J2000	1	
Gaia DR3 6348178649532215168 G=17.809	20:35:10.901	-82:51:08.183	J2000	1	
Gaia DR3 6348188991813530752 G=18.291	20:34:37.137	-82:44:40.682	J2000	1	
Gaia DR3 6348136417118376320 G=18.899	20:39:00.577	-82:53:37.178	J2000	1	
Gaia DR3 6359853229636655744 G=18.461	19:52:07.639	-81:02:18.345	J2000	1	
Gaia DR3 4614803791024100224	04:56:28.490	-84:29:10.401	J2000	1	

Name	RA	Dec	Coord	Runs	Comment
G=17.464					
Gaia DR3 4614626215600513792 G=17.428	05:22:35.077	-84:34:11.303	J2000	1	
Gaia DR3 6347962591200980224 G=17.486	20:59:24.083	-82:48:26.688	J2000	1	
Gaia DR3 6351413172223227392 G=18.533	22:42:08.613	-81:30:34.569	J2000	1	
Gaia DR3 4614399926659143552 G=18.156	04:57:14.718	-85:06:19.192	J2000	1	
Gaia DR3 4614786095758874496 G=18.749	05:06:43.195	-84:40:43.026	J2000	1	
Gaia DR3 4614792143072826112 G=17.594	05:07:10.792	-84:38:25.990	J2000	1	
Gaia DR3 4614430506826409472 G=18.771	04:36:16.122	-85:12:42.134	J2000	1	
Gaia DR3 4614440539869942912 G=17.223	04:37:04.926	-84:57:50.182	J2000	1	
Gaia DR3 4614801523281371904 G=18.298	04:55:54.674	-84:35:03.619	J2000	1	
Gaia DR3 4616972749508861568 G=17.298	02:30:42.183	-84:17:58.567	J2000	1	
Gaia DR3 4614842097835533184 G=18.204	04:56:23.166	-84:04:38.283	J2000	1	
Gaia DR3 4615132270122823552 G=17.933	04:00:32.377	-84:38:51.827	J2000	1	
Gaia DR3 4621377358729545088 G=18.461	05:39:58.926	-81:31:48.474	J2000	1	
Gaia DR3 6345183167541259648 G=18.188	22:31:23.361	-82:47:15.463	J2000	1	
Gaia DR3 6345178181083426944 G=17.651	22:32:32.051	-82:53:45.856	J2000	1	
Gaia DR3 6345161692704706688 G=18.06	22:42:21.409	-83:01:55.088	J2000	1	
Gaia DR3 6344430173875047040	22:50:26.286	-83:06:41.398	J2000	1	

Name	RA	Dec	Coord	Runs	Comment
G=18.039					
Gaia DR3 4615250227104604800 G=17.755	04:25:53.419	-84:12:30.325	J2000	1	
Gaia DR3 6346423481081191040 G=17.765	19:48:27.212	-84:37:29.199	J2000	1	
Gaia DR3 6342933665533895808 G=18.075	21:49:46.647	-85:54:25.752	J2000	1	
Gaia DR3 6345398495726057088 G=17.766	21:54:11.522	-82:33:01.277	J2000	1	
Gaia DR3 4629904105762860032 G=18.851	01:02:30.814	-82:36:50.295	J2000	1	
Gaia DR3 4615812554286977280 G=18.081	04:43:51.719	-82:48:08.455	J2000	1	
Gaia DR3 6350443677845225856 G=17.636	23:00:52.721	-82:34:27.908	J2000	1	
Gaia DR3 6350502566140341760 G=18.709	23:18:16.479	-82:30:55.344	J2000	1	
Gaia DR3 4617113895017310336 G=17.499	01:47:55.810	-84:15:20.519	J2000	1	
Gaia DR3 6348558320345997440 G=17.501	21:44:56.004	-81:26:47.163	J2000	1	
Gaia DR3 4615948103454388480 G=17.492	04:02:00.658	-82:54:10.815	J2000	1	
Gaia DR3 6345334762707088512 G=18.928	22:08:14.112	-82:48:57.311	J2000	1	
Gaia DR3 6348008564530896768 G=18.277	21:33:06.505	-82:49:06.250	J2000	1	
Gaia DR3 4615941716839404800 G=16.975	03:56:22.427	-82:47:52.797	J2000	1	
Gaia DR3 4630021031952040064 G=18.338	00:26:21.615	-82:49:26.321	J2000	1	
Gaia DR3 6364335869824177280 G=17.937	19:26:24.171	-78:20:02.659	J2000	1	
Gaia DR3 6361333756403646080	19:28:27.237	-78:21:38.888	J2000	1	

Name	RA	Dec	Coord	Runs	Comment
G=17.586					
Gaia DR3 2621073615668045824 G=17.944	22:07:57.459	-05:05:50.704	J2000	1	
Gaia DR3 2606747971294886400 G=18.749	22:55:08.693	-09:56:44.914	J2000	1	
Gaia DR3 2622836197232267648 G=18.233	22:32:12.602	-06:28:41.371	J2000	1	
Gaia DR3 2627910688207002112 G=17.867	22:30:46.681	-04:05:43.970	J2000	1	
Gaia DR3 2533226244381309440 G=19.029	01:05:40.757	-00:33:13.854	J2000	1	
Gaia DR3 2680484931906216576 G=18.455	22:04:45.271	00:31:41.849	J2000	1	
Gaia DR3 2533843203548158848 G=18.549	01:24:12.472	-01:00:49.813	J2000	1	
Gaia DR3 2349552547787827456 G=18.318	00:47:05.679	-22:04:48.323	J2000	1	
Gaia DR3 5046637047256088320 G=18.843	03:07:07.648	-37:24:05.435	J2000	1	
Gaia DR3 2601407505880573696 G=18.813	22:36:13.129	-12:53:38.187	J2000	1	
Gaia DR3 2601835941752991872 G=18.281	22:34:33.447	-11:47:24.599	J2000	1	
Gaia DR3 2680349107859540096 G=18.501	22:04:44.169	-00:26:37.779	J2000	1	
Gaia DR3 2421099800928223232 G=18.599	23:56:59.214	-12:50:58.213	J2000	1	
Gaia DR3 2678285084016522112 G=18.097	22:23:41.108	00:01:38.033	J2000	1	
Gaia DR3 2558431960037099264 G=18.786	01:27:02.528	01:14:12.465	J2000	1	
Gaia DR3 4703768674144797824 G=19.224	00:31:28.271	-68:07:14.203	J2000	1	
Gaia DR3 4710253357503073920	01:07:10.611	-62:36:48.387	J2000	1	

Name	RA	Dec	Coord	Runs	Comment
G=18.812					
Gaia DR3 4909573989321693440	01:27:16.879	-58:02:47.369	J2000	1	
G=19.191					

Target Notes

- none -

REMARKS & JUSTIFICATIONS

Lunar Phase and Constraints Justification

Please justify here the requested lunar phase and other observing constraints.

Our targets are metal-poor giants, whose lines are concentrated mainly in the UVB arm, the most sensitive to moon contamination. Plus they are faint. We thus require *at least* gray time to reduce the impact of lunar contamination.

Time Justification

Please describe here a detailed computation of the necessary time to execute the observations, including time-critical aspects if any. Parameters used in the ETC should be mentioned so the computation can be reproduced.

As presented in Chandra et al. (2023, ApJ, 956, 110), who analyzed stars very similar to our targets, spectra with resolution R=10,000, and SNR between 10 and 30 per resolution element can be used to estimate atmospheric metallicities for metal-poor red giants with a precision of 0.1 dex or better, and radial velocities with a precision of about 1 km/s. We propose to use X-SHOOTER to obtain moderate resolution spectra for our sample of stars with SNR ranging from 10 to 30, depending on the specific magnitude of each star. We will use slit widths of 0.8", 0.7", and 0.6" for the UV, VIS, and NIR, respectively, which delivers a spectroscopic resolution of R=11,000 in the optical. We will use the high-gain 2x2 slow read-out mode due to the moderately low SNR of our spectra. Given that our targets have magnitudes between 17 mag and 19 mag in G we will use exposure times between 600s and 1500s, which were determined to be optimal by entering all the above specifications into the current (P115) X-SHOOTER Exposure Time Calculator, and obtaining the required SNR > 10. We will obtain a single spectrum per object and will not use the nodding option because our analysis will be focused in the spectral region between 400nm and 700nm, where most absorption features of our stars are located, and this saves us significant overhead times. For our 69 targets, therefore, we obtain that 32 hours are necessary for this program, which accounts for 10 minutes of overhead (telescope + instrument) per each Observing Block (OB).

Telescope Justification

Please justify why the telescope requested is the best choice for this programme.

Our targets are all very distant (40-100 kpc) halo giants, with G-band magnitudes between 17-19, and our scientific goals require SNR > 10 per pixel with moderate spectral resolution (R > 5000). These are requirements set mostly by the need to derive metallicities, more than the radial velocities Thus a large aperture telescope is needed to achieve the necessary signal-to-noise ratios in reasonable integration times.

Observing Mode Justification

Please justify the choice of SM, VM or dVM.

The observations are straightforward and the targets spread in the sky. Therefore Service Mode is the natural and most efficient choice.

Calibration Request

If you need any special calibration not included in the instrument calibration plan, please specify it here.

No special calibrations needed.

Duplication with ESO Science Archive

If observations of the same target(s) using the same instrument(s) already exist in the ESO archive, please justify why this programme requests further observations.

We have searched for our targets for possible existing XSHOOTER observations in the ESO Archive, finding none. This was expected given the faintness of our targets.

GTO Target Duplication Justification

If an instrument GTO team aims at the same target(s), please justify why this programme requests further observations.

No GTO target duplications to our knowledge.

Background and Expertise

Short description of the background, expertise and roles of the various team members in the context of the science case discussed in the proposal. For small teams the applicants may wish to provide a sentence for the qualifications of each member, while for larger teams (e.g. in Large Programmes), only the leading roles need to be specified. [Non-anonymised]

Rafael Brahm: expert in exoplanet detection and characterization using spectroscopic data. Large experience in spectroscopic observations, processing and analysis. Will be in charge of data reduction and analysis.

Manuel Cavieres: current a PhD student at Leiden Observatory working on hypervelocity stars in the Galactic halo. He did his MSc thesis at PUC, under the guidance of the PI, working with ESO/VIRCAM deep observations of the Galactic halo, successfully detecting and characterizing the predicted LMC stellar wake. Responsible of the selection of targets for the present proposal.

Sebastián Vilaza: currently a MSc student at PUC working under the guidance of the PI. Just completed a radial velocity survey for close binaries using the CORALIE spectrograph. Experienced with the acquisition, reduction, and analysis of high-resolution spectra for the measurement of radial velocities and metallicities. Helped with the target selection and will assist in the data reduction and analysis.

Julio Chanamé: designed the project, assembled the team, and wrote the proposal.

REPORT ON PREVIOUS USAGE OF ESO FACILITIES

Run	PI	Instrument	Time	Mode	Comment
110.23YQ.001	Rafael Brahm	HARPS	7.0n	Visitor	227 spectra of 35 candidates. 17 need more harps RVs, 7 being analyzed, 2 papers in prep.
Transiting Warm Jupiters in the TESS Era: testing migration mechanisms and structural models					
110.23Y8.001	Rafael Brahm	ESPRESSO	0.6n	Visitor	Espinoza-Retamal 2024 in prep
Spin-Orbit alignment of six transiting warm Jupiters for constraining migration mechanisms					
112.25W1.001	Rafael Brahm	HARPS	10.0n	Visitor	137 spectra of 25 candidates. 16 need more harps RVs, 14 being analyzed. 2023ApJ...946L..36B, 2024MNRAS.533..109G
Transiting Warm Jupiters in the TESS Era: testing migration mechanisms and structural models					
114.27CV.003	Rafael Brahm	ESPRESSO	4.2h	Service	not executed yet
The tilted orbit of the warm giant TOI-4507b					
114.27CS.001	Rafael Brahm	HARPS	6.6n	Visitor	not executed yet
Transiting Warm Jupiters in the TESS Era: testing migration mechanisms and structural models					
0104.B-0487(A)	Julio Chaname	XSHOOTER	8.0h	Service	Data reduced, analyzed, and results published in Aguado et al., 2021, ApJ 908, 8A
Chemical characterization of the Gaia Sausage (a.k.a., Gaia Enceladus) and the Sequoia					
0104.B-0487(B)	Julio Chaname	UVES	3.0h	Service	Data reduced, analyzed, and results published in Aguado et al., 2021, ApJ 908, 8A
Chemical characterization of the Gaia Sausage (a.k.a., Gaia Enceladus) and the Sequoia					
0105.A-9003(A)	Julio Chaname	FEROS	0.0n	Visitor	Data reduced and analyzed. Manuscript preparation in progress.
A Clean Test of Gravity at Very Weak Accelerations					
106.21HR.003	Julio Chaname	PIONIER	14.0h	Service	Atmospheric constraints rarely adequate during semester, little data was obtained, with unclear results. Project on hold
Uncovering Hidden Members of Hierarchical Triples in the Solar Neighborhood					
106.21HR.002	Julio Chaname	PIONIER	8.0h	Service	Atmospheric constraints rarely adequate during semester, little data was obtained, with unclear results. Project on hold
Uncovering Hidden Members of Hierarchical Triples in the Solar Neighborhood					
106.21H3.002	Julio Chaname	ESPRESSO	47.3h	Service	Data reduced and analyzed. Manuscript preparation in progress.
A Clean Test of Gravity with ESPRESSO					
106.21HR.001	Julio Chaname	PIONIER	0.7h	Service	Atmospheric constraints rarely adequate during semester, little data was obtained, with unclear results. Project on hold
Uncovering Hidden Members of Hierarchical Triples in the Solar Neighborhood					
106.21H3.001	Julio Chaname	ESPRESSO	15.2h	Service	Data reduced and analyzed. Manuscript preparation in progress.
A Clean Test of Gravity with ESPRESSO					
0106.A-9002(A)	Julio Chaname	FEROS	0.0n	Visitor	Data reduced and analyzed. Manuscript

Run	PI	Instrument	Time	Mode	Comment
					preparation in progress.
A Clean Test of Gravity at Very Weak Accelerations					
108.22FH.001	Julio Chaname	ESPRESSO	9.4h	Service	Data reduced and analyzed. Manuscript preparation in progress.
A Clean Test of Gravity with ESPRESSO, year 2					
109.23H5.001	Julio Chaname	VIRCAM	93.3h	Service	Data reduced, photometry and analysis done, goals achieved, and manuscript about to be sent for publication.
A VISTA?DECam Experiment in Near-Field Cosmology: The Search for the Magellanic Dark Matter Wake					
109.23FD.001	Julio Chaname	ESPRESSO	37.2h	Service	Data reduced and analyzed. Manuscript preparation in progress.
A Clean Test of Gravity with ESPRESSO, faint targets, year 2					
109.23KY.001	Julio Chaname	UVES	39.0h	Service	Program did not obtain any observations. Terminated by ESO.
Probing the Origin of r-process Nucleosynthesis and its Mixing through the Interstellar Medium					
111.24VX.001	Julio Chaname	UVES	16.0h	Service	Data reduced, analyzed, and published in Reggiani et al. 2024, arXiv:2408.10999
Internal Extra-Mixing of Solar Twins probed from Beryllium and Lithium abundances					
111.251M.001	Julio Chaname	UVES	22.6h	Service	Data reduction in progress, part of thesis work by MSc student at PUC.
Fundamental White Dwarf Masses for the Low-Mass End of the Initial-to-Final Mass Relation					
0111.A-9017(A)	Julio Chaname	FEROS	0.0n	Visitor	Data reduced and analyzed. Manuscript preparation in progress.
(Resuming) A Clean Test of Gravity at Very Weak Accelerations					

RECENT PI/CoIs PUBLICATIONS MOST RELEVANT TO THE SUBJECT OF THIS PROPOSAL

1. Tregoning, K. R., Andrews, J. J., Agüeros, M. A., et al. (2024) "Theia 456: Tidally Shredding an Open Cluster," arXiv, arXiv:2405.13133 - 2024arXiv240513133T

2. Briceño-Morales, G., & Chanamé, J. (2023) "Substructure, supernovae, and a time-resolved star formation history for Upper Scorpius," MNRAS, 522, 1288-1309 - 2023MNRAS.522.1288B

3. Casamiquela, L., Olivares, J., Tarricq, Y., et al. (2022) "Unravelling UBC 274: A morphological, kinematical, and chemical analysis of a disrupting open cluster," A&A, 664, A31 - 2022A&A...664A..31C

4. Andrews, J. J., Curtis, J. L., Chanamé, J., et al. (2022) "A Young, Low-density Stellar Stream in the Milky Way Disk: Theia 456," AJ, 163, 275 - 2022AJ....163..275A

5. Schuler, S. C., Andrews, J. J., Clanzy, V. R., et al. (2021) "Combining Astrometry and Elemental Abundances: The Case of the Candidate Pre-Gaia Halo Moving Groups G03-37, G18-39, and G21-22," AJ, 162, 109 - 2021AJ....162..109S

6. Aguado, D. S., Belokurov, V., Myeong, G. C., et al. (2021) "Elevated r-process Enrichment in Gaia Sausage and Sequoia," ApJL, 908, L8 - 2021ApJ...908L...8A

7. Aguado, D. S., Myeong, G. C., Belokurov, V., et al. (2021) "The S2 stream: the shreds of a primitive dwarf galaxy," MNRAS, 500, 889-910 - 2021MNRAS.500..889A

INVESTIGATORS

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OBSERVATIONS

In the table below, the repeat factor is applied to the complete observation on that target, including its overhead.

✔ The PI acknowledged that all the telescope times listed below include overheads.

Run 115.28GR.001 • Run 1 • P115 • XSHOOTER • SM — Tel. Time: 32h00m

FLI: 50% • Turb.: 70% (Seeing < 1.0 arcsec) • pwv: 30.0mm • Sky: Variable, thin cirrus • Airmass: 1.8

Target • Gaia DR3 6359762966604077696 • 19:33:36.640 • -81:34:17.522 — Tel. Time: 00h25m

OS 1	SLT	SLT
Tel. Time: 1500 s	Telescope Overheads: 360 s	UVB Slit: 0.8x11
Repeat: 1 x		VIS Slit: 0.9x11
Total Tel. Time: 1500s		NIR Slit: 0.6x11
		UVB readout mode: 100k/1pt/hg
		VIS readout mode: 100k/1pt/hg
		Integration Time: 900 s
		Instrument Overheads: 240 s
		Signal/Noise: 0.0

Target • Gaia DR3 6361119312980980736 • 19:10:05.865 • -79:36:24.402 — Tel. Time: 00h25m

OS 1	SLT	SLT
Tel. Time: 1500 s	Telescope Overheads: 360 s	UVB Slit: 0.8x11
Repeat: 1 x		VIS Slit: 0.9x11
Total Tel. Time: 1500s		NIR Slit: 0.6x11
		UVB readout mode: 100k/1pt/hg
		VIS readout mode: 100k/1pt/hg
		Integration Time: 900 s
		Instrument Overheads: 240 s
		Signal/Noise: 0.0

Target • Gaia DR3 6347527120173761152 • 20:05:46.821 • -82:21:39.176 — Tel. Time: 00h25m

OS 1	SLT	SLT
Tel. Time: 1500 s	Telescope Overheads: 360 s	UVB Slit: 0.8x11
Repeat: 1 x		VIS Slit: 0.9x11
Total Tel. Time: 1500s		NIR Slit: 0.6x11
		UVB readout mode: 100k/1pt/hg
		VIS readout mode: 100k/1pt/hg
		Integration Time: 900 s
		Instrument Overheads: 240 s
		Signal/Noise: 0.0

Target • Gaia DR3 6367912752949133568 • 19:44:24.586 • -73:33:59.031 — Tel. Time: 00h25m

OS 1	SLT	SLT
Tel. Time: 1500 s	Telescope Overheads: 360 s	UVB Slit: 0.8x11
Repeat: 1 x		VIS Slit: 0.9x11
Total Tel. Time: 1500s		NIR Slit: 0.6x11
		UVB readout mode: 100k/1pt/hg
		VIS readout mode: 100k/1pt/hg
		Integration Time: 900 s
		Instrument Overheads: 240 s
		Signal/Noise: 0.0

Target • Gaia DR3 6351027209282179584 • 23:12:53.704 • -81:05:15.751 — Tel. Time: 00h25m

OS 1	SLT	SLT
Tel. Time: 1500 s	Telescope Overheads: 360 s	UVB Slit: 0.8x11
Repeat: 1 x		VIS Slit: 0.9x11
Total Tel. Time: 1500s		NIR Slit: 0.6x11
		UVB readout mode: 100k/1pt/hg
		VIS readout mode: 100k/1pt/hg
		Integration Time: 900 s
		Instrument Overheads: 240 s
		Signal/Noise: 0.0

Target • Gaia DR3 6361055579961734016 • 18:58:25.701 • -80:20:36.617 — Tel. Time: 00h25m

OS 1	SLT	SLT
Tel. Time: 1500 s	Telescope Overheads: 360 s	UVB Slit: 0.8x11
Repeat: 1 x		VIS Slit: 0.9x11

Total Tel. Time: 1500s		NIR Slit: 0.6x11 UVB readout mode: 100k/1pt/hg VIS readout mode: 100k/1pt/hg Integration Time: 900 s Instrument Overheads: 240 s Signal/Noise: 0.0

Target • Gaia DR3 6360646458556949504 • 18:39:29.602 • -80:49:11.317 Tel. Time: 00h25m

OS 1	SLT	SLT
Tel. Time: 1500 s Repeat: 1 x Total Tel. Time: 1500s	Telescope Overheads: 360 s	UVB Slit: 0.8x11 VIS Slit: 0.9x11 NIR Slit: 0.6x11 UVB readout mode: 100k/1pt/hg VIS readout mode: 100k/1pt/hg Integration Time: 900 s Instrument Overheads: 240 s Signal/Noise: 0.0

Target • Gaia DR3 6414991366949015424 • 19:00:10.797 • -74:08:24.952 Tel. Time: 00h35m

OS 1	SLT	SLT
Tel. Time: 2100 s Repeat: 1 x Total Tel. Time: 2100s	Telescope Overheads: 360 s	UVB Slit: 0.8x11 VIS Slit: 0.9x11 NIR Slit: 0.6x11 UVB readout mode: 100k/1pt/hg VIS readout mode: 100k/1pt/hg Integration Time: 1500 s Instrument Overheads: 240 s Signal/Noise: 0.0

Target • Gaia DR3 6360172843923087744 • 19:32:43.733 • -80:12:08.008 Tel. Time: 00h25m

OS 1	SLT	SLT
Tel. Time: 1500 s Repeat: 1 x Total Tel. Time: 1500s	Telescope Overheads: 360 s	UVB Slit: 0.8x11 VIS Slit: 0.9x11 NIR Slit: 0.6x11 UVB readout mode: 100k/1pt/hg VIS readout mode: 100k/1pt/hg Integration Time: 900 s Instrument Overheads: 240 s Signal/Noise: 0.0

Target • Gaia DR3 6368001950829484544 • 19:58:58.792 • -73:17:25.234 Tel. Time: 00h25m

OS 1	SLT	SLT
Tel. Time: 1500 s Repeat: 1 x Total Tel. Time: 1500s	Telescope Overheads: 360 s	UVB Slit: 0.8x11 VIS Slit: 0.9x11 NIR Slit: 0.6x11 UVB readout mode: 100k/1pt/hg VIS readout mode: 100k/1pt/hg Integration Time: 900 s Instrument Overheads: 240 s Signal/Noise: 0.0

Target • Gaia DR3 6348128003277870976 • 20:35:01.460 • -83:02:56.406 Tel. Time: 00h20m

OS 1	SLT	SLT
Tel. Time: 1200 s Repeat: 1 x Total Tel. Time: 1200s	Telescope Overheads: 360 s	UVB Slit: 0.8x11 VIS Slit: 0.9x11 NIR Slit: 0.6x11 UVB readout mode: 100k/1pt/hg VIS readout mode: 100k/1pt/hg Integration Time: 600 s Instrument Overheads: 240 s Signal/Noise: 0.0

Target • Gaia DR3 6348206961956838656 • 20:32:26.703 • -82:30:39.052 Tel. Time: 00h25m

OS 1	SLT	SLT

Tel. Time: 1500 s Repeat: 1 x Total Tel. Time: 1500s	Telescope Overheads: 360 s	UVB Slit: 0.8x11 VIS Slit: 0.9x11 NIR Slit: 0.6x11 UVB readout mode: 100k/1pt/hg VIS readout mode: 100k/1pt/hg Integration Time: 900 s Instrument Overheads: 240 s Signal/Noise: 0.0

Target • Gaia DR3 6348178649532215168 • 20:35:10.901 • -82:51:08.183 Tel. Time: 00h25m

OS 1	SLT	SLT
Tel. Time: 1500 s Repeat: 1 x Total Tel. Time: 1500s	Telescope Overheads: 360 s	UVB Slit: 0.8x11 VIS Slit: 0.9x11 NIR Slit: 0.6x11 UVB readout mode: 100k/1pt/hg VIS readout mode: 100k/1pt/hg Integration Time: 900 s Instrument Overheads: 240 s Signal/Noise: 0.0

Target • Gaia DR3 6348188991813530752 • 20:34:37.137 • -82:44:40.682 Tel. Time: 00h25m

OS 1	SLT	SLT
Tel. Time: 1500 s Repeat: 1 x Total Tel. Time: 1500s	Telescope Overheads: 360 s	UVB Slit: 0.8x11 VIS Slit: 0.9x11 NIR Slit: 0.6x11 UVB readout mode: 100k/1pt/hg VIS readout mode: 100k/1pt/hg Integration Time: 900 s Instrument Overheads: 240 s Signal/Noise: 0.0

Target • Gaia DR3 6348136417118376320 • 20:39:00.577 • -82:53:37.178 Tel. Time: 00h35m

OS 1	SLT	SLT
Tel. Time: 2100 s Repeat: 1 x Total Tel. Time: 2100s	Telescope Overheads: 360 s	UVB Slit: 0.8x11 VIS Slit: 0.9x11 NIR Slit: 0.6x11 UVB readout mode: 100k/1pt/hg VIS readout mode: 100k/1pt/hg Integration Time: 1500 s Instrument Overheads: 240 s Signal/Noise: 0.0

Target • Gaia DR3 6359853229636655744 • 19:52:07.639 • -81:02:18.345 Tel. Time: 00h35m

OS 1	SLT	SLT
Tel. Time: 2100 s Repeat: 1 x Total Tel. Time: 2100s	Telescope Overheads: 360 s	UVB Slit: 0.8x11 VIS Slit: 0.9x11 NIR Slit: 0.6x11 UVB readout mode: 100k/1pt/hg VIS readout mode: 100k/1pt/hg Integration Time: 1500 s Instrument Overheads: 240 s Signal/Noise: 0.0

Target • Gaia DR3 4614803791024100224 • 04:56:28.490 • -84:29:10.401 Tel. Time: 00h25m

OS 1	SLT	SLT
Tel. Time: 1500 s Repeat: 1 x Total Tel. Time: 1500s	Telescope Overheads: 360 s	UVB Slit: 0.8x11 VIS Slit: 0.9x11 NIR Slit: 0.6x11 UVB readout mode: 100k/1pt/hg VIS readout mode: 100k/1pt/hg Integration Time: 900 s Instrument Overheads: 240 s Signal/Noise: 0.0

Target • Gaia DR3 4614626215600513792 • 05:22:35.077 • -84:34:11.303 — Tel. Time: 00h20m

OS 1	SLT	SLT
Tel. Time: 1200 s	Telescope Overheads: 360 s	UVB Slit: 0.8x11
Repeat: 1 x		VIS Slit: 0.9x11
Total Tel. Time: 1200s		NIR Slit: 0.6x11
		UVB readout mode: 100k/1pt/hg
		VIS readout mode: 100k/1pt/hg
		Integration Time: 600 s
		Instrument Overheads: 240 s
		Signal/Noise: 0.0

Target • Gaia DR3 6347962591200980224 • 20:59:24.083 • -82:48:26.688 — Tel. Time: 00h25m

OS 1	SLT	SLT
Tel. Time: 1500 s	Telescope Overheads: 360 s	UVB Slit: 0.8x11
Repeat: 1 x		VIS Slit: 0.9x11
Total Tel. Time: 1500s		NIR Slit: 0.6x11
		UVB readout mode: 100k/1pt/hg
		VIS readout mode: 100k/1pt/hg
		Integration Time: 900 s
		Instrument Overheads: 240 s
		Signal/Noise: 0.0

Target • Gaia DR3 6351413172223227392 • 22:42:08.613 • -81:30:34.569 — Tel. Time: 00h35m

OS 1	SLT	SLT
Tel. Time: 2100 s	Telescope Overheads: 360 s	UVB Slit: 0.8x11
Repeat: 1 x		VIS Slit: 0.9x11
Total Tel. Time: 2100s		NIR Slit: 0.6x11
		UVB readout mode: 100k/1pt/hg
		VIS readout mode: 100k/1pt/hg
		Integration Time: 1500 s
		Instrument Overheads: 240 s
		Signal/Noise: 0.0

Target • Gaia DR3 4614399926659143552 • 04:57:14.718 • -85:06:19.192 — Tel. Time: 00h25m

OS 1	SLT	SLT
Tel. Time: 1500 s	Telescope Overheads: 360 s	UVB Slit: 0.8x11
Repeat: 1 x		VIS Slit: 0.9x11
Total Tel. Time: 1500s		NIR Slit: 0.6x11
		UVB readout mode: 100k/1pt/hg
		VIS readout mode: 100k/1pt/hg
		Integration Time: 900 s
		Instrument Overheads: 240 s
		Signal/Noise: 0.0

Target • Gaia DR3 4614786095758874496 • 05:06:43.195 • -84:40:43.026 — Tel. Time: 00h35m

OS 1	SLT	SLT
Tel. Time: 2100 s	Telescope Overheads: 360 s	UVB Slit: 0.8x11
Repeat: 1 x		VIS Slit: 0.9x11
Total Tel. Time: 2100s		NIR Slit: 0.6x11
		UVB readout mode: 100k/1pt/hg
		VIS readout mode: 100k/1pt/hg
		Integration Time: 1500 s
		Instrument Overheads: 240 s
		Signal/Noise: 0.0

Target • Gaia DR3 4614792143072826112 • 05:07:10.792 • -84:38:25.990 — Tel. Time: 00h25m

OS 1	SLT	SLT
Tel. Time: 1500 s	Telescope Overheads: 360 s	UVB Slit: 0.8x11
Repeat: 1 x		VIS Slit: 0.9x11
Total Tel. Time: 1500s		NIR Slit: 0.6x11
		UVB readout mode: 100k/1pt/hg
		VIS readout mode: 100k/1pt/hg
		Integration Time: 900 s

		Instrument Overheads: 240 s Signal/Noise: 0.0

Target • Gaia DR3 4614430506826409472 • 04:36:16.122 • -85:12:42.134 Tel. Time: 00h35m

OS 1	SLT	SLT
Tel. Time: 2100 s Repeat: 1 x Total Tel. Time: 2100s	Telescope Overheads: 360 s	UVB Slit: 0.8x11 VIS Slit: 0.9x11 NIR Slit: 0.6x11 UVB readout mode: 100k/1pt/hg VIS readout mode: 100k/1pt/hg Integration Time: 1500 s Instrument Overheads: 240 s Signal/Noise: 0.0

Target • Gaia DR3 4614440539869942912 • 04:37:04.926 • -84:57:50.182 Tel. Time: 00h20m

OS 1	SLT	SLT
Tel. Time: 1200 s Repeat: 1 x Total Tel. Time: 1200s	Telescope Overheads: 360 s	UVB Slit: 0.8x11 VIS Slit: 0.9x11 NIR Slit: 0.6x11 UVB readout mode: 100k/1pt/hg VIS readout mode: 100k/1pt/hg Integration Time: 600 s Instrument Overheads: 240 s Signal/Noise: 0.0

Target • Gaia DR3 4614801523281371904 • 04:55:54.674 • -84:35:03.619 Tel. Time: 00h25m

OS 1	SLT	SLT
Tel. Time: 1500 s Repeat: 1 x Total Tel. Time: 1500s	Telescope Overheads: 360 s	UVB Slit: 0.8x11 VIS Slit: 0.9x11 NIR Slit: 0.6x11 UVB readout mode: 100k/1pt/hg VIS readout mode: 100k/1pt/hg Integration Time: 900 s Instrument Overheads: 240 s Signal/Noise: 0.0

Target • Gaia DR3 4616972749508861568 • 02:30:42.183 • -84:17:58.567 Tel. Time: 00h20m

OS 1	SLT	SLT
Tel. Time: 1200 s Repeat: 1 x Total Tel. Time: 1200s	Telescope Overheads: 360 s	UVB Slit: 0.8x11 VIS Slit: 0.9x11 NIR Slit: 0.6x11 UVB readout mode: 100k/1pt/hg VIS readout mode: 100k/1pt/hg Integration Time: 600 s Instrument Overheads: 240 s Signal/Noise: 0.0

Target • Gaia DR3 4614842097835533184 • 04:56:23.166 • -84:04:38.283 Tel. Time: 00h25m

OS 1	SLT	SLT
Tel. Time: 1500 s Repeat: 1 x Total Tel. Time: 1500s	Telescope Overheads: 360 s	UVB Slit: 0.8x11 VIS Slit: 0.9x11 NIR Slit: 0.6x11 UVB readout mode: 100k/1pt/hg VIS readout mode: 100k/1pt/hg Integration Time: 900 s Instrument Overheads: 240 s Signal/Noise: 0.0

Target • Gaia DR3 4615132270122823552 • 04:00:32.377 • -84:38:51.827 Tel. Time: 00h25m

OS 1	SLT	SLT
Tel. Time: 1500 s Repeat: 1 x Total Tel. Time: 1500s	Telescope Overheads: 360 s	UVB Slit: 0.8x11 VIS Slit: 0.9x11 NIR Slit: 0.6x11 UVB readout mode: 100k/1pt/hg

VIS readout mode: 100k/1pt/hg
Integration Time: 900 s
Instrument Overheads: 240 s
Signal/Noise: 0.0

Target • Gaia DR3 4621377358729545088 • 05:39:58.926 • -81:31:48.474 Tel. Time: 00h35m

OS 1	SLT	SLT
Tel. Time: 2100 s Repeat: 1 x Total Tel. Time: 2100s	Telescope Overheads: 360 s	UVB Slit: 0.8x11 VIS Slit: 0.9x11 NIR Slit: 0.6x11 UVB readout mode: 100k/1pt/hg VIS readout mode: 100k/1pt/hg Integration Time: 1500 s Instrument Overheads: 240 s Signal/Noise: 0.0

Target • Gaia DR3 6345183167541259648 • 22:31:23.361 • -82:47:15.463 Tel. Time: 00h25m

OS 1	SLT	SLT
Tel. Time: 1500 s Repeat: 1 x Total Tel. Time: 1500s	Telescope Overheads: 360 s	UVB Slit: 0.8x11 VIS Slit: 0.9x11 NIR Slit: 0.6x11 UVB readout mode: 100k/1pt/hg VIS readout mode: 100k/1pt/hg Integration Time: 900 s Instrument Overheads: 240 s Signal/Noise: 0.0

Target • Gaia DR3 6345178181083426944 • 22:32:32.051 • -82:53:45.856 Tel. Time: 00h25m

OS 1	SLT	SLT
Tel. Time: 1500 s Repeat: 1 x Total Tel. Time: 1500s	Telescope Overheads: 360 s	UVB Slit: 0.8x11 VIS Slit: 0.9x11 NIR Slit: 0.6x11 UVB readout mode: 100k/1pt/hg VIS readout mode: 100k/1pt/hg Integration Time: 900 s Instrument Overheads: 240 s Signal/Noise: 0.0

Target • Gaia DR3 6345161692704706688 • 22:42:21.409 • -83:01:55.088 Tel. Time: 00h25m

OS 1	SLT	SLT
Tel. Time: 1500 s Repeat: 1 x Total Tel. Time: 1500s	Telescope Overheads: 360 s	UVB Slit: 0.8x11 VIS Slit: 0.9x11 NIR Slit: 0.6x11 UVB readout mode: 100k/1pt/hg VIS readout mode: 100k/1pt/hg Integration Time: 900 s Instrument Overheads: 240 s Signal/Noise: 0.0

Target • Gaia DR3 6344430173875047040 • 22:50:26.286 • -83:06:41.398 Tel. Time: 00h25m

OS 1	SLT	SLT
Tel. Time: 1500 s Repeat: 1 x Total Tel. Time: 1500s	Telescope Overheads: 360 s	UVB Slit: 0.8x11 VIS Slit: 0.9x11 NIR Slit: 0.6x11 UVB readout mode: 100k/1pt/hg VIS readout mode: 100k/1pt/hg Integration Time: 900 s Instrument Overheads: 240 s Signal/Noise: 0.0

Target • Gaia DR3 4615250227104604800 • 04:25:53.419 • -84:12:30.325 Tel. Time: 00h25m

OS 1	SLT	SLT
Tel. Time: 1500 s Repeat: 1 x	Telescope Overheads: 360 s	UVB Slit: 0.8x11 VIS Slit: 0.9x11

Total Tel. Time: 1500s

NIR Slit: 0.6x11
UVB readout mode: 100k/1pt/hg
VIS readout mode: 100k/1pt/hg
Integration Time: 900 s
Instrument Overheads: 240 s
Signal/Noise: 0.0

Target • Gaia DR3 6346423481081191040 • 19:48:27.212 • -84:37:29.199 Tel. Time: 00h25m

OS 1	SLT	SLT
Tel. Time: 1500 s Repeat: 1 x Total Tel. Time: 1500s	Telescope Overheads: 360 s	UVB Slit: 0.8x11 VIS Slit: 0.9x11 NIR Slit: 0.6x11 UVB readout mode: 100k/1pt/hg VIS readout mode: 100k/1pt/hg Integration Time: 900 s Instrument Overheads: 240 s Signal/Noise: 0.0

Target • Gaia DR3 6342933665533895808 • 21:49:46.647 • -85:54:25.752 Tel. Time: 00h25m

OS 1	SLT	SLT
Tel. Time: 1500 s Repeat: 1 x Total Tel. Time: 1500s	Telescope Overheads: 360 s	UVB Slit: 0.8x11 VIS Slit: 0.9x11 NIR Slit: 0.6x11 UVB readout mode: 100k/1pt/hg VIS readout mode: 100k/1pt/hg Integration Time: 900 s Instrument Overheads: 240 s Signal/Noise: 0.0

Target • Gaia DR3 6345398495726057088 • 21:54:11.522 • -82:33:01.277 Tel. Time: 00h25m

OS 1	SLT	SLT
Tel. Time: 1500 s Repeat: 1 x Total Tel. Time: 1500s	Telescope Overheads: 360 s	UVB Slit: 0.8x11 VIS Slit: 0.9x11 NIR Slit: 0.6x11 UVB readout mode: 100k/1pt/hg VIS readout mode: 100k/1pt/hg Integration Time: 900 s Instrument Overheads: 240 s Signal/Noise: 0.0

Target • Gaia DR3 4629904105762860032 • 01:02:30.814 • -82:36:50.295 Tel. Time: 00h35m

OS 1	SLT	SLT
Tel. Time: 2100 s Repeat: 1 x Total Tel. Time: 2100s	Telescope Overheads: 360 s	UVB Slit: 0.8x11 VIS Slit: 0.9x11 NIR Slit: 0.6x11 UVB readout mode: 100k/1pt/hg VIS readout mode: 100k/1pt/hg Integration Time: 1500 s Instrument Overheads: 240 s Signal/Noise: 0.0

Target • Gaia DR3 4615812554286977280 • 04:43:51.719 • -82:48:08.455 Tel. Time: 00h25m

OS 1	SLT	SLT
Tel. Time: 1500 s Repeat: 1 x Total Tel. Time: 1500s	Telescope Overheads: 360 s	UVB Slit: 0.8x11 VIS Slit: 0.9x11 NIR Slit: 0.6x11 UVB readout mode: 100k/1pt/hg VIS readout mode: 100k/1pt/hg Integration Time: 900 s Instrument Overheads: 240 s Signal/Noise: 0.0

Target • Gaia DR3 6350443677845225856 • 23:00:52.721 • -82:34:27.908 Tel. Time: 00h25m

OS 1	SLT	SLT

Tel. Time: 1500 s Repeat: 1 x Total Tel. Time: 1500s	Telescope Overheads: 360 s	UVB Slit: 0.8x11 VIS Slit: 0.9x11 NIR Slit: 0.6x11 UVB readout mode: 100k/1pt/hg VIS readout mode: 100k/1pt/hg Integration Time: 900 s Instrument Overheads: 240 s Signal/Noise: 0.0

Target • Gaia DR3 6350502566140341760 • 23:18:16.479 • -82:30:55.344 Tel. Time: 00h35m

OS 1	SLT	SLT
Tel. Time: 2100 s Repeat: 1 x Total Tel. Time: 2100s	Telescope Overheads: 360 s	UVB Slit: 0.8x11 VIS Slit: 0.9x11 NIR Slit: 0.6x11 UVB readout mode: 100k/1pt/hg VIS readout mode: 100k/1pt/hg Integration Time: 1500 s Instrument Overheads: 240 s Signal/Noise: 0.0

Target • Gaia DR3 4617113895017310336 • 01:47:55.810 • -84:15:20.519 Tel. Time: 00h25m

OS 1	SLT	SLT
Tel. Time: 1500 s Repeat: 1 x Total Tel. Time: 1500s	Telescope Overheads: 360 s	UVB Slit: 0.8x11 VIS Slit: 0.9x11 NIR Slit: 0.6x11 UVB readout mode: 100k/1pt/hg VIS readout mode: 100k/1pt/hg Integration Time: 900 s Instrument Overheads: 240 s Signal/Noise: 0.0

Target • Gaia DR3 6348558320345997440 • 21:44:56.004 • -81:26:47.163 Tel. Time: 00h25m

OS 1	SLT	SLT
Tel. Time: 1500 s Repeat: 1 x Total Tel. Time: 1500s	Telescope Overheads: 360 s	UVB Slit: 0.8x11 VIS Slit: 0.9x11 NIR Slit: 0.6x11 UVB readout mode: 100k/1pt/hg VIS readout mode: 100k/1pt/hg Integration Time: 900 s Instrument Overheads: 240 s Signal/Noise: 0.0

Target • Gaia DR3 4615948103454388480 • 04:02:00.658 • -82:54:10.815 Tel. Time: 00h25m

OS 1	SLT	SLT
Tel. Time: 1500 s Repeat: 1 x Total Tel. Time: 1500s	Telescope Overheads: 360 s	UVB Slit: 0.8x11 VIS Slit: 0.9x11 NIR Slit: 0.6x11 UVB readout mode: 100k/1pt/hg VIS readout mode: 100k/1pt/hg Integration Time: 900 s Instrument Overheads: 240 s Signal/Noise: 0.0

Target • Gaia DR3 6345334762707088512 • 22:08:14.112 • -82:48:57.311 Tel. Time: 00h35m

OS 1	SLT	SLT
Tel. Time: 2100 s Repeat: 1 x Total Tel. Time: 2100s	Telescope Overheads: 360 s	UVB Slit: 0.8x11 VIS Slit: 0.9x11 NIR Slit: 0.6x11 UVB readout mode: 100k/1pt/hg VIS readout mode: 100k/1pt/hg Integration Time: 1500 s Instrument Overheads: 240 s Signal/Noise: 0.0

Target • Gaia DR3 6348008564530896768 • 21:33:06.505 • -82:49:06.250 Tel. Time: 00h25m

OS 1	SLT	SLT
Tel. Time: 1500 s Repeat: 1 x Total Tel. Time: 1500s	Telescope Overheads: 360 s	UVB Slit: 0.8x11 VIS Slit: 0.9x11 NIR Slit: 0.6x11 UVB readout mode: 100k/1pt/hg VIS readout mode: 100k/1pt/hg Integration Time: 900 s Instrument Overheads: 240 s Signal/Noise: 0.0

Target • Gaia DR3 4615941716839404800 • 03:56:22.427 • -82:47:52.797 Tel. Time: 00h20m

OS 1	SLT	SLT
Tel. Time: 1200 s Repeat: 1 x Total Tel. Time: 1200s	Telescope Overheads: 360 s	UVB Slit: 0.8x11 VIS Slit: 0.9x11 NIR Slit: 0.6x11 UVB readout mode: 100k/1pt/hg VIS readout mode: 100k/1pt/hg Integration Time: 600 s Instrument Overheads: 240 s Signal/Noise: 0.0

Target • Gaia DR3 4630021031952040064 • 00:26:21.615 • -82:49:26.321 Tel. Time: 00h25m

OS 1	SLT	SLT
Tel. Time: 1500 s Repeat: 1 x Total Tel. Time: 1500s	Telescope Overheads: 360 s	UVB Slit: 0.8x11 VIS Slit: 0.9x11 NIR Slit: 0.6x11 UVB readout mode: 100k/1pt/hg VIS readout mode: 100k/1pt/hg Integration Time: 900 s Instrument Overheads: 240 s Signal/Noise: 0.0

Target • Gaia DR3 6364335869824177280 • 19:26:24.171 • -78:20:02.659 Tel. Time: 00h25m

OS 1	SLT	SLT
Tel. Time: 1500 s Repeat: 1 x Total Tel. Time: 1500s	Telescope Overheads: 360 s	UVB Slit: 0.8x11 VIS Slit: 0.9x11 NIR Slit: 0.6x11 UVB readout mode: 100k/1pt/hg VIS readout mode: 100k/1pt/hg Integration Time: 900 s Instrument Overheads: 240 s Signal/Noise: 0.0

Target • Gaia DR3 6361333756403646080 • 19:28:27.237 • -78:21:38.888 Tel. Time: 00h25m

OS 1	SLT	SLT
Tel. Time: 1500 s Repeat: 1 x Total Tel. Time: 1500s	Telescope Overheads: 360 s	UVB Slit: 0.8x11 VIS Slit: 0.9x11 NIR Slit: 0.6x11 UVB readout mode: 100k/1pt/hg VIS readout mode: 100k/1pt/hg Integration Time: 900 s Instrument Overheads: 240 s Signal/Noise: 0.0

Target • Gaia DR3 2621073615668045824 • 22:07:57.459 • -05:05:50.704 Tel. Time: 00h25m

OS 1	SLT	SLT
Tel. Time: 1500 s Repeat: 1 x Total Tel. Time: 1500s	Telescope Overheads: 360 s	UVB Slit: 0.8x11 VIS Slit: 0.9x11 NIR Slit: 0.6x11 UVB readout mode: 100k/1pt/hg VIS readout mode: 100k/1pt/hg Integration Time: 900 s

Instrument Overheads: 240 s
Signal/Noise: 0.0

Target • Gaia DR3 2606747971294886400 • 22:55:08.693 • -09:56:44.914 Tel. Time: 00h35m

OS 1	SLT	SLT
Tel. Time: 2100 s Repeat: 1 x Total Tel. Time: 2100s	Telescope Overheads: 360 s	UVB Slit: 0.8x11 VIS Slit: 0.9x11 NIR Slit: 0.6x11 UVB readout mode: 100k/1pt/hg VIS readout mode: 100k/1pt/hg Integration Time: 1500 s Instrument Overheads: 240 s Signal/Noise: 0.0

Target • Gaia DR3 2622836197232267648 • 22:32:12.602 • -06:28:41.371 Tel. Time: 00h25m

OS 1	SLT	SLT
Tel. Time: 1500 s Repeat: 1 x Total Tel. Time: 1500s	Telescope Overheads: 360 s	UVB Slit: 0.8x11 VIS Slit: 0.9x11 NIR Slit: 0.6x11 UVB readout mode: 100k/1pt/hg VIS readout mode: 100k/1pt/hg Integration Time: 900 s Instrument Overheads: 240 s Signal/Noise: 0.0

Target • Gaia DR3 2627910688207002112 • 22:30:46.681 • -04:05:43.970 Tel. Time: 00h25m

OS 1	SLT	SLT
Tel. Time: 1500 s Repeat: 1 x Total Tel. Time: 1500s	Telescope Overheads: 360 s	UVB Slit: 0.8x11 VIS Slit: 0.9x11 NIR Slit: 0.6x11 UVB readout mode: 100k/1pt/hg VIS readout mode: 100k/1pt/hg Integration Time: 900 s Instrument Overheads: 240 s Signal/Noise: 0.0

Target • Gaia DR3 2533226244381309440 • 01:05:40.757 • -00:33:13.854 Tel. Time: 00h35m

OS 1	SLT	SLT
Tel. Time: 2100 s Repeat: 1 x Total Tel. Time: 2100s	Telescope Overheads: 360 s	UVB Slit: 0.8x11 VIS Slit: 0.9x11 NIR Slit: 0.6x11 UVB readout mode: 100k/1pt/hg VIS readout mode: 100k/1pt/hg Integration Time: 1500 s Instrument Overheads: 240 s Signal/Noise: 0.0

Target • Gaia DR3 2680484931906216576 • 22:04:45.271 • 00:31:41.849 Tel. Time: 00h35m

OS 1	SLT	SLT
Tel. Time: 2100 s Repeat: 1 x Total Tel. Time: 2100s	Telescope Overheads: 360 s	UVB Slit: 0.8x11 VIS Slit: 0.9x11 NIR Slit: 0.6x11 UVB readout mode: 100k/1pt/hg VIS readout mode: 100k/1pt/hg Integration Time: 1500 s Instrument Overheads: 240 s Signal/Noise: 0.0

Target • Gaia DR3 2533843203548158848 • 01:24:12.472 • -01:00:49.813 Tel. Time: 00h35m

OS 1	SLT	SLT
Tel. Time: 2100 s Repeat: 1 x Total Tel. Time: 2100s	Telescope Overheads: 360 s	UVB Slit: 0.8x11 VIS Slit: 0.9x11 NIR Slit: 0.6x11 UVB readout mode: 100k/1pt/hg

VIS readout mode: 100k/1pt/hg
Integration Time: 1500 s
Instrument Overheads: 240 s
Signal/Noise: 0.0

Target • Gaia DR3 2349552547787827456 • 00:47:05.679 • -22:04:48.323 Tel. Time: 00h25m

OS 1	SLT	SLT
Tel. Time: 1500 s Repeat: 1 x Total Tel. Time: 1500s	Telescope Overheads: 360 s	UVB Slit: 0.8x11 VIS Slit: 0.9x11 NIR Slit: 0.6x11 UVB readout mode: 100k/1pt/hg VIS readout mode: 100k/1pt/hg Integration Time: 900 s Instrument Overheads: 240 s Signal/Noise: 0.0

Target • Gaia DR3 5046637047256088320 • 03:07:07.648 • -37:24:05.435 Tel. Time: 00h35m

OS 1	SLT	SLT
Tel. Time: 2100 s Repeat: 1 x Total Tel. Time: 2100s	Telescope Overheads: 360 s	UVB Slit: 0.8x11 VIS Slit: 0.9x11 NIR Slit: 0.6x11 UVB readout mode: 100k/1pt/hg VIS readout mode: 100k/1pt/hg Integration Time: 1500 s Instrument Overheads: 240 s Signal/Noise: 0.0

Target • Gaia DR3 2601407505880573696 • 22:36:13.129 • -12:53:38.187 Tel. Time: 00h35m

OS 1	SLT	SLT
Tel. Time: 2100 s Repeat: 1 x Total Tel. Time: 2100s	Telescope Overheads: 360 s	UVB Slit: 0.8x11 VIS Slit: 0.9x11 NIR Slit: 0.6x11 UVB readout mode: 100k/1pt/hg VIS readout mode: 100k/1pt/hg Integration Time: 1500 s Instrument Overheads: 240 s Signal/Noise: 0.0

Target • Gaia DR3 2601835941752991872 • 22:34:33.447 • -11:47:24.599 Tel. Time: 00h25m

OS 1	SLT	SLT
Tel. Time: 1500 s Repeat: 1 x Total Tel. Time: 1500s	Telescope Overheads: 360 s	UVB Slit: 0.8x11 VIS Slit: 0.9x11 NIR Slit: 0.6x11 UVB readout mode: 100k/1pt/hg VIS readout mode: 100k/1pt/hg Integration Time: 900 s Instrument Overheads: 240 s Signal/Noise: 0.0

Target • Gaia DR3 2680349107859540096 • 22:04:44.169 • -00:26:37.779 Tel. Time: 00h35m

OS 1	SLT	SLT
Tel. Time: 2100 s Repeat: 1 x Total Tel. Time: 2100s	Telescope Overheads: 360 s	UVB Slit: 0.8x11 VIS Slit: 0.9x11 NIR Slit: 0.6x11 UVB readout mode: 100k/1pt/hg VIS readout mode: 100k/1pt/hg Integration Time: 1500 s Instrument Overheads: 240 s Signal/Noise: 0.0

Target • Gaia DR3 2421099800928223232 • 23:56:59.214 • -12:50:58.213 Tel. Time: 00h35m

OS 1	SLT	SLT
Tel. Time: 2100 s Repeat: 1 x	Telescope Overheads: 360 s	UVB Slit: 0.8x11 VIS Slit: 0.9x11

Total Tel. Time: 2100s		NIR Slit: 0.6x11 UVB readout mode: 100k/1pt/hg VIS readout mode: 100k/1pt/hg Integration Time: 1500 s Instrument Overheads: 240 s Signal/Noise: 0.0

Target • Gaia DR3 2678285084016522112 • 22:23:41.108 • 00:01:38.033 Tel. Time: 00h25m

OS 1 Tel. Time: 1500 s Repeat: 1 x Total Tel. Time: 1500s	**SLT** Telescope Overheads: 360 s	**SLT** UVB Slit: 0.8x11 VIS Slit: 0.9x11 NIR Slit: 0.6x11 UVB readout mode: 100k/1pt/hg VIS readout mode: 100k/1pt/hg Integration Time: 900 s Instrument Overheads: 240 s Signal/Noise: 0.0

Target • Gaia DR3 2558431960037099264 • 01:27:02.528 • 01:14:12.465 Tel. Time: 00h35m

OS 1 Tel. Time: 2100 s Repeat: 1 x Total Tel. Time: 2100s	**SLT** Telescope Overheads: 360 s	**SLT** UVB Slit: 0.8x11 VIS Slit: 0.9x11 NIR Slit: 0.6x11 UVB readout mode: 100k/1pt/hg VIS readout mode: 100k/1pt/hg Integration Time: 1500 s Instrument Overheads: 240 s Signal/Noise: 0.0

Target • Gaia DR3 4703768674144797824 • 00:31:28.271 • -68:07:14.203 Tel. Time: 00h35m

OS 1 Tel. Time: 2100 s Repeat: 1 x Total Tel. Time: 2100s	**SLT** Telescope Overheads: 360 s	**SLT** UVB Slit: 0.8x11 VIS Slit: 0.9x11 NIR Slit: 0.6x11 UVB readout mode: 100k/1pt/hg VIS readout mode: 100k/1pt/hg Integration Time: 1500 s Instrument Overheads: 240 s Signal/Noise: 0.0

Target • Gaia DR3 4710253357503073920 • 01:07:10.611 • -62:36:48.387 Tel. Time: 00h35m

OS 1 Tel. Time: 2100 s Repeat: 1 x Total Tel. Time: 2100s	**SLT** Telescope Overheads: 360 s	**SLT** UVB Slit: 0.8x11 VIS Slit: 0.9x11 NIR Slit: 0.6x11 UVB readout mode: 100k/1pt/hg VIS readout mode: 100k/1pt/hg Integration Time: 1500 s Instrument Overheads: 240 s Signal/Noise: 0.0

Target • Gaia DR3 4909573989321693440 • 01:27:16.879 • -58:02:47.369 Tel. Time: 00h35m

OS 1 Tel. Time: 2100 s Repeat: 1 x Total Tel. Time: 2100s	**SLT** Telescope Overheads: 360 s	**SLT** UVB Slit: 0.8x11 VIS Slit: 0.9x11 NIR Slit: 0.6x11 UVB readout mode: 100k/1pt/hg VIS readout mode: 100k/1pt/hg Integration Time: 1500 s Instrument Overheads: 240 s Signal/Noise: 0.0