

13443 - Proper Motions along the Orphan Stream: Finding the Parent, Orbit, and Milky Way Halo Shape

Cycle: 21, Proposal Category: GO (Availability Mode: SUPPORTED)

INVESTIGATORS

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VISITS

Visit	Targets used in Visit	Configurations used in Visit	Orbits Used	Last Orbit Planner Run	OP Current with Visit?
01	(1) ORPHAN-STREAM-FIELD1	ACS/WFC WFC3/UVIS	2	07-Jun-2013 21:01:38.0	yes
02	(1) ORPHAN-STREAM-FIELD1	ACS/WFC WFC3/UVIS	2	07-Jun-2013 21:01:56.0	yes
03	(2) ORPHAN-STREAM-FIELD2	ACS/WFC WFC3/UVIS	2	07-Jun-2013 21:02:12.0	yes

Visit	Targets used in Visit	Configurations used in Visit	Orbits Used	Last Orbit Planner Run	OP Current with Visit?
04	(2) ORPHAN-STREAM-FIELD2	ACS/WFC WFC3/UVIS	2	07-Jun-2013 21:02:26.0	yes
05	(3) ORPHAN-STREAM-FIELD3	ACS/WFC WFC3/UVIS	2	07-Jun-2013 21:02:41.0	yes
06	(3) ORPHAN-STREAM-FIELD3	ACS/WFC WFC3/UVIS	2	07-Jun-2013 21:02:55.0	yes
07	(4) ORPHAN-STREAM-FIELD4	ACS/WFC WFC3/UVIS	2	07-Jun-2013 21:03:13.0	yes
08	(4) ORPHAN-STREAM-FIELD4	ACS/WFC WFC3/UVIS	2	07-Jun-2013 21:03:26.0	yes

Proposal 13443 (STScI Edit Number: 0, Created: Friday, June 7, 2013 8:03:36 PM EST) - Overview

16 Total Orbits Used

ABSTRACT

Stellar streams in the Milky Way (MW) support the view that much of its halo was formed hierarchically via the tidal disruption of dwarf galaxies and globular clusters. These streams are unique dynamical tracers of the dark matter halo, and provide strong tests of galaxy formation models. The Orphan Stream, discovered in the SDSS survey area, is closer, colder, and fainter than the better known Sagittarius (Sgr) Stream, and it has no known parent galaxy. It therefore allows a study of the less-massive objects that built up the MW halo. Lack of proper motion (PM) data limits our understanding of stream orbits and MW dark halo properties. HST's excellent astrometric accuracy can now address this, as demonstrated by our ongoing Sgr Stream study. We propose here to map the PM variation along the Orphan Stream. We will target four fields with ACS/WFC for which serendipitous first-epoch observations exist in the Archive with 10-12 yr time baselines. PM accuracies near 6 km/s will be achieved by measuring the relative motion between stream stars and background galaxies, using techniques developed by us for other successful PM programs (e.g., LMC/SMC, Leo I, M31). We will interpret the results using dynamical calculations and N-body models, using our techniques already developed for modeling the Sgr and Magellanic Streams. Our study will yield the orbit of the Orphan Stream, which in turn may allow us to identify its progenitor (if not already entirely disrupted). The orbit will also strongly constrain the shape and mass of the MW dark halo, especially when combined with our ongoing studies of other streams.

Proposal 13443 (STScI Edit Number: 0, Created: Friday, June 7, 2013 8:03:36 PM EST) - Overview **OBSERVING DESCRIPTION**

To measure the absolute proper motion of stars associated with the Orphan stellar stream in the four target fields, we will use compact background galaxies in the field of view as stationary reference sources. We will measure the average motion of stars in each target field between epochs 1 and 2 with respect to their reference sources. Our analysis techniques and expected accuracies are described in the Phase I proposal. First epoch ACS/WFC data are available in the archive from previous observing programs. The present project will obtain the second epoch data.

We will observe each target field for 4 orbits with ACS/WFC. We will use the I-band (F814W or F775W filter, depending on what was used in epoch 1) for astrometry and the V-band (F606W filter) to construct color-magntude diagrams (CMDs). Individual exposures will be dithered using customized patterns designed by J. Anderson (STScI) to maximize pixel phase coverage. These are specificied using POS TARGs on the individual exposures; no pre-specified patterns are used. To maximize the overlapping area and to minimize systematics dependent on location on the detector, we request the same orientations and coordinates as used by the first-epoch observations. We also require that each target field be imaged in 30 day windows so that they can be treated as single epoch data for astrometric analyses.

During our second epoch observations, the WFC3/UVIS camera will be pointed ~6 arcmin away from our target fields. These parallel fields will be observed with F814W and F606W filters to construct CMDs and to study also the stellar population of the Orphan stellar stream.

Finally, to mitigate the impact of CTE in our science which is important for astrometric analyses, we will use the FLASH optional parameters on all of the ACS and WFC3 exposures.

Proposal 13443 - FIELD1-Visit1 (01) - Proper Motions along the Orphan Stream: Finding the Parent, Orbit, and Milky Way Halo Shape

	Proposal 1	3443, FIELD1-Visit1 (01))			Sat Jun 08 01:03:37 GMT 2013		
	Diagnostic	Status: No Diagnostics						
sit	Scientific I	instruments: WFC3/UVIS,	ACS/WFC					
Ë	Special Requirements: ORIENT 118.74D TO 118.74 D; GROUP 01,02 WITHIN 30D							
	Comments. exactly may observed in	: This is the first visit for in tch the previous observatio 1 a 30 day window so that t	naging ORPHAN-STREAM-1 field. Two orbits of ms of PID 9468. We adopt a customized dither they can be treated as single epoch data for astr	are required to complete this visit. Since of pattern designed to optimally cover the pi rometric analysis.	our goal is to measure proper moti ixel phase using the POS-TARG sp	ons of stars in the target field, our orientation is set to ecial requirements. We require that Visits 01 and 02 be		
ts	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous		
ge	(1)	ORPHAN-STREAM-	RA: 10 03 48.9000 (150.9537500d)		V=24+/-2	Reference Frame: ICRS		
Tar		FIELD1	Dec: +29 06 12.80 (29.10356d)					
д			Equinox: J2000					
i,								

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(1) ORPHAN-STRE	ACS/WFC, ACCUM, WFC	F814W		POS TARG 0.0000,0	Sequence 1-6 Non-In	795 Secs (794 Secs)	
		ÀM-FIELD1				.0000	t in FIELD1-Visit1 (01)	[==>794.0 Secs]	
							Prime + Parallel Gro up 1-2 in Sequence 1 -6 Non-Int in FIELD 1-Visit1 (01)		[1]
2		(1) ORPHAN-STRE	WFC3/UVIS, ACCUM, UVIS	F606W			Sequence 1-6 Non-In	800 Secs (800 Secs)	
		AM-FIELD1					t in FIELD1-Visit1 (01)	[==>800.0 Secs]	
							Prime + Parallel Gro up 1-2 in Sequence 1 -6 Non-Int in FIELD 1-Visit1 (01)		[1]
3		(1) ORPHAN-STRE	ACS/WFC, ACCUM, WFC	F814W		POS TARG 0.2141,0	Sequence 1-6 Non-In	795 Secs (794 Secs)	
		AM-FIELD1				.0161	t in FIELD1-Visit1 (01)	[==>794.0 Secs]	
							Prime + Parallel Gro up 3-4 in Sequence 1 -6 Non-Int in FIELD 1-Visit1 (01)		[1]
4		(1) ORPHAN-STRE	WFC3/UVIS, ACCUM, UVIS	F814W			Sequence 1-6 Non-In	800 Secs (800 Secs)	
		AM-FIELD1					t in FIELD1-Visit1 (01)	[==>800.0 Secs]	
sarres							Prime + Parallel Gro up 3-4 in Sequence 1 -6 Non-Int in FIELD 1-Visit1 (01)		[1]
0 5	5	(1) ORPHAN-STRE	ACS/WFC, ACCUM, WFC	F814W		POS TARG 0.4281,0	Sequence 1-6 Non-In	794 Secs (793 Secs)	
Ě		AM-FIELD1				.0322	t in FIELD1-Visit1 (01)	[==>793.0 Secs]	
							Prime + Parallel Gro up 5-6 in Sequence 1 -6 Non-Int in FIELD 1-Visit1 (01)		[1]
6		(1) ORPHAN-STRE	WFC3/UVIS, ACCUM, UVIS	F814W			Sequence 1-6 Non-In	800 Secs (800 Secs)	
		AM-FIELD1					t in FIELD1-Visit1 (01)	[==>]	
							Prime + Parallel Gro up 5-6 in Sequence 1 -6 Non-Int in FIELD 1-Visit1 (01)		[1]
7		(1) ORPHAN-STRE	ACS/WFC, ACCUM, WFC	F814W		POS TARG 0.0504,0	Sequence 7-12 Non-I	859 Secs (859 Secs)	
		AM-FIELD1				.2183	nt in FIELD1-Visit1 (01)	[==>859.0 Secs]	
							Prime + Parallel Gro up 7-8 in Sequence 7 -12 Non-Int in FIEL D1-Visit1 (01)		[2]
8		(1) ORPHAN-STRE	WFC3/UVIS, ACCUM, UVIS	F606W			Sequence 7-12 Non-I	800 Secs (846 Secs)	
		AM-FIELD1					nt in FIELD1-Visit1 (01)	[==>846.0 Secs]	
							Prime + Parallel Gro up 7-8 in Sequence 7 -12 Non-Int in FIEL D1-Visit1 (01)		[2]

Proposal 13443 - FIELD1-Visit1 (01) - Proper Motions along the Orphan Stream: Finding the Parent, Orbit, and Milky Way Halo Shape

Proposal 1344	3 - FIELD1-Visit1 (01)	- Proper Motions alo	ng the Orphan Strean	n: Finding the Parent	t, Orbit, and M	ilky Way Halo S	Shape

9	(1) ORPHAN-STRE ACS/WFC, ACCUM, WFC	F814W	POS TARG 0.2644,0	Sequence 7-12 Non-I	859 Secs (859 Secs)	
	AM-FIELD1		.2344	nt in FIELD1-Visit1 (01)	[==>859.0 Secs]	
				Prime + Parallel Gro up 9-10 in Sequence 7-12 Non-Int in FIE LD1-Visit1 (01)		[2]
10	(1) ORPHAN-STRE WFC3/UVIS, ACCUM, UVIS	F814W		Sequence 7-12 Non-I	800 Secs (846 Secs)	
	AM-FIELDI			nt in FIELD1-Visit1 (01)	[==>846.0 Secs]	
				Prime + Parallel Gro up 9-10 in Sequence 7-12 Non-Int in FIE LD1-Visit1 (01)		[2]
11	(1) ORPHAN-STRE ACS/WFC, ACCUM, WFC	F814W	POS TARG 0.4784,0) Sequence 7-12 Non-	859 Secs (859 Secs)	
	AM-FIELDI		.2505	(01) nt in FIELD1-Visit1	[==>859.0 Secs]	
				Prime + Parallel Gro up 11-12 in Sequenc e 7-12 Non-Int in FI ELD1-Visit1 (01)		[2]
12	(1) ORPHAN-STRE WFC3/UVIS, ACCUM, UVIS	F814W		Sequence 7-12 Non-I	800 Secs (869 Secs)	
	AM-FIELDI			$\begin{array}{c} \text{nt in FIELDI-Visiti} \\ (01) \end{array}$	[==>869.0 Secs]	
				Prime + Parallel Gro up 11-12 in Sequenc e 7-12 Non-Int in FI ELD1-Visit1 (01)		[2]



Proposal 13443 - FIELD1-Visit2 (02) - Proper Motions along the Orphan Stream: Finding the Parent, Orbit, and Milky Way Halo Shape

	Proposal	13443, FIELD1-Visit2 (02)			Sat Jun 08 01:03:40 GMT 2013			
	Diagnosti	ic Status: No Diagnostics							
s;	Scientific Instruments: WFC3/UVIS, ACS/WFC								
Ë	Special Re	equirements: SAME ORIEN	NT AS 01; GROUP 02,01 WITHIN 30D						
	Comments exactly ma observed i	s: This is the second visit fo atch the previous observatic in a 30 day window so that	r imaging ORPHAN-STREAM-1 field. Two orl ons of PID 9468. We adopt a customized dither they can be treated as single epoch data for as	bits are required to complete this visit. Sinc r pattern designed to optimally cover the pi trometric analysis.	ce our goal is to measure proper mo ixel phase using the POS-TARG spe	otions of stars in the target field, our orientation is set to ecial requirements. We require that Visits 01 and 02 be			
ts	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous			
e e	(1)	ORPHAN-STREAM-	RA: 10 03 48.9000 (150.9537500d)		V=24+/-2	Reference Frame: ICRS			
Ta,		FIELD1	Dec: +29 06 12.80 (29.10356d)						
ত			Equinox: J2000						
Ĭ									

	# Lab	bel	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(1) ORPHAN-STRE	ACS/WFC, ACCUM, WFC	F814W		POS TARG 0.1008,0	Sequence 1-6 Non-In	795 Secs (794 Secs)	
			AM-FIELD1				.4366	t in FIELD1-Visit2 (02)	[==>794.0 Secs]	
								Prime + Parallel Gro		[1]
								up 1-2 in Sequence 1		[1]
								1-Visit2 (02)		
	2		(1) ORPHAN-STRE	WFC3/UVIS, ACCUM, UVIS	F606W			Sequence 1-6 Non-In	800 Secs (800 Secs)	
			AM-FIELDI					t in FIELD1-Visit2 (02)	[==>800.0 Secs]	
							Prime + Parallel Gro		m	
								up 1-2 in Sequence 1 -6 Non-Int in FIELD		[1]
								1-Visit2 (02)		
	3		(1) ORPHAN-STRE	ACS/WFC, ACCUM, WFC	F814W		POS TARG 0.3148,0	Sequence 1-6 Non-In	795 Secs (794 Secs)	
			AM-FIELDI				.4327	(111 FIELD1 - VISIL2)	[==>794.0 Secs]	
								Prime + Parallel Gro		m
								up 3-4 in Sequence 1 -6 Non-Int in FIELD		[1]
								1-Visit2 (02)		
	4		(1) ORPHAN-STRE	WFC3/UVIS, ACCUM, UVIS	F814W			Sequence 1-6 Non-In	800 Secs (800 Secs)	
			AM-FIELDI					(02)	[==>800.0 Secs]	
								Prime + Parallel Gro		m
es								up 3-4 in Sequence 1 -6 Non-Int in FIELD		[-]
sul								1-Visit2 (02)		
od	5		(1) ORPHAN-STRE	ACS/WFC, ACCUM, WFC	F814W		POS TARG 0.5288,0	Sequence 1-6 Non-In	794 Secs (793 Secs)	
Ш			AM-TIELDT	IM-MEEDI			.4000	(02)	[==>793.0 Secs]	
								Prime + Parallel Gro		m
								-6 Non-Int in FIELD		2-3
								1-Visit2 (02)		
	6		(1) ORPHAN-STRE	WFC3/UVIS, ACCUM, UVIS	F814W			Sequence 1-6 Non-Ir	800 Secs (800 Secs)	
								02)	[==>]	
								Prime + Parallel Gro		ш
								-6 Non-Int in FIELD		
								1-Visit2 (02)		
	7		(1) ORPHAN-STRE AM-FIFL D1	ACS/WFC, ACCUM, WFC	F606W		POS TARG 0.0000,0	Sequence 7-12 Non-I nt in FIFI D1-Visit2	840 Secs (840 Secs)	
							.0000	(02)	[==>840.0 Secs]	
								Prime + Parallel Gro		[2]
								-12 Non-Int in FIEL		
								D1-Visit2 (02)		
	8		(1) ORPHAN-STRE	WFC3/UVIS, ACCUM, UVIS	F606W			Sequence 7-12 Non-I nt in FIFI D1-Visit2	800 Secs (882 Secs)	
			AM-TILLDT					(02)	[==>882.0 Secs]	
								Prime + Parallel Gro		
								-12 Non-Int in FIEL		[2]
								D1-Visit2 (02)		
									1	1

<u>Pr</u>	oposal 1	3443 - FIELD1-Visit2 (02) - Proper Motio	ons along the Orphan St	ream: Finding the	e Parent, Orbit	<u>t, and Milky Way Halo S</u>	hape
Γ	9	(1) ORPHAN-STRE ACS/WFC, ACCUM, WFC	F606W	POS TARG 0.1150,0	Sequence 7-12 Non-I	840 Secs (840 Secs)	
		AM-HEEDI		.1250	(02)	[==>840.0 Secs]	
					Prime + Parallel Gro up 9-10 in Sequence 7-12 Non-Int in FIE		[2]
	10	(1) ODDHAN STDE WECZUNUS ACCUM UNIS	E91AW		LDI-VISIt2 (02)	800 Saas (827 Saas)	
	10	AM-FIELD1	Г014W		nt in FIELD1-Visit2	[==>827.0 Secs]	
					Prime + Parallel Gro up 9-10 in Sequence 7-12 Non-Int in FIE LD1-Visit2 (02)		[2]
	11	(1) ORPHAN-STRE ACS/WFC, ACCUM, WFC	F606W	POS TARG 0.2310,0	Sequence 7-12 Non-I	840 Secs (840 Secs)	
		AM-FIELD1		.2490	nt in FIELD1-Visit2 (02)	[==>840.0 Secs]	
					Prime + Parallel Gro up 11-12 in Sequenc e 7-12 Non-Int in FI ELD1-Visit2 (02)		[2]
	12	(1) ORPHAN-STRE WFC3/UVIS, ACCUM, UVIS	F814W		Sequence 7-12 Non-I	800 Secs (850 Secs)	
		AM-FIELDI			nt in FIELD1-Visit2 (02)	[==>850.0 Secs]	
					Prime + Parallel Gro up 11-12 in Sequenc e 7-12 Non-Int in FI ELD1-Visit2 (02)		[2]



Proposal 13443 - FIELD2-Visit1 (03) - Proper Motions along the Orphan Stream: Finding the Parent, Orbit, and Milky Way Halo Shape

nostic Status: No Diagnostics ntific Instruments: WFC3/UVIS,	ACS/WEC											
ntific Instruments: WFC3/UVIS,	ACS/WFC		Diagnostic Status: No Diagnostics									
Scientific Instruments: WFC3/UVIS, ACS/WFC												
Special Requirements: ORIENT 109.64D TO 109.64 D; GROUP 03,04 WITHIN 30D												
ments: This is the first visit for im tly match the previous observatio rved in a 30 day window so that t	naging ORPHAN-STREAM-2 field. Two orbits ar ns of PID 9575. We adopt a customized dither pa hey can be treated as single epoch data for astro	e required to complete this visit. Since our ge ttern designed to optimally cover the pixel p netric analysis.	oal is to measure proper motions of hase using the POS-TARG special .	f stars in the target field, our orientation is set to requirements. We require that Visits 03 and 04 be								
Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous								
ORPHAN-STREAM-	RA: 10 19 16.4000 (154.8183333d)		V=24+/-2	Reference Frame: ICRS								
FIELD2	Dec: +20 02 11.70 (20.03658d)											
	Equinox: J2000											
ii m tl	al Requirements: ORIENT 109.6 nents: This is the first visit for in y match the previous observatio ved in a 30 day window so that t Name ORPHAN-STREAM- FIELD2	al Requirements: ORIENT 109.64D TO 109.64 D; GROUP 03,04 WITHIN 30D nents: This is the first visit for imaging ORPHAN-STREAM-2 field. Two orbits are y match the previous observations of PID 9575. We adopt a customized dither pay ved in a 30 day window so that they can be treated as single epoch data for astron Name Target Coordinates ORPHAN-STREAM- FIELD2 RA: 10 19 16.4000 (154.8183333d) Dec: +20 02 11.70 (20.03658d) Equinox: J2000	al Requirements: ORIENT 109.64D TO 109.64 D; GROUP 03,04 WITHIN 30D nents: This is the first visit for imaging ORPHAN-STREAM-2 field. Two orbits are required to complete this visit. Since our go y match the previous observations of PID 9575. We adopt a customized dither pattern designed to optimally cover the pixel pro- ved in a 30 day window so that they can be treated as single epoch data for astrometric analysis. Name Target Coordinates Targ. Coord. Corrections ORPHAN-STREAM- FIELD2 RA: 10 19 16.4000 (154.8183333d) Dec: +20 02 11.70 (20.03658d) Equinox: J2000	al Requirements: ORIENT 109.64D TO 109.64 D; GROUP 03,04 WITHIN 30D nents: This is the first visit for imaging ORPHAN-STREAM-2 field. Two orbits are required to complete this visit. Since our goal is to measure proper motions of y match the previous observations of PID 9575. We adopt a customized dither pattern designed to optimally cover the pixel phase using the POS-TARG special ved in a 30 day window so that they can be treated as single epoch data for astrometric analysis. Name Target Coordinates Targ. Coord. Corrections Fluxes ORPHAN-STREAM- FIELD2 RA: 10 19 16.4000 (154.8183333d) V=24+/-2 Dec: +20 02 11.70 (20.03658d) Equinox: J2000 Equinox: J2000								

	# Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	(2) ORPHAN-STRE	ACS/WFC, ACCUM, WFC	F775W		POS TARG 0.0000,0	Sequence 1-6 Non-In	791 Secs (786 Secs)	
		ÀM-FIELD2				.0000	t in FIELD2-Visit1 (03)	[==>786.0 Secs]	
							Prime + Parallel Gro up 1-2 in Sequence 1 -6 Non-Int in FIELD 2-Visit1 (03)		[1]
	2	(2) ORPHAN-STRE	WFC3/UVIS, ACCUM, UVIS	F606W			Sequence 1-6 Non-In	800 Secs (810 Secs)	
		AM-FIELD2					t in FIELD2-Visit1 (03)	[==>810.0 Secs]	
							Prime + Parallel Gro up 1-2 in Sequence 1 -6 Non-Int in FIELD 2-Visit1 (03)		[1]
	3	(2) ORPHAN-STRE	ACS/WFC, ACCUM, WFC	F775W		POS TARG 0.2141,0	Sequence 1-6 Non-In	791 Secs (786 Secs)	
		AM-FIELD2				.0161	t in FIELD2-Visit1 (03)	[==>786.0 Secs]	
							Prime + Parallel Gro up 3-4 in Sequence 1 -6 Non-Int in FIELD 2-Visit1 (03)		[1]
	4	(2) ORPHAN-STRE	WFC3/UVIS, ACCUM, UVIS	F814W			Sequence 1-6 Non-In	800 Secs (810 Secs)	
		AM-FIELD2					t in FIELD2-Visit1 (03)	[==>810.0 Secs]	
sures							Prime + Parallel Gro up 3-4 in Sequence 1 -6 Non-Int in FIELD 2-Visit1 (03)		[1]
ő	5 (2) ORPHAN-STRE	ACS/WFC, ACCUM, WFC	F775W		POS TARG 0.4281,0	Sequence 1-6 Non-In	791 Secs (786 Secs)		
Exp		AM-FIELD2				.0322	t in FIELD2-Visit1 (03)	[==>786.0 Secs]	
							Prime + Parallel Gro up 5-6 in Sequence 1 -6 Non-Int in FIELD 2-Visit1 (03)		[1]
	6	(2) ORPHAN-STRE	WFC3/UVIS, ACCUM, UVIS	F814W			Sequence 1-6 Non-Ir	800 Secs (810 Secs)	
		AM-FIELD2					t in FIELD2-Visit1 (03)	[==>810.0 Secs]	
							Prime + Parallel Gro up 5-6 in Sequence 1 -6 Non-Int in FIELD 2-Visit1 (03)		[1]
	7	(2) ORPHAN-STRE	ACS/WFC, ACCUM, WFC	F775W		POS TARG 0.0504,0	Sequence 7-12 Non-I	856 Secs (856 Secs)	
		AM-FIELD2				.2183	nt in FIELD2-Visit1 (03)	[==>856.0 Secs]	
							Prime + Parallel Gro up 7-8 in Sequence 7 -12 Non-Int in FIEL D2-Visit1 (03)		[2]
	8	(2) ORPHAN-STRE	WFC3/UVIS, ACCUM, UVIS	F606W			Sequence 7-12 Non-I	800 Secs (843 Secs)	
		AM-FIELD2					nt in FIELD2-Visit1 (03)	[==>843.0 Secs]	
							Prime + Parallel Gro up 7-8 in Sequence 7 -12 Non-Int in FIEL D2-Visit1 (03)		[2]

Proposal 13443 - FIELD2-Visit1 (03) - Proper Motions along the Orphan Stream: Finding the Parent, Orbit, and Milky Way Halo Shape

posal 1	13443 - FIELD2-Visit1 (03) - Proper Moti	ons along the O	rphan Stream: Finding the	<u>e Parent, Orbit</u>	<u>t, and Milky Way Halo S</u>	<u>Shape</u>
9	(2) ORPHAN-STRE ACS/WFC, ACCUM, WFC AM-FIELD2	F775W	POS TARG 0.2644,0 .2344	Sequence 7-12 Non-I nt in FIELD2-Visit1 (03)	856 Secs (856 Secs) [==>856.0 Secs]	
				Prime + Parallel Gro up 9-10 in Sequence 7-12 Non-Int in FIE LD2-Visit1 (03)		[2]
10	(2) ORPHAN-STRE WFC3/UVIS, ACCUM, UVIS	F814W		Sequence 7-12 Non-I	800 Secs (843 Secs)	
	AM-FIELD2			nt in FIELD2-Visiti (03)	[==>843.0 Secs]	
				Prime + Parallel Gro up 9-10 in Sequence 7-12 Non-Int in FIE LD2-Visit1 (03)		[2]
11	(2) ORPHAN-STRE ACS/WFC, ACCUM, WFC	F775W	POS TARG 0.4784,0	Sequence 7-12 Non-I	856 Secs (856 Secs)	
	AM-FIELD2		.2505	nt in FIELD2-Visit1 (03)	[==>856.0 Secs]	
				Prime + Parallel Gro up 11-12 in Sequenc e 7-12 Non-Int in FI ELD2-Visit1 (03)		[2]
12	(2) ORPHAN-STRE WFC3/UVIS, ACCUM, UVIS	F814W		Sequence 7-12 Non-I	800 Secs (866 Secs)	
	AM-FIELD2			nt in FIELD2-Visit1 (03)	[==>866.0 Secs]	
				Prime + Parallel Gro up 11-12 in Sequenc e 7-12 Non-Int in FI ELD2-Visit1 (03)		[2]



Proposal 13443 - FIELD2-Visit1 (03) - Proper Motions along the Orphan Stream: Finding the Parent, Orbit, and Milky Way Halo Shape

Proposal 13443 - FIELD2-Visit2 (04) - Proper Motions along the Orphan Stream: Finding the Parent, Orbit, and Milky Way Halo Shape

	Proposal	13443, FIELD2-Visit2 (04)			Sat Jun 08 01:03:45 GMT 2013					
	Diagnosti	Diagnostic Status: No Diagnostics									
sit	Scientific	Instruments: WFC3/UVIS,	ACS/WFC								
Special Requirements: SAME ORIENT AS 03; GROUP 04,03 WITHIN 30D											
	Comments: This is the second visit for imaging ORPHAN-STREAM-2 field. Two orbits are required to complete this visit. Since our goal is to measure proper motions of stars in the target field, our orientation is set to exactly match the previous observations of PID 9575. We adopt a customized dither pattern designed to optimally cover the pixel phase using the POS-TARG special requirements. We require that Visits 03 and 04 be observed in a 30 day window so that they can be treated as single epoch data for astrometric analysis.										
ts	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous					
ge	(2)	ORPHAN-STREAM-	RA: 10 19 16.4000 (154.8183333d)		V=24+/-2	Reference Frame: ICRS					
Ta,		FIELD2	Dec: +20 02 11.70 (20.03658d)								
ত			Equinox: J2000								
Ĭ											

	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(2) ORPHAN-STRE	ACS/WFC, ACCUM, WFC	F775W		POS TARG 0.1008,0	Sequence 1-6 Non-In	791 Secs (786 Secs)	
			AM-FIELD2				.4366	t in FIELD2-Visit2 (04)	[==>786.0 Secs]	
								Prime + Parallel Gro		[1]
								-6 Non-Int in FIELD		
								2-Visit2 (04)		
	2		(2) ORPHAN-STRE AM-FIELD2	WFC3/UVIS, ACCUM, UVIS	F606W			t in FIELD2-Visit2 (800 Secs (810 Secs)	
								04)	I = >810.0 Secs I	
								Prime + Parallel Gro up 1-2 in Sequence 1		[1]
								-6 Non-Int in FIELD		
	2		(2) ODDIIAN STDE	ACSAVEC ACCUM WEC	E775W		DOS TADO 0 2149 0	2-V1sit2 (04)	701 Saas (786 Saas)	
	3		AM-FIELD2	ACS/WFC, ACCUM, WFC	F773W		.4527	t in FIELD2-Visit2 (191 Secs (780 Secs)	
								04)		
								Prime + Parallel Gro up 3-4 in Sequence 1		[1]
								-6 Non-Int in FIELD		
	4		(2) ODDUAN STDE	WEC2/INIS ACCUM LIVIS	E914W			2-VISIT2 (04)	800 Sees (810 Sees)	
	4		AM-FIELD2	wrc5/0 vis, Accom, 0 vis	1'014 W			t in FIELD2-Visit2 (1 = -5810.0 Secs 1	
								04) Di D 11.0		
ŝ								prime + Parallel Gro up 3-4 in Sequence 1		[1]
nre								-6 Non-Int in FIELD		
Sos	5		(2) ORPHAN-STRE	ACS/WFC, ACCUM, WFC	F775W		POS TARG 0.5288,0	Sequence 1-6 Non-In	791 Secs (786 Secs)	
Г Ц Ц			AM-FIELD2				.4688	t in FIELD2-Visit2 ([==>786.0 Secs]	
 -								Prime + Parallel Gro		
								up 5-6 in Sequence 1		[1]
								2-Visit2 (04)		
	6		(2) ORPHAN-STRE	WFC3/UVIS, ACCUM, UVIS	F814W			Sequence 1-6 Non-In	800 Secs (810 Secs)	
			AM-FIELD2					t in FIELD2-Visit2 (04)	[==>810.0 Secs]	
								Prime + Parallel Gro		[1]
								up 5-6 in Sequence 1 -6 Non-Int in FIFL D		[1]
								2-Visit2 (04)		
	7		(2) ORPHAN-STRE	ACS/WFC, ACCUM, WFC	F606W		POS TARG 0.0000,0	Sequence 7-12 Non-I	842 Secs (842 Secs)	
	1		AW-FIELD2				.0000	(04)	[==>842.0 Secs]	
	1							Prime + Parallel Gro		[2]
								up 7-8 in Sequence 7 -12 Non-Int in FIEL		[]
	Ļ							D2-Visit2 (04)		
	8		(2) ORPHAN-STRE AM-FIEL D2	WFC3/UVIS, ACCUM, UVIS	F606W			Sequence 7-12 Non-I nt in FIEI D2-Visit2	800 Secs (870 Secs)	
			1 1107-1 ILLD2					(04)	[==>870.0 Secs]	
								Prime + Parallel Gro		
								-12 Non-Int in FIEL		[2]
	1							D2-Visit2 (04)		

Proposal 13443 - FIELD2-Visit2 (04) - Proper Motions along the Orphan Stream: Finding the Parent, Orbit, and Milky Way Halo Shape

roposal	13443 - FIELD2-Visit2 (04) - Proper Moti	ons along the (<u> Drphan Stream: Finding the Parent, Orbit, and Milky Way Halo Shar</u>	ре
9	(2) ORPHAN-STRE ACS/WFC, ACCUM, WFC AM-FIELD2	F606W	POS TARG 0.1150,0Sequence 7-12 Non-I 842 Secs (842 Secs).1250nt in FIELD2-Visit2 (04) $[==>842.0$ Secs]	
			Prime + Parallel Gro up 9-10 in Sequence 7-12 Non-Int in FIE LD2-Visit2 (04)	2]
10	(2) ORPHAN-STRE WFC3/UVIS, ACCUM, UVIS AM-FIELD2	F814W	Sequence 7-12 Non-I 800 Secs (829 Secs) nt in FIELD2-Visit2 [==>829.0 Secs]	
			Prime + Parallel Gro up 9-10 in Sequence 7-12 Non-Int in FIE LD2-Visit2 (04)	[2]
11	(2) ORPHAN-STRE ACS/WFC, ACCUM, WFC AM-FIELD2	F606W	POS TARG 0.2310,0 Sequence 7-12 Non-I 842 Secs (842 Secs) .2490 nt in FIELD2-Visit2	
			(04) $I = >842.0 \text{ Secs } I$	
			Prime + Parallel Gro up 11-12 in Sequenc e 7-12 Non-Int in FI ELD2-Visit2 (04)	2]
12	(2) ORPHAN-STRE WFC3/UVIS, ACCUM, UVIS	F814W	Sequence 7-12 Non-I 800 Secs (852 Secs)	
	AM-FIELD2		$\begin{array}{c c} \text{nt in FIELD2-V1Sit2} \\ (04) \end{array} \begin{bmatrix} z = -852.0 \text{ Secs } \end{bmatrix}$	
			Prime + Parallel Gro up 11-12 in Sequenc e 7-12 Non-Int in FI ELD2-Visit2 (04)	2]



Proposal 13443 - FIELD3-Visit1 (05) - Proper Motions along the Orphan Stream: Finding the Parent, Orbit, and Milky Way Halo Shape

	Proposal	13443, FIELD3-Visit1 (05	() ()			Sat Jun 08 01:03:47 GMT 2013						
	Diagnostic Status: No Diagnostics											
sit	Scientific	e Instruments: WFC3/UVIS,	ACS/WFC									
Ë	Special Requirements: SCHED 40%; ORIENT 291.63D TO 291.63 D; GROUP 05,06 WITHIN 30D											
	Comments: This is the first visit for imaging ORPHAN-STREAM-3 field. Two orbits are required to complete this visit. Since our goal is to measure proper motions of stars in the target field, our orientation is set to exactly match the previous observations of PID 9984. We adopt a customized dither pattern designed to optimally cover the pixel phase using the POS-TARG special requirements. We require that Visits 05 and 06 be observed in a 30 day window so that they can be treated as single epoch data for astrometric analysis.											
ts	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous						
ge	(3)	ORPHAN-STREAM-	RA: 10 33 15.4000 (158.3141667d)		V=24+/-2	Reference Frame: ICRS						
Tar		FIELD3	Dec: +07 03 2.20 (7.05061d)									
ত			Equinox: J2000									
Fixe												
ιÊ												

	# Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	(3) ORPHAN-STRE	ACS/WFC, ACCUM, WFC	F775W		POS TARG 0.0000,0	Sequence 1-6 Non-In	765 Secs (760 Secs)	
		AM-FIELD3				.0000	t in FIELD3-Visit1 (05)	[==>760.0 Secs]	
							Prime + Parallel Gro up 1-2 in Sequence 1 -6 Non-Int in FIELD 3-Visit1 (05)		[1]
	2	(3) ORPHAN-STRE	WFC3/UVIS, ACCUM, UVIS	F606W			Sequence 1-6 Non-In	800 Secs (800 Secs)	
		AM-FIELD3					t in FIELD3-Visit1 (05)	[==>800.0 Secs]	
							Prime + Parallel Gro up 1-2 in Sequence 1 -6 Non-Int in FIELD 3-Visit1 (05)		[1]
	3	(3) ORPHAN-STRE	ACS/WFC, ACCUM, WFC	F775W		POS TARG 0.2141,0	Sequence 1-6 Non-In	765 Secs (760 Secs)	
		AM-FIELD3				.0161	t in FIELD3-Visit1 (05)	[==>760.0 Secs]	
							Prime + Parallel Gro up 3-4 in Sequence 1 -6 Non-Int in FIELD 3-Visit1 (05)		[1]
- [4	(3) ORPHAN-STRE	WFC3/UVIS, ACCUM, UVIS	F814W			Sequence 1-6 Non-In	800 Secs (800 Secs)	
		AM-FIELD3					t in FIELD3-Visit1 (05)	[==>800.0 Secs]	
sures							Prime + Parallel Gro up 3-4 in Sequence 1 -6 Non-Int in FIELD 3-Visit1 (05)		[1]
So [5	(3) ORPHAN-STRE	ACS/WFC, ACCUM, WFC	F775W		POS TARG 0.4281,0	Sequence 1-6 Non-In	765 Secs (760 Secs)	
EX		AM-FIELD3				.0322	t in FIELD3-Visit1 (05)	[==>760.0 Secs]	
							Prime + Parallel Gro up 5-6 in Sequence 1 -6 Non-Int in FIELD 3-Visit1 (05)		[1]
	б	(3) ORPHAN-STRE	WFC3/UVIS, ACCUM, UVIS	F814W			Sequence 1-6 Non-In	800 Secs (800 Secs)	
		AMI-FIELD3					(05)	[==>800.0 Secs]	
							Prime + Parallel Gro up 5-6 in Sequence 1 -6 Non-Int in FIELD 3-Visit1 (05)		[1]
	7	(3) ORPHAN-STRE	ACS/WFC, ACCUM, WFC	F775W		POS TARG 0.0504,0	Sequence 7-12 Non-I	852 Secs (837 Secs)	
		AM-FIELD3				.2183	$\begin{array}{c} \text{nt in FIELD3-Visit1} \\ (05) \end{array}$	[==>837.0 Secs]	
							Prime + Parallel Gro up 7-8 in Sequence 7 -12 Non-Int in FIEL D3-Visit1 (05)		[2]
;	8	(3) ORPHAN-STRE	WFC3/UVIS, ACCUM, UVIS	F606W			Sequence 7-12 Non-I	800 Secs (824 Secs)	
		AM-FIELD3					nt in FIELD3-Visit1 (05)	[==>824.0 Secs]	
							Prime + Parallel Gro up 7-8 in Sequence 7 -12 Non-Int in FIEL D3-Visit1 (05)		[2]

roposal	<u> 13443 - FIELD3-Visit1 (05) - Proper Motie</u>	ons along the Orph	han Stream: Finding the	e Parent, Orbit	<u>t, and Milky Way Halo S</u>	Shape
9	(3) ORPHAN-STRE ACS/WFC, ACCUM, WFC	F775W	POS TARG 0.2644,0	Sequence 7-12 Non-I	852 Secs (837 Secs)	
	AM-FIELD3		.2544	(05)	[==>837.0 Secs]	
				Prime + Parallel Gro up 9-10 in Sequence 7-12 Non-Int in FIE		[2]
				LD3-Visit1 (05)		
10	(3) ORPHAN-STRE WFC3/UVIS, ACCUM, UVIS	F814W		Sequence 7-12 Non-I	800 Secs (824 Secs)	
	AM-FIELD3			$\begin{array}{c} \text{nt in FIELD3-Visit1} \\ (05) \end{array}$	[==>824.0 Secs]	
				Prime + Parallel Gro up 9-10 in Sequence 7-12 Non-Int in FIE LD3-Visit1 (05)		[2]
11	(3) ORPHAN-STRE ACS/WFC, ACCUM, WFC	F775W	POS TARG 0.4784,0	Sequence 7-12 Non-I	852 Secs (837 Secs)	
	AM-FIELD3		.2505	nt in FIELD3-Visit1 (05)	[==>837.0 Secs]	
				Prime + Parallel Gro up 11-12 in Sequenc e 7-12 Non-Int in FI ELD3-Visit1 (05)		[2]
12	(3) ORPHAN-STRE WFC3/UVIS, ACCUM, UVIS	F814W		Sequence 7-12 Non-I	800 Secs (847 Secs)	
	AM-FIELD3			nt in FIELD3-Visit1 (05)	[==>847.0 Secs]	
				Prime + Parallel Gro up 11-12 in Sequenc e 7-12 Non-Int in FI ELD3-Visit1 (05)		[2]

Proposal 13443 - FIELD3-Visit1 (05) - Proper Motions along the Orphan Stream: Finding the Parent, Orbit, and Milky Way Halo Shape



Proposal 13443 - FIELD3-Visit2 (06) - Proper Motions along the Orphan Stream: Finding the Parent, Orbit, and Milky Way Halo Shape

	Proposal 1	13443, FIELD3-Visit2 (06)			Sat Jun 08 01:03:49 GMT 2013					
	Diagnosti	Diagnostic Status: No Diagnostics									
sit	Scientific 1	Instruments: WFC3/UVIS,	ACS/WFC								
Special Requirements: SCHED 40%; SAME ORIENT AS 05; GROUP 06,05 WITHIN 30D											
	Comments: This is the second visit for imaging ORPHAN-STREAM-3 field. Two orbits are required to complete this visit. Since our goal is to measure proper motions of stars in the target field, our orientation is set to exactly match the previous observations of PID 9984. We adopt a customized dither pattern designed to optimally cover the pixel phase using the POS-TARG special requirements. We require that Visits 05 and 06 be observed in a 30 day window so that they can be treated as single epoch data for astrometric analysis.										
ts	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous					
ge	(3)	ORPHAN-STREAM-	RA: 10 33 15.4000 (158.3141667d)		V=24+/-2	Reference Frame: ICRS					
Ta,		FIELD3	Dec: +07 03 2.20 (7.05061d)								
, Å			Equinox: J2000								
Ĭ											

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(3) ORPHAN-STRE	ACS/WFC, ACCUM, WFC	F775W		POS TARG 0.1008,0	Sequence 1-6 Non-In	785 Secs (760 Secs)	
		AM-FIELD3				.4366	t in FIELD3-Visit2 (06)	[==>760.0 Secs]	
							Prime + Parallel Gro up 1-2 in Sequence 1 -6 Non-Int in FIELD 3-Visit2 (06)		[1]
2		(3) ORPHAN-STRE	WFC3/UVIS, ACCUM, UVIS	F606W			Sequence 1-6 Non-In	800 Secs (800 Secs)	
		AM-FIELD3					t in FIELD3-Visit2 (06)	[==>800.0 Secs]	
							Prime + Parallel Gro up 1-2 in Sequence 1 -6 Non-Int in FIELD 3-Visit2 (06)		[1]
3		(3) ORPHAN-STRE	ACS/WFC, ACCUM, WFC	F775W		POS TARG 0.3148,0	Sequence 1-6 Non-In	786 Secs (761 Secs)	
		AM-FIELD3				.4527	t in FIELD3-Visit2 (06)	[==>761.0 Secs]	
							Prime + Parallel Gro up 3-4 in Sequence 1 -6 Non-Int in FIELD 3-Visit2 (06)		[1]
4		(3) ORPHAN-STRE	WFC3/UVIS, ACCUM, UVIS	F814W			Sequence 1-6 Non-In	800 Secs (800 Secs)	
		AM-FIELD3					t in FIELD3-Visit2 (06)	[==>800.0 Secs]	
co inc							Prime + Parallel Gro up 3-4 in Sequence 1 -6 Non-Int in FIELD 3-Visit2 (06)		[1]
5		(3) ORPHAN-STRE	ACS/WFC, ACCUM, WFC	F775W		POS TARG 0.5288,0	Sequence 1-6 Non-In	785 Secs (760 Secs)	
Ź		AM-FIELD3				.4688	t in FIELD3-Visit2 (06)	[==>760.0 Secs]	
							06) Prime + Parallel Gro up 5-6 in Sequence 1 -6 Non-Int in FIELD 3-Visit2 (06)		[1]
6		(3) ORPHAN-STRE	WFC3/UVIS, ACCUM, UVIS	F814W			Sequence 1-6 Non-In	800 Secs (800 Secs)	
		AM-FIELD3					t in FIELD3-Visit2 (06)	[==>800.0 Secs]	
							Prime + Parallel Gro up 5-6 in Sequence 1 -6 Non-Int in FIELD 3-Visit2 (06)		[1]
7		(3) ORPHAN-STRE	ACS/WFC, ACCUM, WFC	F606W		POS TARG 0.0000,0	Sequence 7-12 Non-I	839 Secs (823 Secs)	
		AM-FIELD3				.0000	nt in FIELD3-Visit2 (06)	[==>823.0 Secs]	
							Prime + Parallel Gro up 7-8 in Sequence 7 -12 Non-Int in FIEL D3-Visit2 (06)		[2]
8		(3) ORPHAN-STRE	WFC3/UVIS, ACCUM, UVIS	F606W			Sequence 7-12 Non-I	800 Secs (851 Secs)	
		AM-FIELD3					nt in FIELD3-Visit2 (06)	[==>851.0 Secs]	
							Prime + Parallel Gro up 7-8 in Sequence 7 -12 Non-Int in FIEL D3-Visit2 (06)		[2]

Proposal 13443 - FIELD3-Visit2 (06) - Proper Motions along the Orphan Stream: Finding the Parent, Orbit, and Milky Way Halo Shape

ropos	<u>al 13443 - FIELD3-Visit2 (06) - Proper Motic</u>	ons along the Orphan S	Stream: Finding the	e Parent, Orbi	<u>t, and Milky Way Halo S</u>	Shape
9	(3) ORPHAN-STRE ACS/WFC, ACCUM, WFC AM-FIELD3	F606W	POS TARG 0.1150,0 .1250	Sequence 7-12 Non-I nt in FIELD3-Visit2	839 Secs (823 Secs) I = > 823.0 Secs.1	
				(06) Prime + Parallel Gro up 9-10 in Sequence 7-12 Non-Int in FIE LD3-Visit2 (06)		[2]
10	(3) ORPHAN-STRE WFC3/UVIS, ACCUM, UVIS AM-FIELD3	F814W		Sequence 7-12 Non-I nt in FIELD3-Visit2 (06)	800 Secs (800 Secs) [==>]	
				Prime + Parallel Gro up 9-10 in Sequence 7-12 Non-Int in FIE LD3-Visit2 (06)		[2]
11	(3) ORPHAN-STRE ACS/WFC, ACCUM, WFC	F606W	POS TARG 0.2310,0	Sequence 7-12 Non-I	838 Secs (822 Secs)	
	AM-FIELD3		.2490	nt in FIELD3-Visit2 (06)	[==>822.0 Secs]	
				Prime + Parallel Gro up 11-12 in Sequenc e 7-12 Non-Int in FI ELD3-Visit2 (06)		[2]
12	(3) ORPHAN-STRE WFC3/UVIS, ACCUM, UVIS	F814W		Sequence 7-12 Non-I	800 Secs (832 Secs)	
	AM-FIELD3			nt in FIELD3-Visit2 (06)	[==>832.0 Secs]	
				Prime + Parallel Gro up 11-12 in Sequenc e 7-12 Non-Int in FI ELD3-Visit2 (06)		[2]

Proposal 13443 - FIELD3-Visit2 (06) - Proper Motions along the Orphan Stream: Finding the Parent, Orbit, and Milky Way Halo Shape



Proposal 13443 - FIELD4-Visit1 (07) - Proper Motions along the Orphan Stream: Finding the Parent, Orbit, and Milky Way Halo Shape

	Proposal	13443, FIELD4-Visit1 (07)			Sat Jun 08 01:03:51 GMT 2013				
	Diagnosti	c Status: No Diagnostics								
sit	Scientific	Instruments: WFC3/UVIS,	ACS/WFC							
Ë	Special Requirements: ORIENT 124.70D TO 124.70 D; GROUP 07,08 WITHIN 30D									
	Comments: This is the first visit for imaging ORPHAN-STREAM-4 field. Two orbits are required to complete this visit. Since our goal is to measure proper motions of stars in the target field, our orientation is set to exactly match the previous observations of PID 9877. We adopt a customized dither pattern designed to optimally cover the pixel phase using the POS-TARG special requirements. We require that Visits 07 and 08 be observed in a 30 day window so that they can be treated as single epoch data for astrometric analysis.									
ts	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
ge	(4)	ORPHAN-STREAM-	RA: 10 47 24.4000 (161.8516667d)		V=24+/-2	Reference Frame: ICRS				
Tar		FIELD4	Dec: +05 35 43.80 (5.59550d)							
Б			Equinox: J2000							
Fixe										
	1									

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(4) ORPHAN-STRE	ACS/WFC, ACCUM, WFC	F814W		POS TARG 0.0000,0	Sequence 1-6 Non-In	786 Secs (776 Secs)	
		AM-FIELD4				.0000	t in FIELD4-Visit1 (07)	[==>776.0 Secs]	
							Prime + Parallel Gro up 1-2 in Sequence 1 -6 Non-Int in FIELD 4-Visit1 (07)		[1]
2		(4) ORPHAN-STRE	WFC3/UVIS, ACCUM, UVIS	F606W			Sequence 1-6 Non-In	800 Secs (820 Secs)	
		AM-FIELD4					t in FIELD4-Visit1 (07)	[==>820.0 Secs]	
							Prime + Parallel Gro up 1-2 in Sequence 1 -6 Non-Int in FIELD 4-Visit1 (07)		[1]
3		(4) ORPHAN-STRE	ACS/WFC, ACCUM, WFC	F814W		POS TARG 0.2141,0	Sequence 1-6 Non-In	786 Secs (776 Secs)	
		AM-FIELD4				.0161	t in FIELD4-Visiti (07)	[==>776.0 Secs]	
							Prime + Parallel Gro up 3-4 in Sequence 1 -6 Non-Int in FIELD 4-Visit1 (07)		[1]
4		(4) ORPHAN-STRE	WFC3/UVIS, ACCUM, UVIS	F814W			Sequence 1-6 Non-In	800 Secs (820 Secs)	
		AM-FIELD4					t in FIELD4-Visit1 (07)	[==>820.0 Secs]	
sures							Prime + Parallel Gro up 3-4 in Sequence 1 -6 Non-Int in FIELD 4-Visit1 (07)		[1]
SOC 5		(4) ORPHAN-STRE	ACS/WFC, ACCUM, WFC	F814W		POS TARG 0.4281,0	Sequence 1-6 Non-In	785 Secs (775 Secs)	
Ě		AM-FIELD4				.0322	t in FIELD4-Visit1 (07)	[==>775.0 Secs]	
							07) Prime + Parallel Gro up 5-6 in Sequence 1 -6 Non-Int in FIELD 4-Visit1 (07)		[1]
6		(4) ORPHAN-STRE	WFC3/UVIS, ACCUM, UVIS	F814W			Sequence 1-6 Non-In	800 Secs (820 Secs)	
		AM-FIELD4					t in FIELD4- visiti (07)	[==>820.0 Secs]	
							Prime + Parallel Gro up 5-6 in Sequence 1 -6 Non-Int in FIELD 4-Visit1 (07)		[1]
7		(4) ORPHAN-STRE	ACS/WFC, ACCUM, WFC	F814W		POS TARG 0.0504,0	Sequence 7-12 Non-I	852 Secs (852 Secs)	
		AM-FIELD4				.2183	nt in FIELD4-Visit1 (07)	[==>852.0 Secs]	
							Prime + Parallel Gro up 7-8 in Sequence 7 -12 Non-Int in FIEL D4-Visit1 (07)		[2]
8		(4) ORPHAN-STRE	WFC3/UVIS, ACCUM, UVIS	F606W			Sequence 7-12 Non-I	800 Secs (839 Secs)	
		AM-FIELD4					nt in FIELD4-Visit1 (07)	[==>839.0 Secs]	
							Prime + Parallel Gro up 7-8 in Sequence 7 -12 Non-Int in FIEL D4-Visit1 (07)		[2]

Proposal 13443 - FIELD4-Visit1 (07) - Proper Motions along the Orphan Stream: Finding the Parent, Orbit, and Milky Way Halo Shape

Proposal 13443 - FIELD4-Visit1 (07) - Proper Motions along the Orphan Stream: Finding the Parent, Orbit, and Milky Wa	/ Halo Shape
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9	(4) ORPHAN-STRE ACS/WFC, ACCUM, WFC	F814W	POS TARG 0.2644,0	Sequence 7-12 Non-I	852 Secs (852 Secs)	
	AM-FIELD4		.2344	nt in FIELD4-Visit1 (07)	[==>852.0 Secs]	
				Prime + Parallel Gro up 9-10 in Sequence 7-12 Non-Int in FIE LD4-Visit1 (07)		[2]
10	(4) ORPHAN-STRE WFC3/UVIS, ACCUM, UVIS	F814W		Sequence 7-12 Non-I nt in FIELD4-Visit1 (07)	800 Secs (839 Secs)	
	AM-FIELD4				[==>839.0 Secs]	
				Prime + Parallel Gro up 9-10 in Sequence 7-12 Non-Int in FIE LD4-Visit1 (07)		[2]
11	(4) ORPHAN-STRE ACS/WFC, ACCUM, WFC	F814W	POS TARG 0.4784,0	Sequence 7-12 Non-I nt in FIELD4-Visit1 (07)	852 Secs (852 Secs)	
	AM-FIELD4		.2505		[==>852.0 Secs]	
				Prime + Parallel Gro up 11-12 in Sequenc e 7-12 Non-Int in FI ELD4-Visit1 (07)		[2]
12	(4) ORPHAN-STRE WFC3/UVIS, ACCUM, UVIS	F814W		Sequence 7-12 Non-I	800 Secs (862 Secs)	
	AM-FIELD4			nt in FIELD4-Visit1 (07)	[==>862.0 Secs]	
				Prime + Parallel Gro		[2]





Proposal 13443 - FIELD4-Visit2 (08) - Proper Motions along the Orphan Stream: Finding the Parent, Orbit, and Milky Way Halo Shape

	Proposal	13443, FIELD4-Visit2 (08	3)			Sat Jun 08 01:03:53 GMT 2013					
	Diagnostic Status: No Diagnostics										
si:	Scientific 1	Scientific Instruments: WFC3/UVIS, ACS/WFC									
Ë	Special Re	equirements: SAME ORIEN	NT AS 07; GROUP 08,07 WITHIN 30D								
	Comments: This is the second visit for imaging ORPHAN-STREAM-4 field. Two orbits are required to complete this visit. Since our goal is to measure proper motions of stars in the target field, our orientation is set to exactly match the previous observations of PID 9877. We adopt a customized dither pattern designed to optimally cover the pixel phase using the POS-TARG special requirements. We require that Visits 07 and 08 be observed in a 30 day window so that they can be treated as single epoch data for astrometric analysis.										
ts	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous					
e e	(4)	ORPHAN-STREAM-	RA: 10 47 24.4000 (161.8516667d)		V=24+/-2	Reference Frame: ICRS					
Tar		FIELD4	Dec: +05 35 43.80 (5.59550d)								
, Å			Equinox: J2000								
Ĭ											
L#											

	# Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	(4) ORPHAN-STRE	ACS/WFC, ACCUM, WFC	F814W		POS TARG 0.1008,0	Sequence 1-6 Non-In	786 Secs (784 Secs)	
		AM-FIELD4				.4366	t in FIELD4-Visit2 (08)	[==>784.0 Secs]	
							Prime + Parallel Gro up 1-2 in Sequence 1 -6 Non-Int in FIELD 4-Visit2 (08)		[1]
	2	(4) ORPHAN-STRE	WFC3/UVIS, ACCUM, UVIS	F606W			Sequence 1-6 Non-In	800 Secs (800 Secs)	
	AM-FIELD4				t in FIELD4-Visit2 (08)	[==>800.0 Secs]			
							Prime + Parallel Gro up 1-2 in Sequence 1 -6 Non-Int in FIELD 4-Visit2 (08)		[1]
	3	(4) ORPHAN-STRE	ACS/WFC, ACCUM, WFC	F814W		POS TARG 0.3148,0	Sequence 1-6 Non-In	786 Secs (784 Secs)	
		AM-FIELD4				.4527	t in FIELD4-Visit2 (08)	[==>784.0 Secs]	
							Prime + Parallel Gro up 3-4 in Sequence 1 -6 Non-Int in FIELD 4-Visit2 (08)		[1]
	1	(4) ORPHAN-STRE	TRE WFC3/UVIS, ACCUM, UVIS	F814W			Sequence 1-6 Non-In t in FIELD4-Visit2 (08)	800 Secs (800 Secs)	
		AM-FIELD4						[==>800.0 Secs]	
ures							Prime + Parallel Gro up 3-4 in Sequence 1 -6 Non-Int in FIELD 4-Visit2 (08)		[1]
Soc	5 (4 A	(4) ORPHAN-STRE	ACS/WFC, ACCUM, WFC	F814W	POS TARG 0.5288	POS TARG 0.5288,0	 Sequence 1-6 Non-In t in FIELD4-Visit2 (08) Prime + Parallel Gro up 5-6 in Sequence 1 -6 Non-Int in FIELD 4-Visit2 (08) 	785 Secs (783 Secs)	
EXE		AM-FIELD4				.4688		[==>783.0 Secs]	
									[1]
	5	(4) ORPHAN-STRE	WFC3/UVIS, ACCUM, UVIS	F814W			Sequence 1-6 Non-In	800 Secs (800 Secs)	
		AM-FIELD4					t in FIELD4-Visit2 (08) Prime + Parallel Gro up 5-6 in Sequence 1 -6 Non-Int in FIELD 4-Visit2 (08)	[==>800.0 Secs]	
									[1]
	7 (4) 0	(4) ORPHAN-STRE	ACS/WFC, ACCUM, WFC	F606W		POS TARG 0.0000,0) Sequence 7-12 Non-	834 Secs (834 Secs)	
		AM-FIELD4				.0000	nt in FIELD4-Visit2 (08)	[==>834.0 Secs]	
							Prime + Parallel Gro up 7-8 in Sequence 7 -12 Non-Int in FIEL D4-Visit2 (08)		[2]
	8	(4) ORPHAN-STRE	WFC3/UVIS, ACCUM, UVIS	F606W			Sequence 7-12 Non-I	800 Secs (876 Secs)	
		AM-FIELD4					nt in FIELD4-Visit2 (08)	[==>876.0 Secs]	
							Prime + Parallel Gro up 7-8 in Sequence 7 -12 Non-Int in FIEL D4-Visit2 (08)		[2]

Proposal 13443 - FIEL D4-Visit2 (08) - Proper Motions along the Orphan Stream: Finding the Parent, Orbit, and Milky Way Halo Shape

posal 1	<u> 3443 - FIELD4-Visit2 (08) - Proper Moti</u>	<u>ons along the C</u>	<u>Prphan Stream: Finding the provident of the provident of</u>	<u>e Parent, Orbi</u>	<u>t, and Milky Way Halo S</u>	Shape
9	(4) ORPHAN-STRE ACS/WFC, ACCUM, WFC AM-FIELD4	F606W	POS TARG 0.1150,0 .1250	Sequence 7-12 Non-I nt in FIELD4-Visit2 (08)	834 Secs (834 Secs) [==>834.0 Secs]	
				Prime + Parallel Gro up 9-10 in Sequence 7-12 Non-Int in FIE LD4-Visit2 (08)		[2]
10	(4) ORPHAN-STRE WFC3/UVIS, ACCUM, UVIS AM-FIELD4	F814W		Sequence 7-12 Non-I nt in FIELD4-Visit2	800 Secs (821 Secs) I = >821.0 Secs I	
				(08) Prime + Parallel Gro up 9-10 in Sequence 7-12 Non-Int in FIE LD4-Visit2 (08)		[2]
11	(4) ORPHAN-STRE ACS/WFC, ACCUM, WFC	F606W	POS TARG 0.2310,0	Sequence 7-12 Non-I	834 Secs (834 Secs)	
	AM-FIELD4		.2490	nt in FIELD4- v_{1S1t2} (08)	[==>834.0 Secs]	
				Prime + Parallel Gro up 11-12 in Sequenc e 7-12 Non-Int in FI ELD4-Visit2 (08)		[2]
12	(4) ORPHAN-STRE WFC3/UVIS, ACCUM, UVIS AM-FIELD4	F814W		Sequence 7-12 Non-I nt in FIELD4-Visit2 (08)	800 Secs (844 Secs)	
					[==>844.0 Secs]	
				Prime + Parallel Gro up 11-12 in Sequenc e 7-12 Non-Int in FI ELD4-Visit2 (08)		[2]

Proposal 13443 - FIELD4-Visit2 (08) - Proper Motions along the Orphan Stream: Finding the Parent, Orbit, and Milky Way Halo Shape

