



17759 - Discovery of Extremely Faint Galaxy Candidates out to the Edge of the Local Group

Cycle: 32, Proposal Category: GO
(Availability Mode: SUPPORTED)

INVESTIGATORS

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VISITS

<i>Visit</i>	<i>Targets used in Visit</i>	<i>Configurations used in Visit</i>	<i>Orbits Used</i>	<i>Last Orbit Planner Run</i>	<i>OP Current with Visit?</i>
01	(1) ANDROMEDA-H ANY	ACS/WFC WFC3/UVIS	1	15-Sep-2025 13:00:15.0	yes
02	(2) ERIDANUS-T ANY	ACS/WFC WFC3/UVIS	1	15-Sep-2025 13:00:16.0	yes
03	(3) COMA-BERENICES-S ANY	ACS/WFC WFC3/UVIS	1	15-Sep-2025 13:00:17.0	yes

<i>Visit</i>	<i>Targets used in Visit</i>	<i>Configurations used in Visit</i>	<i>Orbits Used</i>	<i>Last Orbit Planner Run</i>	<i>OP Current with Visit?</i>
04	(4) AQUARIUS-Y ANY	ACS/WFC WFC3/UVIS	1	15-Sep-2025 13:00:17.0	yes
05	(5) COMA-BERENICES-M ANY	ACS/WFC WFC3/UVIS	1	15-Sep-2025 13:00:18.0	yes
06	(6) CANES-VENATICI-K ANY	ACS/WFC WFC3/UVIS	1	15-Sep-2025 13:00:19.0	yes

6 Total Orbits Used

ABSTRACT

The smallest galaxies in the universe play an important role in understanding structure formation at all scales. They inform us about the the build-up of more massive galaxies, test our understanding of the coupling of baryon and dark matter physics, and can place critical constraints on our understanding of the epoch of reionization. Yet, because of their paltry stellar content, these systems are incredibly faint and difficult to find. To date, nearly all ultra-faint dwarfs that have been detected are in close proximity to the Milky Way (making them easier to find) or are satellites of another massive galaxy (where searches can be targeted). This has limited our understanding of ultra-faint dwarfs to a single type of environment, which rarely turns out to be representative.

We have discovered 6 ultra-faint dwarf candidates within the Local Group that appear to lie at distances from the MW and M31 that are beyond the virial radius, the traditional definition of "satellite" (i.e., > 400 kpc). If confirmed, these systems will provide unique insights into the growth and evolution of ultra-faint dwarfs that reside in relatively isolated environments and that are not satellites. We request 1-orbit of HST imaging per candidate to confirm and characterize these systems. The data will enable robust measurements of distances, structural parameters, integrated magnitudes, and star formation histories.

OBSERVING DESCRIPTION

The observations included ACS/WFC and WFC3/UVIS imaging in the F606W and F814W filters. The data will be used to confirm that the targets are galaxies, measure the distances to the systems from resolved stars (TRGB and/or Horizontal Branch methods), characterize the stellar properities (star formation histories and metallicities), and measure the structural parameters of the galaxies. The parallel pointings will allow us to observe a field region next to our targets. We will thus be able to estimate more precisely the number of background/foreground contaminants present in our ACS fields.

Each of the 6 targets will be observed for 1 orbit. We use a 5x5 pixel dither implemented using pos-targ (equivalent to the ACS WFC DITHER LINE pattern #14) to reject cosmic rays and handle hot pixels. The first pointing is executed with both filters in ACS and with both filters in WFC3 parallel fields. After the dither, the observations are then repeated. The exposure time per orbit is split roughly equally between the F606W and F814W filters.

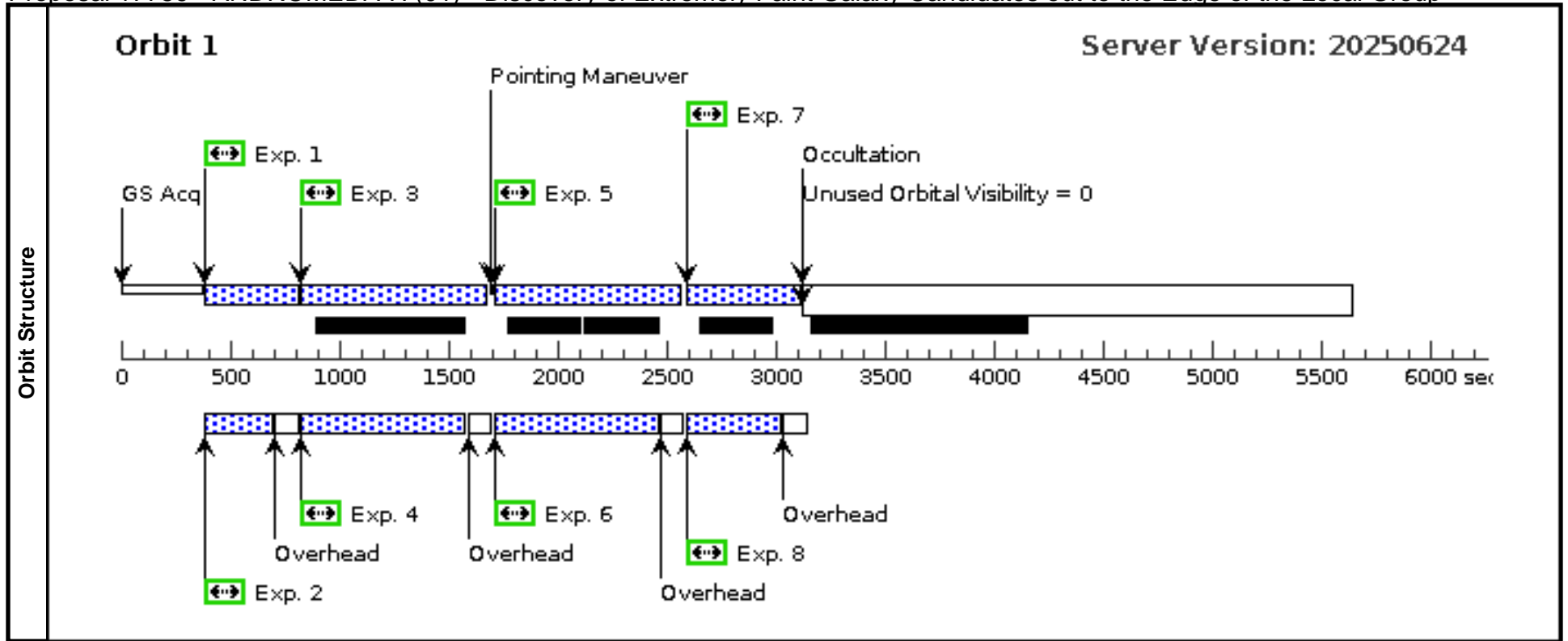
In order to obtain 4 exposures in both ACS and WFC3 in one orbit and accommodate buffer dumps during exposures, we have added a special requirement to the visibility intervals, which was requested as part of the Phase I proposal.

Each visit is 1-orbit. We have placed ORIENT constraints to ensure we have maximum coverage of the stellar disk and prevent the galaxy centers from falling in the ACS chip gap, while avoiding nearby bright stars.

Proposal 17759 - ANDROMEDA-H (01) - Discovery of Extremely Faint Galaxy Candidates out to the Edge of the Local Group

Mon Sep 15 17:00:19 GMT 2025

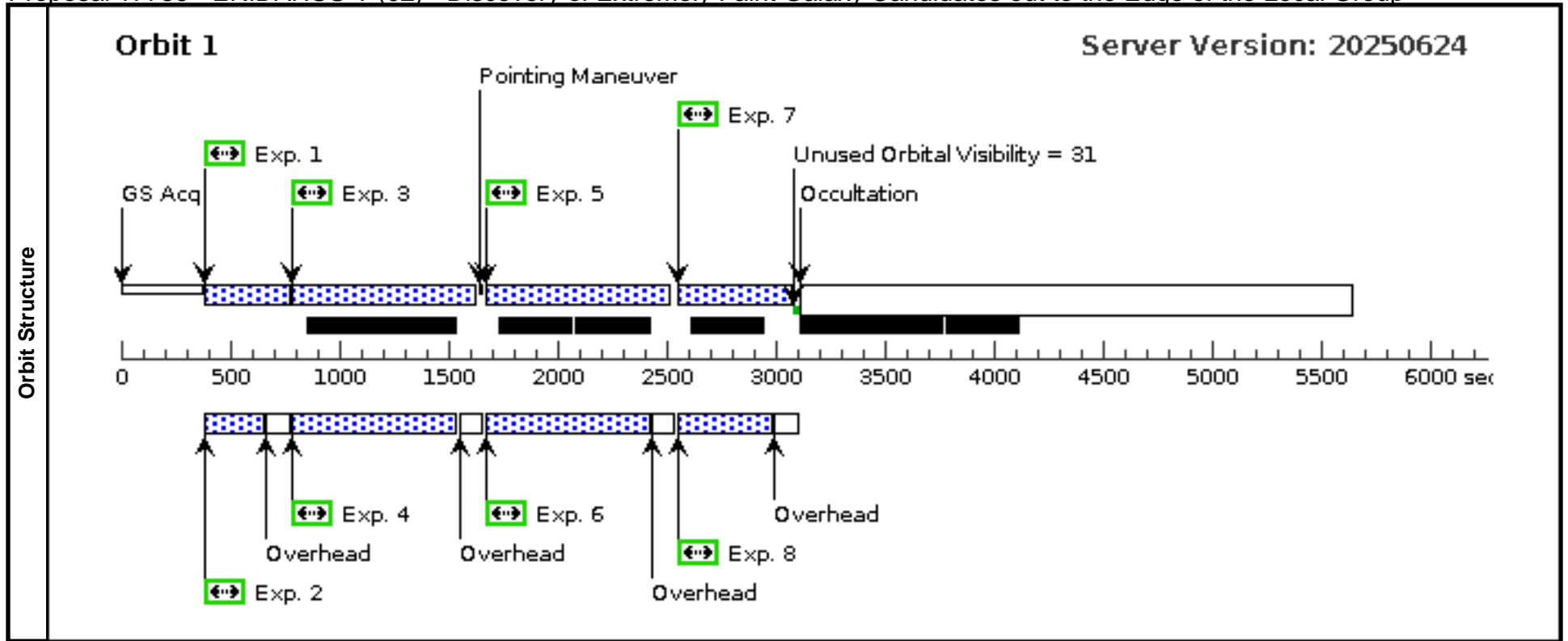
Visit	Proposal 17759, ANDROMEDA-H (01), completed Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS, ACS/WFC Special Requirements: ORIENT 230D TO 265 D; VISIBILITY INTERVAL 3128 S									
	Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous			
	(1)	ANDROMEDA-H	RA: 00 40 31.2940 (10.1303917d) Dec: +22 03 54.05 (22.06501d) Equinox: J2000		V=17	Reference Frame: ICRS				
	<i>Comments:</i> Category=GALAXY Description=[DWARF SPHEROIDAL]									
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(1) ANDROMEDA-H	ACS/WFC, ACCUM, WFC	F606W	FLASH=10		Prime + Parallel Group 1-2 in ANDROMEDA-H (01)	224 Secs (224 Secs) [==>]	[1]
	2		ANY	WFC3/UVIS, ACCUM, UVIS	F606W	FLASH=9		Prime + Parallel Group 1-2 in ANDROMEDA-H (01)	283 Secs (283 Secs) [==>]	[1]
	3		(1) ANDROMEDA-H	ACS/WFC, ACCUM, WFC	F814W			Prime + Parallel Group 3-4 in ANDROMEDA-H (01)	670 Secs (670 Secs) [==>]	[1]
	4		ANY	WFC3/UVIS, ACCUM, UVIS	F814W			Prime + Parallel Group 3-4 in ANDROMEDA-H (01)	730 Secs (730 Secs) [==>]	[1]
	5		(1) ANDROMEDA-H	ACS/WFC, ACCUM, WFC	F606W		POS TARG 0.247,0.267	Prime + Parallel Group 5-6 in ANDROMEDA-H (01)	670 Secs (670 Secs) [==>]	[1]
	6		ANY	WFC3/UVIS, ACCUM, UVIS	F606W			Prime + Parallel Group 5-6 in ANDROMEDA-H (01)	730 Secs (730 Secs) [==>]	[1]
	7		(1) ANDROMEDA-H	ACS/WFC, ACCUM, WFC	F814W	FLASH=7	SAME POS AS 5	Prime + Parallel Group 7-8 in ANDROMEDA-H (01)	337 Secs (337 Secs) [==>]	[1]
	8		ANY	WFC3/UVIS, ACCUM, UVIS	F814W	FLASH=11		Prime + Parallel Group 7-8 in ANDROMEDA-H (01)	410 Secs (410 Secs) [==>]	[1]



Proposal 17759 - ERIDANUS-T (02) - Discovery of Extremely Faint Galaxy Candidates out to the Edge of the Local Group

Mon Sep 15 17:00:19 GMT 2025

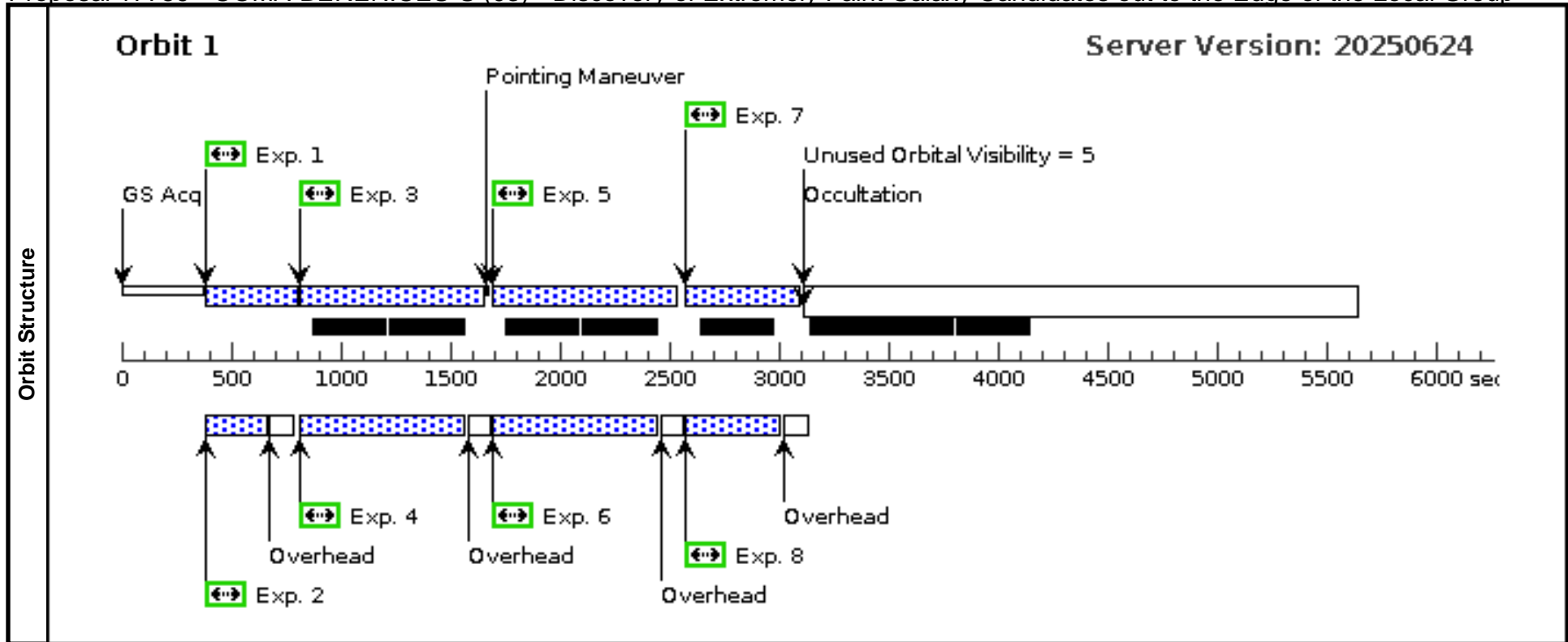
Visit	Proposal 17759, ERIDANUS-T (02), scheduling Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS, ACS/WFC Special Requirements: ORIENT 33D TO 36 D; VISIBILITY INTERVAL 3117 S									
	Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous			
	(2)	ERIDANUS-T	RA: 02 58 37.0819 (44.6545079d) Dec: -03 15 21.66 (-3.25602d) Equinox: J2000		V=17	Reference Frame: ICRS				
	<i>Comments:</i> Category=GALAXY Description=[DWARF SPHEROIDAL]									
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	(2) ERIDANUS-T	ACS/WFC, ACCUM, WFC	F606W	FLASH=10			Prime + Parallel Group 1-2 in ERIDANUS-T (02)	180 Secs (180 Secs) [==>]	[1]
	2	ANY	WFC3/UVIS, ACCUM, UVIS	F606W	FLASH=9			Prime + Parallel Group 1-2 in ERIDANUS-T (02)	239 Secs (239 Secs) [==>]	[1]
	3	(2) ERIDANUS-T	ACS/WFC, ACCUM, WFC	F814W				Prime + Parallel Group 3-4 in ERIDANUS-T (02)	660 Secs (660 Secs) [==>]	[1]
	4	ANY	WFC3/UVIS, ACCUM, UVIS	F814W				Prime + Parallel Group 3-4 in ERIDANUS-T (02)	730 Secs (730 Secs) [==>]	[1]
	5	(2) ERIDANUS-T	ACS/WFC, ACCUM, WFC	F606W			POS TARG 0.247,0.267	Prime + Parallel Group 5-6 in ERIDANUS-T (02)	660 Secs (660 Secs) [==>]	[1]
	6	ANY	WFC3/UVIS, ACCUM, UVIS	F606W				Prime + Parallel Group 5-6 in ERIDANUS-T (02)	730 Secs (730 Secs) [==>]	[1]
	7	(2) ERIDANUS-T	ACS/WFC, ACCUM, WFC	F814W	FLASH=7		SAME POS AS 5	Prime + Parallel Group 7-8 in ERIDANUS-T (02)	337 Secs (337 Secs) [==>]	[1]
	8	ANY	WFC3/UVIS, ACCUM, UVIS	F814W	FLASH=11			Prime + Parallel Group 7-8 in ERIDANUS-T (02)	410 Secs (410 Secs) [==>]	[1]



Proposal 17759 - COMA-BERENICES-S (03) - Discovery of Extremely Faint Galaxy Candidates out to the Edge of the Local Group

Mon Sep 15 17:00:19 GMT 2025

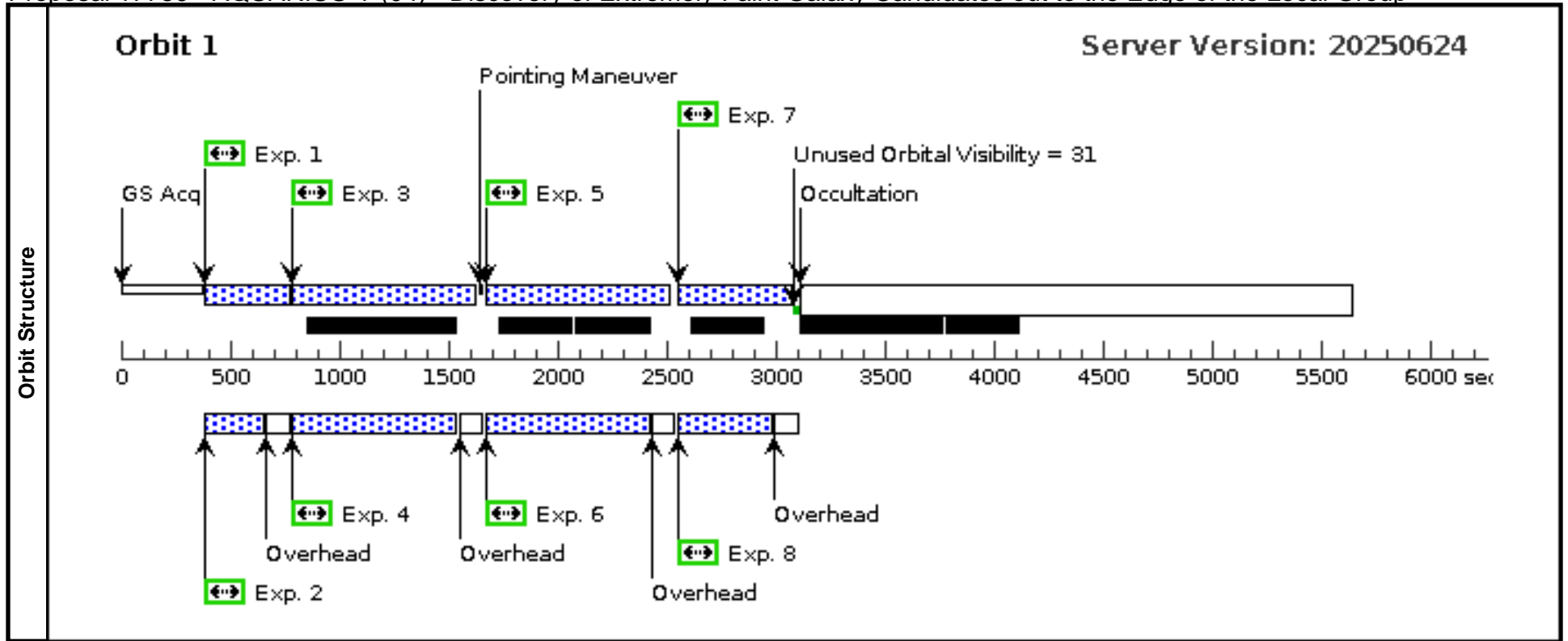
Visit	Proposal 17759, COMA-BERENICES-S (03), scheduling Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS, ACS/WFC Special Requirements: ORIENT 248D TO 256 D; VISIBILITY INTERVAL 3117 S									
	Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous			
	(3)	COMA-BERENICES-S	RA: 12 32 39.3168 (188.1638200d) Dec: +25 31 14.06 (25.52057d) Equinox: J2000		V=17	Reference Frame: ICRS				
	<i>Comments:</i> Category=GALAXY Description=[DWARF SPHEROIDAL]									
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(3) COMA-BERENICES-S	ACS/WFC, ACCUM, WFC	F606W	FLASH=8		Prime + Parallel Group 1-2 in COMA-BERENICES-S (03)	210 Secs (210 Secs) [==>]	[1]
	2	ANY		WFC3/UVIS, ACCUM, UVIS	F606W	FLASH=9		Prime + Parallel Group 1-2 in COMA-BERENICES-S (03)	254 Secs (254 Secs) [==>]	[1]
	3		(3) COMA-BERENICES-S	ACS/WFC, ACCUM, WFC	F814W			Prime + Parallel Group 3-4 in COMA-BERENICES-S (03)	660 Secs (660 Secs) [==>]	[1]
	4	ANY		WFC3/UVIS, ACCUM, UVIS	F814W			Prime + Parallel Group 3-4 in COMA-BERENICES-S (03)	730 Secs (730 Secs) [==>]	[1]
	5		(3) COMA-BERENICES-S	ACS/WFC, ACCUM, WFC	F606W		POS TARG 0.247,0.267	Prime + Parallel Group 5-6 in COMA-BERENICES-S (03)	660 Secs (660 Secs) [==>]	[1]
	6	ANY		WFC3/UVIS, ACCUM, UVIS	F606W			Prime + Parallel Group 5-6 in COMA-BERENICES-S (03)	730 Secs (730 Secs) [==>]	[1]
	7		(3) COMA-BERENICES-S	ACS/WFC, ACCUM, WFC	F814W	FLASH=7	SAME POS AS 5	Prime + Parallel Group 7-8 in COMA-BERENICES-S (03)	337 Secs (337 Secs) [==>]	[1]
	8	ANY		WFC3/UVIS, ACCUM, UVIS	F814W	FLASH=11		Prime + Parallel Group 7-8 in COMA-BERENICES-S (03)	410 Secs (410 Secs) [==>]	[1]



Proposal 17759 - AQUARIUS-Y (04) - Discovery of Extremely Faint Galaxy Candidates out to the Edge of the Local Group

Mon Sep 15 17:00:19 GMT 2025

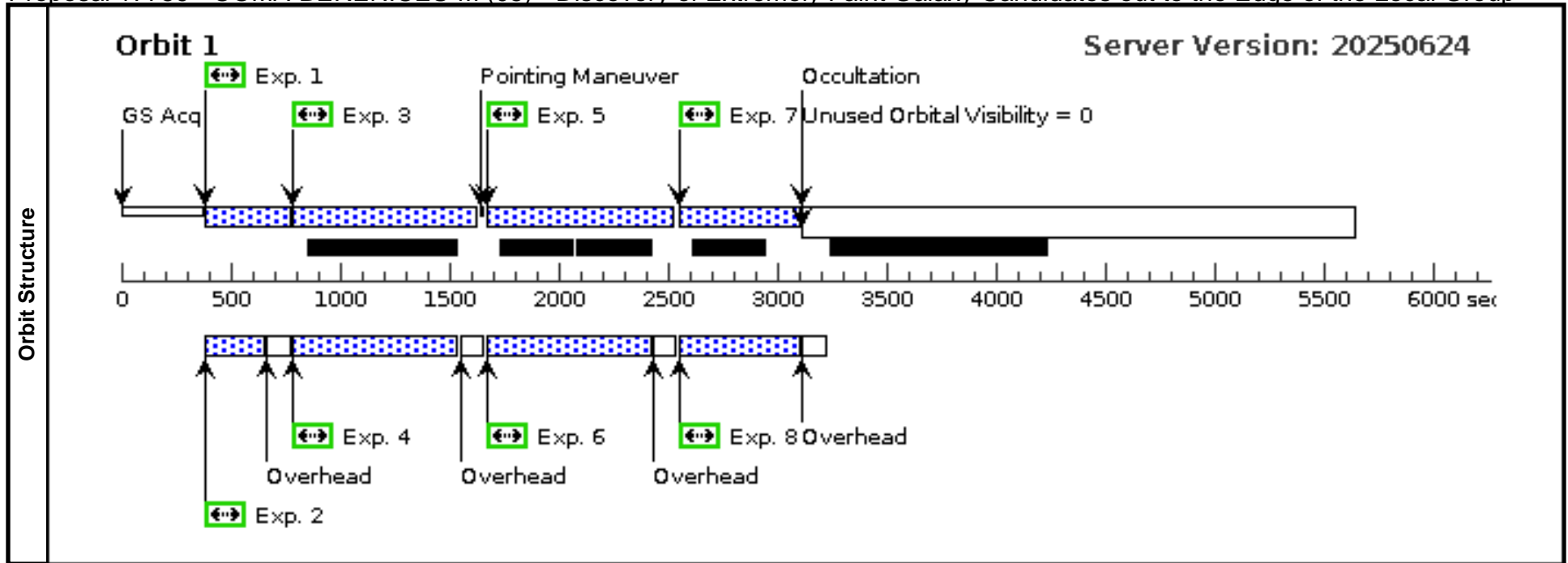
Visit	Proposal 17759, AQUARIUS-Y (04), completed Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS, ACS/WFC Special Requirements: ORIENT 220D TO 260 D; VISIBILITY INTERVAL 3117 S									
	Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous			
	(4)	AQUARIUS-Y	RA: 22 01 48.5825 (330.4524271d) Dec: -02 34 49.34 (-2.58037d) Equinox: J2000		V=17	Reference Frame: ICRS				
	<i>Comments:</i> Category=GALAXY Description=[DWARF SPHEROIDAL]									
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	(4) AQUARIUS-Y		ACS/WFC, ACCUM, WFC	F606W	FLASH=11		Prime + Parallel Group 1-2 in AQUARIUS-Y (04)	180 Secs (180 Secs) [==>]	[1]
	2	ANY		WFC3/UVIS, ACCUM, UVIS	F606W	FLASH=9		Prime + Parallel Group 1-2 in AQUARIUS-Y (04)	239 Secs (239 Secs) [==>]	[1]
	3	(4) AQUARIUS-Y		ACS/WFC, ACCUM, WFC	F814W			Prime + Parallel Group 3-4 in AQUARIUS-Y (04)	660 Secs (660 Secs) [==>]	[1]
	4	ANY		WFC3/UVIS, ACCUM, UVIS	F814W			Prime + Parallel Group 3-4 in AQUARIUS-Y (04)	730 Secs (730 Secs) [==>]	[1]
	5	(4) AQUARIUS-Y		ACS/WFC, ACCUM, WFC	F606W		POS TARG 0.247,0.267	Prime + Parallel Group 5-6 in AQUARIUS-Y (04)	660 Secs (660 Secs) [==>]	[1]
	6	ANY		WFC3/UVIS, ACCUM, UVIS	F606W			Prime + Parallel Group 5-6 in AQUARIUS-Y (04)	730 Secs (730 Secs) [==>]	[1]
	7	(4) AQUARIUS-Y		ACS/WFC, ACCUM, WFC	F814W	FLASH=7	SAME POS AS 5	Prime + Parallel Group 7-8 in AQUARIUS-Y (04)	337 Secs (337 Secs) [==>]	[1]
	8	ANY		WFC3/UVIS, ACCUM, UVIS	F814W	FLASH=11		Prime + Parallel Group 7-8 in AQUARIUS-Y (04)	410 Secs (410 Secs) [==>]	[1]



Proposal 17759 - COMA-BERENICES-M (05) - Discovery of Extremely Faint Galaxy Candidates out to the Edge of the Local Group

Mon Sep 15 17:00:19 GMT 2025

Visit	Proposal 17759, COMA-BERENICES-M (05), implementation Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS, ACS/WFC Special Requirements: ORIENT 250D TO 302 D; VISIBILITY INTERVAL 3117 S									
	Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous			
	(5)	COMA-BERENICES-M	RA: 12 26 49.3175 (186.7054896d) Dec: +18 43 15.13 (18.72087d) Equinox: J2000		V=17	Reference Frame: ICRS				
	<i>Comments:</i> Category=GALAXY Description=[DWARF SPHEROIDAL]									
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(5) COMA-BERENICES-M	ACS/WFC, ACCUM, WFC	F606W	FLASH=8		Prime + Parallel Group 1-2 in COMA-BERENICES-M (05)	180 Secs (180 Secs) [==>]	[1]
	2	ANY		WFC3/UVIS, ACCUM, UVIS	F606W	FLASH=9		Prime + Parallel Group 1-2 in COMA-BERENICES-M (05)	239 Secs (239 Secs) [==>]	[1]
	3		(5) COMA-BERENICES-M	ACS/WFC, ACCUM, WFC	F814W			Prime + Parallel Group 3-4 in COMA-BERENICES-M (05)	660 Secs (660 Secs) [==>]	[1]
	4	ANY		WFC3/UVIS, ACCUM, UVIS	F814W			Prime + Parallel Group 3-4 in COMA-BERENICES-M (05)	730 Secs (730 Secs) [==>]	[1]
	5		(5) COMA-BERENICES-M	ACS/WFC, ACCUM, WFC	F606W		POS TARG 0.247,0.267	Prime + Parallel Group 5-6 in COMA-BERENICES-M (05)	676 Secs (676 Secs) [==>]	[1]
	6	ANY		WFC3/UVIS, ACCUM, UVIS	F606W			Prime + Parallel Group 5-6 in COMA-BERENICES-M (05)	730 Secs (730 Secs) [==>]	[1]
	7		(5) COMA-BERENICES-M	ACS/WFC, ACCUM, WFC	F814W	FLASH=4	SAME POS AS 5	Prime + Parallel Group 7-8 in COMA-BERENICES-M (05)	368 Secs (368 Secs) [==>]	[1]
	8	ANY		WFC3/UVIS, ACCUM, UVIS	F814W	FLASH=11		Prime + Parallel Group 7-8 in COMA-BERENICES-M (05)	531 Secs (531 Secs) [==>]	[1]



Proposal 17759 - CANES-VENATICI-K (06) - Discovery of Extremely Faint Galaxy Candidates out to the Edge of the Local Group

Mon Sep 15 17:00:19 GMT 2025

Visit	Proposal 17759, CANES-VENATICI-K (06), completed Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS, ACS/WFC Special Requirements: ORIENT 297D TO 304 D; VISIBILITY INTERVAL 3176 S									
	Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous			
	(6)	CANES-VENATICI-K	RA: 14 02 28.4854 (210.6186892d) Dec: +31 15 4.96 (31.25138d) Equinox: J2000		V=17	Reference Frame: ICRS				
	<i>Comments:</i> Category=GALAXY Description=[DWARF SPHEROIDAL]									
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(6) CANES-VENATICI-K	ACS/WFC, ACCUM, WFC	F606W	FLASH=9		Prime + Parallel Group 1-2 in CANES-VENATICI-K (06)	242 Secs (242 Secs) [==>]	[1]
	2		ANY	WFC3/UVIS, ACCUM, UVIS	F606W	FLASH=9		Prime + Parallel Group 1-2 in CANES-VENATICI-K (06)	296 Secs (296 Secs) [==>]	[1]
	3		(6) CANES-VENATICI-K	ACS/WFC, ACCUM, WFC	F814W			Prime + Parallel Group 3-4 in CANES-VENATICI-K (06)	670 Secs (670 Secs) [==>]	[1]
	4		ANY	WFC3/UVIS, ACCUM, UVIS	F814W			Prime + Parallel Group 3-4 in CANES-VENATICI-K (06)	730 Secs (730 Secs) [==>]	[1]
	5		(6) CANES-VENATICI-K	ACS/WFC, ACCUM, WFC	F606W		POS TARG 0.247,0.267	Prime + Parallel Group 5-6 in CANES-VENATICI-K (06)	670 Secs (670 Secs) [==>]	[1]
	6		ANY	WFC3/UVIS, ACCUM, UVIS	F606W			Prime + Parallel Group 5-6 in CANES-VENATICI-K (06)	730 Secs (730 Secs) [==>]	[1]
	7		(6) CANES-VENATICI-K	ACS/WFC, ACCUM, WFC	F814W	FLASH=4	SAME POS AS 5	Prime + Parallel Group 7-8 in CANES-VENATICI-K (06)	367 Secs (367 Secs) [==>]	[1]
	8		ANY	WFC3/UVIS, ACCUM, UVIS	F814W	FLASH=11		Prime + Parallel Group 7-8 in CANES-VENATICI-K (06)	410 Secs (410 Secs) [==>]	[1]

