



18416 - HST Imaging of A Nearby Dwarf Galaxy Surrounded by an Ionized Ring of Pristine Circumgalactic Gas

Cycle: 34, Proposal Category: GO

(Availability Mode: SUPPORTED)

INVESTIGATORS

<i>Name</i>	<i>Institution</i>
Dr. Imad Pasha (PI) (Contact)	CIERA, Northwestern University
Prof. Pieter van Dokkum (CoI) (CoPI)	Yale University
Chloe Neufeld (CoI)	Yale University

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) LEDA-135162	ACS/WFC	2	10-Aug-2026 17:00:13.0	yes
02	(1) LEDA-135162	ACS/WFC	2	10-Aug-2026 17:00:14.0	yes
03	(1) LEDA-135162	ACS/WFC	2	10-Aug-2026 17:00:14.0	yes
04	(1) LEDA-135162	ACS/WFC	2	10-Aug-2026 17:00:14.0	yes
05	(1) LEDA-135162	ACS/WFC	2	10-Aug-2026 17:00:15.0	yes
06	(1) LEDA-135162	ACS/WFC	2	10-Aug-2026 17:00:15.0	yes

12 Total Orbits Used

ABSTRACT

It was recently discovered that the nearby dwarf galaxy LEDA 135162 hosts a large, low surface brightness ring surrounding the galaxy, well beyond its optical extent. Followup spectroscopy has revealed that the gas, clumps of which have been ionized by triggered star formation in the ring, is

remarkably lacking in almost any [NII] emission, despite being bright in [OIII] and H-alpha, suggesting this ring is composed of low metallicity, diffuse gas from the circumgalactic medium of the system. Unexpectedly, the [OIII]/H-beta line ratios vary considerably from clump to clump in the ring (and even from spaxel to spaxel) as measured from KCWI IFU spectroscopy, suggesting sub-seeing variation in metallicity or ionization conditions. We propose 12 orbits of HST narrowband and broadband imaging to characterize the properties of this unique ring, which provides a rare opportunity to study the spatially resolved circumgalactic medium of a nearby dwarf galaxy in situ, as well as to study the nature of star formation in the low-density, low metallicity regime.

OBSERVING DESCRIPTION

We aim to carry out a 12 orbit ACS/WFC program, split between 8 orbits of narrowband imaging (4 orbits in F502N, 4 orbits in F660N), with accompanying 4 orbits of broad band coverage (2 orbits in F475W, 2 orbits in F625W).

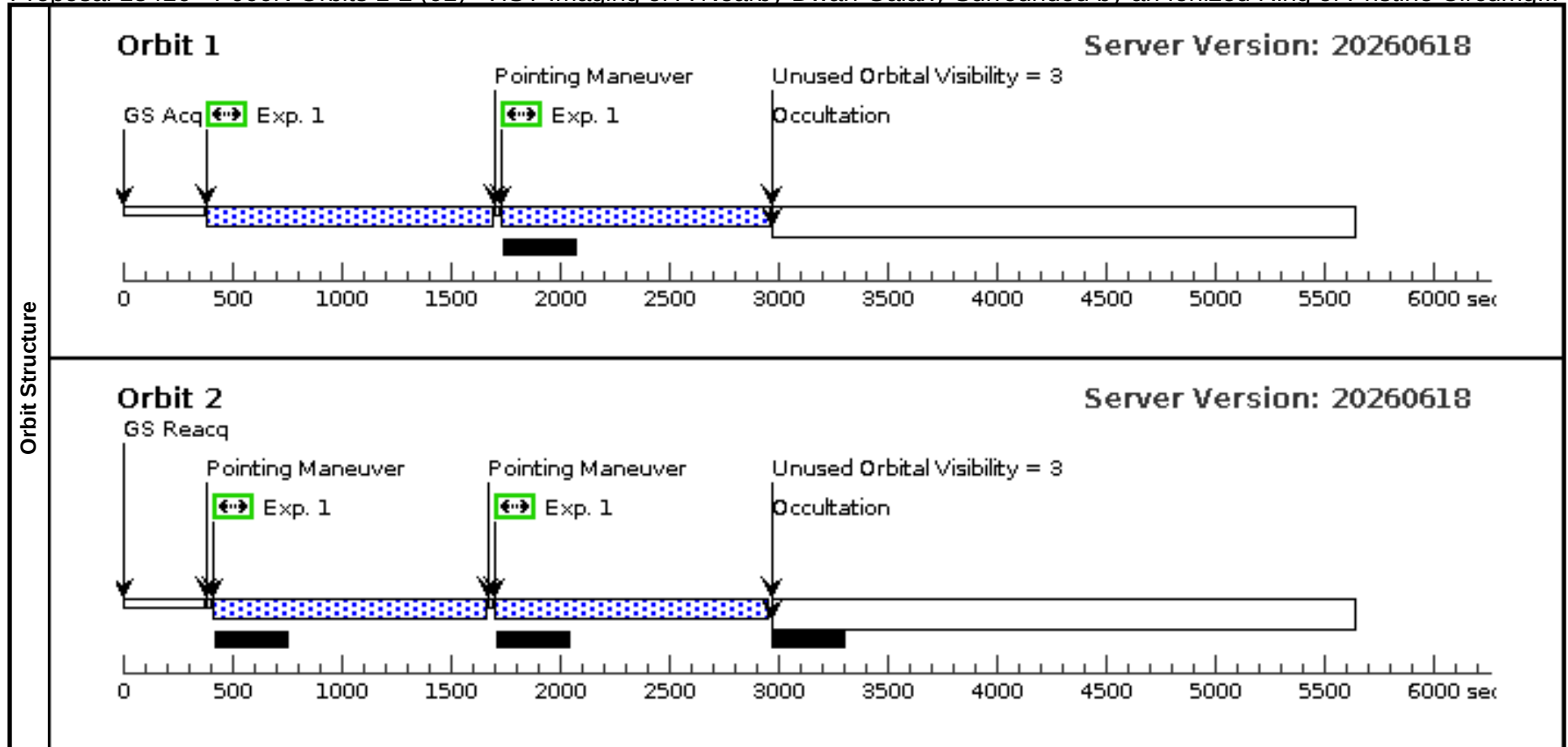
To maximize signal accumulation per subexposure, particularly in the narrowband filters, we have scheduled 2 images per orbit, maximizing availability at around 1000-1200 seconds per exposure. We complete 1 full 4 point dither pattern (large, at 9.5" scale --- we are aiming to ensure uniform filling of the field, rather than high subpixel aligned sampling) per visit/orient, with each visit comprising 2 orbits. There are no roll angle constraints for any individual visit.

Per ETC recommendations, we have input $10e^-$ of post flash per NB exposure, though we seek guidance on this front. ETC: ACS.im.2363734 (see submission comments).

Updating from the proposal, we reran the ETC using the same clump input spectrum (0.4" source with a 0.4" extraction aperture) but with an updated exposure time of 1099 seconds (based on the 2 exposure per orbit packing), and determined $10e^-$ of post flash would be sufficient compared to the $27e^-$ for the initial proposal.

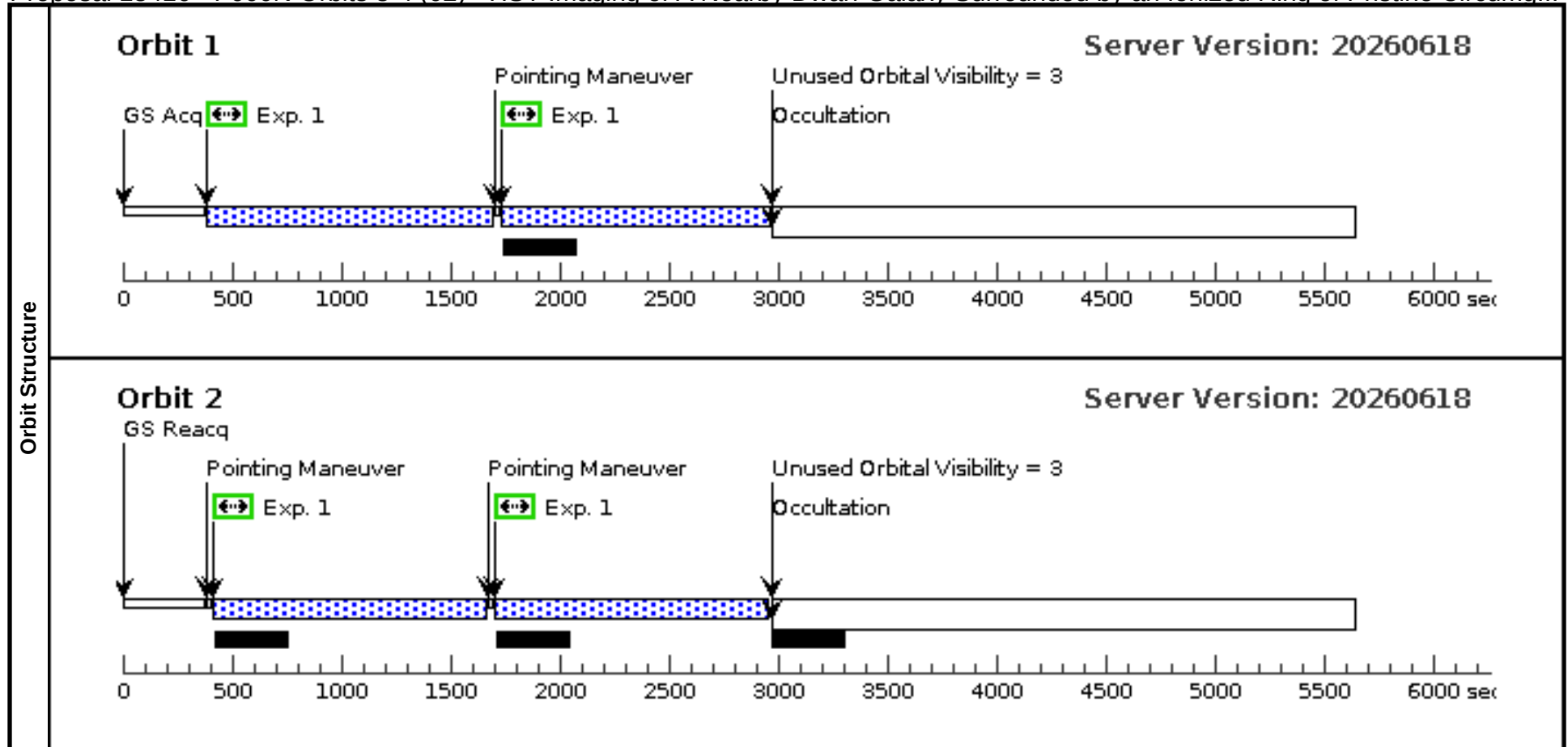
Proposal 18416 - F660N Orbits 1-2 (01) - HST Imaging of A Nearby Dwarf Galaxy Surrounded by an Ionized Ring of Pristine Circumg...

Visit	Proposal 18416, F660N Orbits 1-2 (01)										Mon Aug 10 21:00:16 GMT 2026	
	Diagnostic Status: No Diagnostics											
	Scientific Instruments: ACS/WFC											
	Special Requirements: (none)											
Patterns	#	Primary Pattern				Secondary Pattern				Exposures		
	(1)	Pattern Type=ACS-WFC-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=9.5 Line Spacing=9.5		Coordinate Frame=POS-TARG Pattern Orientation=20.7 Angle Between Sides=69.02 Center Pattern=false						(1)		
Fixed Targets	#	Name	Target Coordinates		Targ. Coord. Corrections		Fluxes		Miscellaneous			
	(1)	LEDA-135162	RA: 04 30 46.5857 (67.6941071d) Dec: -20 36 25.61 (-20.60711d) Equinox: J2000		Epoch of Position: 2000		V=16.0160		Reference Frame: ICRS			
	Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.											
	Category=GALAXY Description=[DWARF COMPACT, INTERACTING GALAXY, KNOT, RING, STAR FORMING REGION] Extended=YES											
Exposures	#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]		Orbit	
	1	(ACS.im.23 63734)	(1) LEDA-135162	ACS/WFC, ACCUM, WFC	F660N	FLASH=10	POS TARG -2.6208 9904834826,-23.872 154086798375	Pattern 1, Exps 1-1 in F660N Orbits 1-2 (01) (1)	1099 Secs (4448 Secs)			
									[==>(Pattern 1)]		[1]	
									[==>(Pattern 2)]			
								[==>1125.0 Secs (Pattern 3)]		[2]		
								[==>1125.0 Secs (Pattern 4)]				



Proposal 18416 - F660N Orbits 3-4 (02) - HST Imaging of A Nearby Dwarf Galaxy Surrounded by an Ionized Ring of Pristine Circumg...

Visit	Proposal 18416, F660N Orbits 3-4 (02)										Mon Aug 10 21:00:16 GMT 2026	
	Diagnostic Status: No Diagnostics											
	Scientific Instruments: ACS/WFC											
	Special Requirements: (none)											
Patterns	#	Primary Pattern					Secondary Pattern				Exposures	
	(1)	Pattern Type=ACS-WFC-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=9.5 Line Spacing=9.5			Coordinate Frame=POS-TARG Pattern Orientation=20.7 Angle Between Sides=69.02 Center Pattern=false						(1)	
Fixed Targets	#	Name		Target Coordinates		Targ. Coord. Corrections		Fluxes		Miscellaneous		
	(1)	LEDA-135162		RA: 04 30 46.5857 (67.6941071d) Dec: -20 36 25.61 (-20.60711d) Equinox: J2000		Epoch of Position: 2000		V=16.0160		Reference Frame: ICRS		
	Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.											
	Category=GALAXY Description=[DWARF COMPACT, INTERACTING GALAXY, KNOT, RING, STAR FORMING REGION] Extended=YES											
Exposures	#	Label (ETC Run)	Target	Config,Mode,Aperture		Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]		Orbit
	1	(ACS.im.23 63734)	(1) LEDA-135162	ACS/WFC, ACCUM, WFC		F660N	FLASH=10	POS TARG -2.6208 9904834826,-23.872 154086798375	Pattern 1, Exps 1-1 in F660N Orbits 3-4 (02) (1)	1099 Secs (4448 Secs)		
										[==>(Pattern 1)]		[1]
										[==>(Pattern 2)]		
										[==>1125.0 Secs (Pattern 3)]		[2]
									[==>1125.0 Secs (Pattern 4)]			

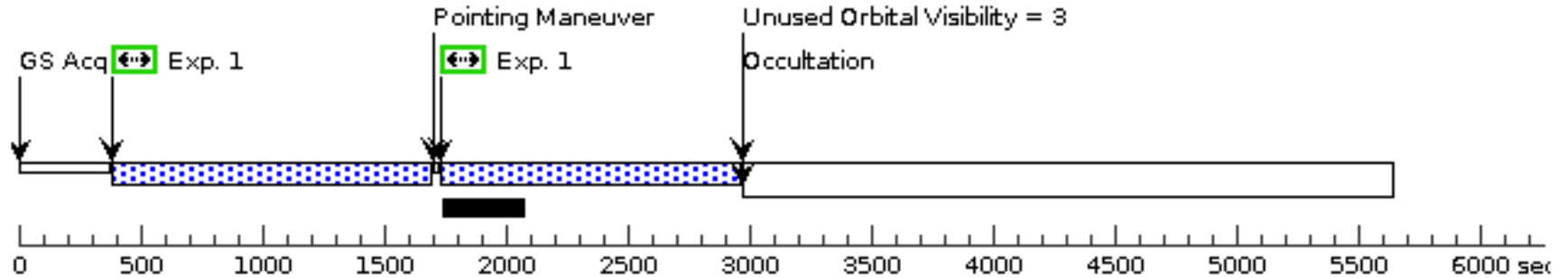


Proposal 18416 - F502N Orbits 1-2 (03) - HST Imaging of A Nearby Dwarf Galaxy Surrounded by an Ionized Ring of Pristine Circumg...

Visit	Proposal 18416, F502N Orbits 1-2 (03)										Mon Aug 10 21:00:16 GMT 2026
	Diagnostic Status: No Diagnostics										
	Scientific Instruments: ACS/WFC										
	Special Requirements: (none)										
Patterns	#	Primary Pattern				Secondary Pattern				Exposures	
	(1)	Pattern Type=ACS-WFC-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=9.5 Line Spacing=9.5		Coordinate Frame=POS-TARG Pattern Orientation=20.7 Angle Between Sides=69.02 Center Pattern=false						(1)	
Fixed Targets	#	Name	Target Coordinates		Targ. Coord. Corrections		Fluxes		Miscellaneous		
	(1)	LEDA-135162	RA: 04 30 46.5857 (67.6941071d) Dec: -20 36 25.61 (-20.60711d) Equinox: J2000		Epoch of Position: 2000		V=16.0160		Reference Frame: ICRS		
	Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.										
	Category=GALAXY Description=[DWARF COMPACT, INTERACTING GALAXY, KNOT, RING, STAR FORMING REGION] Extended=YES										
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]		Orbit
	1		(1) LEDA-135162	ACS/WFC, ACCUM, WFC	F502N	FLASH=10	POS TARG -2.6208 9904834826,-23.872 154086798375	Pattern 1, Exps 1-1 i n F502N Orbits 1-2 (03) (1)	1200 Secs (4448 Secs)		
									[==>1099.0 Secs (Pattern 1)]		[1]
									[==>1099.0 Secs (Pattern 2)]		
										[==>1125.0 Secs (Pattern 3)]	
									[==>1125.0 Secs (Pattern 4)]		

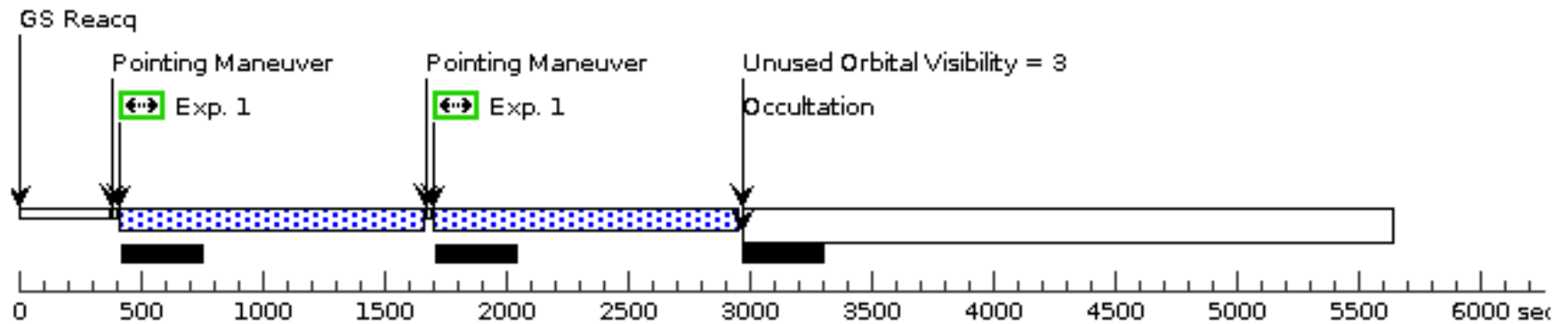
Orbit 1

Server Version: 20260618



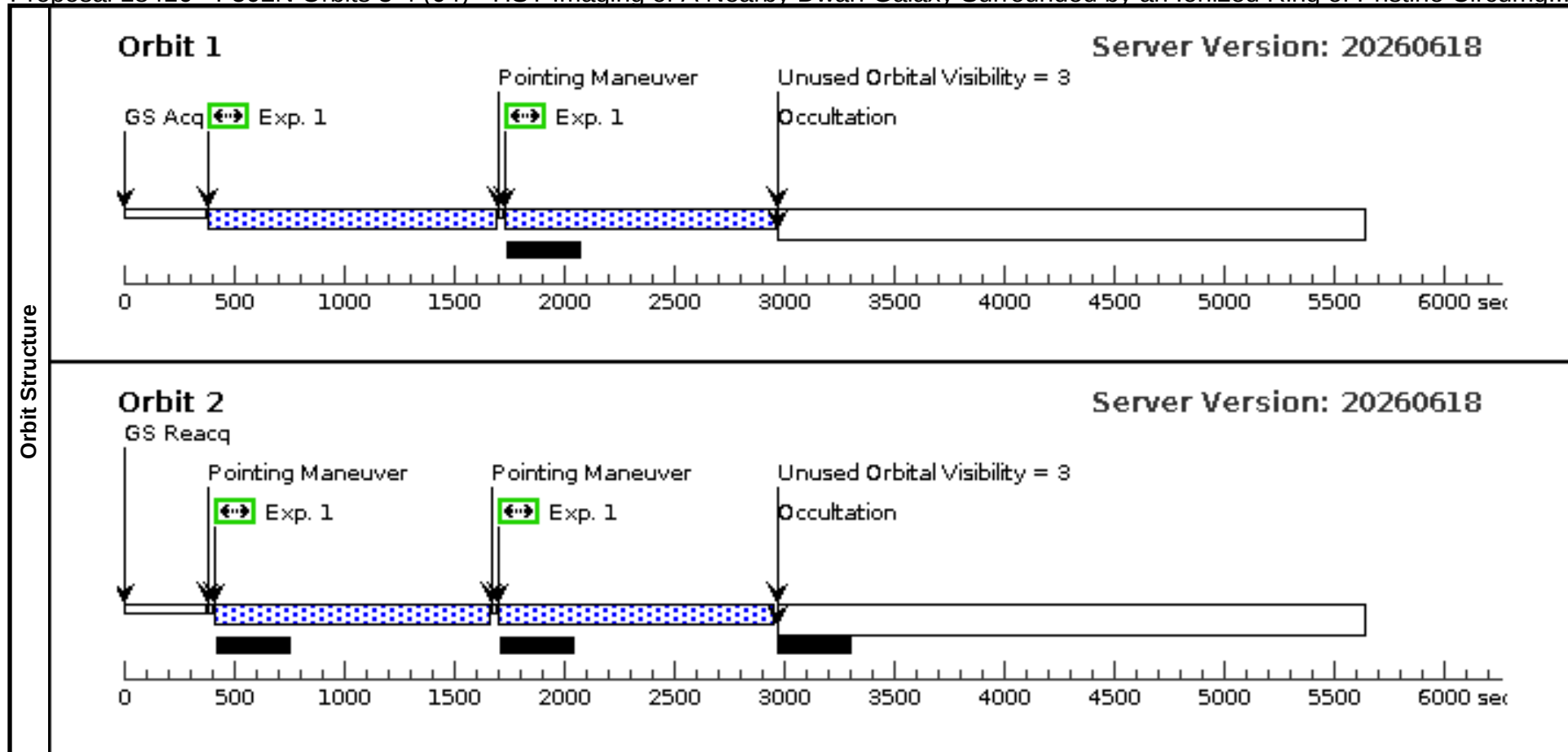
Orbit 2

Server Version: 20260618



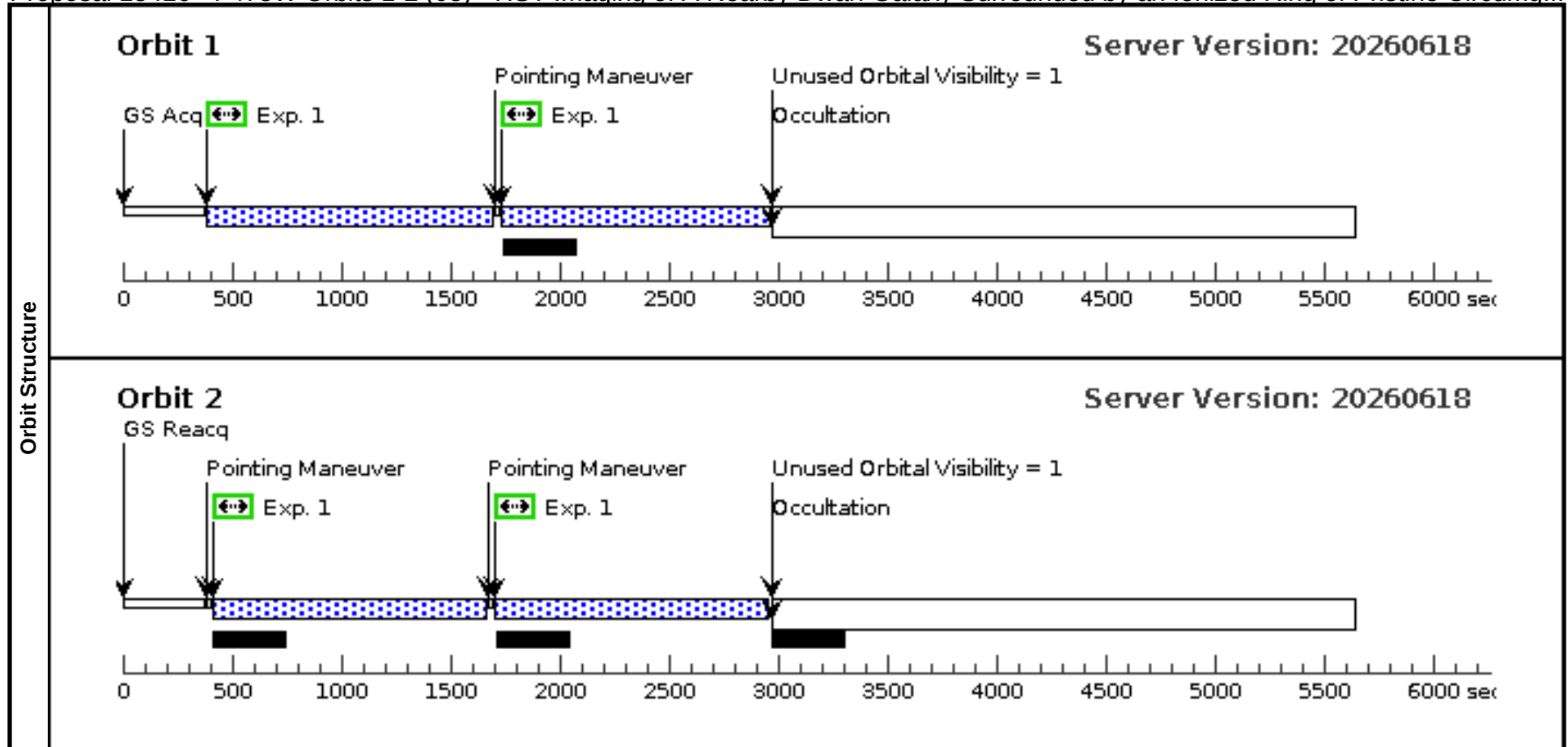
Proposal 18416 - F502N Orbits 3-4 (04) - HST Imaging of A Nearby Dwarf Galaxy Surrounded by an Ionized Ring of Pristine Circumg...

Visit	Proposal 18416, F502N Orbits 3-4 (04)										Mon Aug 10 21:00:16 GMT 2026
	Diagnostic Status: No Diagnostics										
	Scientific Instruments: ACS/WFC										
	Special Requirements: (none)										
Patterns	#	Primary Pattern				Secondary Pattern				Exposures	
	(1)	Pattern Type=ACS-WFC-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=9.5 Line Spacing=9.5		Coordinate Frame=POS-TARG Pattern Orientation=20.7 Angle Between Sides=69.02 Center Pattern=false						(1)	
Fixed Targets	#	Name	Target Coordinates		Targ. Coord. Corrections		Fluxes		Miscellaneous		
	(1)	LEDA-135162	RA: 04 30 46.5857 (67.6941071d) Dec: -20 36 25.61 (-20.60711d) Equinox: J2000		Epoch of Position: 2000		V=16.0160		Reference Frame: ICRS		
	Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.										
	Category=GALAXY Description=[DWARF COMPACT, INTERACTING GALAXY, KNOT, RING, STAR FORMING REGION] Extended=YES										
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]		Orbit
	1		(1) LEDA-135162	ACS/WFC, ACCUM, WFC	F502N	FLASH=10	POS TARG -2.6208 9904834826,-23.872 154086798375	Pattern 1, Exps 1-1 i n F502N Orbits 3-4 (04) (1)	1200 Secs (4448 Secs)		
									[==>1099.0 Secs (Pattern 1)]		[1]
									[==>1099.0 Secs (Pattern 2)]		
										[==>1125.0 Secs (Pattern 3)]	
									[==>1125.0 Secs (Pattern 4)]		



Proposal 18416 - F475W Orbits 1-2 (05) - HST Imaging of A Nearby Dwarf Galaxy Surrounded by an Ionized Ring of Pristine Circumg...

Visit	Proposal 18416, F475W Orbits 1-2 (05)										Mon Aug 10 21:00:16 GMT 2026	
	Diagnostic Status: No Diagnostics											
	Scientific Instruments: ACS/WFC											
	Special Requirements: (none)											
Patterns	#	Primary Pattern				Secondary Pattern				Exposures		
	(1)	Pattern Type=ACS-WFC-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=9.5 Line Spacing=9.5		Coordinate Frame=POS-TARG Pattern Orientation=20.7 Angle Between Sides=69.02 Center Pattern=false						(1)		
Fixed Targets	#	Name	Target Coordinates		Targ. Coord. Corrections		Fluxes		Miscellaneous			
	(1)	LEDA-135162	RA: 04 30 46.5857 (67.6941071d) Dec: -20 36 25.61 (-20.60711d) Equinox: J2000		Epoch of Position: 2000		V=16.0160		Reference Frame: ICRS			
	Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.											
	Category=GALAXY Description=[DWARF COMPACT, INTERACTING GALAXY, KNOT, RING, STAR FORMING REGION] Extended=YES											
Exposures	#	Label	Target	Config,Mode,Aperture		Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]		Orbit
	1		(1) LEDA-135162	ACS/WFC, ACCUM, WFC		F475W		POS TARG -2.6208 9904834826,-23.872 154086798375	Pattern 1, Exps 1-1 i n F475W Orbits 1-2 (05) (1)	1200 Secs (4472 Secs)		
										[==>1105.0 Secs (Pattern 1)]		[1]
										[==>1105.0 Secs (Pattern 2)]		
											[==>1131.0 Secs (Pattern 3)]	
										[==>1131.0 Secs (Pattern 4)]		



Proposal 18416 - F625W Orbits 1-2 (06) - HST Imaging of A Nearby Dwarf Galaxy Surrounded by an Ionized Ring of Pristine Circumg...

Visit	Proposal 18416, F625W Orbits 1-2 (06)										Mon Aug 10 21:00:16 GMT 2026
	Diagnostic Status: No Diagnostics										
	Scientific Instruments: ACS/WFC										
	Special Requirements: (none)										
Patterns	#	Primary Pattern				Secondary Pattern				Exposures	
	(1)	Pattern Type=ACS-WFC-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=9.5 Line Spacing=9.5		Coordinate Frame=POS-TARG Pattern Orientation=20.7 Angle Between Sides=69.02 Center Pattern=false						(1)	
Fixed Targets	#	Name	Target Coordinates		Targ. Coord. Corrections		Fluxes		Miscellaneous		
	(1)	LEDA-135162	RA: 04 30 46.5857 (67.6941071d) Dec: -20 36 25.61 (-20.60711d) Equinox: J2000		Epoch of Position: 2000		V=16.0160		Reference Frame: ICRS		
	Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. Category=GALAXY Description=[DWARF COMPACT, INTERACTING GALAXY, KNOT, RING, STAR FORMING REGION] Extended=YES										
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]		Orbit
	1		(1) LEDA-135162	ACS/WFC, ACCUM, WFC	F625W		POS TARG -2.6208 9904834826,-23.872 154086798375	Pattern 1, Exps 1-1 i n F625W Orbits 1-2 (06) (1)	1200 Secs (4472 Secs)		
									[==>1105.0 Secs (Pattern 1)]		[1]
									[==>1105.0 Secs (Pattern 2)]		
										[==>1131.0 Secs (Pattern 3)]	
									[==>1131.0 Secs (Pattern 4)]		

