



# 17141 - Probing Multiple Formation Below 1Msun: Towards the Opacity-Limit for Fragmentation from 7.5-150 au in NGC 1333ars

Cycle: 30, Proposal Category: GO

(Availability Mode: SUPPORTED)

## INVESTIGATORS

<i>Name</i>	<i>Institution</i>
<b>Dr. Matthew De Furio (PI) (Contact)</b>	<b>University of Texas at Austin</b>
Prof. Michael R. Meyer (CoI) (CoPI)	University of Michigan
Dr. Aleks Scholz (CoI) (ESA Member)	University of St Andrews
Dr. Jay Anderson (CoI)	Space Telescope Science Institute
Dr. Megan Reiter (CoI)	Rice 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) NGC-1333 ANY	ACS/WFC WFC3/UVIS	1	02-Jul-2025 11:00:15.0	yes
02	(1) NGC-1333 ANY	ACS/WFC WFC3/UVIS	1	02-Jul-2025 11:00:16.0	yes
09	(1) NGC-1333 ANY	ACS/WFC WFC3/UVIS	1	02-Jul-2025 11:00:16.0	yes
03	(1) NGC-1333 ANY	ACS/WFC WFC3/UVIS	1	02-Jul-2025 11:00:17.0	yes
04	(1) NGC-1333 ANY	ACS/WFC WFC3/UVIS	1	02-Jul-2025 11:00:18.0	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>
05	(1) NGC-1333 ANY	ACS/WFC WFC3/UVIS	1	02-Jul-2025 11:00:19.0	yes
06	(1) NGC-1333 ANY	ACS/WFC WFC3/UVIS	1	02-Jul-2025 11:00:19.0	yes
07	(1) NGC-1333 ANY	ACS/WFC WFC3/UVIS	1	02-Jul-2025 11:00:20.0	yes
08	(1) NGC-1333 ANY	ACS/WFC WFC3/UVIS	1	02-Jul-2025 11:00:21.0	yes
10	(1) NGC-1333 ANY	ACS/WFC WFC3/UVIS	1	02-Jul-2025 11:00:22.0	yes

10 Total Orbits Used

## **ABSTRACT**

Multiplicity studies of the Galactic field have revealed important trends in companion frequency, mass ratio, and separation as a function of primary mass, from O-stars to T-dwarfs. Importantly, similar studies in young, star-forming regions have identified an excess of companions to low-mass stars relative to the field in low-density regions, but find a comparable frequency of companions to low-mass stars relative to the field in high-density regions. We propose a small, seven-orbit program with ACS/WFC in parallel with WFC3/UVIS to obtain multi-filter photometry of NGC 1333 (a nearby intermediate density cluster) to perform a multiplicity survey, characterizing the companion population for primary masses 0.01-1.0 Msun and search for trends based on primary mass and stellar density. Using the empirical PSFs previously derived across the detector for each filter/instrument combination, we will search for close companions with a PSF-fitting technique, proven to detect companions down to 0.5 pixels (0.025") on ACS/WFC, corresponding to 7.5 AU at 300 pc. With the 150 confirmed cluster members within our field of view, we expect to detect 33 companions (if the companion population of NGC 1333 resembles the field) which allows us to place constraints on its mass ratio distribution as a function of primary mass and separation, exploring star formation processes and cluster dynamics in creating and shaping these multiple systems.

## **OBSERVING DESCRIPTION**

We propose a small program of seven orbits to observe NGC 1333 in visible wavelengths with the ACS/WFC (hereafter ACS) coordinated in parallel with WFC3/UVIS (hereafter UVIS), as ACS has a field of view 60% larger than UVIS. Each orbit will observe one ACS and UVIS field, enclosing 150 known members (130 with ACS, 20 with UVIS and some overlap). These seven fields were selected to observe the largest number of sources in

the fewest number of frames where any additional field adds a maximum of ten members.

To accomplish our science goals, we require short (3s) and long (340s) exposures in the F435W, F606W, and F814W filters that attain  $S/N > 10$  across 12 orders of magnitude with ACS. Sources of 13 (13.7, 12.6) mag in F435W (F606W, F814W) nearly saturate in 3s, and sources of 20.1 (20.1, 19.8) mag achieve a  $S/N=10$  in 3s. Sources of 18.1 (18.8, 17.8) mag in F435W (F606W, F814W) nearly saturate in 340s while sources of 25.3 (25.5, 24.6) mag achieve a  $S/N=10$  in 340s. These limiting magnitudes for F435W and F606W are 4.5 and 5.5 mags deeper than previously attained in the B and R filters (Monet et al. 2003). That of F814W is equivalent to the previous limit in  $i'$  and  $z'$  filters with Suprime-Cam at the Subaru telescope (Scholz et al. 2009). The data must be unsaturated to apply the PSF-fitting technique and detect companions at  $0.5 \times \text{pixel}$  on ACS. Luhman et al. (2016) were complete down to  $K_s = 16.2$  mas for  $A_j < 3$  mag, 15-20 Mjup for  $A_j = 3$  at a distance of 300 pc using the Ames-Cond and BT-Settl evolutionary models (Allard et al. 2001,2011). Scholz et al. (2009) were complete down to  $J = 20.8$  or 6 Mjup for  $A_j = 3$ , while our limit in F814W corresponds to a 8-12 Mjup for  $A_j = 3$ . With the median extinction of cluster members ( $A_j=1.1$ ), our observations can achieve  $S/N = 10$  for 0.09 Msun objects in F435W, 0.015 Msun objects in F606W, and .005 Msun objects in F814W. The short exposures are designed to collect data on the bright stellar members of the cluster without saturating, up to 1 Msun, while the long exposures are designed to collect data on the sub-stellar members of the cluster down to 0.01 Msun.

The UVIS parallels can occur within the same orbit if only two images are taken due to the inability to buffer dump to the solid state recorder simultaneously with ACS and UVIS. We select long exposures for F606W and F814W in order to observe sub-stellar members on the outer portion of the star-forming region.

Short exposures have low background and suffer significant charge transfer efficiency (CTE) losses, particularly for low  $S/N$ , which affect the photometric and astrometric estimates. We combat this effect in two ways: 1) select exposures times with two magnitudes of overlap so low  $S/N$  sources in the short exposures will be observed with high  $S/N$  in the long exposures, e.g. 18.1-20.1 mag in the F435W filter, 2) invoke a 20e- post-flash for the short exposures of ACS and less post-flash for the long exposures with UVIS which allows for proper pixel-based CTE corrections through the HST pipeline (Anderson & Bedin 2010, Ogaz et al. 2014, Bellini et al. 2017, Miles 2018, Anderson 2020), as recommended by STScI HST help desk.

We will take undithered short and long exposures in the F435W, F606W, and F814W filters. The images are undrizzled in accordance with Anderson & King (2006) and Anderson & Bedin (2017) to fit empirical PSFs to the data and avoid interpolated data from drizzle-combined images. Cosmic rays will not be confused with companions within single exposures due to poor PSF fits and their absence in images from other filters. Fields will

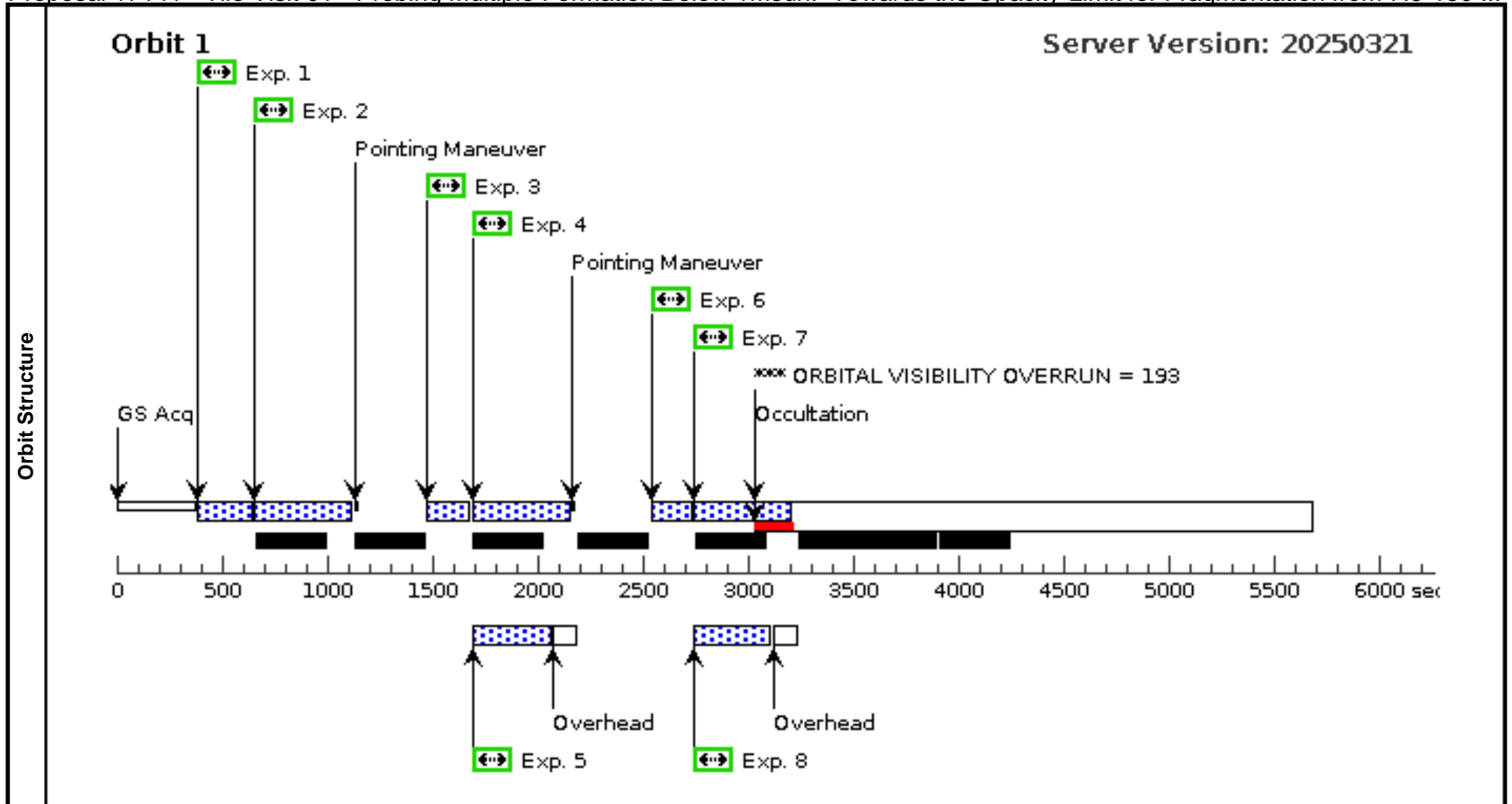
have a small offset in between exposures of different filters to mitigate hot pixels.

Each orbit is made of a 6.5min guide star acquisition, 4min first exposure with ACS, 3s observation in F435W with post-flash (5s), 2.5min overhead, 340s observation in F435W, 5.8min buffer dump, 3s observation in F606W with post-flash (5s), 2.5min exposure overhead, 340s observation in F606W, 5.8min buffer dump, 3s observation in F814W with post-flash (5s), 2.5min exposure overhead, and 340s observation in F814W.

Proposal 17141 - Tile Visit 01 - Probing Multiple Formation Below 1Msun: Towards the Opacity-Limit for Fragmentation from 7.5-150 ...

Wed Jul 02 15:00:22 GMT 2025

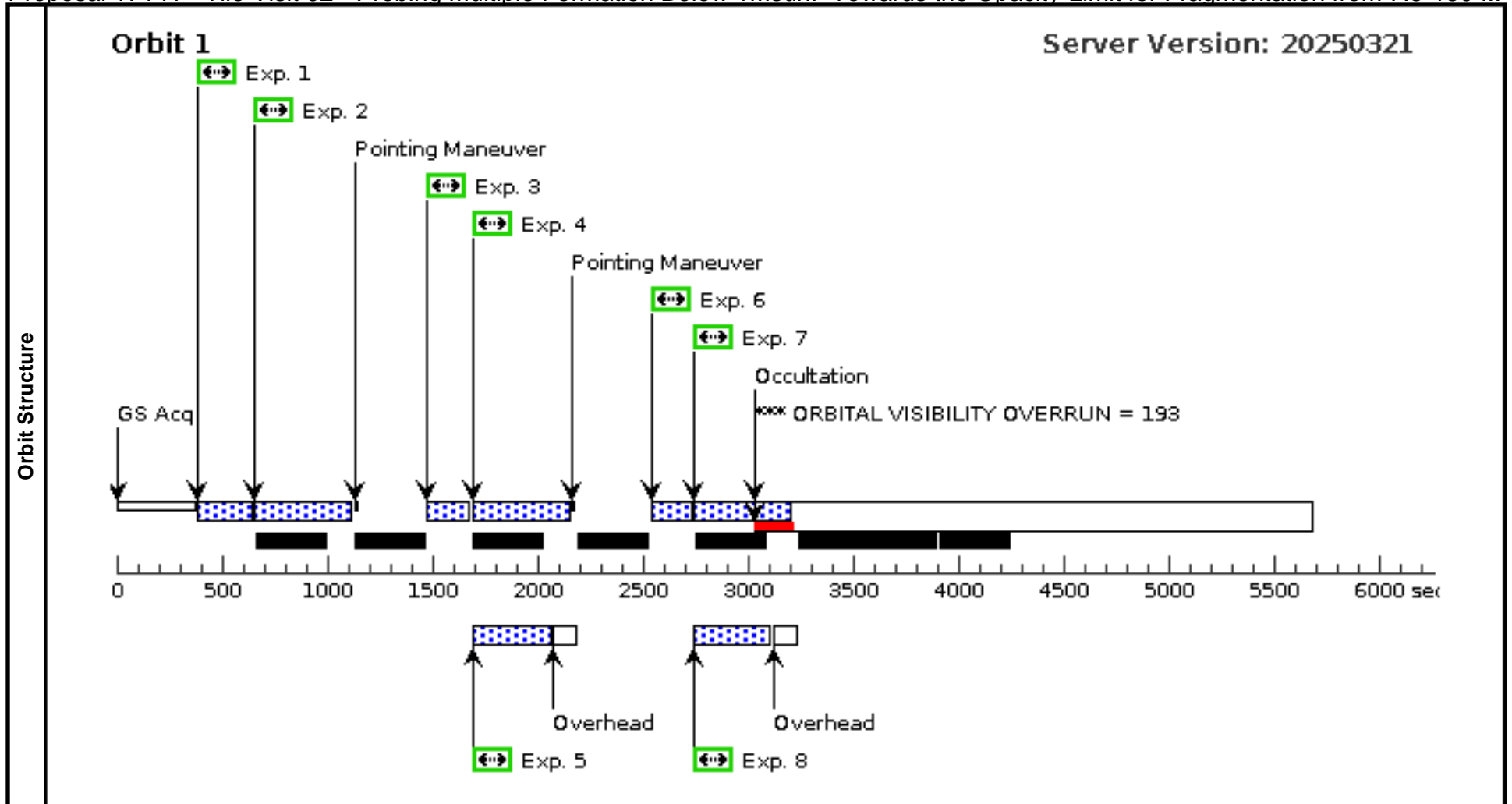
Visit	<b>Proposal 17141, Tile Visit 01, withdrawn</b> <b>Diagnostic Status: Warning</b> Scientific Instruments: WFC3/UVIS, ACS/WFC Special Requirements: ORIENT 111D TO 111 D									
	Diagnostics	(Tile Visit 01) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN								
Fixed Targets		#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous			
		(1)	NGC-1333	RA: 03 28 50.7637 (52.2115154d) Dec: +31 22 2.45 (31.36735d) Equinox: J2000	Proper Motion RA: 5.793755344431927E-4 sec of time/yr Proper Motion Dec: -0.009864999901765259 arcsec/yr Epoch of Position: 2015.5	V=5.6	Reference Frame: SIMBAD			
	<i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.</i> Category=STELLAR CLUSTER Description=[STAR FORMING REGION]									
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	F435W ACS 3s	(1) NGC-1333	ACS/WFC, ACCUM, WFC	F435W	FLASH=20.0	POS TARG -36.376 42893517996,-410.7 568541734737		3 Secs (3 Secs) [==>]	[1]
	2	F435W ACS 340s	(1) NGC-1333	ACS/WFC, ACCUM, WFC	F435W		POS TARG -36.376 42893517996,-410.7 568541734737		340 Secs (340 Secs) [==>]	[1]
	3	F606W ACS 3s	(1) NGC-1333	ACS/WFC, ACCUM, WFC	F606W	FLASH=20.0	POS TARG -35.876 42893517996,-410.2 568541734737		3 Secs (3 Secs) [==>]	[1]
	4	F606W ACS 340s	(1) NGC-1333	ACS/WFC, ACCUM, WFC	F606W		POS TARG -35.876 42893517996,-410.2 568541734737	Prime + Parallel Group 4-5 in Tile Visit 01	340 Secs (340 Secs) [==>]	[1]
	5	F606W WF C3/UVIS 340s	ANY	WFC3/UVIS, ACCUM, UVIS	F606W	FLASH=7.0		Prime + Parallel Group 4-5 in Tile Visit 01	340 Secs (340 Secs) [==>]	[1]
	6	F814W ACS 3s	(1) NGC-1333	ACS/WFC, ACCUM, WFC	F814W	FLASH=20.0	POS TARG -35.376 42893517996,-409.7 568541734737		3 Secs (3 Secs) [==>]	[1]
	7	F814W ACS 340s	(1) NGC-1333	ACS/WFC, ACCUM, WFC	F814W		POS TARG -35.376 42893517996,-409.7 568541734737	Prime + Parallel Group 7-8 in Tile Visit 01	340 Secs (340 Secs) [==>]	[1]
	8	F814W WF C3 340s	ANY	WFC3/UVIS, ACCUM, UVIS	F814W	FLASH=13.0		Prime + Parallel Group 7-8 in Tile Visit 01	340 Secs (340 Secs) [==>]	[1]



Proposal 17141 - Tile Visit 02 - Probing Multiple Formation Below 1Msun: Towards the Opacity-Limit for Fragmentation from 7.5-150 ...

Wed Jul 02 15:00:22 GMT 2025

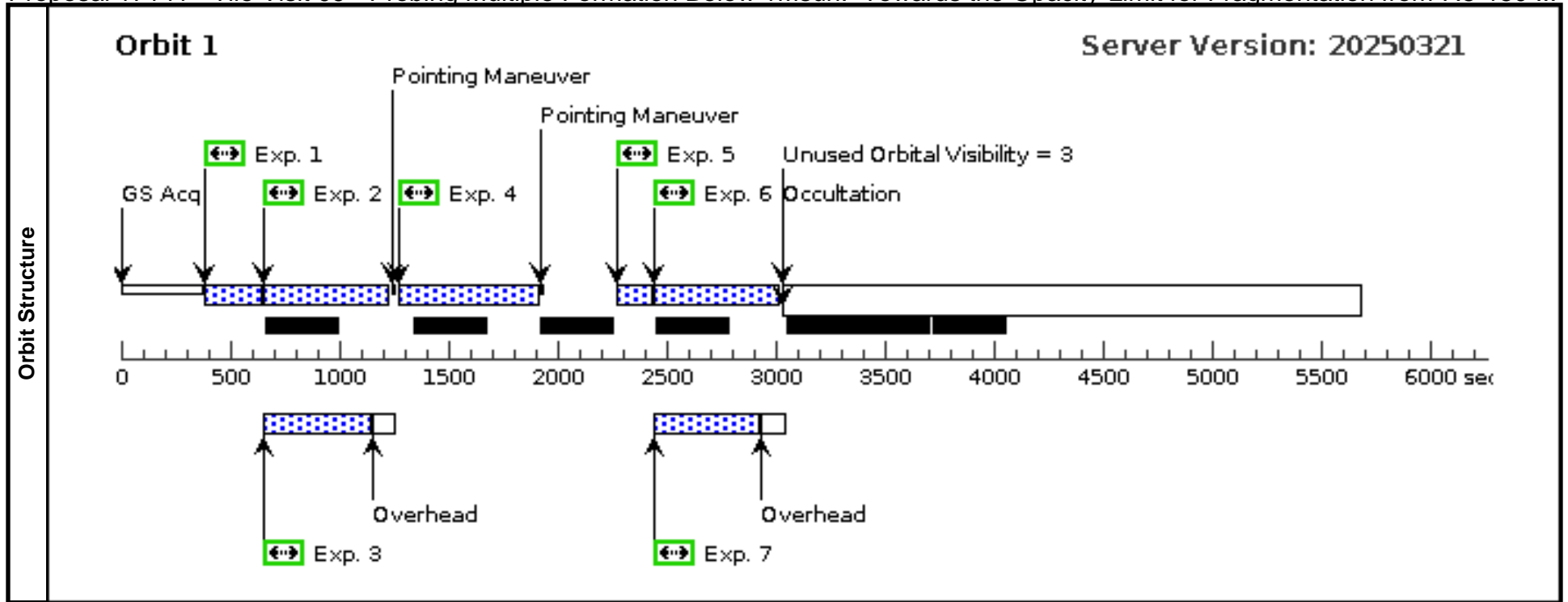
Visit	<b>Proposal 17141, Tile Visit 02, failed</b> <b>Diagnostic Status: Warning</b> Scientific Instruments: WFC3/UVIS, ACS/WFC Special Requirements: ORIENT 107D TO 107 D									
	Diagnostics	(Tile Visit 02) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN								
Fixed Targets		#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous			
		(1)	NGC-1333	RA: 03 28 50.7637 (52.2115154d) Dec: +31 22 2.45 (31.36735d) Equinox: J2000	Proper Motion RA: 5.793755344431927E-4 sec of time/yr Proper Motion Dec: -0.009864999901765259 arcsec/yr Epoch of Position: 2015.5	V=5.6	Reference Frame: SIMBAD			
	<i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.</i> Category=STELLAR CLUSTER Description=[STAR FORMING REGION]									
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	F435W ACS 3s	(1) NGC-1333	ACS/WFC, ACCUM, WFC	F435W	FLASH=20.0	POS TARG -49.133 021769301834,-185. 26661937988305		3 Secs (3 Secs) [==>]	[1]
	2	F435W ACS 340s	(1) NGC-1333	ACS/WFC, ACCUM, WFC	F435W		POS TARG -49.133 021769301834,-185. 26661937988305		340 Secs (340 Secs) [==>]	[1]
	3	F606W ACS 3s	(1) NGC-1333	ACS/WFC, ACCUM, WFC	F606W	FLASH=20.0	POS TARG -48.633 021769301834,-184. 76661937988305		3 Secs (3 Secs) [==>]	[1]
	4	F606W ACS 340s	(1) NGC-1333	ACS/WFC, ACCUM, WFC	F606W		POS TARG -48.633 021769301834,-184. 76661937988305	Prime + Parallel Group 4-5 in Tile Visit 02	340 Secs (340 Secs) [==>]	[1]
	5	F606W WF C3/UVIS 340s	ANY	WFC3/UVIS, ACCUM, UVIS	F606W	FLASH=7.0		Prime + Parallel Group 4-5 in Tile Visit 02	340 Secs (340 Secs) [==>]	[1]
	6	F814W ACS 3s	(1) NGC-1333	ACS/WFC, ACCUM, WFC	F814W	FLASH=20.0	POS TARG -48.133 021769301834,-184. 26661937988305		3 Secs (3 Secs) [==>]	[1]
	7	F814W ACS 340s	(1) NGC-1333	ACS/WFC, ACCUM, WFC	F814W		POS TARG -48.133 021769301834,-184. 26661937988305	Prime + Parallel Group 7-8 in Tile Visit 02	340 Secs (340 Secs) [==>]	[1]
	8	F814W WF C3 340s	ANY	WFC3/UVIS, ACCUM, UVIS	F814W	FLASH=13.0		Prime + Parallel Group 7-8 in Tile Visit 02	340 Secs (340 Secs) [==>]	[1]



Proposal 17141 - Tile Visit 09 - Probing Multiple Formation Below 1Msun: Towards the Opacity-Limit for Fragmentation from 7.5-150 ...

Wed Jul 02 15:00:22 GMT 2025

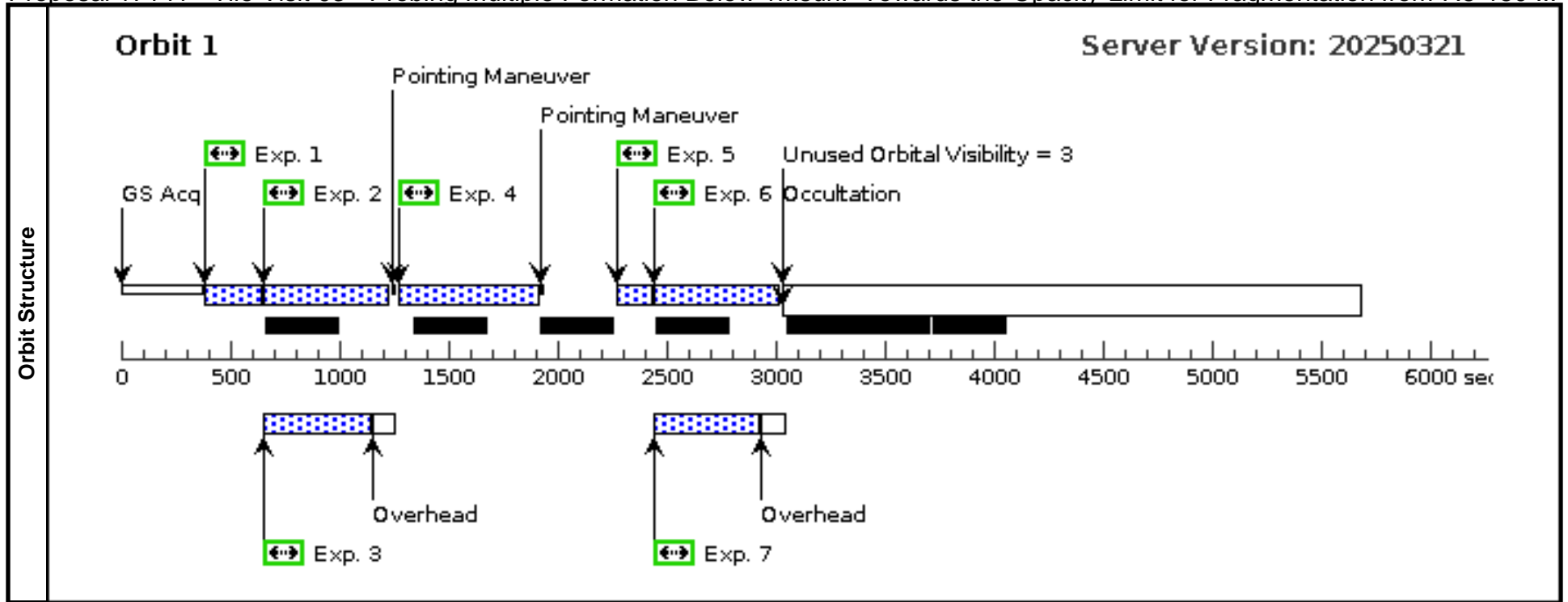
Visit	<b>Proposal 17141, Tile Visit 09, scheduling</b> <b>Diagnostic Status: No Diagnostics</b> Scientific Instruments: WFC3/UVIS, ACS/WFC Special Requirements: ORIENT 270D TO 270 D									
	<b>Fixed Targets</b>									
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous					
(1)	NGC-1333	RA: 03 28 50.7637 (52.2115154d) Dec: +31 22 2.45 (31.36735d) Equinox: J2000	Proper Motion RA: 5.793755344431927E-4 sec of time/yr Proper Motion Dec: -0.009864999901765259 arcsec/yr Epoch of Position: 2015.5	V=5.6	Reference Frame: SIMBAD					
<i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.</i> Category=STELLAR CLUSTER Description=[STAR FORMING REGION]										
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	F606W ACS 3s	(1) NGC-1333	ACS/WFC, ACCUM, WFC	F606W	FLASH=20.0	POS TARG -14.379 264831830817,163.3 6049817472625		3 Secs (3 Secs) [==>]	[1]
	2	F606W ACS 450s	(1) NGC-1333	ACS/WFC, ACCUM, WFC	F606W		POS TARG -14.379 264831830817,163.3 6049817472625	Prime + Parallel Group 2-3 in Tile Visit 09	450 Secs (450 Secs) [==>]	[1]
	3	F606W WF C3/UVIS 460s	ANY	WFC3/UVIS, ACCUM, UVIS	F606W			Prime + Parallel Group 2-3 in Tile Visit 09	460 Secs (460 Secs) [==>]	[1]
	4	F435W ACS 450s	(1) NGC-1333	ACS/WFC, ACCUM, WFC	F435W		POS TARG -14.879 264831830817,162.8 6049817472625		450 Secs (450 Secs) [==>]	[1]
	5	F814W ACS 3s	(1) NGC-1333	ACS/WFC, ACCUM, WFC	F814W	FLASH=20.0	POS TARG -13.879 264831830817,163.8 6049817472625		3 Secs (3 Secs) [==>]	[1]
	6	F814W ACS 450s	(1) NGC-1333	ACS/WFC, ACCUM, WFC	F814W		POS TARG -13.879 264831830817,163.8 6049817472625	Prime + Parallel Group 6-7 in Tile Visit 09	450 Secs (450 Secs) [==>]	[1]
	7	F814W WF C3 460s	ANY	WFC3/UVIS, ACCUM, UVIS	F814W	FLASH=6.0		Prime + Parallel Group 6-7 in Tile Visit 09	460 Secs (460 Secs) [==>]	[1]



Proposal 17141 - Tile Visit 03 - Probing Multiple Formation Below 1Msun: Towards the Opacity-Limit for Fragmentation from 7.5-150 ...

Wed Jul 02 15:00:22 GMT 2025

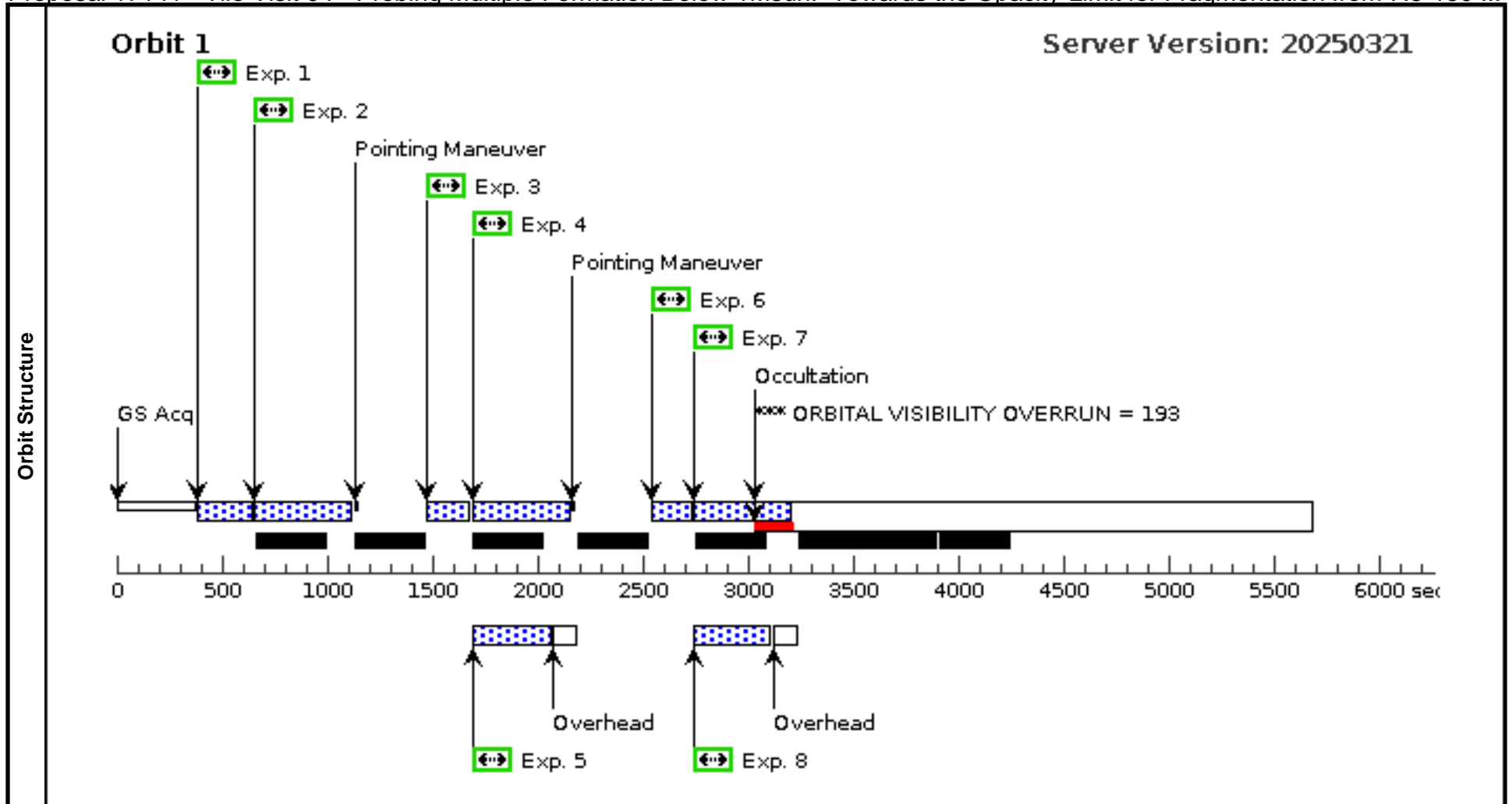
Visit	<b>Proposal 17141, Tile Visit 03, completed</b> <b>Diagnostic Status: No Diagnostics</b> Scientific Instruments: WFC3/UVIS, ACS/WFC Special Requirements: ORIENT 230D TO 230 D									
	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
Fixed Targets	(1)	NGC-1333	RA: 03 28 50.7637 (52.2115154d) Dec: +31 22 2.45 (31.36735d) Equinox: J2000	Proper Motion RA: 5.793755344431927E-4 sec of time/yr Proper Motion Dec: -0.009864999901765259 arcsec/yr Epoch of Position: 2015.5	V=5.6	Reference Frame: SIMBAD				
	<i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.</i> Category=STELLAR CLUSTER Description=[STAR FORMING REGION]									
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	F606W ACS 3s	(1) NGC-1333	ACS/WFC, ACCUM, WFC	F606W	FLASH=20.0	POS TARG -249.87 024800060482,-118. 24991024515359		3 Secs (3 Secs) [==>]	[1]
	2	F606W ACS 450s	(1) NGC-1333	ACS/WFC, ACCUM, WFC	F606W		POS TARG -249.87 024800060482,-118. 24991024515359	Prime + Parallel Group 2-3 in Tile Visit 03	450 Secs (450 Secs) [==>]	[1]
	3	F606W WF C3/UVIS 460s	ANY	WFC3/UVIS, ACCUM, UVIS	F606W			Prime + Parallel Group 2-3 in Tile Visit 03	460 Secs (460 Secs) [==>]	[1]
	4	F435W ACS 450s	(1) NGC-1333	ACS/WFC, ACCUM, WFC	F435W		POS TARG -250.37 024800060482,-118. 74991024515359		450 Secs (450 Secs) [==>]	[1]
	5	F814W ACS 3s	(1) NGC-1333	ACS/WFC, ACCUM, WFC	F814W	FLASH=20.0	POS TARG -249.37 024800060482,-117. 74991024515359		3 Secs (3 Secs) [==>]	[1]
	6	F814W ACS 450s	(1) NGC-1333	ACS/WFC, ACCUM, WFC	F814W		POS TARG -249.37 024800060482,-117. 74991024515359	Prime + Parallel Group 6-7 in Tile Visit 03	450 Secs (450 Secs) [==>]	[1]
	7	F814W WF C3 460s	ANY	WFC3/UVIS, ACCUM, UVIS	F814W	FLASH=6.0		Prime + Parallel Group 6-7 in Tile Visit 03	460 Secs (460 Secs) [==>]	[1]



Proposal 17141 - Tile Visit 04 - Probing Multiple Formation Below 1Msun: Towards the Opacity-Limit for Fragmentation from 7.5-150 ...

Wed Jul 02 15:00:22 GMT 2025

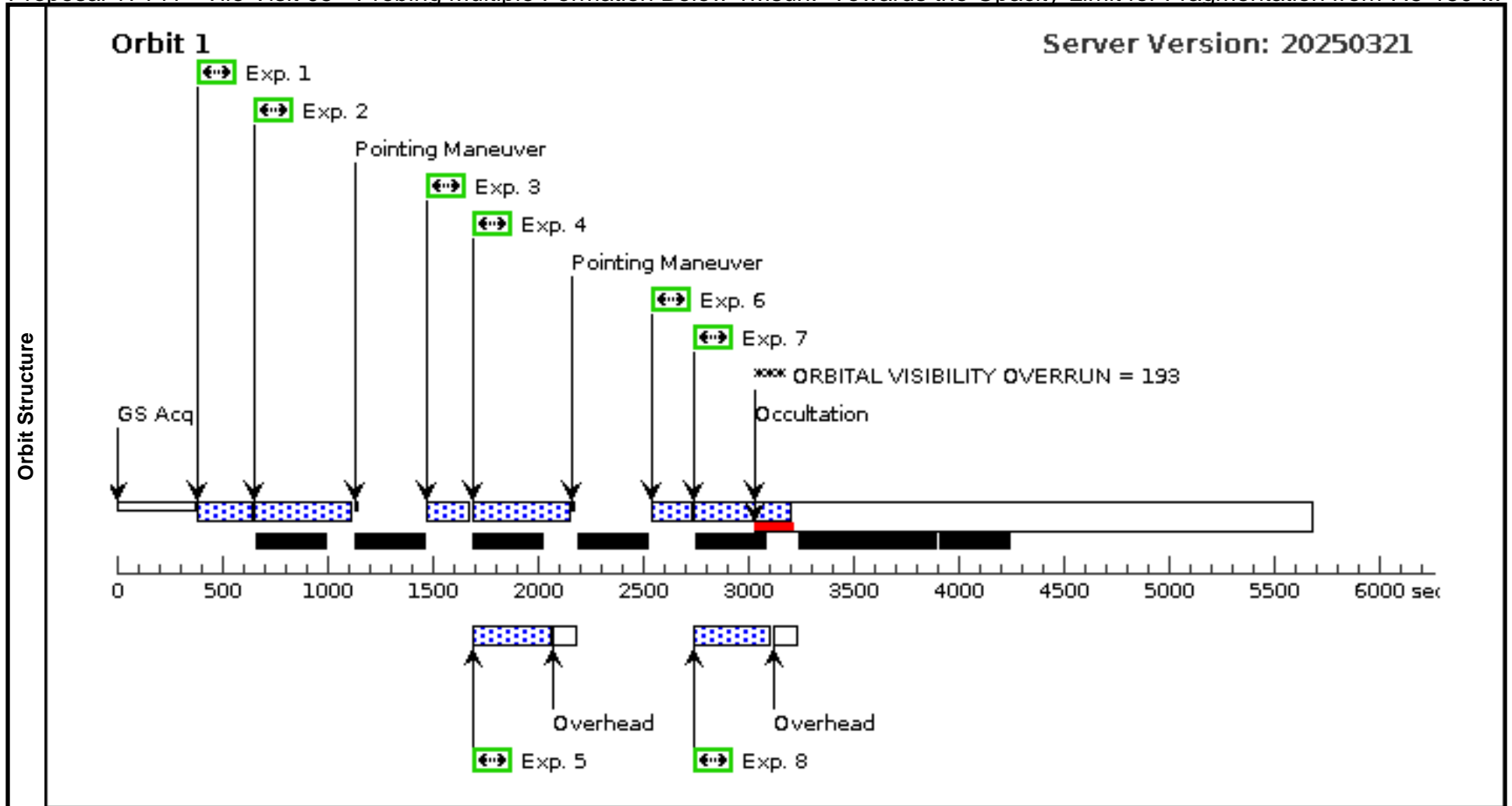
Visit	<b>Proposal 17141, Tile Visit 04, completed</b> <b>Diagnostic Status: Warning</b> Scientific Instruments: WFC3/UVIS, ACS/WFC Special Requirements: ORIENT 270D TO 270 D									
	Diagnostics	(Tile Visit 04) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN								
Fixed Targets		#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous			
		(1)	NGC-1333	RA: 03 28 50.7637 (52.2115154d) Dec: +31 22 2.45 (31.36735d) Equinox: J2000	Proper Motion RA: 5.793755344431927E-4 sec of time/yr Proper Motion Dec: -0.009864999901765259 arcsec/yr Epoch of Position: 2015.5	V=5.6	Reference Frame: SIMBAD			
	<i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.</i> Category=STELLAR CLUSTER Description=[STAR FORMING REGION]									
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	F435W ACS 3s	(1) NGC-1333	ACS/WFC, ACCUM, WFC	F435W	FLASH=20.0	POS TARG -346.95 66057914773,-40.43 991728160246		3 Secs (3 Secs) [==>]	[1]
	2	F435W ACS 340s	(1) NGC-1333	ACS/WFC, ACCUM, WFC	F435W		POS TARG -346.95 66057914773,-40.43 991728160246		340 Secs (340 Secs) [==>]	[1]
	3	F606W ACS 3s	(1) NGC-1333	ACS/WFC, ACCUM, WFC	F606W	FLASH=20.0	POS TARG -346.45 66057914773,-39.93 991728160246		3 Secs (3 Secs) [==>]	[1]
	4	F606W ACS 340s	(1) NGC-1333	ACS/WFC, ACCUM, WFC	F606W		POS TARG -346.45 66057914773,-39.93 991728160246	Prime + Parallel Group 4-5 in Tile Visit 04	340 Secs (340 Secs) [==>]	[1]
	5	F606W WF C3/UVIS 340s	ANY	WFC3/UVIS, ACCUM, UVIS	F606W	FLASH=7.0		Prime + Parallel Group 4-5 in Tile Visit 04	340 Secs (340 Secs) [==>]	[1]
	6	F814W ACS 3s	(1) NGC-1333	ACS/WFC, ACCUM, WFC	F814W	FLASH=20.0	POS TARG -345.95 66057914773,-39.43 991728160246		3 Secs (3 Secs) [==>]	[1]
	7	F814W ACS 340s	(1) NGC-1333	ACS/WFC, ACCUM, WFC	F814W		POS TARG -345.95 66057914773,-39.43 991728160246	Prime + Parallel Group 7-8 in Tile Visit 04	340 Secs (340 Secs) [==>]	[1]
	8	F814W WF C3 340s	ANY	WFC3/UVIS, ACCUM, UVIS	F814W	FLASH=13.0		Prime + Parallel Group 7-8 in Tile Visit 04	340 Secs (340 Secs) [==>]	[1]



Proposal 17141 - Tile Visit 05 - Probing Multiple Formation Below 1Msun: Towards the Opacity-Limit for Fragmentation from 7.5-150 ...

Wed Jul 02 15:00:22 GMT 2025

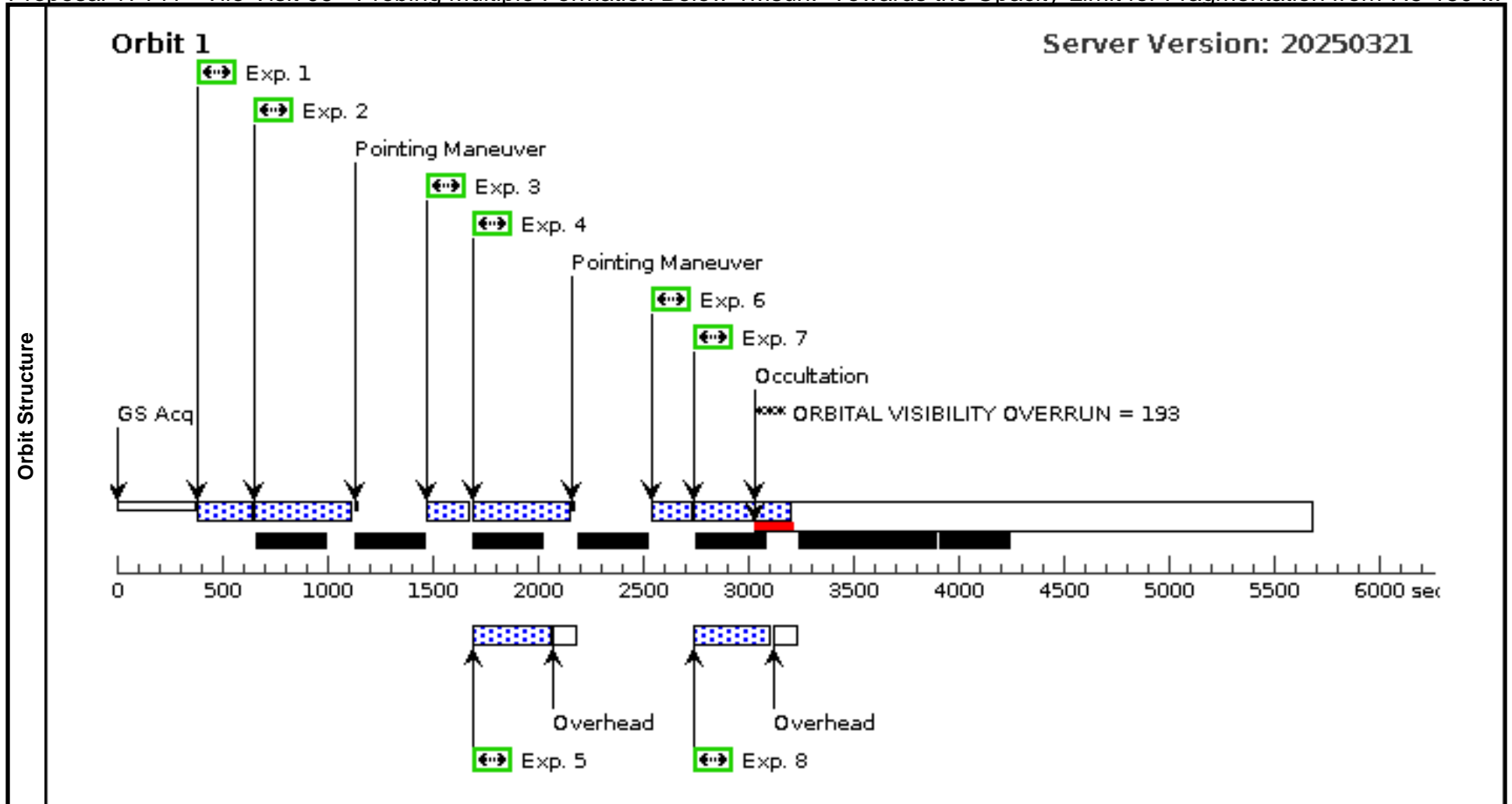
<b>Visit</b>	<b>Proposal 17141, Tile Visit 05, completed</b> <b>Diagnostic Status: Warning</b> Scientific Instruments: WFC3/UVIS, ACS/WFC Special Requirements: ORIENT 89.6D TO 89.6 D										
	(Tile Visit 05) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN										
<b>Fixed Targets</b>	<b>#</b>	<b>Name</b>	<b>Target Coordinates</b>	<b>Targ. Coord. Corrections</b>		<b>Fluxes</b>	<b>Miscellaneous</b>				
	(1)	NGC-1333	RA: 03 28 50.7637 (52.2115154d) Dec: +31 22 2.45 (31.36735d) Equinox: J2000	Proper Motion RA: 5.793755344431927E-4 sec of time/yr Proper Motion Dec: -0.009864999901765259 arcsec/yr Epoch of Position: 2015.5		V=5.6	Reference Frame: SIMBAD				
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. Category=STELLAR CLUSTER Description=[STAR FORMING REGION]											
<b>Exposures</b>	<b>#</b>	<b>Label</b>	<b>Target</b>	<b>Config,Mode,Aperture</b>	<b>Spectral Els.</b>	<b>Opt. Params.</b>	<b>Special Reqs.</b>	<b>Groups</b>	<b>Exp. Time (Total)/[Actual Dur.]</b>		<b>Orbit</b>
	1	F435W ACS 3s	(1) NGC-1333	ACS/WFC, ACCUM, WFC	F435W	FLASH=20.0	POS TARG 230.419 55000312998,188.72 191385998678		3 Secs (3 Secs)	[==>]	[1]
	2	F435W ACS 340s	(1) NGC-1333	ACS/WFC, ACCUM, WFC	F435W		POS TARG 230.419 55000312998,188.72 191385998678		340 Secs (340 Secs)	[==>]	[1]
	3	F606W ACS 3s	(1) NGC-1333	ACS/WFC, ACCUM, WFC	F606W	FLASH=20.0	POS TARG 230.919 55000312998,189.22 191385998678		3 Secs (3 Secs)	[==>]	[1]
	4	F606W ACS 340s	(1) NGC-1333	ACS/WFC, ACCUM, WFC	F606W		POS TARG 230.919 55000312998,189.22 191385998678	Prime + Parallel Group 4-5 in Tile Visit 05	340 Secs (340 Secs)	[==>]	[1]
	5	F606W WF C3/UVIS 340s	ANY	WFC3/UVIS, ACCUM, UVIS	F606W	FLASH=7.0		Prime + Parallel Group 4-5 in Tile Visit 05	340 Secs (340 Secs)	[==>]	[1]
	6	F814W ACS 3s	(1) NGC-1333	ACS/WFC, ACCUM, WFC	F814W	FLASH=20.0	POS TARG 231.419 55000312998,189.72 191385998678		3 Secs (3 Secs)	[==>]	[1]
	7	F814W ACS 340s	(1) NGC-1333	ACS/WFC, ACCUM, WFC	F814W		POS TARG 231.419 55000312998,189.72 191385998678	Prime + Parallel Group 7-8 in Tile Visit 05	340 Secs (340 Secs)	[==>]	[1]
	8	F814W WF C3 340s	ANY	WFC3/UVIS, ACCUM, UVIS	F814W	FLASH=13.0		Prime + Parallel Group 7-8 in Tile Visit 05	340 Secs (340 Secs)	[==>]	[1]



Proposal 17141 - Tile Visit 06 - Probing Multiple Formation Below 1Msun: Towards the Opacity-Limit for Fragmentation from 7.5-150 ...

Wed Jul 02 15:00:22 GMT 2025

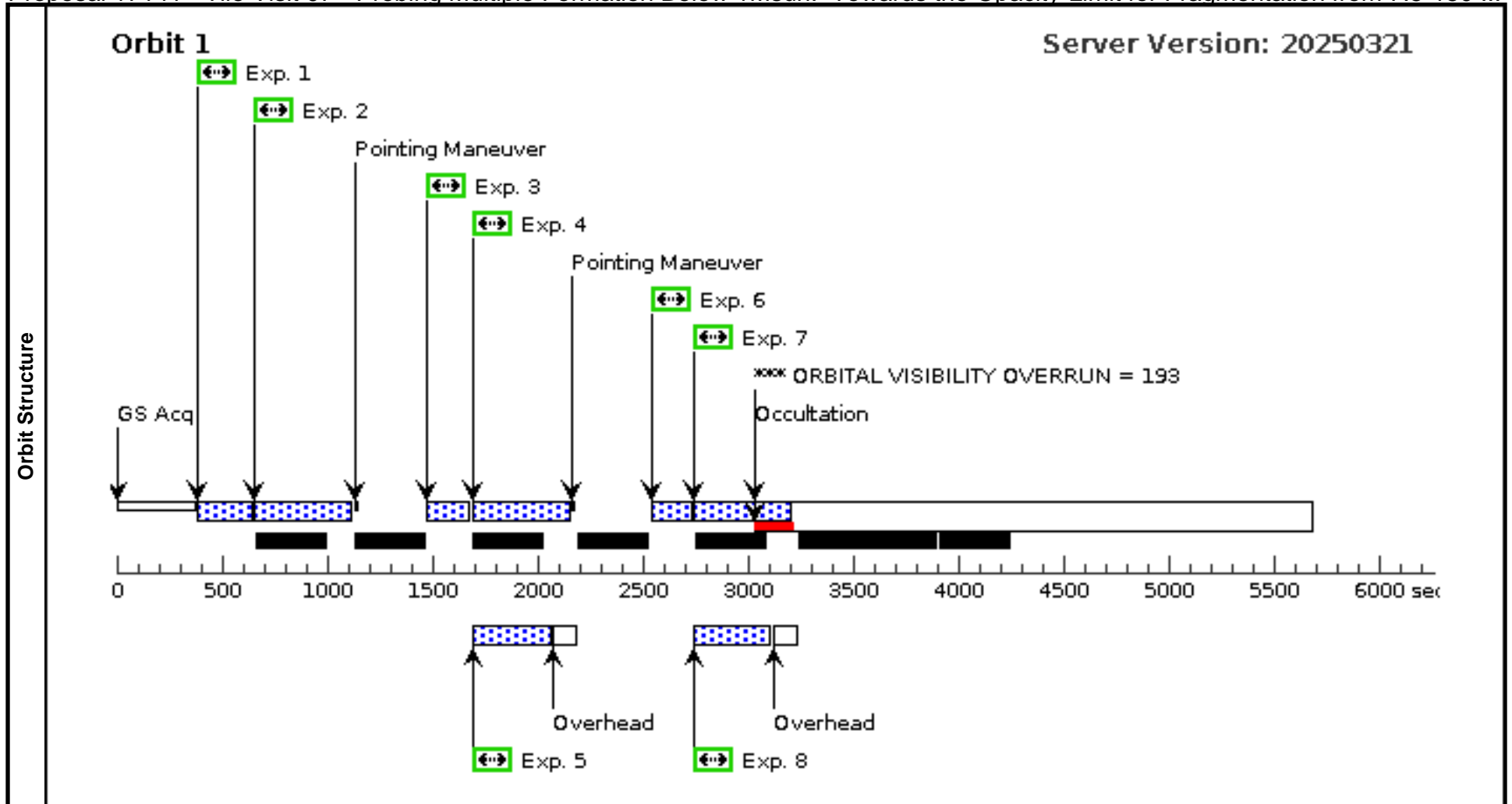
Visit	<b>Proposal 17141, Tile Visit 06, completed</b> <b>Diagnostic Status: Warning</b> Scientific Instruments: WFC3/UVIS, ACS/WFC Special Requirements: ORIENT 90D TO 90 D									
Diagnostics	(Tile Visit 06) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN									
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(1)	NGC-1333	RA: 03 28 50.7637 (52.2115154d) Dec: +31 22 2.45 (31.36735d) Equinox: J2000	Proper Motion RA: 5.793755344431927E-4 sec of time/yr Proper Motion Dec: -0.009864999901765259 arcsec/yr Epoch of Position: 2015.5	V=5.6	Reference Frame: SIMBAD				
	Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. Category=STELLAR CLUSTER Description=[STAR FORMING REGION]									
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	F435W ACS 3s	(1) NGC-1333	ACS/WFC, ACCUM, WFC	F435W	FLASH=20.0	POS TARG -243.85 008814433007,-474. 2695280773311		3 Secs (3 Secs) [==>]	[1]
	2	F435W ACS 340s	(1) NGC-1333	ACS/WFC, ACCUM, WFC	F435W		POS TARG -243.85 008814433007,-474. 2695280773311		340 Secs (340 Secs) [==>]	[1]
	3	F606W ACS 3s	(1) NGC-1333	ACS/WFC, ACCUM, WFC	F606W	FLASH=20.0	POS TARG -243.35 008814433007,-473. 7695280773311		3 Secs (3 Secs) [==>]	[1]
	4	F606W ACS 340s	(1) NGC-1333	ACS/WFC, ACCUM, WFC	F606W		POS TARG -243.35 008814433007,-473. 7695280773311	Prime + Parallel Group 4-5 in Tile Visit 06	340 Secs (340 Secs) [==>]	[1]
	5	F606W WF C3/UVIS 340s	ANY	WFC3/UVIS, ACCUM, UVIS	F606W	FLASH=7.0		Prime + Parallel Group 4-5 in Tile Visit 06	340 Secs (340 Secs) [==>]	[1]
	6	F814W ACS 3s	(1) NGC-1333	ACS/WFC, ACCUM, WFC	F814W	FLASH=20.0	POS TARG -242.85 008814433007,-473. 2695280773311		3 Secs (3 Secs) [==>]	[1]
	7	F814W ACS 340s	(1) NGC-1333	ACS/WFC, ACCUM, WFC	F814W		POS TARG -242.85 008814433007,-473. 2695280773311	Prime + Parallel Group 7-8 in Tile Visit 06	340 Secs (340 Secs) [==>]	[1]
	8	F814W WF C3 340s	ANY	WFC3/UVIS, ACCUM, UVIS	F814W	FLASH=13.0		Prime + Parallel Group 7-8 in Tile Visit 06	340 Secs (340 Secs) [==>]	[1]



Proposal 17141 - Tile Visit 07 - Probing Multiple Formation Below 1Msun: Towards the Opacity-Limit for Fragmentation from 7.5-150 ...

Wed Jul 02 15:00:22 GMT 2025

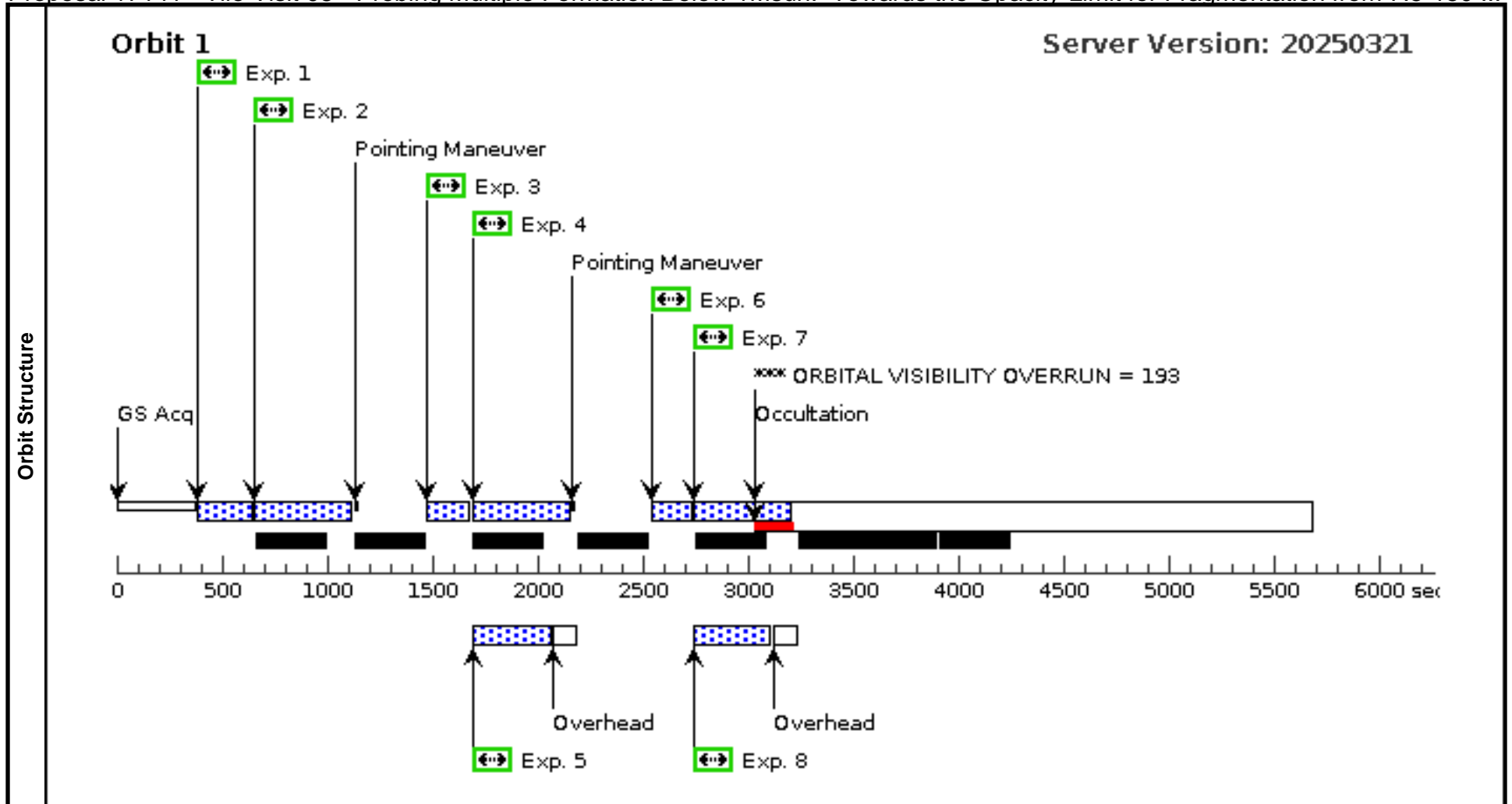
Visit	<b>Proposal 17141, Tile Visit 07, completed</b> <b>Diagnostic Status: Warning</b> Scientific Instruments: WFC3/UVIS, ACS/WFC Special Requirements: ORIENT 85.7D TO 85.7 D									
	Diagnostics	(Tile Visit 07) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN								
Fixed Targets		#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous			
		(1)	NGC-1333	RA: 03 28 50.7637 (52.2115154d) Dec: +31 22 2.45 (31.36735d) Equinox: J2000	Proper Motion RA: 5.793755344431927E-4 sec of time/yr Proper Motion Dec: -0.009864999901765259 arcsec/yr Epoch of Position: 2015.5	V=5.6	Reference Frame: SIMBAD			
	<i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.</i> Category=STELLAR CLUSTER Description=[STAR FORMING REGION]									
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	F435W ACS 3s	(1) NGC-1333	ACS/WFC, ACCUM, WFC	F435W	FLASH=20.0	POS TARG -7.0012 25783515265,-378.2 4479937170565		3 Secs (3 Secs) [==>]	[1]
	2	F435W ACS 340s	(1) NGC-1333	ACS/WFC, ACCUM, WFC	F435W		POS TARG -7.0012 25783515265,-378.2 4479937170565		340 Secs (340 Secs) [==>]	[1]
	3	F606W ACS 3s	(1) NGC-1333	ACS/WFC, ACCUM, WFC	F606W	FLASH=20.0	POS TARG -6.5012 25783515265,-377.7 4479937170565		3 Secs (3 Secs) [==>]	[1]
	4	F606W ACS 340s	(1) NGC-1333	ACS/WFC, ACCUM, WFC	F606W		POS TARG -6.5012 25783515265,-377.7 4479937170565	Prime + Parallel Group 4-5 in Tile Visit 07	340 Secs (340 Secs) [==>]	[1]
	5	F606W WF C3/UVIS 340s	ANY	WFC3/UVIS, ACCUM, UVIS	F606W	FLASH=7.0		Prime + Parallel Group 4-5 in Tile Visit 07	340 Secs (340 Secs) [==>]	[1]
	6	F814W ACS 3s	(1) NGC-1333	ACS/WFC, ACCUM, WFC	F814W	FLASH=20.0	POS TARG -6.0012 25783515265,-377.2 4479937170565		3 Secs (3 Secs) [==>]	[1]
	7	F814W ACS 340s	(1) NGC-1333	ACS/WFC, ACCUM, WFC	F814W		POS TARG -6.0012 25783515265,-377.2 4479937170565	Prime + Parallel Group 7-8 in Tile Visit 07	340 Secs (340 Secs) [==>]	[1]
	8	F814W WF C3 340s	ANY	WFC3/UVIS, ACCUM, UVIS	F814W	FLASH=13.0		Prime + Parallel Group 7-8 in Tile Visit 07	340 Secs (340 Secs) [==>]	[1]



Proposal 17141 - Tile Visit 08 - Probing Multiple Formation Below 1Msun: Towards the Opacity-Limit for Fragmentation from 7.5-150 ...

Wed Jul 02 15:00:23 GMT 2025

Visit	<b>Proposal 17141, Tile Visit 08, failed</b> <b>Diagnostic Status: Warning</b> Scientific Instruments: WFC3/UVIS, ACS/WFC Special Requirements: ORIENT 111D TO 111 D									
Diagnostics	(Tile Visit 08) Warning (Orbit Planner): ORBITAL VISIBILITY OVERRUN									
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(1)	NGC-1333	RA: 03 28 50.7637 (52.2115154d) Dec: +31 22 2.45 (31.36735d) Equinox: J2000	Proper Motion RA: 5.793755344431927E-4 sec of time/yr Proper Motion Dec: -0.009864999901765259 arcsec/yr Epoch of Position: 2015.5	V=5.6	Reference Frame: SIMBAD				
	Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. Category=STELLAR CLUSTER Description=[STAR FORMING REGION]									
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	F435W ACS 3s	(1) NGC-1333	ACS/WFC, ACCUM, WFC	F435W	FLASH=20.0	POS TARG -7.0012 25783515265,-378.2 4479937170565		3 Secs (3 Secs) [==>]	[1]
	2	F435W ACS 340s	(1) NGC-1333	ACS/WFC, ACCUM, WFC	F435W		POS TARG -7.0012 25783515265,-378.2 4479937170565		340 Secs (340 Secs) [==>]	[1]
	3	F606W ACS 3s	(1) NGC-1333	ACS/WFC, ACCUM, WFC	F606W	FLASH=20.0	POS TARG -6.5012 25783515265,-377.7 4479937170565		3 Secs (3 Secs) [==>]	[1]
	4	F606W ACS 340s	(1) NGC-1333	ACS/WFC, ACCUM, WFC	F606W		POS TARG -6.5012 25783515265,-377.7 4479937170565	Prime + Parallel Group 4-5 in Tile Visit 08	340 Secs (340 Secs) [==>]	[1]
	5	F606W WF C3/UVIS 340s	ANY	WFC3/UVIS, ACCUM, UVIS	F606W	FLASH=7.0		Prime + Parallel Group 4-5 in Tile Visit 08	340 Secs (340 Secs) [==>]	[1]
	6	F814W ACS 3s	(1) NGC-1333	ACS/WFC, ACCUM, WFC	F814W	FLASH=20.0	POS TARG -6.0012 25783515265,-377.2 4479937170565		3 Secs (3 Secs) [==>]	[1]
	7	F814W ACS 340s	(1) NGC-1333	ACS/WFC, ACCUM, WFC	F814W		POS TARG -6.0012 25783515265,-377.2 4479937170565	Prime + Parallel Group 7-8 in Tile Visit 08	340 Secs (340 Secs) [==>]	[1]
	8	F814W WF C3 340s	ANY	WFC3/UVIS, ACCUM, UVIS	F814W	FLASH=13.0		Prime + Parallel Group 7-8 in Tile Visit 08	340 Secs (340 Secs) [==>]	[1]



Proposal 17141 - Tile Visit 10 - Probing Multiple Formation Below 1Msun: Towards the Opacity-Limit for Fragmentation from 7.5-150 ...

Wed Jul 02 15:00:23 GMT 2025

Visit	<b>Proposal 17141, Tile Visit 10, implementation</b> <b>Diagnostic Status: No Diagnostics</b> Scientific Instruments: WFC3/UVIS, ACS/WFC Special Requirements: (none)																																																																																									
	Fixed Targets	<table border="1"> <thead> <tr> <th>#</th> <th>Name</th> <th>Target Coordinates</th> <th>Targ. Coord. Corrections</th> <th>Fluxes</th> <th>Miscellaneous</th> </tr> </thead> <tbody> <tr> <td>(1)</td> <td>NGC-1333</td> <td>RA: 03 28 50.7637 (52.2115154d) Dec: +31 22 2.45 (31.36735d) Equinox: J2000</td> <td>Proper Motion RA: 5.793755344431927E-4 sec of time/yr Proper Motion Dec: -0.009864999901765259 arcsec/yr Epoch of Position: 2015.5</td> <td>V=5.6</td> <td>Reference Frame: SIMBAD</td> </tr> <tr> <td colspan="6"> <i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.</i>                      Category=STELLAR CLUSTER                      Description=[STAR FORMING REGION]                 </td> </tr> </tbody> </table>										#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous	(1)	NGC-1333	RA: 03 28 50.7637 (52.2115154d) Dec: +31 22 2.45 (31.36735d) Equinox: J2000	Proper Motion RA: 5.793755344431927E-4 sec of time/yr Proper Motion Dec: -0.009864999901765259 arcsec/yr Epoch of Position: 2015.5	V=5.6	Reference Frame: SIMBAD	<i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.</i> Category=STELLAR CLUSTER Description=[STAR FORMING REGION]																																																																		
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(1)	NGC-1333	RA: 03 28 50.7637 (52.2115154d) Dec: +31 22 2.45 (31.36735d) Equinox: J2000	Proper Motion RA: 5.793755344431927E-4 sec of time/yr Proper Motion Dec: -0.009864999901765259 arcsec/yr Epoch of Position: 2015.5	V=5.6	Reference Frame: SIMBAD																																																																																					
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Exposures	<table border="1"> <thead> <tr> <th>#</th> <th>Label</th> <th>Target</th> <th>Config,Mode,Aperture</th> <th>Spectral Els.</th> <th>Opt. Params.</th> <th>Special Reqs.</th> <th>Groups</th> <th>Exp. Time (Total)/[Actual Dur.]</th> <th>Orbit</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>F606W ACS 3s</td> <td>(1) NGC-1333</td> <td>ACS/WFC, ACCUM, WFC</td> <td>F606W</td> <td>FLASH=20.0</td> <td>POS TARG -154.69 112339756558,307.5 1996194901164</td> <td></td> <td>3 Secs (3 Secs) [==&gt;]</td> <td>[1]</td> </tr> <tr> <td>2</td> <td>F606W ACS 450s</td> <td>(1) NGC-1333</td> <td>ACS/WFC, ACCUM, WFC</td> <td>F606W</td> <td></td> <td>POS TARG -154.69 112339756558,307.5 1996194901164</td> <td>Prime + Parallel Group 2-3 in Tile Visit 1</td> <td>450 Secs (450 Secs) [==&gt;]</td> <td>[1]</td> </tr> <tr> <td>3</td> <td>F606W WF C3/UVIS 460s</td> <td>ANY</td> <td>WFC3/UVIS, ACCUM, UVIS</td> <td>F606W</td> <td></td> <td></td> <td>Prime + Parallel Group 2-3 in Tile Visit 1</td> <td>460 Secs (460 Secs) [==&gt;]</td> <td>[1]</td> </tr> <tr> <td>4</td> <td>F435W ACS 450s</td> <td>(1) NGC-1333</td> <td>ACS/WFC, ACCUM, WFC</td> <td>F435W</td> <td></td> <td>POS TARG -155.19 112339756558,307.0 1996194901164</td> <td></td> <td>450 Secs (450 Secs) [==&gt;]</td> <td>[1]</td> </tr> <tr> <td>5</td> <td>F814W ACS 3s</td> <td>(1) NGC-1333</td> <td>ACS/WFC, ACCUM, WFC</td> <td>F814W</td> <td>FLASH=20.0</td> <td>POS TARG -154.19 112339756558,308.0 1996194901164</td> <td></td> <td>3 Secs (3 Secs) [==&gt;]</td> <td>[1]</td> </tr> <tr> <td>6</td> <td>F814W ACS 450s</td> <td>(1) NGC-1333</td> <td>ACS/WFC, ACCUM, WFC</td> <td>F814W</td> <td></td> <td>POS TARG -154.19 112339756558,308.0 1996194901164</td> <td>Prime + Parallel Group 6-7 in Tile Visit 1</td> <td>450 Secs (450 Secs) [==&gt;]</td> <td>[1]</td> </tr> <tr> <td>7</td> <td>F814W WF C3 460s</td> <td>ANY</td> <td>WFC3/UVIS, ACCUM, UVIS</td> <td>F814W</td> <td>FLASH=6</td> <td></td> <td>Prime + Parallel Group 6-7 in Tile Visit 1</td> <td>460 Secs (460 Secs) [==&gt;]</td> <td>[1]</td> </tr> </tbody> </table>										#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit	1	F606W ACS 3s	(1) NGC-1333	ACS/WFC, ACCUM, WFC	F606W	FLASH=20.0	POS TARG -154.69 112339756558,307.5 1996194901164		3 Secs (3 Secs) [==>]	[1]	2	F606W ACS 450s	(1) NGC-1333	ACS/WFC, ACCUM, WFC	F606W		POS TARG -154.69 112339756558,307.5 1996194901164	Prime + Parallel Group 2-3 in Tile Visit 1	450 Secs (450 Secs) [==>]	[1]	3	F606W WF C3/UVIS 460s	ANY	WFC3/UVIS, ACCUM, UVIS	F606W			Prime + Parallel Group 2-3 in Tile Visit 1	460 Secs (460 Secs) [==>]	[1]	4	F435W ACS 450s	(1) NGC-1333	ACS/WFC, ACCUM, WFC	F435W		POS TARG -155.19 112339756558,307.0 1996194901164		450 Secs (450 Secs) [==>]	[1]	5	F814W ACS 3s	(1) NGC-1333	ACS/WFC, ACCUM, WFC	F814W	FLASH=20.0	POS TARG -154.19 112339756558,308.0 1996194901164		3 Secs (3 Secs) [==>]	[1]	6	F814W ACS 450s	(1) NGC-1333	ACS/WFC, ACCUM, WFC	F814W		POS TARG -154.19 112339756558,308.0 1996194901164	Prime + Parallel Group 6-7 in Tile Visit 1	450 Secs (450 Secs) [==>]	[1]	7	F814W WF C3 460s	ANY	WFC3/UVIS, ACCUM, UVIS	F814W	FLASH=6		Prime + Parallel Group 6-7 in Tile Visit 1	460 Secs (460 Secs) [==>]	[1]
#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit																																																																																	
1	F606W ACS 3s	(1) NGC-1333	ACS/WFC, ACCUM, WFC	F606W	FLASH=20.0	POS TARG -154.69 112339756558,307.5 1996194901164		3 Secs (3 Secs) [==>]	[1]																																																																																	
2	F606W ACS 450s	(1) NGC-1333	ACS/WFC, ACCUM, WFC	F606W		POS TARG -154.69 112339756558,307.5 1996194901164	Prime + Parallel Group 2-3 in Tile Visit 1	450 Secs (450 Secs) [==>]	[1]																																																																																	
3	F606W WF C3/UVIS 460s	ANY	WFC3/UVIS, ACCUM, UVIS	F606W			Prime + Parallel Group 2-3 in Tile Visit 1	460 Secs (460 Secs) [==>]	[1]																																																																																	
4	F435W ACS 450s	(1) NGC-1333	ACS/WFC, ACCUM, WFC	F435W		POS TARG -155.19 112339756558,307.0 1996194901164		450 Secs (450 Secs) [==>]	[1]																																																																																	
5	F814W ACS 3s	(1) NGC-1333	ACS/WFC, ACCUM, WFC	F814W	FLASH=20.0	POS TARG -154.19 112339756558,308.0 1996194901164		3 Secs (3 Secs) [==>]	[1]																																																																																	
6	F814W ACS 450s	(1) NGC-1333	ACS/WFC, ACCUM, WFC	F814W		POS TARG -154.19 112339756558,308.0 1996194901164	Prime + Parallel Group 6-7 in Tile Visit 1	450 Secs (450 Secs) [==>]	[1]																																																																																	
7	F814W WF C3 460s	ANY	WFC3/UVIS, ACCUM, UVIS	F814W	FLASH=6		Prime + Parallel Group 6-7 in Tile Visit 1	460 Secs (460 Secs) [==>]	[1]																																																																																	

