



16848 - Imaging of Compact Cluster HCG 40

Cycle: 28, Proposal Category: GO/DD

(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) ARP-321 ANY	ACS/WFC WFC3/UVIS	3	14-Oct-2021 11:01:06.0	yes
02	(1) ARP-321 ANY	ACS/WFC WFC3/UVIS	3	14-Oct-2021 11:01:07.0	yes

6 Total Orbits Used

ABSTRACT

HCG 40, or Arp 321, is a compact galaxy group with 5 cluster members. Member galaxies include an optical AGN and galaxies at a variety of star formation rates as measured in both UV and IR, though no Hubble data on these objects yet exists. We propose to take broadband optical and H-

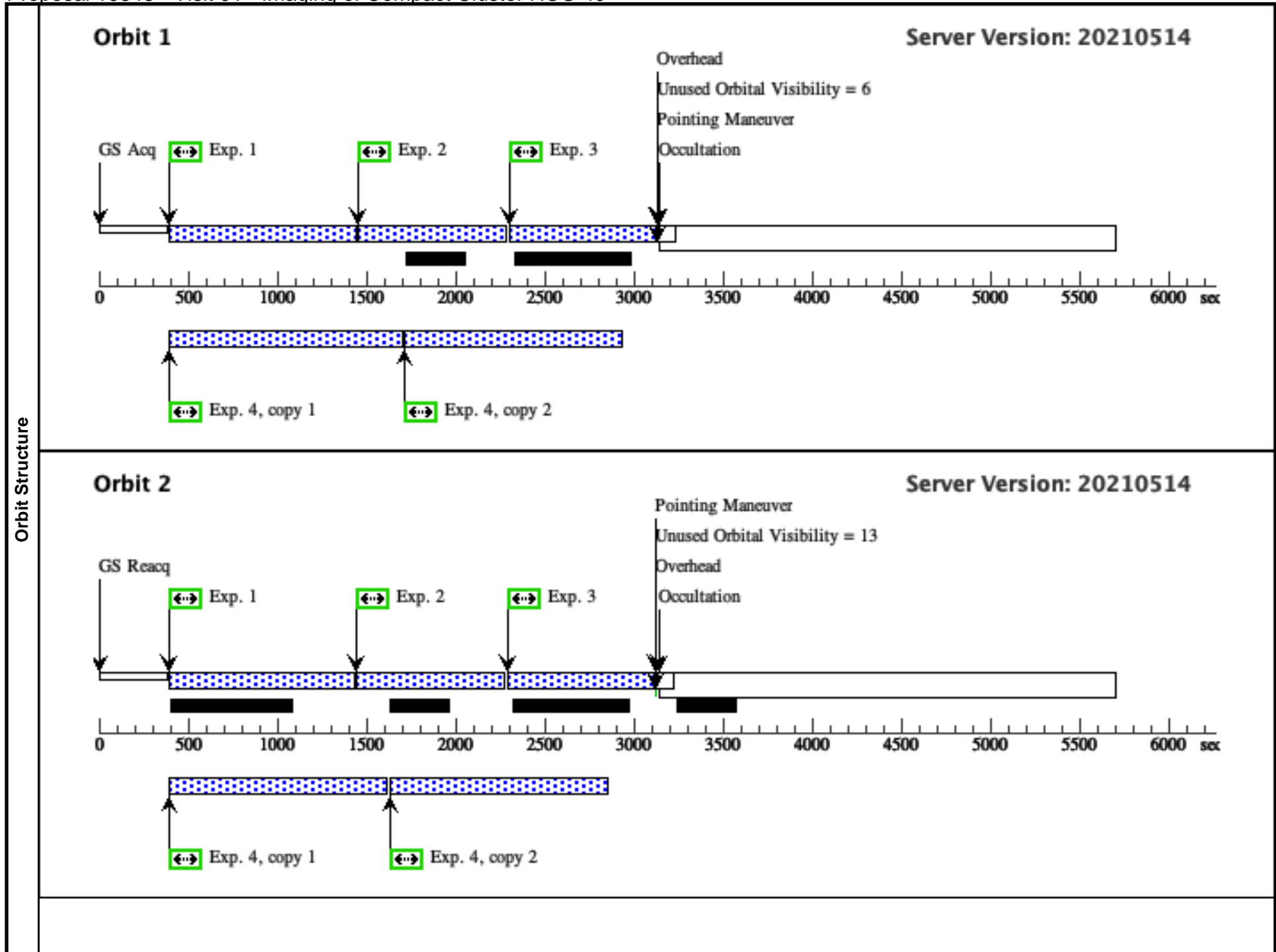
OBSERVING DESCRIPTION

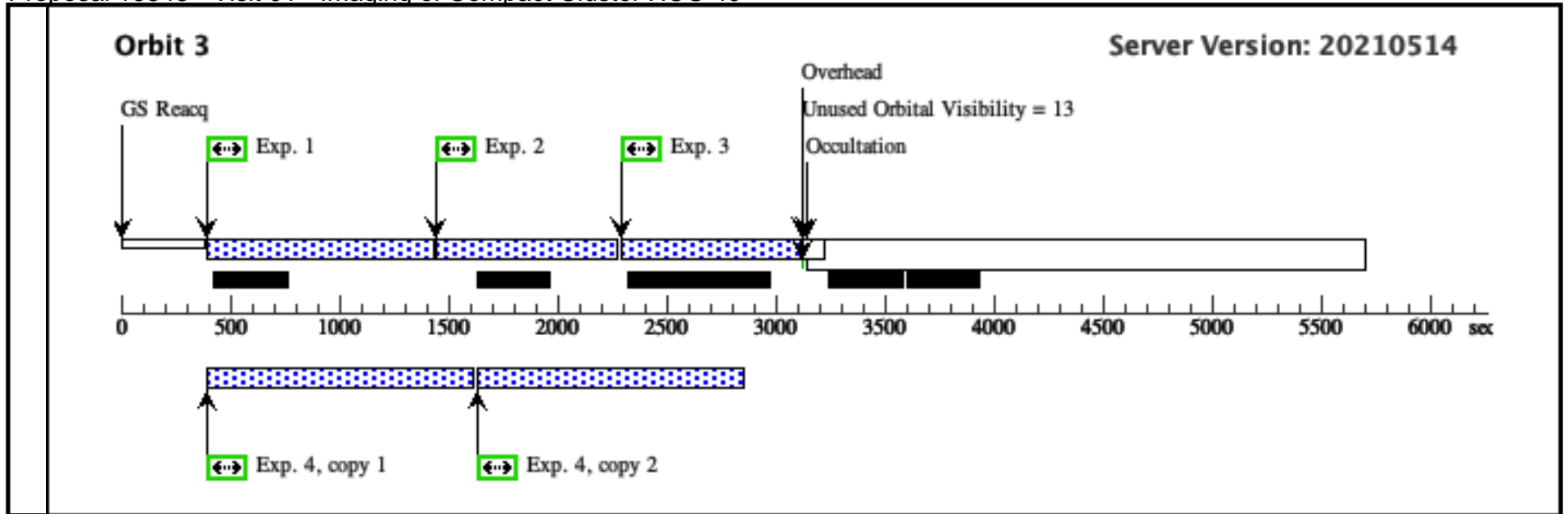
We will obtain high signal-to-noise imaging of the compact galaxy group Arp 321, or HCG 40, with both broad and narrow band optical filters using the WFC3/UVIS instrument. No previous Hubble observations of this group exist. We propose to take new F475W, F606W, F814W, and F665N observations with WFC3/UVIS. The faintest and smallest member of HCG 40 has a total magnitude of $R=15.4$ and $B=17.4$, while the brightest and largest has a total magnitude of $R=12.2$ and $B=13.8$. Altogether, we request 6 orbits to make these observations. Using Arp 220 as a template spectrum in the WFC3/UVIS Exposure Time Calculator, we can achieve a S/N ratio of at least 100 per resolution element in F475W, F606W, and F814W with exposures of 2400s in F475W, 1000s in F606W, and 1100s in F814W, for the brightest cluster member, and at least 50 per resolution element in the faintest cluster member with 3600s in F814W. We can achieve high signal to noise for quality imaging by splitting 3 orbits between the broad-band filters. To highlight regions with high star formation activity, we request an additional 3 orbits with F665N on WFC3, which will reach high S/N in those areas and highlight the strong differences in star formation rate between cluster members. HCG 40 is at a redshift of $z=0.0223$, which still falls within the F665N filter's coverage. This filter is unavailable on ACS. The WFC3 field of view is also sufficient to encompass the entire cluster without constraint on orientation. We propose a single WFC3 pointing with a 3-point gap dither to mitigate artifacts such as cosmic rays, hot pixels, and the interchip gap. At the same time as the primary WFC3 observations, we will obtain parallel observations with ACS in F475W and F606W. The WFC3 dither shift is oversized a bit so that it also covers the ACS chip gap in the parallel field. With 3 orbits in each ACS filter we expect to detect many faint background galaxies in the parallel field. This target is schedulable in late 2021 at the desired orient. Scheduling as early as possible in November is ideal.

Proposal 16848 - Visit 01 - Imaging of Compact Cluster HCG 40

Thu Oct 14 15:01:08 GMT 2021

Visit	Proposal 16848, Visit 01, implementation Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS, ACS/WFC Special Requirements: ORIENT 268D TO 285 D; BEFORE 06-DEC-2021:00:00:00									
	Patterns	#	Primary Pattern	Secondary Pattern	Exposures					
	(1)	Pattern Type=LINE Purpose=DITHER Number Of Points=3 Point Spacing=5 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=87 Angle Between Sides= Center Pattern=false		(1-4)					
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(1)	ARP-321	RA: 09 38 55.2487 (144.7302029d) Dec: -04 51 10.35 (-4.85287d) Equinox: J2000	Epoch of Position: 2015.5	V=13.3+/-0.2	Reference Frame: SIMBAD				
<i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.</i> Category=CLUSTER OF GALAXIES Description=[GROUP, INTERACTING GALAXY, TIDAL TAIL] Extended=YES										
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(1) ARP-321	WFC3/UVIS, ACCUM, UVIS-CENTER	F475W	CR-SPLIT=NO; FLASH=2	GS ACQ SCENARIO BASE1BE	Pattern 1, Exps 1-4 in Visit 01 (1)	900 Secs (2700 Secs)	
								Prime + Parallel Group 1-4 in Pattern 1, Exps 1-4 in Visit 01	[==>(Pattern 1)]	[1]
									[==>(Pattern 2)]	[2]
									[==>(Pattern 3)]	[3]
	2		(1) ARP-321	WFC3/UVIS, ACCUM, UVIS-CENTER	F606W	CR-SPLIT=NO		Pattern 1, Exps 1-4 in Visit 01 (1)	700 Secs (2100 Secs)	
								Prime + Parallel Group 1-4 in Pattern 1, Exps 1-4 in Visit 01	[==>(Pattern 1)]	[1]
									[==>(Pattern 2)]	[2]
									[==>(Pattern 3)]	[3]
	3		(1) ARP-321	WFC3/UVIS, ACCUM, UVIS-CENTER	F814W	CR-SPLIT=NO; FLASH=2		Pattern 1, Exps 1-4 in Visit 01 (1)	800 Secs (2400 Secs)	
								Prime + Parallel Group 1-4 in Pattern 1, Exps 1-4 in Visit 01	[==>(Pattern 1)]	[1]
									[==>(Pattern 2)]	[2]
									[==>(Pattern 3)]	[3]
4		ANY	ACS/WFC, ACCUM, WFCENTER	F606W			Pattern 1, Exps 1-4 in Visit 01 (1)	1100 Secs X 2 (6600 Secs)		
							Prime + Parallel Group 1-4 in Pattern 1, Exps 1-4 in Visit 01	[==>(Pattern 1, Copy 1)]	[1]	
								[==>(Pattern 1, Copy 2)]	[2]	
								[==>(Pattern 2, Copy 1)]	[1]	
								[==>(Pattern 2, Copy 2)]	[2]	
								[==>(Pattern 3, Copy 1)]	[1]	
								[==>(Pattern 3, Copy 2)]	[2]	





Proposal 16848 - Visit 02 - Imaging of Compact Cluster HCG 40

Thu Oct 14 15:01:08 GMT 2021

Visit	Proposal 16848, Visit 02, implementation Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS, ACS/WFC Special Requirements: SAME ORIENT AS 01; BEFORE 06-DEC-2021:00:00:00									
	Patterns	#	Primary Pattern	Secondary Pattern	Exposures					
	(1)	Pattern Type=LINE Purpose=DITHER Number Of Points=3 Point Spacing=5 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=87 Angle Between Sides= Center Pattern=false		(1-2)					
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(1)	ARP-321	RA: 09 38 55.2487 (144.7302029d) Dec: -04 51 10.35 (-4.85287d) Equinox: J2000	Epoch of Position: 2015.5	V=13.3+/-0.2	Reference Frame: SIMBAD				
<i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.</i> Category=CLUSTER OF GALAXIES Description=[GROUP, INTERACTING GALAXY, TIDAL TAIL] Extended=YES										
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(1) ARP-321	WFC3/UVIS, ACCUM, UVIS-CENTER	F665N	CR-SPLIT=NO; FLASH=15	GS ACQ SCENARIO BASE1BE	Pattern 1, Exps 1-2 in Visit 02 (1) Prime + Parallel Group 1-2 in Pattern 1, Exps 1-2 in Visit 02	1230 Secs X 2 (7380 Secs) [==>(Pattern 1, Copy 1)] [==>(Pattern 1, Copy 2)] [==>(Pattern 2, Copy 1)] [==>(Pattern 2, Copy 2)] [==>(Pattern 3, Copy 1)] [==>(Pattern 3, Copy 2)]	[1] [2] [3]
2		ANY	ACS/WFC, ACCUM, WFCENTER	F475W			Pattern 1, Exps 1-2 in Visit 02 (1) Prime + Parallel Group 1-2 in Pattern 1, Exps 1-2 in Visit 02	1100 Secs X 2 (6600 Secs) [==>(Pattern 1, Copy 1)] [==>(Pattern 1, Copy 2)] [==>(Pattern 2, Copy 1)] [==>(Pattern 2, Copy 2)] [==>(Pattern 3, Copy 1)] [==>(Pattern 3, Copy 2)]	[1] [2] [3]	

