



12526 - Mapping Recent Star Formation and Dust in NGC 1266, a Local Example of AGN-driven Feedback

Cycle: 19, Proposal Category: GO

(Availability Mode: SUPPORTED)

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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) NGC-1266	WFC3/UVIS	1	04-Oct-2011 21:27:57.0	yes
02	(1) NGC-1266	WFC3/IR	1	04-Oct-2011 21:28:04.0	yes
04	(1) NGC-1266	ACS/WFC	1	04-Oct-2011 21:28:12.0	yes

3 Total Orbits Used

ABSTRACT

NGC 1266 is a nearby lenticular galaxy with a unique property: it hosts a massive outflow of molecular gas. This outflow appears to be driven by an AGN. AGN feedback may play an important role in galaxy evolution, particularly as a star formation quenching mechanism, but the details are not well understood. At only 30 Mpc away, NGC 1266 presents the best local laboratory for studying the AGN feedback process in action. A large multi-wavelength data set already exists, including high resolution X-ray imaging and radio observations, as well as resolved stellar kinematics from integral field unit data. The existing ground-based optical imaging shows hints of a dust cone along the direction of the outflow, and possibly indications of a recent minor merger, which may have triggered the current outflow and AGN activity. However, the images are of modest resolution, significantly worse than the resolution necessary to provide information about the star formation history and dust distribution associated with the outflow. This proposal aims to acquire high resolution optical, near-infrared, and NUV imaging using ACS/WFC, WFC3/IR, and WFC3/UVIS. The primary goals are to resolve the sites of recent star formation, create multi-stellar population models on the same scale as the molecular gas features ($> 1''$), to map the detailed dust morphology and properties, and to further constrain the total mass of outflowing material.

OBSERVING DESCRIPTION

NGC 1266 will be observed using WFC3 and ACS

The near UV image uses the WFC3 UVIS channel with the F225W filter, with which we can detect the presence of young, hot stars. We estimate the time to obtain a S/N 3 per PSF based on the GALEX NUV photometry. If the NUV flux is smoothly distributed, then 2700 seconds is required to achieve the minimum S/N. However, if the NUV flux is produced in clumps then the S/N in the same exposure time will be higher. This will map the presence of young stars at 30 pc metric resolution to high significance. The orbit will be split into at least four dithered sub-exposures to facilitate cosmic ray subtraction and to remove hot pixels or bad columns and avoid the effect of the droplets. The resulting NUV image will locate regions with recent star formation within the galaxy.

1 orbit for the NUV image.

Deep near infrared images will be obtained with the WFC3 IR channel using the broad band F110W, F140W and F160W filters. Exposure times of 500 seconds yield a S/N per pixel of 90 for a flux density of 20 mag/sq. arcsec. Exposures are dithered to avoid bad/hot pixels, skip over the “blobs,” and minimize persistence.

1 orbit for WFC3/IR images.

Proposal 12526 (STScI Edit Number: 0, Created: Tuesday, October 4, 2011 8:28:17 PM EST) - Overview

The single orbit in ACS/WFC will be divided between three optical filters: F435W (Johnson B), F555W (Johnson V), and F814W (Broad I). The exposure time will be divided between them so as to achieve roughly equal S/N per pixel in each filter. Exposures of 1800 seconds in F435W, 500 seconds in F555W, and 140 seconds in F814W will produce a S/N 15 per pixel in each of the three filters. As with the UVIS orbit, these exposures will be split into dithered sub-exposures to avoid cosmic rays, hot pixels, and bad columns.

1 orbit for optical imaging.

The multi-band imaging will allow us to map the stellar morphology of the galaxy, as well as the detailed dust distribution both in the center of the galaxy and out near one effective radius. The diameter of NGC 1266 ($D_{25} = 90$) will fill most of the field of view of both instruments. The galaxy will be positioned off-center on each detector to avoid placing the critical central region of the galaxy over the gap between CCDs.

Proposal 12526 - Visit 01 - Mapping Recent Star Formation and Dust in NGC 1266, a Local Example of AGN-driven Feedback

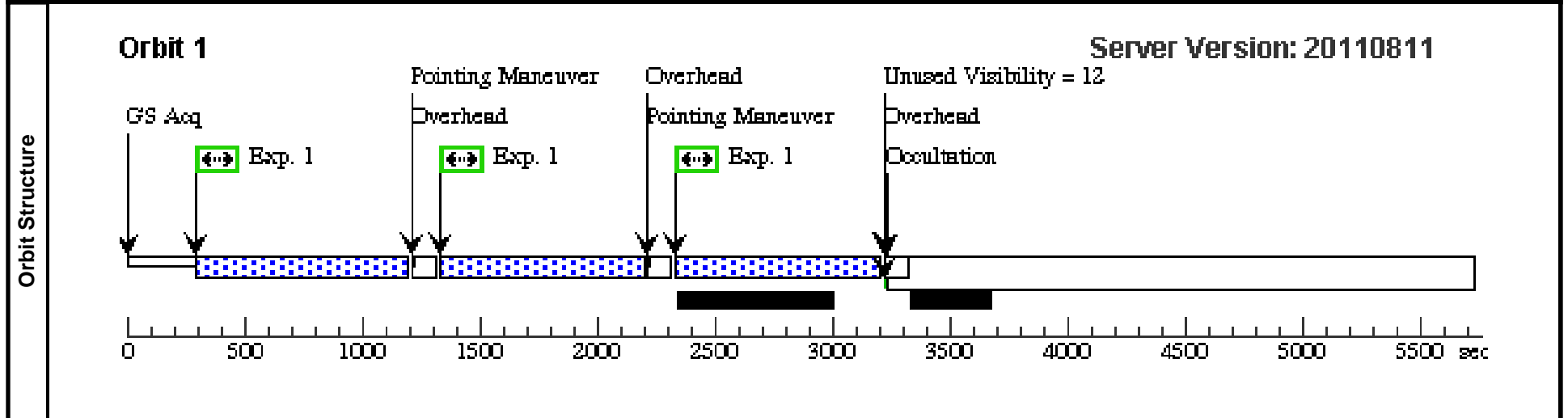
Wed Oct 05 01:28:19 GMT 2011

Visit	Proposal 12526, Visit 01, scheduling		
	Diagnostic Status: No Diagnostics		
	Scientific Instruments: WFC3/UVIS		
	Special Requirements: (none)		

Patterns	#	Primary Pattern	Secondary Pattern	Exposures
	(1)	Pattern Type=WFC3-UVIS-DITHER- LINE-3PT Purpose=DITHER Number Of Points=3 Point Spacing=0.135 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=46.84 Angle Between Sides= Center Pattern=false	(1)

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(1)	NGC-1266	RA: 03 16 0.7488 (49.0031200d) Dec: -02 25 38.50 (-2.42736d) Equinox: J2000		V=12.5	Reference Frame: ICRS
	<i>Comments: This object was generated by the targetselector and retrieved from the NED database.</i>					

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1		(1) NGC-1266	WFC3/UVIS, ACCUM, UVIS	F225W			Pattern 1, Exps 1-1 i n Visit 01 (1)	875 Secs	
									[=>(Pattern 1)]	
									[=>(Pattern 2)]	[1]
									[=>(Pattern 3)]	



Proposal 12526 - Visit 02 - Mapping Recent Star Formation and Dust in NGC 1266, a Local Example of AGN-driven Feedback

Wed Oct 05 01:28:21 GMT 2011

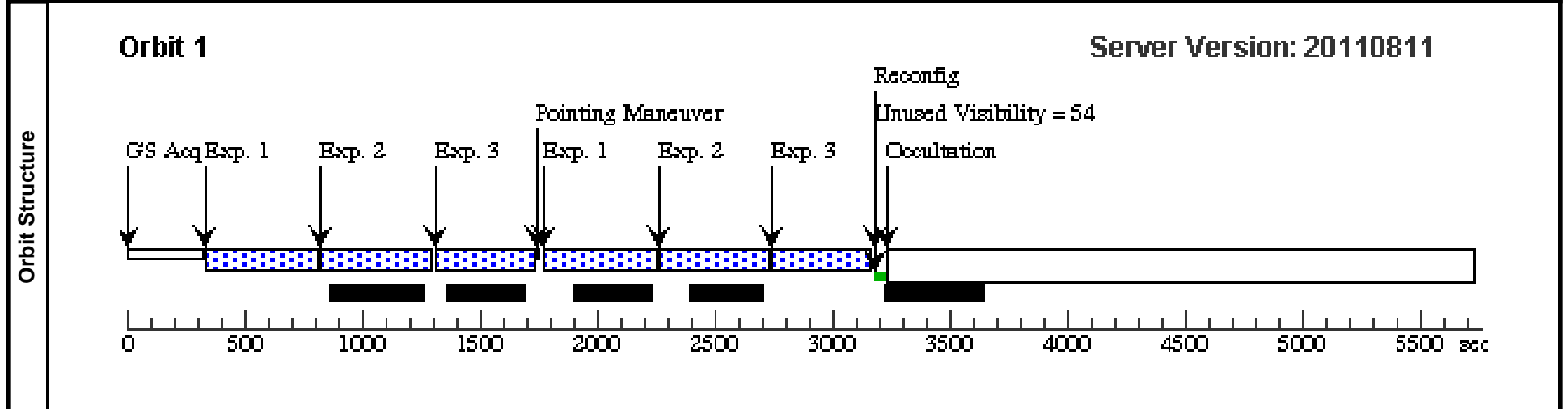
Visit	Proposal 12526, Visit 02, scheduled		
	Diagnostic Status: No Diagnostics		
	Scientific Instruments: WFC3/IR		
	Special Requirements: (none)		

Patterns	#	Primary Pattern	Secondary Pattern	Exposures
	(2)	Pattern Type=WFC3-IR-DITHER-BLOB Purpose=DITHER Number Of Points=2 Point Spacing=5.183 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=41.859 Angle Between Sides= Center Pattern=true	

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(1)	NGC-1266	RA: 03 16 0.7488 (49.0031200d) Dec: -02 25 38.50 (-2.42736d) Equinox: J2000		V=12.5	Reference Frame: ICRS

Comments: This object was generated by the targetselector and retrieved from the NED database.

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1		(1) NGC-1266	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=14; SAMP-SEQ=STEP5 0		Pattern 2, Exps 1-3 in Visit 02 (2)	[==>(Pattern 1)] [==>(Pattern 2)]	[1]
	2		(1) NGC-1266	WFC3/IR, MULTIACCUM, IR	F140W	NSAMP=14; SAMP-SEQ=STEP5 0		Pattern 2, Exps 1-3 in Visit 02 (2)	[==>(Pattern 1)] [==>(Pattern 2)]	[1]
	3		(1) NGC-1266	WFC3/IR, MULTIACCUM, IR	F110W	SAMP-SEQ=STEP5 0; NSAMP=13		Pattern 2, Exps 1-3 in Visit 02 (2)	[==>(Pattern 1)] [==>(Pattern 2)]	[1]



Proposal 12526 - Visit 04 - Mapping Recent Star Formation and Dust in NGC 1266, a Local Example of AGN-driven Feedback

Wed Oct 05 01:28:22 GMT 2011

Visit	Proposal 12526, Visit 04		
	Diagnostic Status: No Diagnostics		
	Scientific Instruments: ACS/WFC		
	Special Requirements: (none)		

Patterns	#	Primary Pattern	Secondary Pattern	Exposures
	(3)	Pattern Type=ACS-WFC-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=3.011 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=85.28 Angle Between Sides= Center Pattern=false	

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(1)	NGC-1266	RA: 03 16 0.7488 (49.0031200d) Dec: -02 25 38.50 (-2.42736d) Equinox: J2000		V=12.5	Reference Frame: ICRS

Comments: This object was generated by the targetselector and retrieved from the NED database.

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	F814W-140	(1) NGC-1266	ACS/WFC, ACCUM, WFC	F814W					135 Secs [==>]
2	F435W - 90 0	(1) NGC-1266	ACS/WFC, ACCUM, WFC	F435W				Pattern 3, Exps 2-3 in Visit 04 (3)	560 Secs [==>(Pattern 1)] [==>(Pattern 2)]	[1]
3	F555W-340	(1) NGC-1266	ACS/WFC, ACCUM, WFC	F555W				Pattern 3, Exps 2-3 in Visit 04 (3)	339 Secs [==>(Pattern 1)] [==>(Pattern 2)]	[1]

