



18186 - The First Serendipitous Dual [Ne V] AGN: Probing Obscured Black Hole Growth with Chandra

Cycle: 33, Proposal Category: GO
(Availability Mode: SUPPORTED)

INVESTIGATORS

<i>Name</i>	<i>Institution</i>
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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) LEDA-855412	WFC3/IR WFC3/UVIS	2	03-Oct-2025 11:00:14.0	yes

2 Total Orbits Used

ABSTRACT

We propose a 50 ks Chandra ACIS observation to resolve X-ray emission in the merging Seyfert 2 galaxy 2MASX J22373491-1925343, which exhibits dual narrow-line [Ne V] 3426 Å emission, a hallmark of AGN activity. Keck/KCWI data reveal two distinct [Ne V] regions, suggesting either a dual AGN or a single AGN illuminating multiple gas structures. Chandra's subarcsecond resolution will determine whether both nuclei are X-ray bright and assess their obscuration, providing the first X-ray-confirmed dual AGN detected in [Ne V]. We also request 2 HST orbits (F814W/F160W) to map stellar structures and extinction. This study will refine [Ne V] as an AGN tracer and inform JWST high-z AGN searches. T

OBSERVING DESCRIPTION

The goal of this program is to search for two sources of extended emission potentially associated with dual [Ne V] emission from black holes, using the i-band and H-band with WFC3. The WFC3/UVIS detector with F814W provides the highest spatial resolution, with a fine plate scale of 0.04" for optimal PSF sampling. The complementary F160W observations are critical because the NIR traces the bulk of the stellar mass, dominated by cooler stars in older populations, and is far less affected by dust extinction.

Our exposure strategy is designed to maximize sensitivity to faint host galaxy features while avoiding saturation and limiting overheads. For F814W, the nucleus has an i-band PSF magnitude of ~ 17.0 (from gaia), but it's a Sy 2 so should be extended. To ensure an unsaturated measurement, we begin with a short 20 s exposure, followed by a 4-point dither pattern with 550 s exposures at each pointing. We employ the 40x 40" UVIS2-C1K1C subarray to reduce readout and buffer-dump overheads, while the dither pattern improves PSF reconstruction and cosmic-ray rejection.

For the F160W observations, the nucleus has a 2MASS H magnitude of 14.9 mag. To balance field of view and efficiency, we adopt the IRSUB512 aperture, providing a 60"x60" FOV. We use the 4-point BOX dither pattern with long MULTIACCUM exposures (SPARS25 and STEP25 sequences, 14 or 15 reads each) to achieve both deep sensitivity to faint extended emission and unsaturated short reads for the nucleus.

Proposal 18186 - Visit 01 - The First Serendipitous Dual [Ne V] AGN: Probing Obscured Black Hole Growth with Chandra

Fri Oct 03 15:00:14 GMT 2025

Visit	Proposal 18186, Visit 01 Diagnostic Status: Warning Scientific Instruments: WFC3/IR, WFC3/UVIS Special Requirements: (none)					
	Diagnosics (Exposure 1 (Visit 01)) Warning (Form): FLASH level may be too low for this exposure or a short subexposure. See extended explanation in the diagnostic browser					
Patterns	#	Primary Pattern	Secondary Pattern	Exposures		
	(2)	Pattern Type=WFC3-IR-DITHER-BOX-MIN Purpose=DITHER Number Of Points=4 Point Spacing=1.716 Line Spacing=1.095	Coordinate Frame=POS-TARG Pattern Orientation=18.528 Angle Between Sides=74.653 Center Pattern=false		(3-4)	
(3)	Pattern Type=WFC3-UVIS-DITHER-BOX Purpose=DITHER Number Of Points=4 Point Spacing=0.173 Line Spacing=0.112	Coordinate Frame=POS-TARG Pattern Orientation=23.884 Angle Between Sides=81.785 Center Pattern=false		(2)		
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(1)	LEDA-855412	RA: 22 37 34.9145 (339.3954771d) Dec: -19 25 34.40 (-19.42622d) Equinox: J2000	Proper Motion RA: 0 mas/yr Proper Motion Dec: 0 mas/yr Parallax: 0" Epoch of Position: 2000 Redshift: 0.1252	V=18.	Reference Frame: ICRS
Comments: Position based on WISE/Simbad. Category=GALAXY Description=[INTERACTING GALAXY, NLR, QUASAR, SEYFERT] Extended=YES						

Proposal 18186 - Visit 01 - The First Serendipitous Dual [Ne V] AGN: Probing Obscured Black Hole Growth with Chandra

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(1) LEDA-855412	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F814W				20 Secs (20 Secs)	
									[==>]	[1]
	2		(1) LEDA-855412	WFC3/UVIS, ACCUM, UVIS2-C1K1C-SUB	F814W	FLASH=10		Pattern 3, Exps 2-2 i n Visit 01 (3)	550 Secs (2200 Secs)	
									[==>(Pattern 1)] [==>(Pattern 2)] [==>(Pattern 3)] [==>(Pattern 4)]	[1]
3		(1) LEDA-855412	WFC3/IR, MULTIACCUM, IRSUB512	F160W	NSAMP=15; SAMP-SEQ=SPAR S25		Pattern 2, Exps 3-4 i n Visit 01 (2)	321.750541 Secs (1287.002 Secs)		
								[==>(Pattern 1)] [==>(Pattern 2)] [==>(Pattern 3)] [==>(Pattern 4)]	[2]	
4		(1) LEDA-855412	WFC3/IR, MULTIACCUM, IRSUB512	F160W	NSAMP=14; SAMP-SEQ=STEP2 5		Pattern 2, Exps 3-4 i n Visit 01 (2)	220.12465 Secs (880.499 Secs)		
								[==>(Pattern 1)] [==>(Pattern 2)] [==>(Pattern 3)] [==>(Pattern 4)]	[2]	



