



6782 - Resolving fuel and products of SF in a lensed dusty protocluster core at $z=2.7$

Cycle: 3, Proposal Category: GO

INVESTIGATORS

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OBSERVATIONS

<i>Folder</i>	<i>Observation</i>	<i>Label</i>	<i>Observing Template</i>	<i>Science Target</i>
Observation Folder				
	1		NIRCam Imaging	(1) PJ0846

ABSTRACT

Here we propose a VLA+JWST joint program to simultaneously characterize the molecular gas properties and the obscured/unobscured stellar populations within a Planck-selected strongly lensed, gas-rich protocluster, J08. J08 hosts at least 11 dusty star-forming galaxies (DSFGs) all at $z=2.66$, within 300 kpc and total SFR > 5000 Ms/yr. J08 offers a valuable opportunity to study gas-rich environmental effects on galaxy evolution and assembly at Cosmic Noon. We seek Ka observations in B and D configuration to image the CO(1-0) line emission across this overdense field. We propose to conduct for the first time in a gas-rich $z>1$ overdensity, a spatially resolved non-LTE radiative transfer multi-line modeling with a full sampling of the [CI] and CO line and dust spectral energy distribution at 100s pc scales. Existing 0.2" ALMA data covering CO(3-2;7-6;8-7) and both [CI] lines requires the proposed wellcalibrated CO(1-0) line as the last missing piece to effectively anchor the CO SLED. JWST NIRCcam imaging will be used to obtain the needed spectral coverage (restframe 0.25 - 1.2m) to conduct stellar SED fitting to investigate the gas-to-stellar mass fraction and positions on/off the star-forming main sequence relative to other protocluster members and field galaxies. NRAO proposal ID: VLA/25A-310

OBSERVING DESCRIPTION

We propose for NIRCcam imaging in F090W, F115W, F150W, F277W, F356W, and F444W to obtain the needed spectral coverage (rest 0.25m - 1.21m) and matched spatial resolution (10-100 pc scales) to conduct a resolved stellar SED analysis, tracing obscured/un-obscured stellar population. This VLA + JWST program will allow us to simultaneously study the resolved gas/dust and associated stellar distribution within a diverse environment of protocluster galaxies

Proposal 6782 - Targets - Resolving fuel and products of SF in a lensed dusty protocluster core at $z=2.7$

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
	(1)	PJ0846	RA: 08 46 49.0163 (131.7042346d) Dec: +15 05 48.24 (15.09673d) Equinox: J2000		
<i>Comments:</i> Category= <i>Clusters of Galaxies</i> Description= <i>[Galaxy groups, High-redshift clusters]</i>					

Proposal 6782 - Observation 1 - Resolving fuel and products of SF in a lensed dusty protocluster core at z=2.7

Wed Apr 02 17:00:17 GMT 2025

Observation	Proposal 6782, Observation 1 Diagnostic Status: Warning Observing Template: NIRCcam Imaging									
Diagnostics	(Visit 1:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.									
Fixed Targets	#	Name	Target Coordinates		Targ. Coord. Corrections			Miscellaneous		
	(1)	PJ0846	RA: 08 46 49.0163 (131.7042346d) Dec: +15 05 48.24 (15.09673d) Equinox: J2000							
	<i>Comments:</i> Category=Clusters of Galaxies Description=[Galaxy groups, High-redshift clusters]									
Template	Module				Subarray					
	B				FULL					
Dithers	#	Primary Dither Type		Primary Dithers	Subpixel Dither Type		Dither Size	Subpixel Positions		
	1	INTRAMODULEBOX		4	STANDARD			1		
Spectral Elements	#	Short Filter	Long Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Dithers	Total Exposure Time	ETC Wkbk.Calc ID
	1	F090W	F444W	MEDIUM8	7	1	4	4	2920.401	
	2	F115W	F277W	SHALLOW4	9	1	4	4	1889.672	
	3	F150W	F356W	SHALLOW4	7	1	4	4	1460.201	
Special Requirements	Offset -27.0 arcsec, -27.0 arcsec									