



4548 - The intermediate-mass protostellar outflow, HH288

Cycle: 3, Proposal Category: GTO

INVESTIGATORS

<i>Name</i>	<i>Institution</i>
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OBSERVATIONS

<i>Folder</i>	<i>Observation</i>	<i>Label</i>	<i>Observing Template</i>	<i>Science Target</i>
NIRCam imaging				
	1		NIRCam Imaging	(1) HH288_offset

ABSTRACT

We will obtain NIRCam images of the intermediate-mass protostellar outflow HH288 in lines of shocked molecular hydrogen and carbon monoxide to delineate the jet and its interaction with the surrounding star-forming core. We will also image the region in four wide continuum filters to map out faint surface brightness nebulosity around the outflow and protostar, and to assess the stellar content of the region, including nearby embedded objects.

HH288 is associated with the deeply embedded protostar IRAS 00342+6347 in Cassiopeia, at a distance of roughly 2kpc. Its characteristics suggest that is an intermediate-mass counterpart to the classical Class 0 protostellar stage defined for low-mass stars. It has bright molecular emission along a jet / outflow spanning at least 4.5 arcminutes, i.e. ~ 2.6 parsecs, with some fainter orthogonal H₂ emission, consistent with millimetre interferometry showing a quadrupolar CO outflow. The two flows may be driven by a binary system, with two components seen in the radio separated by ~ 4 arcsec or 8000AU. The aim of this study is to provide better qualitative and quantitative information on the "intermediate-mass Class 0" hypothesis, much rarer objects than low-mass Class 0 protostars.

High-resolution, high-sensitivity JWST imaging will enable us to trace the outflows in much more detail and to much lower surface brightness, so disentangle the two flows and other small-scale nebulosity in the region. The long wavelength baseline will help us better identify the positions and immediate environs of the possible driving sources and other embedded stars. Possible future NIRCам imaging could help determine the proper motions and thus velocity in the jet and outflow, while MIRI imaging may better characterise the embedded sources.

A 2 x 2 NIRCам mosaic is made to cover the desired region with offsets and dithers to fill the inter-SCA and inter-module gaps: the total region covered is $\sim 7.5 \times 4.5$ arcminutes.

Version 1: 2023-06-28

OBSERVING DESCRIPTION

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A 2 x 2 NIRCам mosaic is made to cover the desired region with offsets and dithers to fill the inter-SCA and inter-module gaps: the total region

JWST Proposal 4548 (Created: Thursday, June 29, 2023 at 2:04:28 PM Eastern Standard Time) - Overview

covered is $\sim 7.5 \times 4.5$ arcminutes.

Proposal 4548 - Targets - The intermediate-mass protostellar outflow, HH288

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
	(1)	HH288_offset	RA: 00 37 10.3740 (9.2932250d)	Proper Motion RA: 0 mas/yr	
			Dec: +64 03 46.84 (64.06301d)	Proper Motion Dec: 0 mas/yr	
			Equinox: J2000	Parallax: 0.0"	
				Epoch of Position: 2000.0	
Comments: HH288 is associated with a young intermediate-mass protostar (IRAS 00342+6347) in Cepheus, with shocked molecular hydrogen jets and bow shocks, and carbon monoxide emission from a quadrupolar outflow. There are additional embedded sources in the region and the offset position given here gives good mosaic coverage of them all. Category=ISM Description=[Bipolar nebulae, Molecular gas, Nebulae, Pre-main sequence stars, Stellar jets] Extended=YES					

Proposal 4548 - Observation 1 - The intermediate-mass protostellar outflow, HH288

Observation	Proposal 4548, Observation 1										
	Diagnostic Status: Warning										
	Observing Template: NIRCcam Imaging										
	Comments: A PA of 53° is used to align the HH288 molecular hydrogen emission along the long axis of the mosaic. Rotating the whole mosaic by 180° to a PA of 233° is scheduleable in principle, but lies in the MAZ.										
Diagnostics	(Visit 1:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.										
	(Visit 1:2) Warning (Form): Overheads are provisional until the Visit Planner has been run.										
	(Visit 1:3) Warning (Form): Overheads are provisional until the Visit Planner has been run.										
	(Visit 1:4) Warning (Form): Overheads are provisional until the Visit Planner has been run.										
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	Dec: +64 03 46.84 (64.06301d)			Proper Motion Dec: 0 mas/yr							
	Equinox: J2000			Parallax: 0.0"							
	Epoch of Position: 2000.0										
Template	Module		Subarray				Target Placement				
	ALL		FULL				Module Gap				
Mosaic	Rows	Columns	Row Overlap %		Column Overlap %		Row shift (deg)		Column shift (deg)		Tile Order
	2	2	2.0		58.0		-1.0		0.5		DEFAULT
Dithers	#	Primary Dither Type		Primary Dithers		Subpixel Dither Type		Dither Size		Subpixel Positions	
	1	INTRAMODULEX		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	F212N	F470N+F444W	SHALLOW4	4	1	4	4	815.995		
	2	F212N	F466N+F444W	SHALLOW4	4	1	4	4	815.995		
	3	F150W	F356W	SHALLOW4	3	1	4	4	601.259		
	4	F200W	F444W	SHALLOW4	3	1	4	4	601.259		

Proposal 4548 - Observation 1 - The intermediate-mass protostellar outflow, HH288

Special Requirements	Group Visits within 53.0 Days Aperture PA Range 53 to 53 Degrees (V3 53.0713531 to 53.0713531) Visits Same PA
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