



4343 - Hunting for IMBHs in the Omega Centauri Globular Cluster

Cycle: 2, 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		MIRI Imaging	(1) OMEGACEN
	2		NIRCam Imaging	(1) OMEGACEN

ABSTRACT

We propose to use the outstanding IR sensitivity and superb angular resolution of JWST to search for emission from IMBH(s) in the most massive Galactic globular cluster (GC), omega Cen. The state-of-the-art ADAF models of low-rate accretion from the ambient medium predict that the spectral flux of an IMBH peaks in IR, while most of the previous searches for IMBHs in GCs were conducted in X-rays and radio, where IMBHs can be much fainter. Omega Cen is one of the best candidates to host IMBH(s), while also being nearby and having a relatively low central stellar density. Therefore, JWST should be able to resolve even very faint sources in the core of the cluster. Observing in four bands (evenly distributed between 2 and 15 micron) and leveraging the existing extraordinary amount of HST data on Omega Cen (including very deep WFC3/IR observations), we will be able to detect IMBH candidates using their distinct IR-NIR colors and a lack of optical counterparts. The data from this program will also be useful for evaluating the dust content in the globular clusters and for cross-calibration between JWST and Spitzer.

OBSERVING DESCRIPTION

This JWST project consists of imaging observations with MIRI and NIRCam. Our goal is to resolve sources in the dense core of Omega Cen cluster and perform accurate photometry in 4 bands evenly distributed across 2-15 micron range.

For the MIRI imaging we will use two filters: F1500W and F770W. For observations with each filter we will use 4-point dither and FASTR1 readout. For NIRCam observations we will employ F200W and F444W filters. We will use the INTRAMODULEBOX dither pattern for 4 dithers to fill the gaps between the NIRCAM modules and chips. BRIGHT1 readout pattern with 4 groups per integration and two integrations per dither will be used.

Proposal 4343 - Targets - Hunting for IMBHs in the Omega Centauri Globular Cluster

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
	(1)	OMEGACEN	RA: 13 26 47.6376 (201.6984900d)	Dec: -47 28 42.08 (-47.47836d)	
		Equinox: J2000			
Fixed Targets	<i>Comments:</i>				
	<i>Category=Stellar Cluster</i>				
	<i>Description=[Globular star clusters]</i>				
Fixed Targets	<i>Extended=NO</i>				

Proposal 4343 - Observation 1 - Hunting for IMBHs in the Omega Centauri Globular Cluster

Thu Mar 21 15:00:55 GMT 2024

Observation	Proposal 4343, Observation 1 Diagnostic Status: Warning Observing Template: MIRI Imaging										
	(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)	OMEGACEN	RA: 13 26 47.6376 (201.6984900d) Dec: -47 28 42.08 (-47.47836d) Equinox: J2000								
<i>Comments:</i> Category=Stellar Cluster Description=[Globular star clusters] Extended=NO											
Template	Subarray										
	FULL										
Dithers	#	Dither Type	Starting Point	Number of Points	Points	Starting Set	Number of Sets	Optimized For	Direction	Pattern Size	
	1	CYCLING	1	8	5	5	2			LARGE	
	2	CYCLING	1	4	5	5	1			LARGE	
Spectral Elements	#	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Dither	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
	1	F1500W	FASTR1	25	12	1	Dither 1	8	96	6904.3	147497
	2	F770W	FASTR1	18	10	1	Dither 2	4	40	2097.93	147494

Proposal 4343 - Observation 2 - Hunting for IMBHs in the Omega Centauri Globular Cluster

Thu Mar 21 15:00:55 GMT 2024

Observation	<p>Proposal 4343, Observation 2 Diagnostic Status: Warning Observing Template: NIRCam Imaging</p>									
Diagnostics	(Visit 2:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.									
Fixed Targets	#	Name	Target Coordinates		Targ. Coord. Corrections			Miscellaneous		
	(1)	OMEGACEN	RA: 13 26 47.6376 (201.6984900d) Dec: -47 28 42.08 (-47.47836d) Equinox: J2000							
	<p><i>Comments:</i> Category=Stellar Cluster Description=[Globular star clusters] Extended=NO</p>									
Template	Module		Subarray			Target Placement				
	B		FULL			Module Gap				
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	F200W	F444W	BRIGHT1	4	2	8	4	644.206	147500