



6035 - Hidden Clusters No More! Completing a Full Cluster Catalog from NUV to MIR in *The Extreme* Star-Forming and Dusty Galaxy NGC 1614

Cycle: 3, Proposal Category: GO

INVESTIGATORS

<i>Name</i>	<i>Institution</i>
Ms. Miranda Caputo (PI)	University of Toledo
Dr. Rupali Chandar (CoI)	University of Toledo
Dr. Paul Goudfrooij (CoI)	Space Telescope Science Institute
Dr. Angus Mok (CoI) (CSA Member)	OCAD University
Dr. Sean Linden (CoI)	University of Arizona

OBSERVATIONS

<i>Folder</i>	<i>Observation</i>	<i>Label</i>	<i>Observing Template</i>	<i>Science Target</i>
Observation Folder				
	1		NIRCam Imaging	(1) NGC1614

ABSTRACT

NGC 1614 is a highly star-forming and luminous infrared galaxy with a range of environments from a dust-free UV-bright arm to a highly dust-enshrouded nuclear region that is home to a large number of optically-obscured clusters. The Hubble Space Telescope has been used extensively to find and determine the ages and masses of optically visible clusters. These HST data have been used to quantify the shape and normalization of the cluster mass function and the fraction of stars that form in clusters. These quantities are predicted to increase with increasing star formation rate density. However, these works are almost certainly missing many clusters that are younger than 10 Myr old due to the large amounts of dust, potentially leading to grave underestimates for both quantities. JWST will enable the detection, along with age and mass estimates of all the deeply embedded ($A_V = 15$ or more), young (<10 Myr), and massive ($>10,000$ Msun) clusters in the extremely star forming and dusty central region of NGC 1614. This IR-based catalog, combined with the optical HST-based cluster catalog, will span from the NUV to MIR and reveal the the shape of the

initial cluster mass function and the fraction of stars formed in clusters. The use of NIRCAM to observe hydrogen emission lines and broadband colors in NGC 1614 will enable the calculation of both the extinction and age of clusters with ages from 1Myr to 1Gyr, that are completely invisible to optical observations.

OBSERVING DESCRIPTION

We will use NIRCAM to detect and age-date the obscured cluster population in recent merger and luminous infrared galaxy NGC 1614. We propose to use single-module NIRCAM imaging in 6 filters: F182M and F410M to get two hydrogen recombination lines, Paschen alpha and Brackett alpha respectively, as well as F200W, F210M, F277W, and F480M to serve as continuum bands for the hydrogen lines and cover the full wavelength range available on NIRCAM.

The SHALLOW4 readout pattern with at least 5 groups per integration will be used. This will help with saturation effects - although we do not expect to saturate - and cosmic ray removal.

Proposal 6035 - Targets - Hidden Clusters No More! Completing a Full Cluster Catalog from NUV to MIR in *The Extreme* Star-Formi...

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
	(1)	NGC1614	RA: 04 33 59.9885 (68.4999521d) Dec: -08 34 45.51 (-8.57931d) Equinox: J2000		
<i>Comments:</i> Category=Galaxy Description=[Active galaxies, Infrared galaxies, Interacting galaxies, Radio cores, Starburst galaxies]					

Proposal 6035 - Observation 1 - Hidden Clusters No More! Completing a Full Cluster Catalog from NUV to MIR in *The Extreme* Star...

Fri Nov 22 19:00:18 GMT 2024

Observation	Proposal 6035, Observation 1 Diagnostic Status: Warning Observing Template: NIRCam 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)	NGC1614	RA: 04 33 59.9885 (68.4999521d) Dec: -08 34 45.51 (-8.57931d) Equinox: J2000							
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Template	Module				Subarray					
	B				FULL					
Dithers	#	Primary Dither Type		Primary Dithers		Subpixel Dither Type		Dither Size		Subpixel Positions
	1	INTRAMODULEBOX		4		SMALL-GRID-DITHER				3
Spectral Elements	#	Short Filter	Long Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Dithers	Total Exposure Time	ETC Wkbk.Calc ID
	1	F182M	F410M	SHALLOW4	5	1	12	12	3092.19	178449
	2	F210M	F480M	SHALLOW4	5	1	12	12	3092.19	178449
	3	F200W	F277W	SHALLOW4	5	1	12	12	3092.19	178449
Special Requirements	Offset 45.0 arcsec, 32.0 arcsec									