



16284 - Imaging of an apparent "globular cluster galaxy"

Cycle: 28, Proposal Category: GO

(Availability Mode: SUPPORTED)

INVESTIGATORS

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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) NGC5846-UDG1	WFC3/UVIS	2	25-Sep-2020 18:00:18.0	yes

2 Total Orbits Used

ABSTRACT

Recently a remarkable low surface brightness galaxy, NGC5846-UDG1, was discovered in archival ground-based CFHT data. The galaxy has a low stellar mass ($\sim 10^8$ solar masses), a large size ($r_e=1.8$ kpc), and an unprecedented number of compact sources that resemble globular clusters. Keck spectroscopy confirms the association of the globular clusters and the diffuse light: they are at a common radial velocity of ~ 2000 km/s, close to the group velocity of ~ 1900 km/s. Based on the current ground-based imaging and spectroscopic data the galaxy might have up to 30% of its light in the

Proposal 16284 (STScI Edit Number: 2, Created: Friday, September 25, 2020 at 5:00:19 PM Eastern Standard Time) - Overview

form of globular clusters, significantly higher than any other galaxy known to date. Taking diffusion of low mass clusters into account, it is possible that the galaxy consisted solely of ~ 100 globular clusters when it formed. Here we request 2 WFC3/UVIS orbits to study this extreme galaxy along with its unusual globular cluster system. With WFC3/UVIS we will measure the sizes, colors, ellipticities and luminosity function of the clusters. These properties will be compared to the globular cluster systems of other galaxies (and in particular other Ultra Diffuse Galaxies), to determine whether NGC5846-UDG1's globular clusters have similarities to those in other galaxies or represent something entirely new. We will also use the data to better determine the structure and morphology of this enigmatic galaxy in order to put further constraints on its dynamical state.

OBSERVING DESCRIPTION

The program is ought to obtain F606W and F475W imaging of a single ultra-diffuse galaxy which seems to host an outstanding number of bright globular clusters. The goal is to obtain photometry of these compact point sources over the entire WFC3/UVIS field of view.

Instrumental setup: We will use WFC3/UVIS, and the F606W and F475W filters. The F606W filter is the primary filter for selecting globular clusters, with the F475W - F606W colors of compact objects helping (in conjunction with their sizes and the Keck spectroscopy) to distinguish them from background galaxies. A single pointing is sufficient as the candidate fits well inside the UVIS field of view.

Total orbits and observing strategy: the target is observed for two orbits in a single visit, with one orbit per filter in two filters (F606W and F475W). We have no ORIENT constraints.

We will be using the WFC3-UVIS-MOS-DITH-LINE pattern with 2 primary points and 2 sub-pattern points. This allows both dithering over the chip gap and includes a secondary pattern which adds a sub-pixel dither to each of the primary steps.

Apertures and POSTARGs: the galaxy is observed near UVIS2 with a slight shift from the chip center.

Proposal 16284 - Visit 01 - Imaging of an apparent "globular cluster galaxy"

Fri Sep 25 22:00:19 GMT 2020

Visit	Proposal 16284, Visit 01, implementation Diagnostic Status: Warning Scientific Instruments: WFC3/UVIS Special Requirements: (none)									
	(Exposure 1 (Pattern 1, Exps 1-1 in Visit 01) special requirements) Warning (Form): Be very careful mixing POS TARG and Center_Pattern = Yes (Exposure 2 (Pattern 1, Exps 2-2 in Visit 01) special requirements) Warning (Form): Be very careful mixing POS TARG and Center_Pattern = Yes									
Diagnosics										
Patterns	#	Primary Pattern	Secondary Pattern	Exposures						
	(1)	Pattern Type=WFC3-UVIS-MOS-DITH-LINE Purpose=DITHER Number Of Points=2 Point Spacing=2.4 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=85.754 Angle Between Sides= Center Pattern=true	Pattern Type=WFC3-UVIS-MOS-DITH-LINE Purpose=DITHER Number Of Points=2 Point Spacing=0.119 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=33.606 Angle Between Sides= Center Pattern=false	(1), (2)				
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(1)	NGC5846-UDG1	RA: 15 05 20.2900 (226.3345417d) Dec: +01 48 46.60 (1.81294d) Equinox: J2000	Radial Velocity: 2000 km/sec	V=25.0	Reference Frame: ICRS				
<i>Comments:</i> Category=GALAXY Description=[LSB]										
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	(1) NGC5846-UDG1	WFC3/UVIS, ACCUM, UVIS2	F606W			POS TARG 1.91495 47243532645,6.1043 51303643155	Pattern 1, Exps 1-1 i n Visit 01 (1)	590 Secs (2360 Secs) [=>(Pattern 1,1)] [=>(Pattern 1,2)] [=>(Pattern 2,1)] [=>(Pattern 2,2)]	[1]
2	(1) NGC5846-UDG1	WFC3/UVIS, ACCUM, UVIS2	F475W			POS TARG 0.11424 270911157405,5.958 445254507281	Pattern 1, Exps 2-2 i n Visit 01 (1)	585 Secs (2349 Secs) [=>594.0 Secs (Pattern 1,1)] [=>(Pattern 1,2)] [=>(Pattern 2,1)] [=>(Pattern 2,2)]	[2]	



