



13756 - Rings within Rings: High Resolution Imaging of a Spectacular Gravitational Lens

Cycle: 22, 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) GAL-CLUS-022058-38303 ANY	ACS/WFC WFC3/IR WFC3/UVIS	2	23-Jul-2014 21:30:30.0	yes

2 Total Orbits Used

ABSTRACT

We propose WFC3 optical and infrared imaging of the largest, nearly-complete Einstein ring known. The ring has an extreme diameter, approximately 20 arcseconds, and is the result of gravitational lensing by a massive cluster elliptical galaxy at $z = 0.36$. This spectacular system shows two source galaxies (perhaps interacting), resulting in double arcs with striking differences in color. The proposed high resolution images will unveil detailed structure in the ring arcs (which exhibit a complex structure), allowing for the identification of multiply imaged regions in the source galaxies. Modelling the images over the full range of position angles around the rings will provide the best constraints on the lens mass distribution, and will connect observations and models from galaxy to cluster scales. These data will allow for the study of spatially resolved star-formation in the source galaxies, and enable additional followup through a more democratic window to the high-redshift Universe.

OBSERVING DESCRIPTION

The ring features observed in the ground-based images range in surface brightness from 24 to 25 AB mag/arcsec² in Sloan g, and 23 to 24 AB mag/arcsec² in i. To achieve a S/N ~ 5 for the faintest of these in a 0.2 arcsec radius aperture requires ~ 1000 sec in F555W and F775W with WFC3/UVIS according to the WFC3 ETC; with overhead this corresponds to one orbit for the optical observations. We choose WFC3/UVIS rather than ACS/WFC to get the best possible spatial resolution (smaller pixels); to this end we will employ a standard dither pattern to subsample and eliminate pixel artifacts.

We will also obtain one orbit of WFC3/IR F160W imaging to study at high resolution the red arcs that are bright in the IR and potentially find more distant lensed images.

Coordinated parallel observations with ACS/WFC in F475W, F625W, and F775W will probe the lensing cluster environment, and a foreground cluster.

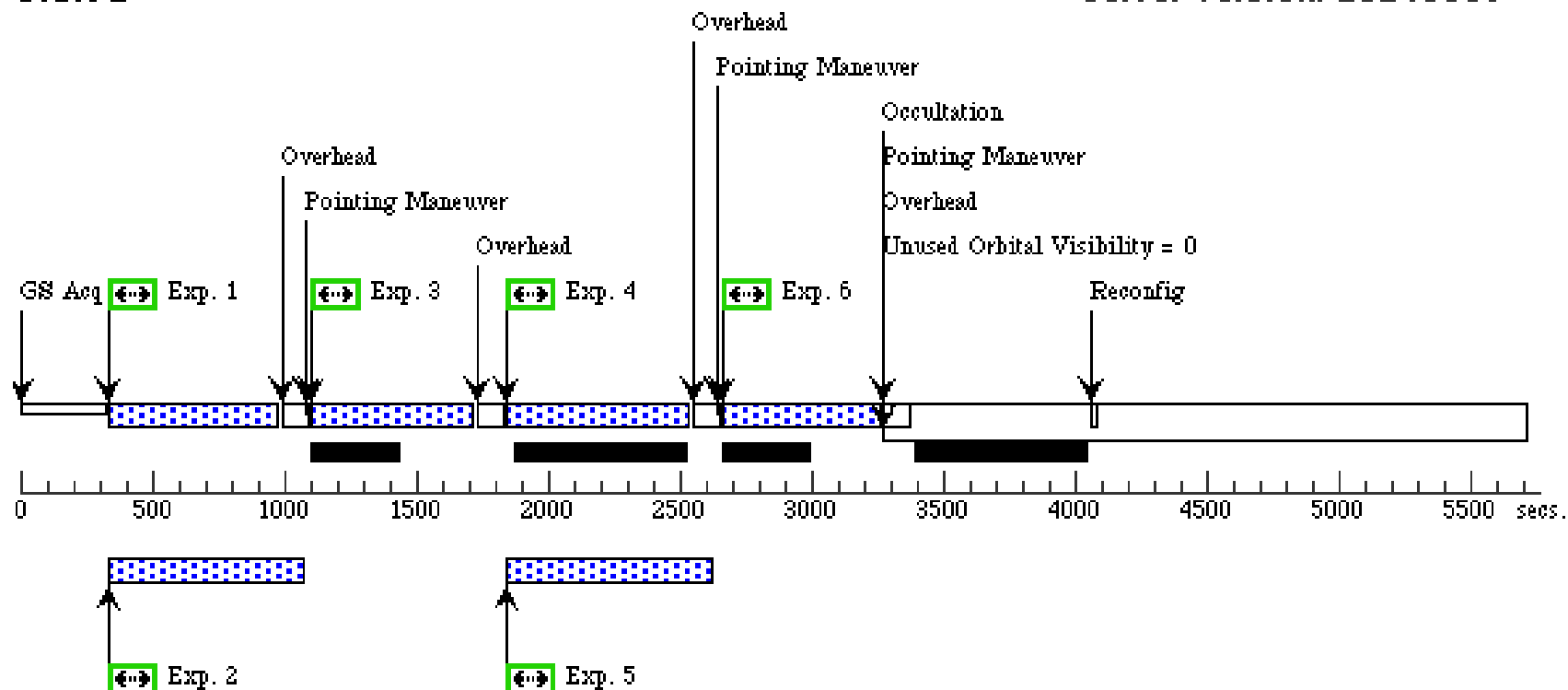
Proposal 13756 - Visit 01 - Rings within Rings: High Resolution Imaging of a Spectacular Gravitational Lens

Visit	Proposal 13756, Visit 01 Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/IR, WFC3/UVIS, ACS/WFC Special Requirements: (none) Thu Jul 24 01:30:32 GMT 2014									
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(1)	GAL-CLUS-022058-38303	RA: 02 20 57.6870 (35.2403625d) Dec: -38 33 3.47 (-38.55096d) Equinox: J2000		V=19.5+/-0.5	Reference Frame: ICRS				
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(1) GAL-CLUS-022058-38303	WFC3/UVIS, ACCUM, UVIS2	F555W		POS TARG -0.089,-1.203	Prime + Parallel Group 1-2 in Visit 01	614 Secs (614 Secs) [==>]	[1]
	2		ANY	ACS/WFC, ACCUM, WFC	F475W			Prime + Parallel Group 1-2 in Visit 01	535 Secs (535 Secs) [==>]	[1]
	3		(1) GAL-CLUS-022058-38303	WFC3/UVIS, ACCUM, UVIS2	F555W		POS TARG 0.089,1.203		613 Secs (613 Secs) [==>]	[1]
	4		(1) GAL-CLUS-022058-38303	WFC3/UVIS, ACCUM, UVIS2	F775W		POS TARG 0.089,1.203	Prime + Parallel Group 4-5 in Visit 01	670 Secs (670 Secs) [==>]	[1]
	5		ANY	ACS/WFC, ACCUM, WFC	F475W			Prime + Parallel Group 4-5 in Visit 01	659 Secs (659 Secs) [==>]	[1]
	6		(1) GAL-CLUS-022058-38303	WFC3/UVIS, ACCUM, UVIS2	F775W		POS TARG -0.089,-1.203		600 Secs (600 Secs) [==>]	[1]
	7		(1) GAL-CLUS-022058-38303	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=15; SAMP-SEQ=SPAR S50	POS TARG 0.000,0.000	Prime + Parallel Group 7-8 in Visit 01	702.938605 Secs (702.939 Secs) [==>]	[2]
	8		ANY	ACS/WFC, ACCUM, WFC	F625W			Prime + Parallel Group 7-8 in Visit 01	577 Secs (577 Secs) [==>]	[2]
	9		(1) GAL-CLUS-022058-38303	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=15; SAMP-SEQ=SPAR S50	POS TARG 0.542,0.182	Prime + Parallel Group 9-10 in Visit 01	702.938605 Secs (702.939 Secs) [==>]	[2]
	10		ANY	ACS/WFC, ACCUM, WFC	F625W			Prime + Parallel Group 9-10 in Visit 01	607 Secs (607 Secs) [==>]	[2]
	11		(1) GAL-CLUS-022058-38303	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=15; SAMP-SEQ=SPAR S50	POS TARG 0.339,0.485	Prime + Parallel Group 11-12 in Visit 01	702.938605 Secs (702.939 Secs) [==>]	[2]
	12		ANY	ACS/WFC, ACCUM, WFC	F775W			Prime + Parallel Group 11-12 in Visit 01	589 Secs (589 Secs) [==>]	[2]
	13		(1) GAL-CLUS-022058-38303	WFC3/IR, MULTIACCUM, IR	F160W	NSAMP=15; SAMP-SEQ=SPAR S50	POS TARG -0.203,0.303	Prime + Parallel Group 13-14 in Visit 01	702.938605 Secs (702.939 Secs) [==>]	[2]
	14		ANY	ACS/WFC, ACCUM, WFC	F775W			Prime + Parallel Group 13-14 in Visit 01	607 Secs (607 Secs) [==>]	[2]

Orbit 1

Server Version: 20140605

Orbit Structure



Orbit 2

Server Version: 20140605

