



17593 - Studying a massive galaxy cluster to be used as gravitational lens telescope

Cycle: 31, Proposal Category: GO

(Availability Mode: SUPPORTED)

INVESTIGATORS

<i>Name</i>	<i>Institution</i>
Prof. Hans Boehringer (PI) (ESA Member) (Contact)	Max Planck Institute for Extraterrestrial Physics
Gayoung Chon (CoI) (ESA Member)	Max-Planck-Institut für extraterrestrische Physik
Prof. Adi Zitrin (CoI)	Ben Gurion University of the Negev
Prof. Richard S. Ellis (CoI) (ESA Member)	University College London
Dr. Nicolas Laporte (CoI) (ESA Member)	CNRS, Laboratoire d'Astrophysique de Marseille

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) RXCJ1317.1-3821	ACS/WFC WFC3/IR	2	25-Jun-2024 18:00:39.0	yes

2 Total Orbits Used

ABSTRACT

This is a proposal for re-observation of the cluster RXCJ1317.1-3821 with highly flared observational data from an A-rated proposal in AO20 with an additional request for HST observations. It belongs to a programme granted in AO18 to study the most massive clusters at $z=0.25-0.5$, ideal gravitational lens candidates - which had no pointed X-ray observations so far. This cluster still has insufficient data for a precise temperature determination. Aiming for a good construction of a lensing model, we require sufficiently good data to characterise its precise mass distribution. For another cluster from this study we obtained HST observations which revealed a spectacular lensed image. The present target is the second most promising lensing candidate and we therefore ask for HST imaging.

OBSERVING DESCRIPTION

This observation request is based on an XMM-Newton proposal with jointly allocated HST Time.

Massive galaxy clusters are important study objects for Astrophysics and Cosmology. Since they are also very rare objects, the discovery and study of them is very valuable. In our project to complete detailed X-ray observations for X-ray luminous clusters of galaxies we have one last massive cluster (estimated $M > 6.4 \times 10^{14} M_{\text{sun}}$) among 119 such objects in the redshift range $z = 0.25$ to 0.5 which has not been studied before. Massive clusters in this redshift range are the best gravitational lens telescopes for the study of the distant Universe. Because of the importance of these objects, we have requested XMM-Newton observing time to determine its properties, its mass and the mass distribution in the cluster. The latter will allow us to construct a first gravitational lensing model of the cluster and evaluate its efficiency as gravitational lens telescope. To make use of the target as gravitational lens telescope, we have also requested HST observations for this system to detect gravitational lensing features and identify lensed objects. To be able to determine photometric redshifts for the galaxies in the sky field of the cluster, we requested optical observations with ACS F814W and near infrared observations with WFC3 F110W and 160W. With the obtained data we will be able to detect magnified background galaxies up to redshift $z = 6$ and beyond. The field-of-view of the observations will cover a cluster region of 0.7 Mpc for ACS and 0.5 Mpc for WFC3. This will easily provide a complete coverage of the strong lensing regions of the clusters.

Proposal 17593 - RXCJ1317 (01) - Studying a massive galaxy cluster to be used as gravitational lens telescope

Tue Jun 25 22:00:39 GMT 2024

Visit	Proposal 17593, RXCJ1317 (01), implementation Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/IR, ACS/WFC Special Requirements: (none)									
	#	Primary Pattern	Secondary Pattern	Exposures						
Patterns	(1)	Pattern Type=WFC3-IR-DITHER-BLOB Purpose=DITHER Number Of Points=2 Point Spacing=5.183 Line Spacing= Coordinate Frame=POS-TARG Pattern Orientation=41.859 Angle Between Sides= Center Pattern=false		(1-2)						
	(2)	Pattern Type=ACS-WFC-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=3.034 Line Spacing= Coordinate Frame=POS-TARG Pattern Orientation=85.29 Angle Between Sides= Center Pattern=false		(3)						
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(1)	RXCJ1317.1-3821 Alt Name1: MCXM-J1317.1-3821	RA: 13 17 12.1600 (199.3006667d) Dec: -38 21 55.50 (-38.36542d) Equinox: J2000	Epoch of Position: 2000	V=18.5+/-0.5	Reference Frame: SIMBAD				
<i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.</i> Category=CLUSTER OF GALAXIES Description=[RICH CLUSTER]										
Exposures	#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	RXCJ1317_F110W (1800176)	(1) RXCJ1317.1-3821	WFC3/IR, MULTIACCUM, IR-FIX	F110W	SAMP-SEQ=SPARS 100; NSAMP=7		Pattern 1, Exps 1-2 in RXCJ1317 (01) (1)	602.934229 Secs (1205.868 Secs) [=>(Pattern 1)] [=>(Pattern 2)]	[1]
	2	RXCJ1317_F160W (1800177)	(1) RXCJ1317.1-3821	WFC3/IR, MULTIACCUM, IR-FIX	F160W	SAMP-SEQ=SPARS 100; NSAMP=7		Pattern 1, Exps 1-2 in RXCJ1317 (01) (1)	602.934229 Secs (1205.868 Secs) [=>(Pattern 1)] [=>(Pattern 2)]	[1]
	3	RXCJ1317_F814W (1900189)	(1) RXCJ1317.1-3821	ACS/WFC, ACCUM, WFC	F814W			Pattern 2, Exps 3-3 in RXCJ1317 (01) (2)	1150 Secs (2276 Secs) [=>1138.0 Secs (Pattern 1)] [=>1138.0 Secs (Pattern 2)]	[2]

