



15324 - Imaging the Lenses in the Quintuple Gravitational Lens PMN J0134-0931

Cycle: 25, Proposal Category: GO

(UV Initiative)

(Availability Mode: SUPPORTED)

INVESTIGATORS

<i>Name</i>	<i>Institution</i>	<i>E-Mail</i>
Dr. Tommy Wiklind (PI) (Contact)	Catholic University of America	wiklind@cua.edu
Dr. Anton M. Koekemoer (CoI)	Space Telescope Science Institute	koekemoer@stsci.edu
Ms. Emmaris Soto (CoI)	Catholic University of America	88soto@cardinalmail.cua.edu
Dr. Françoise Combes (CoI) (ESA Member)	Observatoire de Paris	francoise.combes@obspm.fr
Dr. Nissim Kanekar (CoI)	National Centre for Radio Astrophysics, TIFR	nkanekar@aoc.nrao.edu

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) QSO-B0132-097	WFC3/UVIS	3	18-Jul-2017 17:06:53.0	yes

3 Total Orbits Used

ABSTRACT

The gravitational lens PMN J0134-0931 is one of only two known non-cluster lenses producing six images of the background source. In this case the source is a quasar located at $z=2.2$ and the lens plane at $z=0.76$. It is likely that a small compact group of galaxies are located in the lens plane. The lens modeling for these six-image systems has, however, proven to be extraordinarily complicated and no satisfactory lens model has been produced for this system.

PMN J0194-0931 is also unique in the sense that it is one of only two cases where molecular absorption lines are seen against two or more background images, the other one being PKS1830-211. The absorption lines make it possible to probe the kinematics of the lensing galaxies on sub-

Proposal 15324 (STScI Edit Number: 1, Created: Tuesday, July 18, 2017 4:06:54 PM EST) - Overview

kpc scales and to determine kinematically derived total masses. Comparing with the mass derived from lens models, it provides a test of the assumed dark matter halo profile. In order to use the absorption lines to constrain the rotation curve it is necessary to know where the sight lines cross the galaxies, the galaxy center and their inclination.

The goal with this proposal is to image the galaxies at $z=0.76$ that lens the background quasar PMN J0134-0931. At optical and near-infrared wavelengths the highly magnified background quasar dominates the light. Attempts to subtract the quasar light has not produced useable results. We propose to observe PMN J0134-0931 at a wavelength short of the redshifted Lyman limit of the background quasar. This ensures that the quasar is essentially "turned off". This can be accomplished by using the WFC3/F275W filter. The lensing galaxies will be observed in restframe 1500Å.

OBSERVING DESCRIPTION

This observation consists of imaging of the lens in a gravitational lens system using WFC3/UVIS F275W. At this wavelength the light from the background QSO is all but extinguished. The exposure time is estimated based on a L^* galaxy at the redshift of the lens ($z=0.765$), but is uncertain. A S/N of 20 should be reached in 7200 sec.

The setup is a simple imaging observation. Getting as much exposure time as possible (given the uncertain magnitude of the lens galaxy(ies)).

The angular extent of the lens system is $\sim 2-3''$.

A pre-flash is needed as there are only faint objects in the field of view.

The observation is contained in a single visit.

Proposal 15324 - Visit 01 - Imaging the Lenses in the Quintuple Gravitational Lens PMN J0134-0931

Tue Jul 18 21:06:54 GMT 2017

Visit	Proposal 15324, Visit 01, implementation Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS Special Requirements: (none)									
	Patterns	#	Primary Pattern			Secondary Pattern			Exposures	
		(1)	Pattern Type=WFC3-UVIS-MOS-DITH-LINE Purpose=MOSAIC Number Of Points=3 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)			
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections		Fluxes	Miscellaneous			
	(1)	QSO-B0132-097	RA: 01 34 35.6608 (23.6485867d) Dec: -09 31 2.94 (-9.51748d) Equinox: J2000			V=22.7	Reference Frame: SIMBAD			
	<i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.</i>									
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(1) QSO-B0132-097	WFC3/UVIS, ACCUM, UVIS2-C1K1C-CTE	F275W	FLASH=10		Pattern 1, Exps 1-1 in Visit 01 (1)	500 Secs (8410 Secs) [=>1365.0 Secs (Pattern 1,1)] [=>1365.0 Secs (Pattern 1,2)] [=>1420.0 Secs (Pattern 2,1)] [=>1420.0 Secs (Pattern 2,2)] [=>1420.0 Secs (Pattern 3,1)] [=>1420.0 Secs (Pattern 3,2)]	[1] [2] [3]



