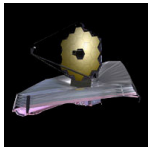

3621 - Confirming a Giant Planet Around the White Dwarf GD 140

Cycle: 2, Proposal Category: GO

INVESTIGATORS

Name	*Institution*
Mr. Alexander Venner (PI)	**University of Southern Queensland**
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Dr. Simon Blouin (CoI) (CSA Member)	University of Victoria
Dr. Markus R. Janson (CoI) (ESA Member)	Stockholm University
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Dr. Kevin Stevenson (CoI)	The Johns Hopkins University Applied Physics Laboratory

OBSERVATIONS

Folder	*Observation*	*Label*	*Observing Template*	*Science Target*
Observation Folder				
	1		MIRI Imaging	(1) GD-140
	2		MIRI Imaging	(1) GD-140

ABSTRACT

White dwarfs represent the end state of evolution for the vast majority of stars in the galaxy. Planets are now known to be ubiquitous companions to stars, yet very little is known about their fate after their host stars after they become white dwarfs. We have discovered a candidate giant planet orbiting the nearby young white dwarf GD 140 based on evidence from astrometry and Spitzer photometry. We request 0.8 hours of MIRI imaging observations to detect and confirm this planet candidate. We will accomplish this by detecting a mid-infrared excess in GD 140's spectrum arising from planetary thermal emission. The planet is predicted to outshine the white dwarf beyond 12 micrometres, allowing us to confirm the planet with overwhelming confidence and precisely measure its temperature and mass. Additionally, we will be able to fully resolve the planet if it lies more than approximately 0.8 arcseconds (>12 AU) from the white dwarf. The confirmation of this planet would represent a significant addition to the small

number of known planets around white dwarfs, and would offer immense opportunities for further study such as characterising its orbit and atmosphere.

OBSERVING DESCRIPTION

We request time to conduct MIRI broadband imaging in the F560W, F770W, F1000W, F1280W, F1500W, F1800W and F2100W filters. We will observe for 4 mins in F560W-F1500W, 6 mins in F1800W, and 24 mins in F2100W. We have adjusted our exposure times such that we are at <70% saturation in the four bluest bands and <35% in the three reddest bands, designed as such to ensure that the planet (which will dominate the flux contribution at long wavelengths) does not saturate the detector. We will use the cycling 4-point dither pattern with to remove bad pixels and background. We will acquire on the target star. There are no scientific requirements for when the observations must take place. No parallel observations are planned.

Proposal 3621 - Targets - Confirming a Giant Planet Around the White Dwarf GD 140

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(1)	GD-140	RA: 11 37 4.9283 (174.2705346d) Dec: +29 47 58.09 (29.79947d) Equinox: J2000	Proper Motion RA: -0.011348167712132312 sec of time/yr Proper Motion Dec: -0.012532999994618876 arcsec/yr Parallax: 0.0637329" Epoch of Position: 2015.5	

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Category=Star
Description=[White dwarfs]
Extended=NO

Observation

Proposal 3621, Observation 1

Tue May 21 23:00:29 GMT 2024

Diagnostic Status: Warning

Observing Template: MIRI 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)	GD-140	RA: 11 37 4.9283 (174.2705346d) Dec: +29 47 58.09 (29.79947d) Equinox: J2000	Proper Motion RA: -0.011348167712132312 sec of time/yr Proper Motion Dec: -0.012532999994618876 arcsec/yr Parallax: 0.0637329" Epoch of Position: 2015.5	

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Category=Star
Description=[White dwarfs]
Extended=NO

Template

Subarray
FULL

Dithers

#	Dither Type	Starting Point	Number of Points	Points	Starting Set	Number of Sets	Optimized For	Direction	Pattern Size
1	CYCLING	1	4						DEFAULT

Spectral Elements

#	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Dither	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	F560W	FASTR1	10	2	1	Dither 1	4	8	233.103	
2	F770W	FASTR1	10	2	1	Dither 1	4	8	233.103	
3	F1000W	FASTR1	10	2	1	Dither 1	4	8	233.103	
4	F1280W	FASTR1	10	2	1	Dither 1	4	8	233.103	
5	F1500W	FASTR1	10	2	1	Dither 1	4	8	233.103	
6	F1800W	FASTR1	10	3	1	Dither 1	4	12	355.205	
7	F2100W	FASTR1	10	12	1	Dither 1	4	48	1454.121	

Observation

Proposal 3621, Observation 2

Tue May 21 23:00:29 GMT 2024

Diagnostic Status: Warning

Observing Template: MIRI Imaging

Diagnostics

(Visit 2:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(1)	GD-140	RA: 11 37 4.9283 (174.2705346d) Dec: +29 47 58.09 (29.79947d) Equinox: J2000	Proper Motion RA: -0.011348167712132312 sec of time/yr Proper Motion Dec: -0.012532999994618876 arcsec/yr Parallax: 0.0637329" Epoch of Position: 2015.5	

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Category=Star
Description=[White dwarfs]
Extended=NO

Template

Subarray
FULL

Dithers

#	Dither Type	Starting Point	Number of Points	Points	Starting Set	Number of Sets	Optimized For	Direction	Pattern Size
1	CYCLING	1	4						DEFAULT

Spectral Elements

#	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Dither	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	F560W	FASTR1	10	2	1	Dither 1	4	8	233.103	
2	F770W	FASTR1	10	2	1	Dither 1	4	8	233.103	
3	F1000W	FASTR1	10	2	1	Dither 1	4	8	233.103	
4	F1280W	FASTR1	10	2	1	Dither 1	4	8	233.103	
5	F1500W	FASTR1	10	2	1	Dither 1	4	8	233.103	
6	F1800W	FASTR1	10	3	1	Dither 1	4	12	355.205	
7	F2100W	FASTR1	10	12	1	Dither 1	4	48	1454.121	