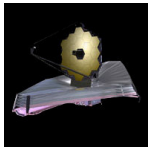

2574 - JWST observations of Lucy mission targets

Cycle: 1, Proposal Category: GO

INVESTIGATORS

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OBSERVATIONS

Folder	*Observation*	*Label*	*Observing Template*	*Science Target*
NIRSPEC observations				
	1	Patroclus NIRSPEC	NIRSpec IFU Spectroscopy	(1) PATROCLUS
	2	Eurybates NIRSPEC	NIRSpec IFU Spectroscopy	(2) EURYBATES
	5	Polymele NIRSPEC	NIRSpec IFU Spectroscopy	(3) POLYMELE
	3	Orus NIRSPEC	NIRSpec IFU Spectroscopy	(4) ORUS
	4	Leucus NIRSPEC	NIRSpec IFU Spectroscopy	(5) LEUCUS
MIRI observsations				
	6	Patroclus MIRI	MIRI Medium Resolution Spectroscopy	(1) PATROCLUS
	7	Eurybates MIRI	MIRI Medium Resolution Spectroscopy	(2) EURYBATES

Folder	*Observation*	*Label*	*Observing Template*	*Science Target*
	8	Polymele MIRI	MIRI Medium Resolution Spectroscopy	(3) POLYMELE
	9	Orus MIRI	MIRI Medium Resolution Spectroscopy	(4) ORUS
	10	Leucus MIRI	MIRI Medium Resolution Spectroscopy	(5) LEUCUS

ABSTRACT

The Lucy spacecraft – to be launched at approximately the same time as JWST – will perform the first ever in situ exploration of the Jupiter Trojan asteroids. Trojans are the largest population of solar system bodies currently unvisited by spacecraft, and revealing their composition and formation history is the key to untangling disparate hypothesis for the early dynamical evolution of the entire solar system.

Understanding these enigmatic bodies requires not just the high spatial resolution imagery and spectroscopy that will be afforded by Lucy, but also the superb near- and mid-infrared spectroscopy of which JWST is uniquely capable. The high signal-to-noise, high spectral resolution, and extended wavelength coverage beyond the capabilities of Lucy will allow JWST to sensitively probe the organic, carbonate, and silicate components of the surfaces of the Trojans. Meanwhile, the Lucy spectra and images will place these observations into their geological and historical context, greatly extending the scientific utility of both the JWST observations and the Lucy visit. Together these observations will paint a rich picture of this population, allowing us to trace connections with other bodies studied remotely and in situ across the solar system.

OBSERVING DESCRIPTION

This proposal observes the 5 Jupiter Trojan asteroids which are targets of the Lucy Discovery mission using NIRSpec medium resolution grisms and MIRI medium resolution spectroscopy.

All NIRSPEC observations use the IFU to avoid acquisition overheads and each target is observed in the G235M and G395M grism.

The MIRI observations cover the full wavelength range using the MRS mode.

Solar System Targets

#	Name	Level 1	Level 2	Level 3
(1)	PATROCLUS	TYPE=ASTEROID,A=5.215517641812021,E=0.1385502505848889,I=22.04899474618036,O=44.35071270314538,W=307.9185919333477,M=212.0791052840003,EQUINOX=J2000,EPOCH=05-AUG-2019:00:00:00,EpochTimeScale=TDB		
Comments: Extended=NO				
(2)	EURYBATES	TYPE=ASTEROID,A=5.194825660909952,E=0.08892019463262771,I=8.05897310596958,O=43.53959194136358,W=27.42986950746389,M=279.393486820639,EQUINOX=J2000,EPOCH=05-AUG-2019:00:00:00,EpochTimeScale=TDB		
Comments: Extended=NO				
(3)	POLYMELE	TYPE=ASTEROID,A=5.168430829356419,E=0.09482321984419208,I=12.98961897481968,O=50.31762273700706,W=4.401542022614581,M=295.7073098559924,EQUINOX=J2000,EPOCH=05-AUG-2019:00:00:00,EpochTimeScale=TDB		
Comments: Extended=NO				
(4)	ORUS	TYPE=ASTEROID,A=5.124810282153678,E=0.03658970317187408,I=8.468403159996859,O=258.5587161952973,W=179.5712616902102,M=255.0205285275914,EQUINOX=J2000,EPOCH=04-NOV-2019:00:00:00,EpochTimeScale=TDB		
Comments: Extended=NO				
(5)	LEUCUS	TYPE=ASTEROID,A=5.289931541558216,E=0.06389741304353526,I=11.55528629570898,O=251.0747110759296,W=160.4023205400799,M=299.103797324611,EQUINOX=J2000,EPOCH=05-AUG-2019:00:00:00,EpochTimeScale=TDB		
Comments: Extended=NO				

Observation

Proposal 2574, Observation 1: Patroclus NIRSPEC

Tue Apr 18 21:01:31 GMT 2023

Diagnostic Status: Warning

Observing Template: NIRSpec IFU Spectroscopy

Diagnostics

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

Solar System Targets

#	Name	Level 1	Level 2	Level 3
(1)	PATROCLUS	TYPE=ASTEROID,A=5.215517641812021,E=0.1385502505848889,I=22.04899474618036,O=44.35071270314538,W=307.9185919333477,M=212.0791052840003,EQUINOX=J2000,EPOCH=05-AUG-2019:00:00:00,EpochTimeScale=TDB		

Comments: Extended=NO

Template

TA Method
NONE

Dithers

#	Dither Type	Size	Starting Point	Number of Points	Points
1	CYCLING	SMALL	1	2	

Spectral Elements

#	Grating/Filter	Readout Pattern	Groups/Int	Integrations/Exp	Leakcal	Dither	Autocal	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	G395M/F290LP	NRSIRS2RAPID	11	1	false	true	NONE	2	2	350.133	
2	G235M/F170LP	NRSIRS2RAPID	4	1	false	true	NONE	2	2	145.889	

Special Requirements

DEFAULT WINDOW: ANGULAR RATE PATROCLUS FROM JWST LESS THAN 0.03

Observation

Proposal 2574, Observation 2: Eurybates NIRSPEC Tue Apr 18 21:01:31 GMT 2023

Diagnostic Status: Warning

Observing Template: NIRSpec IFU Spectroscopy

Diagnostics

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

Solar System Targets

#	Name	Level 1	Level 2	Level 3
(2)	EURYBATES	TYPE=ASTEROID,A=5.194825660909952,E=0.0889 2019463262771,I=8.05897310596958,O=43.53959194 136358,W=27.42986950746389,M=279.39348682063 9,EQUINOX=J2000,EPOCH=05-AUG- 2019:00:00:00,EpochTimeScale=TDB		

Comments: Extended=NO

Template

TA Method
NONE

Dithers

#	Dither Type	Size	Starting Point	Number of Points	Points
1	CYCLING	SMALL	1	2	

Spectral Elements

#	Grating/Filter	Readout Pattern	Groups/Int	Integrations/Exp	Leakcal	Dither	Autocal	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	G395M/F290LP	NRSIRS2RAPID	45	1	false	true	NONE	2	2	1342.178	
2	G235M/F170LP	NRSIRS2RAPID	13	1	false	true	NONE	2	2	408.489	

Special Requirements

DEFAULT WINDOW: ANGULAR RATE EURYBATES FROM JWST LESS THAN 0.03

Observation

Proposal 2574, Observation 5: Polymele NIRSPEC Tue Apr 18 21:01:31 GMT 2023

Diagnostic Status: Warning

Observing Template: NIRSpec IFU Spectroscopy

Diagnostics

(Visit 5:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Solar System Targets

#	Name	Level 1	Level 2	Level 3
(3)	POLYMELE	TYPE=ASTEROID,A=5.168430829356419,E=0.0948232198441920 8,I=12.98961897481968,O=50.3176227370070 6,W=4.401542022614581,M=295.7073098559924,EQUINOX=J2000,EPOCH=05-AUG-2019:00:00:00,EpochTimeScale=TDB		

Comments: Extended=NO

Template

TA Method
NONE

Dithers

#	Dither Type	Size	Starting Point	Number of Points	Points
1	CYCLING	SMALL	1	2	

Spectral Elements

#	Grating/Filter	Readout Pattern	Groups/Int	Integrations/Exp	Leakcal	Dither	Autocal	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	G395M/F290LP	NRSIRS2RAPID	56	2	false	true	NONE	2	4	3326.267	
2	G235M/F170LP	NRSIRS2RAPID	71	1	false	true	NONE	2	2	2100.8	

Special Requirements

DEFAULT WINDOW: ANGULAR RATE POLYMELE FROM JWST LESS THAN 0.03

Observation

Proposal 2574, Observation 3: Orus NIRSPEC

Tue Apr 18 21:01:31 GMT 2023

Diagnostic Status: Warning

Observing Template: NIRSpec IFU Spectroscopy

Diagnostics

(Visit 3:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Solar System Targets

#	Name	Level 1	Level 2	Level 3
(4)	ORUS	TYPE=ASTEROID,A=5.124810282153678,E=0.0365 8970317187408,I=8.468403159996859,O=258.558716 1952973,W=179.5712616902102,M=255.0205285275 914,EQUINOX=J2000,EPOCH=04-NOV-2019:00:00:00,EpochTimeScale=TDB		

Comments: Extended=NO

Template

TA Method
NONE

Dithers

#	Dither Type	Size	Starting Point	Number of Points	Points
1	CYCLING	SMALL	1	2	

Spectral Elements

#	Grating/Filter	Readout Pattern	Groups/Int	Integrations/Exp	Leakcal	Dither	Autocal	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	G395M/F290LP	NRSIRS2RAPID	39	1	false	true	NONE	2	2	1167.111	
2	G235M/F170LP	NRSIRS2RAPID	12	1	false	true	NONE	2	2	379.311	

Special Requirements

DEFAULT WINDOW: ANGULAR RATE ORUS FROM JWST LESS THAN 0.03

Observation

Proposal 2574, Observation 4: Leucus NIRSPEC

Tue Apr 18 21:01:31 GMT 2023

Diagnostic Status: Warning

Observing Template: NIRSpec IFU Spectroscopy

Diagnostics

(Visit 4:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Solar System Targets

#	Name	Level 1	Level 2	Level 3
(5)	LEUCUS	TYPE=ASTEROID,A=5.289931541558216,E=0.0638 9741304353526,I=11.55528629570898,O=251.074711 0759296,W=160.4023205400799,M=299.1037973246 11,EQUINOX=J2000,EPOCH=05-AUG-2019:00:00:00,EpochTimeScale=TDB		

Comments: Extended=NO

Template

TA Method
NONE

Dithers

#	Dither Type	Size	Starting Point	Number of Points	Points
1	CYCLING	SMALL	1	2	

Spectral Elements

#	Grating/Filter	Readout Pattern	Groups/Int	Integrations/Exp	Leakcal	Dither	Autocal	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	G395M/F290LP	NRSIRS2RAPID	98	1	false	true	NONE	2	2	2888.6	
2	G235M/F170LP	NRSIRS2RAPID	23	1	false	true	NONE	2	2	700.267	

Special Requirements

DEFAULT WINDOW: ANGULAR RATE LEUCUS FROM JWST LESS THAN 0.03

Observation

Proposal 2574, Observation 6: Patroclus MIRI Tue Apr 18 21:01:31 GMT 2023

Diagnostic Status: Warning

Observing Template: MIRI Medium Resolution Spectroscopy

Diagnostics

(Visit 6:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Solar System Targets

#	Name	Level 1	Level 2	Level 3
(1)	PATROCLUS	TYPE=ASTEROID,A=5.215517641812021,E=0.1385502505848889,I=22.04899474618036,O=44.35071270314538,W=307.9185919333477,M=212.0791052840003,EQUINOX=J2000,EPOCH=05-AUG-2019:00:00:00,EpochTimeScale=TDB		

Comments: Extended=NO

Acquisition

#	Target
1	NONE

Template

AcqFilter	Primary Channel	Simultaneous Imaging	Imager Subarray
	ALL	NO	FULL

Dithers

#	Dither Type	Optimized For	Direction
1	4-Point	POINT SOURCE	NEGATIVE

Spectral Elements

#	Wavelength Range	Detector	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Dither	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	LONG(C)	MRSLONG		FASTR1	7	2	1	Dither 1	4	8	166.502	
1	LONG(C)	MRSSHORT		FASTR1	7	2	1	Dither 1	4	8	166.502	
2	MEDIUM(B)	MRSLONG		FASTR1	9	2	1	Dither 1	4	8	210.903	
2	MEDIUM(B)	MRSSHORT		FASTR1	9	2	1	Dither 1	4	8	210.903	
3	SHORT(A)	MRSLONG		FASTR1	10	2	1	Dither 1	4	8	233.103	
3	SHORT(A)	MRSSHORT		FASTR1	10	2	1	Dither 1	4	8	233.103	

Special Requirements	DEFAULT WINDOW: ANGULAR RATE PATROCLUS FROM JWST LESS THAN 0.03

Observation

Proposal 2574, Observation 7: Eurybates MIRI Tue Apr 18 21:01:31 GMT 2023

Diagnostic Status: Warning

Observing Template: MIRI Medium Resolution Spectroscopy

Diagnostics

(Visit 7:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Solar System Targets

#	Name	Level 1	Level 2	Level 3
(2)	EURYBATES	TYPE=ASTEROID,A=5.194825660909952,E=0.0889 2019463262771,I=8.05897310596958,O=43.53959194 136358,W=27.42986950746389,M=279.39348682063 9,EQUINOX=J2000,EPOCH=05-AUG- 2019:00:00:00,EpochTimeScale=TDB		

Comments: Extended=NO

Acquisition

#	Target
1	NONE

Template

AcqFilter	Primary Channel	Simultaneous Imaging	Imager Subarray
	ALL	NO	FULL

Dithers

#	Dither Type	Optimized For	Direction
1	4-Point	POINT SOURCE	NEGATIVE

Spectral Elements

#	Wavelength Range	Detector	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Dither	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	LONG(C)	MRSLONG		FASTR1	18	2	1	Dither 1	4	8	410.706	62218.6
1	LONG(C)	MRSSHORT		FASTR1	18	2	1	Dither 1	4	8	410.706	62218.5
2	MEDIUM(B)	MRSLONG		FASTR1	30	2	1	Dither 1	4	8	677.11	62218.3
2	MEDIUM(B)	MRSSHORT		FASTR1	30	2	1	Dither 1	4	8	677.11	62218.4
3	SHORT(A)	MRSLONG		FASTR1	50	2	1	Dither 1	4	8	1121.116	62218.2
3	SHORT(A)	MRSSHORT		FASTR1	50	2	1	Dither 1	4	8	1121.116	62218.1

Special Requirements	DEFAULT WINDOW: ANGULAR RATE EURYBATES FROM JWST LESS THAN 0.03

Observation

Proposal 2574, Observation 8: Polymele MIRI

Tue Apr 18 21:01:31 GMT 2023

Diagnostic Status: Warning

Observing Template: MIRI Medium Resolution Spectroscopy

Diagnostics

(Visit 8:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Solar System Targets

#	Name	Level 1	Level 2	Level 3
(3)	POLYMELE	TYPE=ASTEROID,A=5.168430829356419,E=0.0948232198441920 8,I=12.98961897481968,O=50.3176227370070 6,W=4.401542022614581,M=295.7073098559924,EQUINOX=J2000,EPOCH=05-AUG-2019:00:00:00,EpochTimeScale=TDB		

Comments: Extended=NO

Acquisition

#	Target
1	NONE

Template

AcqFilter	Primary Channel	Simultaneous Imaging	Imager Subarray
	ALL	NO	FULL

Dithers

#	Dither Type	Optimized For	Direction
1	4-Point	POINT SOURCE	NEGATIVE

Spectral Elements

#	Wavelength Range	Detector	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Dither	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	SHORT(A)	MRSLONG		SLOWR1	34	2	1	Dither 1	4	8	6593.618	62248.2
1	SHORT(A)	MRSSHORT		SLOWR1	34	2	1	Dither 1	4	8	6593.618	62248.1
2	MEDIUM(B)	MRSLONG		SLOWR1	39	2	1	Dither 1	4	8	7549.215	62248.4
2	MEDIUM(B)	MRSSHORT		SLOWR1	39	2	1	Dither 1	4	8	7549.215	62248.3
3	LONG(C)	MRSLONG		SLOWR1	31	1	1	Dither 1	4	4	2962.35	62248.6
3	LONG(C)	MRSSHORT		SLOWR1	31	1	1	Dither 1	4	4	2962.35	62248.5

Special Requirements	DEFAULT WINDOW: ANGULAR RATE POLYMELE FROM JWST LESS THAN 0.03

Observation

Proposal 2574, Observation 9: Orus MIRI Tue Apr 18 21:01:31 GMT 2023

Diagnostic Status: Warning

Observing Template: MIRI Medium Resolution Spectroscopy

Diagnostics

(Visit 9:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Solar System Targets

#	Name	Level 1	Level 2	Level 3
(4)	ORUS	TYPE=ASTEROID,A=5.124810282153678,E=0.0365897031718740 8,I=8.468403159996859,O=258.5587161952973,W=179.5712616902102,M=255.0205285275914,EQUINOX=J2000,EPOCH=04-NOV-2019:00:00:00,EpochTimeScale=TDB		

Comments: Extended=NO

Acquisition

#	Target
1	NONE

Template

AcqFilter	Primary Channel	Simultaneous Imaging	Imager Subarray
	ALL	NO	FULL

Dithers

#	Dither Type	Optimized For	Direction
1	4-Point	POINT SOURCE	NEGATIVE

Spectral Elements

#	Wavelength Range	Detector	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Dither	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	LONG(C)	MRSLONG		FASTR1	30	2	1	Dither 1	4	8	677.11	62244.6
1	LONG(C)	MRSSHORT		FASTR1	30	2	1	Dither 1	4	8	677.11	62244.5
2	MEDIUM(B)	MRSLONG		FASTR1	45	2	1	Dither 1	4	8	1010.115	62244.4
2	MEDIUM(B)	MRSSHORT		FASTR1	45	2	1	Dither 1	4	8	1010.115	62244.3
3	SHORT(A)	MRSLONG		FASTR1	90	2	1	Dither 1	4	8	2009.129	62244.2
3	SHORT(A)	MRSSHORT		FASTR1	90	2	1	Dither 1	4	8	2009.129	62244.1

Special Requirements	DEFAULT WINDOW: ANGULAR RATE ORUS FROM JWST LESS THAN 0.03

Observation

Proposal 2574, Observation 10: Leucus MIRI Tue Apr 18 21:01:31 GMT 2023

Diagnostic Status: Warning

Observing Template: MIRI Medium Resolution Spectroscopy

Diagnostics

(Visit 10:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Solar System Targets

#	Name	Level 1	Level 2	Level 3
(5)	LEUCUS	TYPE=ASTEROID,A=5.289931541558216,E=0.0638 9741304353526,I=11.55528629570898,O=251.074711 0759296,W=160.4023205400799,M=299.1037973246 11,EQUINOX=J2000,EPOCH=05-AUG- 2019:00:00:00,EpochTimeScale=TDB		

Comments: Extended=NO

Acquisition

#	Target
1	NONE

Template

AcqFilter	Primary Channel	Simultaneous Imaging	Imager Subarray
	ALL	NO	FULL

Dithers

#	Dither Type	Optimized For	Direction
1	4-Point	POINT SOURCE	NEGATIVE

Spectral Elements

#	Wavelength Range	Detector	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Dither	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	LONG(C)	MRSLONG		FASTR1	60	2	1	Dither 1	4	8	1343.119	62237.6
1	LONG(C)	MRSSHORT		FASTR1	60	2	1	Dither 1	4	8	1343.119	62237.5
2	MEDIUM(B)	MRSLONG		FASTR1	80	2	1	Dither 1	4	8	1787.126	62237.4
2	MEDIUM(B)	MRSSHORT		FASTR1	80	2	1	Dither 1	4	8	1787.126	62237.3
3	SHORT(A)	MRSLONG		FASTR1	170	2	1	Dither 1	4	8	3785.155	62237.2
3	SHORT(A)	MRSSHORT		FASTR1	170	2	1	Dither 1	4	8	3785.155	62237.1

Special Requirements	DEFAULT WINDOW: ANGULAR RATE LEUCUS FROM JWST LESS THAN 0.03