

# 1272 - Kuiper Belt Science with JWST

Cycle: 1, Proposal Category: GTO

# **INVESTIGATORS**

Name	Institution
Dr. Dean C. Hines (PI)	Space Telescope Science Institute
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Dr. Michael Migo Mueller (CoI) (ESA Member)	University of Groningen

# **OBSERVATIONS**

Folder	Observation	Label	Observing Template	Science Target
TRITO	N			
	1	MIRI MRS	MIRI Medium Resolution Spectroscopy	(1) TRITON
	9	MIRI MRS	MIRI Medium Resolution Spectroscopy	(1) TRITON
	2	MIRI IMAGING	MIRI Imaging	(1) TRITON
	12	MIRI IMAGING BCK G	MIRI Imaging	(5) TRITON-BCKG
	10	MIRI IMAGING	MIRI Imaging	(1) TRITON
	13	MIRI IMAGING BCK G	MIRI Imaging	(5) TRITON-BCKG
	3	NIRSPEC IFU	NIRSpec IFU Spectroscopy	(1) TRITON
	11	NIRSPEC IFU	NIRSpec IFU Spectroscopy	(1) TRITON
2013 X	Z8	1		
	4	MIRI MRS	MIRI Medium Resolution Spectroscopy	(2) 2013XZ8
	5	NIRSPEC IFU	NIRSpec IFU Spectroscopy	(2) 2013XZ8
CHARI	KLO	1		
	6	NIRSPEC IFU	NIRSpec IFU Spectroscopy	(3) CHARIKLO
	106	NIRSPEC IFU	NIRSpec IFU Spectroscopy	(3) CHARIKLO

JWST Proposal 1272 (Created: Monday, February 27, 2023 at 12:01:22 PM Eastern Standard Time) - Overview

Folder Observation	Label	Observing Template	Science Target
SEDNA			
8	NIRSPEC IFU	NIRSpec IFU Spectroscopy	(4) SEDNA

### **ABSTRACT**

Observation IDs: HINES\_1000, HINES\_1001, HINES\_2000, HINES\_2001, HINES\_3000, HINES\_3001, HINES\_4000, HINES\_5000, HINES\_6000, HINES\_7000, HINES\_8000, HINES\_9000, HINES\_10000, WRIGHT\_2001

We plan to exploit JWST's exquisite sensitivity in the 1-5 micron region to study the largest trans-Neptunian Objects and Kuiper Belt objects via reflectance spectroscopy. The composition of even the largest of these bodies is poorly constrained. We propose to use NIRSpec's IFU to obtain the first high-SNR, R > 100 spectra for a sample of these objects. MIRI spectra will also be obtained on some targets. These data can be expected to reveal the presence of previously unseen molecular ices, constrain their physical state (crystalline phase, solution with other species, temperature, grain-size), identify new organic species, and constrain isotopic ratios for some elements (H, O, C, N). MIRI MRS and Imaging data will also be used to study temperature variations on several targets, and will be interpreted in the context of existing Herschel and/or Spitzer thermal data. The targets represent a large fraction of the diversity of the Kuiper Belt in terms of collisional history (Pluto and Haumea underwent catastrophic impacts), effects of planetary migration (resonant, classical, Centaur and scattered objects), multiplicity (several host at least one moon), albedo, and major species composition (H2O, CH4, N2, NH3, CO). These objects represent the end-state of accretion and subsequent processing in the Kuiper Belt. This initial reconnaissance of their surface compositions will inform our understanding of the long history of processes in the outermost regions of the Sun's proto-planetary disk.

### **OBSERVING DESCRIPTION**

TRITON: Observations are planned for 2 different hemispheres on Triton, the largest moon of Neptune, with one centered on peak absorption from volatile ices (340-20 degrees) and one on the opposite hemisphere where absorption from volatiles is at a minimum (160-180 degrees). Observations 1, 2, and 3 were grouped to observe the volatile-rich hemisphere of Triton and observations 9, 10, and 11 were grouped to observe the volatile-poor hemisphere of Triton. Triton's rotation period is ~5.9 days. These central longitude constraints place a time window for the observations to occur less than 24 hours, but greater than 1 hour, so will not receive a 1-hour overhead in a future version of APT. NIRSpec IFU observations are at the highest resolution due to the brightness of Triton; a high SNR can be achieved throughout the wavelength range even at high resolution. The NRSIRS2RAPID readout mode was chosed to further increase the SNR in a shorter amount of time. The imaging filters chosen are the longest wavelength filters available on MIRI because the flux is the highest at these longest wavelengths (due to Triton's thermal peak at even longer wavelengths). 5 groups (the minimum recommended) are specified for the MIRI imaging observations because a high SNR can be achieved in only a

JWST Proposal 1272 (Created: Monday, February 27, 2023 at 12:01:22 PM Eastern Standard Time) - Overview short period of time. The full MRS range (all 3 grating settings) will be used to obtain observations from 5.6 to 28 microns. The FAST readout mode

was selected due to Triton's brightness. Simultaneous imaging of the field near Triton during the MRS observations are planned with the F1280W filter. TA for the Triton MRS observations are not required but must be specified in APT 25.4.0.1 since there is currently no option for "No TA." TA will be removed in a future version of APT.

ECHECLUS: Medium resolution and PRISM observations will be made of the Centaur Echeclus with the NIRSpec IFU to obtain a decent SNR. The NRSIRS2RAPID readout mode was chosen to increase the SNR of these observations. The FAST readout mode was selected due to Echeclus's brightness. Simultaneous imaging of the field near Echeclus during the MRS observations are planned with the F1280W filter. TA for the Echeclus MRS observations are not required but must be specified in APT 25.4.0.1 since there is currently no option for "No TA." TA will be removed in a future version of APT.

BIENOR: PRISM observations will be made of the grey Centaur Bienor with the NIRSpec IFU to obtain a decent SNR. The NRSIRS2RAPID readout mode was chosen to increase the SNR of these observations.

SEDNA: Medium resolution and PRISM observations will be made of the KBO Sedna with the NIRSpec IFU to obtain a decent SNR. The NRSIRS2RAPID readout mode was chosen to increase the SNR of these observations. Due to the relative faintness of Sedna, observations at the longest near-infrared wavelengths, where flux from the object is lowest, will be made with the low-resolution PRISM mode instead of the medium resolution grating. PRISM also covers the full wavelength range and will contribute to a higher SNR at the shorter wavelengths.

Proposal 1272 - Targets - Kuiper Belt Science with JWST

	#	Name	Level 1	Level 2	Level 3
	(1)	TRITON	STD=NEPTUNE	STD=TRITON	
	Comments:	Extended=NO			
argets	(2)	2013XZ8	TYPE=ASTEROID,A=13.48208814347893,E=0.3749 557191831147,I=22.5294787346963 ,O=266.6779574293917,W=288.1682043722156,M=3 34.4891311063574,EQUINOX=J2000,EPOCH=26-OCT-2017:00:00:00,EpochTimeScale=TDB		
Į	Comments:	Extended=NO			
System Ta	(3)	CHARIKLO	TYPE=ASTEROID,A=15.74776694990585,E=0.1713 543678296343,I=23.41162716731226 ,O=300.3797700739185,W=241.5029631295137,M=5 8.44575455857901,EQUINOX=J2000,EPOCH=29-JAN-2014:00:00:00,EpochTimeScale=TDB		
100	Comments:	Extended=NO			
Solar	(4)	SEDNA	TYPE=ASTEROID,A=500.5169750897563,E=0.8480 834646428406,I=11.92871162913267 ,O=144.5263866414448,W=311.5200318768571,M=3 58.0681026495191,EQUINOX=J2000,EPOCH=08-JUL-2016:00:00:00,EpochTimeScale=TDB		
	Comments:	Extended=NO			
	(5)	TRITON-BCKG	STD=NEPTUNE	STD=TRITON	TYPE=POS_ANGLE,RAD=300,ANG=0,REF=NORT H
I	Comments:	Extended=NO			

<u>Pro</u>	posal 12.	<u> 72 - Obser</u>	<u>/atıon 1 - I</u>	Kuiper Be	elt Science	with JWS							
٦	Proposal 1272	2, Observation 1:	MIRI MRS									Mon Feb 27 17	7:01:22 GMT 2023
Iặ	Diagnostic Sta	atus: Warning											
Observation	Observing Ter	nplate: MIRI Med	lium Resolution	Spectroscopy									
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S	(MIRI MRS (	Obs 1)) Warning (	Form): Imager F	ilter overlap.									
Į₩	(MIRI MRS (	Obs 1)) Warning (											
۱ë	(MIRI MRS (	Obs 1)) Warning (	Form): Imager F	ilter overlap.									
ag	(Visit 1:1) Wa	rning (Form): Ov	erheads are provi	isional until the	Visit Planner ha	is been run.							
Diagnostics													
ts	#	Name	I	Level 1			Level 2			Leve	13		
ge	(1)	TRITON	S	STD=NEPTUN	E		STD=TRIT	ON					
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Acquisition													
_	AcqFilter			Primary	Channel		Simult	aneous Imaging		Im	ager Subarray		
<u>a</u>	F1500W			ALL			YES			•	ULL .		
Template													
rs.	#			Dither T	ype		Optim	ized For		Di	rection		
he	1			4-Point			EXTE	NDED SOURCE		NE	EGATIVE		
Dithers													
	#	Wavelength	Detector	Filter	Readout	Groups/Int	Integrations/E	Exposures/Dit	Dither	Total Dithers	Total	Total	ETC
1		Range			Pattern	_	xp	h			Integrations	Exposure Time	Wkbk.Calc ID
Spectral Elements	1		IMAGER	F1280W	FASTR1	8	10	1	Dither 1	4	40	987.914	
Je l	1	LONG(C)	MRSLONG	1120011	FASTR1	90	1	1	Dither 1	4	4	999.014	
<u>le</u>	1	LONG(C)	MRSSHORT		FASTR1	90	1	1	Dither 1	4	4	999.014	
	2		IMAGER	F1280W	FASTR1	8	10	1	Dither 1	4	40	987.914	
tra	2	MEDIUM(B)	MRSLONG		FASTR1	90	1	1	Dither 1	4	4	999.014	
e S	2	MEDIUM(B)	MRSSHORT		FASTR1	90	1	1	Dither 1	4	4	999.014	
Sp	3	. ,	IMAGER	F1280W	FASTR1	8	10	1	Dither 1	4	40	987.914	
1	3	SHORT(A)	MRSLONG		FASTR1	90	1	1	Dither 1	4	4	999.014	
L	3	SHORT(A)	MRSSHORT		FASTR1	90	1	1	Dither 1	4	4	999.014	

Group Observations 1, 2, 3, 12, Non-interruptible
DEFAULT WINDOW: ANGULAR RATE TRITON FROM JWST LESS THAN 0.03
DEFAULT WINDOW: NOT OCCULTATION OF TRITON BY NEPTUNE FROM JWST

REPORT OF TRITON BY NEPTUNE FROM JWST

REPORT OF TRITON BY NEPTUNE FROM JWST

REPORT OF TRITON BY NEPTUNE FROM JWST

<u>Pro</u>	oposal 127	<u> 72 - Obser</u>	<u>vation 9 - I</u>	<u> Kuiper Be</u>	<u>It Science</u>	with JWST	_						
		, Observation 9										Mon Feb 27 17	:01:22 GMT 2023
ΙĘ	Diagnostic Sta	atus: Warning											
Observation	Observing Ten	nplate: MIRI Med	dium Resolution	Spectroscopy									
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۱å													
S	(MIRI MRS (C	Obs 9)) Warning (	Form): Imager F	ilter overlap.									
Ι÷		Obs 9)) Warning (	_	_									
۱ĕ	(MIRI MRS (Obs 9)) Warning (Form): Imager Filter overlap.												
Diagnostics	(Visit 9:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.												
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ge	(1)	TRITON	S	TD=NEPTUNI	E		STD=TRIT	ON					
ā	Comments: Ex	tended=NO											
System Targets													
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Solar													
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Acquisition	#						Target						
Siti	1						NONE						
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_	AcqFilter			Primary	Channel		Simult	aneous Imaging		Im	ager Subarray		
<u>a</u>	F1500W			ALL	<u> </u>		YES	gg			LL		
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Template													
ပ်	#			Dither T	ype		Optimi	ized For		Di	rection		
Dithers	1			4-Point			EXTEN	NDED SOURCE		NE	EGATIVE		
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	#	Wavelength	Detector	Filter	Readout	Groups/Int	Integrations/E	Exposures/Dit	Dither	Total Dithers	Total	Total	ETC
		Range			Pattern	-	xp	h			Integrations	Exposure Time	Wkbk.Calc ID
Spectral Elements	1		IMAGER	F1280W	FASTR1	8	10	1	Dither 1	4	40	987.914	
le l	1	LONG(C)	MRSLONG	- 1200	FASTR1	90	1	1	Dither 1	4	4	999.014	
e l	1	LONG(C)	MRSSHORT		FASTR1	90	1	1	Dither 1	4	4	999.014	
1 4	2	/ - /	IMAGER	F1280W	FASTR1	8	10	1	Dither 1	4	40	987.914	
t a	2	MEDIUM(B)	MRSLONG		FASTR1	90	1	1	Dither 1	4	4	999.014	
e C	2	MEDIUM(B)	MRSSHORT		FASTR1	90	1	1	Dither 1	4	4	999.014	
l S	3	. ,	IMAGER	F1280W	FASTR1	8	10	1	Dither 1	4	40	987.914	
	3	SHORT(A)	MRSLONG		FASTR1	90	1	1	Dither 1	4	4	999.014	
	3	SHORT(A)	MRSSHORT		FASTR1	90	1	1	Dither 1	4	4	999.014	

Group Observations 9, 10, 11, 13, Non-interruptible
DEFAULT WINDOW: ANGULAR RATE TRITON FROM JWST LESS THAN 0.03
DEFAULT WINDOW: NOT OCCULTATION OF TRITON BY NEPTUNE FROM JWST

IN THE PROPOSAL 1272 - Observation 9 - Kuiper Belt Science with JWST

Group Observations 9, 10, 11, 13, Non-interruptible

DEFAULT WINDOW: ANGULAR RATE TRITON FROM JWST LESS THAN 0.03
DEFAULT WINDOW: NOT OCCULTATION OF TRITON BY NEPTUNE FROM JWST

<u>Pro</u>	oposal 1272 - Observa	tion 2 - Kuipe	Belt Scier	nce with JWS1	Γ					
_									Mon Feb 27	17:01:22 GMT 2023
Iĕ	Diagnostic Status: Warning									
ĬŽ	Observing Template: MIRI Imagin	g								
Observation										
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Diagnostics		eads are provisional un	til the Visit Plann	ner has been run.						
ts	# Name	Level 1			Level 2			Level 3		
Targets	(1) TRITON	STD=NEI	TUNE		STD=TRITO	N				
⊒I	Comments: Extended=NO									
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Solar System										
<u>a</u>	FULL									
Template										
Dithers	# Dither Type	Starting Poin	t Number	of Points Points	Starting	g Set	Number of Sets O	ptimized For	Direction	Pattern Size
[ 달	1 2-Point									DEFAULT
△										
Spectral Elements	# Filter	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Dither	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
ΙĔ	1 F2100W	FASTR1	5	1	1	Dither 1	2	2	27.75	
I≗	2 F2550W	FASTR1	5	1	1	Dither 1	2	2	27.75	
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l e	Group Observations 1, 2, 3, 12, No	n-interruptible								
<u>i.</u>	DEFAULT WINDOW: ANGULA DEFAULT WINDOW: NOT OCC	R RATE TRITON FRO	OM JWST LESS	THAN 0.03						
ᅵᇴ	DEFAULT WINDOW: NOT OCC	ULTATION OF TRIT	ON BY NEPTUN	NE FROM JWST						
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Special Requiremen										
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Pro	posal 1272 - Observati	on 12 - Kuipe	r Belt Sci	ience with JWS	ST					
	Proposal 1272, Observation 12: MI								Mon Feb 27	17:01:22 GMT 2023
Observation	Diagnostic Status: Warning									
Įξ	Observing Template: MIRI Imaging									
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Diagnostics	(Visit 12:1) Warning (Form): Overhe	ads are provisional unt	il the Visit Pla	anner has been run.						
ts	# Name	Level 1			Level 2			Level 3		
] B	(5) TRITON-BCKG	STD=NEPT	UNE		STD=TRITO	N			S_ANGLE,RAD=300,A	ANG=0,REF=NORT
필								Н		
ľε	Comments: Extended=NO									
ste										
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Solar System Targets										
te	Subarray									
Template	FULL									
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Dithers	# Dither Type	Starting Point	Number	r of Points Points	Starting	g Set	Number of Sets	Optimized For	Direction	Pattern Size
<u>‡</u>	1 2-Point									DEFAULT
Spectral Elements	# Filter	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Dither	Total Dither	s Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
Įξ	1 F2550W	FASTR1	5	1	1	Dither 1	2	2	27.75	·
I =										
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	N. 5. 11.1									
ents	No Parallel Attachments									
Special Requiremer	Group Observations 1, 2, 3, 12, Non-	_								
I≝	DEFAULT WINDOW: NOT OCCU DEFAULT WINDOW: ANGULAR	LTATION OF TRITO RATE TRITON-RCK	N-BCKG BY	NEPTUNE FROM JWS	ST					
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Pro	oposal 1272 - Observa	ation 10 - Kuipe	er Belt Sci	ience with JWS	ST.					
	Proposal 1272, Observation 10:								Mon Feb 27	17:01:22 GMT 2023
월	Diagnostic Status: Warning									
≥	Observing Template: MIRI Imagi	ng								
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Observation										
Diagnostics	(Visit 10:1) Warning (Form): Ove	rheads are provisional u	ntil the Visit Pla	anner has been run.						
ß	# Name	Level 1			Level 2			Level 3		
Targets	(1) TRITON	STD=NEF	TUNE		STD=TRITC	N				
آڃ	Comments: Extended=NO									
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Solar System										
_	Subarray									
<u>a</u>	FULL									
Template	1022									
Dithers	# Dither Typ	e Starting Poin	t Number	r of Points Points	Starting	g Set	Number of Sets	Optimized For	Direction	Pattern Size
Ιŝ	1 2-Point									DEFAULT
₫										
Spectral Elements	# Filter	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Dither	Total Dither	rs Total	Total Exposure	ETC Wkbk.Calc ID
l e	1 F2100W	FASTR1	5	1	1	Dither 1	2	Integrations 2	27.75	
<u>e</u>	2 F2550W	FASTR1	5	1	1	Dither 1	2	2	27.75	
lΞ	2 F2330 W	FASIKI	3	1	1	Dittier 1	2	2	21.13	
tra										
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Sp.										
ts	No Parallel Attachments									
Special Requirement	Group Observations 9, 10, 11, 13,	Non-interruptible								
l ë	DEEVILLA MINDOM: VNCTIT		M IWST I ESS	S THAN 0.03						
ΙĒ	DEFAULT WINDOW: ANGULA DEFAULT WINDOW: NOT OCC	CULTATION OF TRIT	ON BY NEPTU	INE FROM JWST						
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Observation	Observing Template: MIRI Imaging								17:01:22 GMT 2023
Diagnostic	(Visit 13:1) Warning (Form): Overhea	ds are provisional until the Visit Plan	ner has been run.						
şţ	# Name	Level 1		Level 2			Level 3		
rg	(5) TRITON-BCKG	STD=NEPTUNE		STD=TRITC	N		TYPE=POS H	S_ANGLE,RAD=300,A	NG=0,REF=NORT
Ta	Comments: Extended=NO						**		
tem									
System Targets									
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Solar									
_	Subarray								
- T	FULL								
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ers	# Dither Type 1 2-Point	Starting Point Number of	of Points Points	Starting	Set	Number of Sets O	otimized For	-	Pattern Size DEFAULT
Dithers	1 Z-FUIII								DEFAULT
	# Filter	Readout Pattern Groups/Int	Integrations/Exp	Exposures/Dith	Dither	Total Dithers	Total	Total Exposure	ETC Wkbk.Calc
Jen	1 F2550W	EACTD1 5	1	1	Disk - :: 1	2	Integrations	Time	ID
er	1 F2550W	FASTR1 5	1	1	Dither 1	2	2	27.75	
tra									
Spectral Elements									
-									
<u> </u>	No Parallel Attachments								
m' Jue	Group Observations 9, 10, 11, 13, Non								
ire	DEFAULT WINDOW: NOT OCCUL DEFAULT WINDOW: ANGULAR R	TATION OF TRITON-BCKG BY N	EPTUNE FROM JWS	Т					
edi	DELAULI WINDOW, ANGULAR R	ALL INITON-DUNG PROM JWS1	LLSS THAN 0.03						
Special Requireme									
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ation	Dosal 1272 - Observa Proposal 1272, Observation 3: NI										
ervatic		RSPEC IFU								Mon Feb 27 17	:01:22 GMT 2023
<u>                                   </u>	Diagnostic Status: Warning										
41	Observing Template: NIRSpec IFU	Spectroscopy									
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<b>Diagnostics</b>	Visit 3:1) Warning (Form): Overh	eads are provision	al until the Visit	Planner has been rui	1.						
ŧ\$	# Name	Level	1			Level 2		]	Level 3		
ge	(1) TRITON	STD=	NEPTUNE			STD=TRITON					
<u>a</u> [	Comments: Extended=NO										
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Solar System Targets											
-	DA M. A. J										
at	<b>ΓΑ Method</b> NONE										
l d l'	NONE										
Template											
	<del></del>	Dither Type		Size		Starting Poi	int	Number of Poi	nts	Points	
<b>je</b>	1	CYCLING		SMALL		1		2		•	
Dithers											
Spectral Elements	# Grating/Filter	Readout Pattern	Groups/Int	Integrations/Ex	Leakcal	Dither	Autocal	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1 <b>e</b>	1 G140H/F100LP	NRSIRS2RAPI	10	1	false	true	NONE	2	2	320.956	
<u>     </u>		D									
	2 G235H/F170LP	NRSIRS2RAPI D	15	1	false	true	NONE	2	2	466.844	
t   3	G395H/F290LP	NRSIRS2RAPI	20	1	false	true	NONE	2	2	612.733	
be		D									
-											
	Group Observations 1, 2, 3, 12, No	n-interruptible									
] <u>a</u>	DEFAULT WINDOW: ANGULA	R RATE TRITON	FROM JWST L	ESS THAN 0.03							
I ≒ IL	DEFAULT WINDOW: NOT OCC CENTRAL MERIDIAN LONGITI	ULTATION OF I JDE OF TRITON	FROM JWST B	PTUNE FROM JWS ETWEEN 340 20	ST						
2 IC											
quire											
Require											
al Require											
Special Requiremer											
ts c	Group Observations 1, 2, 3, 12, No DEFAULT WINDOW: ANGULAI DEFAULT WINDOW: NOT OCC CENTRAL MERIDIAN LONGITU	n-interruptible R RATE TRITON ULTATION OF 1	RITON BY NEI	PTUNE FROM JWS	ST						

Pro	oposal 1272 -	Observa	tion 11 - Ku	uiper Belt	Science with	JWST						
_	Proposal 1272, Ob										Mon Feb 27 17	:01:22 GMT 2023
Observation	Diagnostic Status:											
S	Observing Template	_	J Spectroscopy									
Se l	<i>y</i>											
۱ä												
Diagnostics	(Visit 11:1) Warnin	g (Form): Over	heads are provision	nal until the Visi	it Planner has been r	un.						
_	# Nam	P	Level	1			Level 2		,	Level 3		
Jet	(1) TRIT			NEPTUNE			STD=TRITON			Level 3		
Targets	Comments: Extende		515-	TVEI TOTVE			SID-INITOIN					
15												
Solar System												
Š												
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볉	TA Method											
빌	NONE											
Template												
	#		Dither Type		Size		Starting Poi	nt .	Number of Poi	nte	Points	
ē	1		CYCLING		SMALL		1	III.	2	its	Tomus	
Dithers			CTCLING		SIVITEL		1		L			
	# 6	rating/Filter	Readout	Groups/Int	Integrations/Ex	Leakcal	Dither	Autocal	Total Dithers	Total	Total Exposure	ETC
Spectral Elements			Pattern		p					Integrations	Time	Wkbk.Calc ID
ΙĔ	1 G	140H/F100LP	NRSIRS2RAPI	10	1	false	true	NONE	2	2	320.956	
Iä		22511/E1701 D	D NRSIRS2RAPI	1.5	1	£-1	4	NONE	2	2	466.844	
ल		233H/F1/ULP	D	13	1	false	true	NONE	2	2	400.844	
5	3 G	395H/F290LP	NRSIRS2RAPI	20	1	false	true	NONE	2	2	612.733	
l g			D									
_		0 10 11 12 1	NT 1									
nts	Group Observations		_									
l e	DEFAULT WINDO	OW: ANGULA	R RATE TRITON	FROM JWST L	LESS THAN 0.03 PTUNE FROM JWS	er.						
<u>ē</u>	CENTRAL MERIC				BETWEEN 160 200	0.1						
Ϊ́Ξ												
å												
<u>=</u>												
<u>\S</u>												
Special Requiremen												
1 "	1											

Pro	posal 127	72 - Observ	vation 4 - I	Kuiper Be	lt Science	with JWST	-								
_		, Observation 4:										Mon Feb 27 1	7:01:22 GMT 2023		
I≅	Diagnostic Sta	tus: Warning													
Observation	Observing Ten	nplate: MIRI Med	lium Resolution	Spectroscopy											
Se															
١8															
-	(MIRI MRS (C	)bs 4)) Warning (	Form): Imager F	Filter overlan											
;;		MIRI MRS (Obs 4)) Warning (Form): Imager Filter overlap.  MIRI MRS (Obs 4)) Warning (Form): Imager Filter overlap.													
l s		(MIRI MRS (Obs 4)) Warning (Form): Imager Filter overlap.													
Ιğ		(Visit 4:1) Warning (Form): Data Excess over lower threshold													
Diagnostics		rning (Form): Ov			Visit Planner ha	s been run.									
-		Name		Level 1			Level 2			Leve	13				
System Targets	(2)	2013XZ8				8814347893,E=0.3	749								
ıق					=22.5294787346 1293917 W=288	6963 .1682043722156,N	<b>1</b> =3								
ľε			3	34.4891311063	574,EQUINOX=	J2000,EPOCH=26									
Ē	g		(	CT-2017:00:0	0:00,EpochTime	Scale=TDB									
ڇّا	Comments: Ex	tenaea=NO													
≒ّا															
Solar															
_	#						Т4								
Acquisition	1						Target NONE								
<u>.is</u>							NONE								
ᅵᇴ															
¥															
ţ	AcqFilter			Primary	Channel		Simult	aneous Imaging		Im	ager Subarray				
ᇛ	F1500W			ALL			YES			FU	ULL				
Template															
rs.	#			Dither T	ype		Optimi	ized For		Di	Pirection				
Dithers	1			2-Point			POINT SOURCE NEGATIVE								
ă															
	#	Wavelength	Detector	Filter	Readout	Groups/Int	Integrations/E	Exposures/Dit	Dither	<b>Total Dithers</b>		Total	ETC		
l		Range			Pattern		xp	h			Integrations	Exposure Time	Wkbk.Calc ID		
l ŧ	1		IMAGER	F1280W	FASTR1	12	25	1	Dither 1	2	50	1798.226			
Je I	1	LONG(C)	MRSLONG		FASTR1	55	6	1	Dither 1	2	12	1859.277			
<u>e</u>	1	LONG(C)	MRSSHORT		FASTR1	55	6	1	Dither 1	2	12	1859.277			
Spectral Elements	2		IMAGER	F1280W	FASTR1	12	25	1	Dither 1	2	50	1798.226			
tra	2	MEDIUM(B)	MRSLONG		FASTR1	55	6	1	Dither 1	2	12	1859.277			
ê	2	MEDIUM(B)	MRSSHORT		FASTR1	55	6	1	Dither 1	2	12	1859.277			
၂	3	. ,	IMAGER	F1280W	FASTR1	12	25	1	Dither 1	2	50	1798.226			
1	3	SHORT(A)	MRSLONG		FASTR1	55	6	1	Dither 1	2	12	1859.277			
1	3	SHORT(A)	MRSSHORT		FASTR1	55	6	1	Dither 1	2	12	1859.277			

<u>Pr</u>	oposal 1272 - Observation 4 - Kuiper Belt Science with JWST
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Special	

Pro	posal 1272	2 - Observa	tion 5 - Kui	per Belt S	cience with	JWST						
$\overline{}$		Observation 5: N									Mon Feb 27 17	:01:22 GMT 2023
Observation	Diagnostic Statu	ıs: Warning										
<u> </u>	Observing Temp	late: NIRSpec IFU	J Spectroscopy									
pse												
ō												
Diagnostics	(Visit 5:1) Warni	ing (Form): Overh	eads are provision	al until the Visit	Planner has been rui	n.						
)ts		ame	Level				Level 2			Level 3		
Solar System Targets	(2) 20	)13XZ8	55719	91831147,I=22.5	X=13.4820881434789 5294787346963							
≝			.O=20	56.67795742939	17,W=288.1682043° QUINOX=J2000,EP	722156,M=3 OCH=26-						
le l			OCT-	2017:00:00:00,E	EpochTimeScale=TD	)B						
yst	Comments: Exter	nded=NO										
S												
၂ဗ္ဗ												
-	TA Method											
Template	NONE											
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-												
) srs	#		Dither Type		Size		Starting Po	int	Number of Poi	nts	Points	
Dithers	1		CYCLING		SMALL		1		2			
	ш	C - 42 - 75214	D. 1. 4	C	T. 4 4 /F2	T 1 1	DW	A 41	T.4.1 D'41	TD 4 1	T. A. I. E.	ETIC
Spectral Elements	#	Grating/Filter	Readout Pattern	Groups/Int	Integrations/Ex p	Leakcal	Dither	Autocal	Total Dithers	Total Integrations	Total Exposure Time	Wkbk.Calc ID
١٣١	1	G235M/F170LP	NRSIRS2RAPI D	20	1	false	true	NONE	2	2	612.733	
👸	2	G395M/F290LP	NRSIRS2RAPI	40	1	false	true	NONE	2	2	1196.289	
ra			D									
ect	3	PRISM/CLEAR	NRSIRS2RAPI D	3	1	false	true	NONE	2	2	116.711	
Sp			2									
ts	DEFAULT WIN	DOW: ANGULA	R RATE 2013XZ8	FROM JWST I	LESS THAN 0.03							
le l	DISTANCE 201	3XZ8 SUN LESS	THAN 9.0									
e.												
ΙΞ												
Şe												
<u>a</u>												
eci												
Sp												
Special Requiremen												
Sp												

Pro	posal 1272	2 - Observa	ation 6 - Kui	per Belt Se	cience with	JWST						
		Observation 6: N									Mon Feb 27 17	:01:22 GMT 2023
ati I	Diagnostic Status: Warning											
Įξ	Observing Temp	late: NIRSpec IFU	J Spectroscopy									
Observation												
ō												
Diagnostics	(Visit 6:1) Warn	ing (Form): Overh	eads are provision	al until the Visit	Planner has been rui	1.						
ts.	# N	ame	Level	11			Level 2		]	Level 3		
m Targets	(3) C.	HARIKLO	5436° ,O=30 8.445	78296343,I=23.4 00.379770073918 75455857901,EQ	=15.7477669499058 1162716731226 85,W=241.50296312 QUINOX=J2000,EP pochTimeScale=TD	295137,M=5 OCH=29-						
Ste	Comments: Exter	nded-NO	JAIN-	2014.00.00.00,Ej	pocii i iniescale - i D	Б						
ŝ	Comments. Exter	nueu=110										
a												
Solar System												
_	TA Method											
<u>a</u>	NONE											
Template												
Dithers	#		Dither Type		Size		Starting Poir	ıt	Number of Poir	nts	Points	
₽ E	1		CYCLING		SMALL		1		2			
ق												
Spectral Elements	#	Grating/Filter	Readout Pattern	Groups/Int	Integrations/Ex	Leakcal	Dither	Autocal	<b>Total Dithers</b>	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
Je l	1	PRISM/CLEAR	NRSIRS2RAPI	10	1	false	true	NONE	2	2	320.956	, , , , , , , , , , , , , , , , , , ,
<u> </u>			D									
١Ë												
ΙË												
þě												
_												
nts	DEFAULT WIN	DOW: ANGULA	R RATE CHARIK	KLO FROM JWS	T LESS THAN 0.03	3						
Special Requiremer												
<u>ē</u>												
뮹												
Re												
<u>a</u>												
ပ္												
Δ												

Pro	oposal 1272 - Observa	tion 106 - k	Kuiper Belt	t Science wit	th JWST	-						
										Mon Feb 27 17	:01:22 GMT 2023	
Ιij	Diagnostic Status: Warning											
I≌	Observing Template: NIRSpec IFU	Spectroscopy										
Se												
Observation												
Diagnostics	(Visit 106:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.											
ş	# Name	Level	1			Level 2		]	Level 3			
Solar System Targets	(3) CHARIKLO	54367 O=30	78296343,I=23.4 00.379770073913	=15.747766949905 1162716731226 85,W=241.5029631	295137,M=5							
١٤		8.445 IAN-	75455857901,E0 2014:00:00:00 F	QUINOX=J2000,EP pochTimeScale=TD	OCH=29- B							
ste	Comments: Extended=NO	37111	2011.00.00.00,2	poen i mieseure - 12	D							
<u>S</u>												
<u>a</u>												
ပ္တ												
ē	TA Method											
<u>a</u>	NONE											
Template												
J's	#	Dither Type		Size		Starting Poi	nt	Number of Poir	nts	Points		
Dithers	1	CYCLING		SMALL		1		2				
Spectral Elements	# Grating/Filter	Readout Pattern	Groups/Int	Integrations/Ex p		Dither	Autocal	<b>Total Dithers</b>	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID	
Ę	1 PRISM/CLEAR	NRSIRS2RAPI D	10	1	false	true	NONE	2	2	320.956		
Ιŭ		D										
ह्न												
뒪												
١ğ												
ts	DEFAULT WINDOW: ANGULAR	р рате спарів	TO EBOW IMA	T I ESS THAN OO	3							
		KATE CHARIN	TO LYOM 1 M 2	or Less Than 0.0.	,							
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<u>.</u>												
Special Requiremen											l	
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Pro	posal 127	2 - Observa	ition 8 - Kui	per Belt S	cience with	JWST						
		Observation 8: N									Mon Feb 27 17	:01:22 GMT 2023
Ιij	Diagnostic Stat											
≥		plate: NIRSpec IFU	J Spectroscopy									
Sel		•										
Observation												
Diagnostics	(Visit 8:1) Warr	iing (Form): Overh	eads are provision	al until the Visit	Planner has been rui	n.						
ts	# N	Name	Level	1			Level 2		]	Level 3		
Solar System Targets	(4)	SEDNA			=500.516975089756	63,E=0.8480						
⊒.I			83464 .O=14	16428406,I=11.9 14.52638664144	2871162913267 48,W=311.52003187	768571.M=3						
ľε			58.06	81026495191,E0	QUINOX=J2000,EP	OCH=08-						
ite	C	1.1.110	JUL-	2016:00:00:00,E <sub>j</sub>	pochTimeScale=TD	В						
چّا	Comments: Exte	enaea=NO										
Ϊ́												
١ÿ												
_												
ate	TA Method NONE											
I됻	NONE											
Template												
	#		Dither Type		Size		Starting Poi	nt	Number of Poir	nts	Points	
l e	1		CYCLING		SMALL		1		2		•	
Dithers												
Spectral Elements	#	Grating/Filter	Readout Pattern	Groups/Int	Integrations/Ex	Leakcal	Dither	Autocal	<b>Total Dithers</b>	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
l ë	1	PRISM/CLEAR	NRSIRS2RAPI	25	1	false	true	NONE	2	2	758.622	
<u> </u>			D									
۱ä												
1 #												
Ιĕ												
S												
ıts		NDOW: ANGULA	R RATE SEDNA	FROM JWST LI	ESS THAN 0.03							
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Special Requiremen												l
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