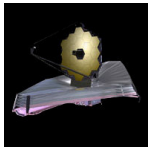

2869 - The interiors of Jupiter Trojans as tracers of Solar System evolution

Cycle: 2, Proposal Category: GO

INVESTIGATORS

Name	*Institution*
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OBSERVATIONS

Folder	*Observation*	*Label*	*Observing Template*	*Science Target*
1998SU52				
	1	1998SU52	NIRSpec IFU Spectroscopy	(1) 1998SU52
Anchialos				
	2	Anchialos	NIRSpec IFU Spectroscopy	(2) ANCHIALOS
1998RM11				
	3	1998RM11	NIRSpec IFU Spectroscopy	(3) 1988RM11
2001 CT13				
	4		NIRSpec IFU Spectroscopy	(4) 2001CT13

ABSTRACT

The Nice models of solar system-wide dynamical instability predict that the Jupiter Trojans should be derived from the same region and thus have the same icy composition as the objects in the Kuiper belt. Spectra have shown no relationship between the surface compositions of these objects (and Cycle 1 spectra have made the differences even more dramatic), but it is plausible that the higher temperatures of the Jupiter Trojans would sufficiently modify Kuiper belt surfaces to make them unrecognizable. We have identified 4 ~20km Jupiter Trojans with albedos elevated above the typical Trojan values. Statistically, this is approximately the number of objects of this size which are expected to have had catastrophic collisions in the past ~100 Myr. These objects are plausibly the largest recent impacts in the Jupiter Trojan population and could retain the spectroscopic

signatures of fresh interior materials. We propose a short reconnaissance program designed to measure the surface composition of these objects. Such a program could quickly and definitively establish the connection between the Jupiter Trojans and the Kuiper belt objects, confirming an early dynamical instability in our solar system.

OBSERVING DESCRIPTION

We propose to observe 4 high albedo albedo Jupiter Trojans using NIRSPEC IFU PRISM mode. These objects could be fragments of recent catastrophic impacts in the Trojan clouds and thus retain pristine signatures of interior materials (perhaps explaining their unusal albedos).

All targets have well known position so we use the IFU with no target centering. We target a S/N to allow robust detection of water ice Fresnel features, CO2 ice, and hydrate silicates, if present. The high signal-to-noise across the entire wavelength range will allow us to detect ices, silicates, organics, and other materials that could plausibly be exposed in recent impacts.

Solar System Targets

#	Name	Level 1	Level 2	Level 3
(1)	1998SU52	TYPE=ASTEROID,A=5.077579803258887,E=0.1077271763004729,I=2.294929726163167,O=284.7866009590653,W=149.2068964473947,M=186.4018862942164,EQUINOX=J2000,EPOCH=15-MAY-2017:00:00:00,EpochTimeScale=TDB		
Comments: Extended=NO				
(2)	ANCHIALOS	TYPE=ASTEROID,A=5.181122544230447,E=0.03945570479469644,I=10.61603602785205,O=311.4104099568912,W=147.35055240962,M=176.6376357578446,EQUINOX=J2000,EPOCH=30-OCT-2016:00:00:00,EpochTimeScale=TDB		
Comments: Extended=NO				
(3)	1988RM11	TYPE=ASTEROID,A=5.156557320233074,E=0.03798565135126015,I=3.353432579701592,O=140.7011585401921,W=237.0578118710311,M=94.78911585902534,EQUINOX=J2000,EPOCH=21-JAN-2016:00:00:00,EpochTimeScale=TDB		
Comments: Extended=Unknown				
(4)	2001CT13	TYPE=ASTEROID,A=5.162165783085905,E=0.0583317611017318,I=13.99540048133923,O=120.1085246895411,W=182.9163546779045,M=337.900385600269,EQUINOX=J2000,EPOCH=04-JUN-2017:00:00:00,EpochTimeScale=TDB		
Comments: Extended=Unknown				

Observation

Proposal 2869, Observation 1: 1998SU52

Wed May 10 23:00:54 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)	1998SU52	TYPE=ASTEROID,A=5.077579803258887,E=0.1077271763004729,I=2.294929726163167,O=284.7866009590653,W=149.2068964473947,M=186.4018862942164,EQUINOX=J2000,EPOCH=15-MAY-2017:00:00:00,EpochTimeScale=TDB		

Comments: Extended=NO

Template

TA Method
NONE

Dithers

#	Dither Type	Size	Starting Point	Number of Points	Points
1	2-POINT-NOD				

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	PRISM/CLEAR	NRSIRS2RAPID	8	1	false	true	NONE	2	2	262.6	

Special Requirements

DEFAULT WINDOW: ANGULAR RATE 1998SU52 FROM JWST LESS THAN 0.075

Observation

Proposal 2869, Observation 2: Anchialos Wed May 10 23:00:54 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)	ANCHIALOS	TYPE=ASTEROID,A=5.181122544230447,E=0.0394 5570479469644,I=10.61603602785205 ,O=311.4104099568912,W=147.35055240962,M=176. 6376357578446,EQUINOX=J2000,EPOCH=30-OCT-2016:00:00:00,EpochTimeScale=TDB		

Comments: Extended=NO

Template

TA Method
NONE

Dithers

#	Dither Type	Size	Starting Point	Number of Points	Points
1	2-POINT-NOD				

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	PRISM/CLEAR	NRSIRS2RAPID	11	1	false	true	NONE	2	2	350.133	

Special Requirements

DEFAULT WINDOW: ANGULAR RATE ANCHIALOS FROM JWST LESS THAN 0.075

Observation

Proposal 2869, Observation 3: 1998RM11

Wed May 10 23:00:54 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
(3)	1988RM11	TYPE=ASTEROID,A=5.156557320233074,E=0.0379 8565135126015,I=3.353432579701592 ,O=140.7011585401921,W=237.0578118710311,M=9 4.78911585902534,EQUINOX=J2000,EPOCH=21- JAN-2016:00:00:00,EpochTimeScale=TDB		

Comments: Extended=Unknown

Template

TA Method
NONE

Dithers

#	Dither Type	Size	Starting Point	Number of Points	Points
1	2-POINT-NOD				

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	PRISM/CLEAR	NRSIRS2RAPID	8	1	false	true	NONE	2	2	262.6	

Special Requirements

DEFAULT WINDOW: ANGULAR RATE 1988RM11 FROM JWST LESS THAN 0.075

Observation

Proposal 2869, Observation 4

Wed May 10 23:00:54 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
(4)	2001CT13	TYPE=ASTEROID,A=5.162165783085905,E=0.0583317611017318,I=13.99540048133923,O=120.1085246895411,W=182.9163546779045,M=337.900385600269,EQUINOX=J2000,EPOCH=04-JUN-2017:00:00:00,EpochTimeScale=TDB		

Comments: Extended=Unknown

Template

TA Method
NONE

Dithers

#	Dither Type	Size	Starting Point	Number of Points	Points
1	2-POINT-NOD				

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	PRISM/CLEAR	NRSIRS2RAPID	12	1	false	true	NONE	2	2	379.311	

Special Requirements

DEFAULT WINDOW: ANGULAR RATE 2001CT13 FROM JWST LESS THAN 0.075