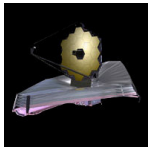

2666 - Are Supernovae Dust Factories?

Cycle: 1, Proposal Category: GO

INVESTIGATORS

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OBSERVATIONS

Folder	*Observation*	*Label*	*Observing Template*	*Science Target*
SN 2004et				
	1	MIRI Imaging	MIRI Imaging	(1) SN-2004ET
SN 2017eaw and 2004et BG				
	2	MIRI Imaging BG	MIRI Imaging	(10) SN-2017EAW-2004ET-BG
SN 2017eaw				
	3	MIRI Imaging	MIRI Imaging	(5) SN-2017EAW
SN 2005af				
	4	MIRI Imaging	MIRI Imaging	(2) SN-2005AF
SN 2011ja and 2005af BG				
	5	MIRI Imaging BG	MIRI Imaging	(8) SN-2011JA-2005AF-BG
SN 2011ja				
	6	MIRI Imaging	MIRI Imaging	(3) SN-2011JA

Folder	*Observation*	*Label*	*Observing Template*	*Science Target*
SN 2013ej				
	7	MIRI Imaging	MIRI Imaging	(4) SN-2013EJ
SN 2013ej BG				
	8	MIRI Imaging BG	MIRI Imaging	(9) SN-2013EJ-BG

ABSTRACT

Core-collapse supernovae (CCSNe) have long been considered as possible sources of dust in the Universe. Searches with Spitzer and other telescopes have historically come up with dust masses 2-3 orders of magnitude too small compared to theoretical predictions. These observations, however, have generally been limited to early epochs, and in many cases, just the warmer dust. Over the past decade, however, new observations suggest that continuous dust formation builds over decades. As new dust forms, the old dust cools so that massive reservoirs of colder dust are hidden, except at longer wavelengths. Although SN 1987A showed a clear trend in dust growth from 10^-3 to 1.0 solar masses over a 30 year period, no other SNe have measured dust masses later than 5 years post-explosion. The limited data is mostly due to the fact that no instrument has been sensitive to colder (~100-200 K) dust in extragalactic SNe (beyond SN 1987A). Here we propose JWST MIRI Imaging of five of the most dusty, nearby, extragalactic SNe Type IIP that will be more than 5 years old by the time JWST observations begin. Our proposed data will result in a spectral energy distribution of the dust in each SN, which we will us to quantify the mass of cooler dust hidden at longer wavelengths and measure its characteristics. Taken all together, the data points will correspond to a variety of ages that will fill in the missing data of dust growth in SNe.

OBSERVING DESCRIPTION

This proposal will image 5 nearby SNe IIP with MIRI Imager. Each observation will consist of F1000W, F1130W, F1280W, F1500W, F1800W, F2100W, F2550W filters. We also request F560W imaging. Even though we don't expect to detect the SN at these wavelengths, we request the data for image and source alignment with archival Spitzer 4.5 um imaging of the SN when it was younger to ensure we are able to identify our source in the other filters.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(1)	SN-2004ET	RA: 20 35 25.3300 (308.8555417d) Dec: +60 07 17.70 (60.12158d) Equinox: J2000	Epoch of Position: 2015.5	
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. *Category=Star* *Description=[Supernovae]* *Extended=NO*				
(2)	SN-2005AF	RA: 13 04 44.0600 (196.1835833d) Dec: -49 33 59.80 (-49.56661d) Equinox: J2000	Epoch of Position: 2015.5	
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. *Category=Star* *Description=[Supernovae]* *Extended=NO*				
(3)	SN-2011JA	RA: 13 05 11.1200 (196.2963333d) Dec: -49 31 27.00 (-49.52417d) Equinox: J2000	Epoch of Position: 2015.5	
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. *Category=Star* *Description=[Supernovae]* *Extended=NO*				
(4)	SN-2013EJ	RA: 01 36 48.1600 (24.2006667d) Dec: +15 45 31.00 (15.75861d) Equinox: J2000	Epoch of Position: 2015.5	
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. *Category=Star* *Description=[Supernovae]* *Extended=NO*				
(5)	SN-2017EAW	RA: 20 34 44.2400 (308.6843333d) Dec: +60 11 35.90 (60.19331d) Equinox: J2000	Epoch of Position: 2015.5	
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. *Category=Star* *Description=[Supernovae]* *Extended=NO*				
(8)	SN-2011JA-2005AF-BG	RA: 13 04 24.3100 (196.1012917d) Dec: -49 30 48.90 (-49.51358d) Equinox: J2000	Epoch of Position: 2015.5	
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. *Category=Star* *Description=[Supernovae]* *Extended=NO*				
(9)	SN-2013EJ-BG	RA: 01 36 56.5300 (24.2355417d) Dec: +15 43 56.00 (15.73222d) Equinox: J2000	Epoch of Position: 2015.5	
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. *Category=Star* *Description=[Supernovae]* *Extended=NO*				

	(10)	SN-2017EAW-2004ET-BG	RA: 20 34 12.6500 (308.5527083d) Dec: +60 14 20.00 (60.23889d) Equinox: J2000	Epoch of Position: 2015.5

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

Observation

Proposal 2666, Observation 1: MIRI Imaging Mon Aug 08 23:01:27 GMT 2022

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)	SN-2004ET	RA: 20 35 25.3300 (308.8555417d) Dec: +60 07 17.70 (60.12158d) Equinox: J2000	Epoch of Position: 2015.5	

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Category=Star
Description=[Supernovae]
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	4-Point-Sets				5	1	EXTENDED SOURCE	POSITIVE	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	1	1	Dither 1	4	4	111.002	
2	F1000W	FASTR1	60	1	1	Dither 1	4	4	666.01	
3	F1130W	FASTR1	30	1	1	Dither 1	4	4	333.005	
4	F1280W	FASTR1	20	1	1	Dither 1	4	4	222.003	
5	F1500W	FASTR1	20	1	1	Dither 1	4	4	222.003	
6	F1800W	FASTR1	20	1	1	Dither 1	4	4	222.003	
7	F2100W	FASTR1	10	4	1	Dither 1	4	16	477.307	
8	F2550W	FASTR1	10	4	1	Dither 1	4	16	477.307	

Special Requirements

Sequence Observations 1, 2, 3, Non-interruptible

Observation

Proposal 2666, Observation 2: MIRI Imaging BG Mon Aug 08 23:01:27 GMT 2022

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
(10)	SN-2017EAW-2004ET-BG	RA: 20 34 12.6500 (308.5527083d) Dec: +60 14 20.00 (60.23889d) Equinox: J2000	Epoch of Position: 2015.5	

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Category=Star
Description=[Supernovae]
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	4-Point-Sets				5	1	EXTENDED SOURCE	POSITIVE	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	F2550W	FASTR1	10	4	1	Dither 1	4	16	477.307	

Special Requirements

Sequence Observations 1, 2, 3, Non-interruptible

Observation

Proposal 2666, Observation 3: MIRI Imaging Mon Aug 08 23:01:27 GMT 2022

Diagnostic Status: Warning

Observing Template: MIRI Imaging

Diagnostics

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

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(5)	SN-2017EAW	RA: 20 34 44.2400 (308.6843333d) Dec: +60 11 35.90 (60.19331d) Equinox: J2000	Epoch of Position: 2015.5	

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Category=Star
Description=[Supernovae]
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	4-Point-Sets				5	1	EXTENDED SOURCE	POSITIVE	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	1	1	Dither 1	4	4	111.002	
2	F1000W	FASTR1	60	1	1	Dither 1	4	4	666.01	
3	F1130W	FASTR1	30	1	1	Dither 1	4	4	333.005	
4	F1280W	FASTR1	20	1	1	Dither 1	4	4	222.003	
5	F1500W	FASTR1	20	1	1	Dither 1	4	4	222.003	
6	F1800W	FASTR1	20	1	1	Dither 1	4	4	222.003	
7	F2100W	FASTR1	10	4	1	Dither 1	4	16	477.307	
8	F2550W	FASTR1	10	4	1	Dither 1	4	16	477.307	

Special Requirements

Sequence Observations 1, 2, 3, Non-interruptible

Observation

Proposal 2666, Observation 4: MIRI Imaging Mon Aug 08 23:01:28 GMT 2022

Diagnostic Status: Warning

Observing Template: MIRI Imaging

Diagnostics

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

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(2)	SN-2005AF	RA: 13 04 44.0600 (196.1835833d) Dec: -49 33 59.80 (-49.56661d) Equinox: J2000	Epoch of Position: 2015.5	

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Category=Star
Description=[Supernovae]
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	4-Point-Sets				5	1	EXTENDED SOURCE	POSITIVE	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	1	1	Dither 1	4	4	111.002	
2	F1000W	FASTR1	10	1	1	Dither 1	4	4	111.002	
3	F1130W	FASTR1	10	1	1	Dither 1	4	4	111.002	
4	F1280W	FASTR1	10	1	1	Dither 1	4	4	111.002	
5	F1500W	FASTR1	10	1	1	Dither 1	4	4	111.002	
6	F1800W	FASTR1	10	1	1	Dither 1	4	4	111.002	
7	F2100W	FASTR1	10	1	1	Dither 1	4	4	111.002	
8	F2550W	FASTR1	10	1	1	Dither 1	4	4	111.002	

Special Requirements

Sequence Observations 4, 5, 6, Non-interruptible

Observation

Proposal 2666, Observation 5: MIRI Imaging BG Mon Aug 08 23:01:28 GMT 2022

Diagnostic Status: Warning

Observing Template: MIRI Imaging

Diagnostics

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

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(8)	SN-2011JA-2005AF-BG	RA: 13 04 24.3100 (196.1012917d) Dec: -49 30 48.90 (-49.51358d) Equinox: J2000	Epoch of Position: 2015.5	

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Category=Star
Description=[Supernovae]
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	4-Point-Sets				5	1	EXTENDED SOURCE	POSITIVE	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	F2550W	FASTR1	10	1	1	Dither 1	4	4	111.002	

Special Requirements

Sequence Observations 4, 5, 6, Non-interruptible

Observation

Proposal 2666, Observation 6: MIRI Imaging Mon Aug 08 23:01:28 GMT 2022

Diagnostic Status: Warning

Observing Template: MIRI Imaging

Diagnostics

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

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(3)	SN-2011JA	RA: 13 05 11.1200 (196.2963333d) Dec: -49 31 27.00 (-49.52417d) Equinox: J2000	Epoch of Position: 2015.5	

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Category=Star
Description=[Supernovae]
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	4-Point-Sets				5	1	EXTENDED SOURCE	POSITIVE	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	1	1	Dither 1	4	4	111.002	
2	F1000W	FASTR1	10	1	1	Dither 1	4	4	111.002	
3	F1130W	FASTR1	10	1	1	Dither 1	4	4	111.002	
4	F1280W	FASTR1	10	1	1	Dither 1	4	4	111.002	
5	F1500W	FASTR1	10	1	1	Dither 1	4	4	111.002	
6	F1800W	FASTR1	10	1	1	Dither 1	4	4	111.002	
7	F2100W	FASTR1	10	1	1	Dither 1	4	4	111.002	
8	F2550W	FASTR1	10	1	1	Dither 1	4	4	111.002	

Special Requirements

Sequence Observations 4, 5, 6, Non-interruptible

Observation

Proposal 2666, Observation 7: MIRI Imaging Mon Aug 08 23:01:28 GMT 2022

Diagnostic Status: Warning

Observing Template: MIRI Imaging

Diagnostics

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

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(4)	SN-2013EJ	RA: 01 36 48.1600 (24.2006667d) Dec: +15 45 31.00 (15.75861d) Equinox: J2000	Epoch of Position: 2015.5	

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Category=Star
Description=[Supernovae]
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	4-Point-Sets				5	1	EXTENDED SOURCE	POSITIVE	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	1	1	Dither 1	4	4	111.002	
2	F1000W	FASTR1	80	3	1	Dither 1	4	12	2686.239	
3	F1130W	FASTR1	80	1	1	Dither 1	4	4	888.013	
4	F1280W	FASTR1	20	1	1	Dither 1	4	4	222.003	
5	F1500W	FASTR1	20	1	1	Dither 1	4	4	222.003	
6	F1800W	FASTR1	20	1	1	Dither 1	4	4	222.003	
7	F2100W	FASTR1	20	4	1	Dither 1	4	16	921.313	
8	F2550W	FASTR1	20	4	1	Dither 1	4	16	921.313	

Special Requirements

Sequence Observations 7, 8, Non-interruptible

Observation

Proposal 2666, Observation 8: MIRI Imaging BG Mon Aug 08 23:01:28 GMT 2022

Diagnostic Status: Warning

Observing Template: MIRI Imaging

Diagnostics

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

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(9)	SN-2013EJ-BG	RA: 01 36 56.5300 (24.2355417d) Dec: +15 43 56.00 (15.73222d) Equinox: J2000	Epoch of Position: 2015.5	

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Category=Star
Description=[Supernovae]
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	4-Point-Sets				5	1	EXTENDED SOURCE	POSITIVE	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	F2550W	FASTR1	20	4	1	Dither 1	4	16	921.313	

Special Requirements

Sequence Observations 7, 8, Non-interruptible