



3855 - Catching stellar winds with the JWST: a NIRspec study of O stars in the low-metallicity young cluster NGC346

Cycle: 2, Proposal Category: GO

INVESTIGATORS

<i>Name</i>	<i>Institution</i>
Prof. Lidia Oskinova (PI) (ESA Member)	Universitat Potsdam
Dr. Peter Zeidler (CoI) (ESA Member) (US Admin CoI)	Space Telescope Science Institute - ESA - JWST
Daniel Pauli (CoI) (ESA Member)	Universitat Potsdam
Dr. Wolf-Rainer Hamann (CoI) (ESA Member)	Universitat Potsdam
Dr. Helge Todt (CoI) (ESA Member)	Universitat Potsdam
Dr. Andreas Sander (CoI) (ESA Member)	Astronomisches Rechen-Institut Heidelberg
Mr. Matthew J Rickard (CoI) (ESA Member)	University College London
Dr. Varsha Ramachandran (CoI) (ESA Member)	Universitat Heidelberg
Prof. John S. Gallagher III (CoI)	Macalester College
Ms. Sabela Reyero Serantes (CoI) (ESA Member)	Universitat Potsdam
Prof. Raman K. Prinja (CoI) (ESA Member)	University College London
Dr. Elena Sabbi (CoI)	NOIRLab - Gemini North (HI)
Dr. Derck L. Massa (CoI)	Space Science Institute
Dr. Tomer Shenar (CoI)	Tel Aviv University
Dr. Mauricio A. Gomez-Gonzalez Sr. (CoI) (ESA Member)	Universitat Potsdam

OBSERVATIONS

<i>Folder</i>	<i>Observation</i>	<i>Label</i>	<i>Observing Template</i>	<i>Science Target</i>
Bright Group				
	1		NIRSpec Fixed Slit Spectroscopy	(23) Group BRIGHT-STARS
New Observations				

<i>Folder</i>	<i>Observation</i>	<i>Label</i>	<i>Observing Template</i>	<i>Science Target</i>
	2	O-stars	NIRSpec Fixed Slit Spectroscopy	(120) Group NewObs

ABSTRACT

Massive hot O-type stars are among the top cosmic influencers. Their ionizing radiation and stellar winds determine the physical conditions in young star clusters at times when low-mass stars and their planetary systems are still forming. The JWST opens a new era in studies of star clusters in galaxies across the Universe. To unleash the full potential of the JWST in uncovering the properties of O-stars at low-metallicity, new diagnostics must be developed.

We request NIRspec time to obtain the first IR spectra of the nearly complete sample of O-stars in NGC346 - the most massive young cluster in the metal-poor SMC galaxy. Recent attempts to obtain accurate measurements of stellar winds with HST UV spectroscopy reached their limits, as the key diagnostic UV lines formed in stellar winds of O stars with later sub-types vanish at this low metallicity. On the other hand, the hydrogen lines in the IR offer a sensitive diagnostic tool. Utilizing the unprecedented capabilities of NIRspec we will measure spectra of 21 O-stars with a broad range of masses. The new data will be complemented by UV and optical spectra and analysed using modern non-LTE models. For the first time the consistent stellar and wind parameters will be derived for a nearly full spectral range of metal poor O-stars. This program will deliver calibrated measurements of mass-loss rates in O stars and establish near-IR spectroscopy as a key tool for studies of stellar feedback at low-metallicities and in obscured regions. These strategic observations can be performed only by the JWST and will have long lasting impact.

OBSERVING DESCRIPTION

We propose observations of 21 individual blue O-type stars located in a proximity to each other within a star cluster. Each star should be observed with a NIRspec FS using G395H grating. The stars are divided in two groups according to their brightness. The bright star group is observed using the SUBS200A1 subarray to avoid saturation, while the faint star group is observed using the FULL array. There are two visits, one per target group. The acquisition is performed once per visit, and then slewed to each individual target within the group.

Proposal 3855 - Targets - Catching stellar winds with the JWST: a NIRSpec study of O stars in the low-metallicity young cluster NGC...

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(1)	SSN-7	RA: 00 59 4.4990 (14.7687458d) Dec: -72 10 24.76 (-72.17354d) Equinox: J2000	Epoch of Position: 2016.0	
<i>Comments: Coordinates are based on Cycle 1 NIRCam photometry in teh Gaia DR3 reference frame</i> Category=Star Description=[O stars] Extended=NO				
(2)	SSN-18	RA: 00 59 6.7525 (14.7781354d) Dec: -72 10 41.28 (-72.17813d) Equinox: J2000	Epoch of Position: 2016.0	
<i>Comments: Coordinates are based on Cycle 1 NIRCam photometry in teh Gaia DR3 reference frame</i> Category=Star Description=[O stars] Extended=NO				
(4)	SSN-9	RA: 00 59 0.7583 (14.7531596d) Dec: -72 10 28.17 (-72.17449d) Equinox: J2000	Epoch of Position: 2016.0	
<i>Comments: Coordinates are based on Cycle 1 NIRCam photometry in teh Gaia DR3 reference frame</i> Category=Star Description=[O stars] Extended=NO				
(5)	SSN-11	RA: 00 59 0.0541 (14.7502254d) Dec: -72 10 37.97 (-72.17721d) Equinox: J2000	Epoch of Position: 2016.0	
<i>Comments: Coordinates are based on Cycle 1 NIRCam photometry in teh Gaia DR3 reference frame</i> Category=Star Description=[O stars] Extended=NO				
(6)	SSN-15	RA: 00 59 1.8181 (14.7575754d) Dec: -72 10 31.27 (-72.17535d) Equinox: J2000	Epoch of Position: 2016.0	
<i>Comments: Coordinates are based on Cycle 1 NIRCam photometry in teh Gaia DR3 reference frame</i> Category=Star Description=[O stars] Extended=NO				
(7)	SSN-14	RA: 00 59 5.9858 (14.7749408d) Dec: -72 10 33.84 (-72.17607d) Equinox: J2000	Epoch of Position: 2016.0	
<i>Comments: Coordinates are based on Cycle 1 NIRCam photometry in teh Gaia DR3 reference frame</i> Category=Star Description=[O stars] Extended=NO				
(13)	SSN-36	RA: 00 59 7.3357 (14.7805654d) Dec: -72 10 25.42 (-72.17373d) Equinox: J2000	Epoch of Position: 2016.0	
<i>Comments: Coordinates are based on Cycle 1 NIRCam photometry in teh Gaia DR3 reference frame</i> Category=Star Description=[O stars] Extended=NO				

Fixed Targets

Proposal 3855 - Targets - Catching stellar winds with the JWST: a NIRSpec study of O stars in the low-metallicity young cluster NGC...

(15)	SSN-46	RA: 00 59 7.6412 (14.7818383d) Dec: -72 10 48.33 (-72.18009d) Equinox: J2000	Epoch of Position: 2016.0
<p><i>Comments: Coordinates are based on Cycle 1 NIRCam photometry in teh Gaia DR3 reference frame</i> Category=Star Description=[O stars] Extended=NO</p>			
(16)	SSN-57	RA: 00 59 5.4477 (14.7726987d) Dec: -72 10 42.41 (-72.17845d) Equinox: J2000	Epoch of Position: 2016.0
<p><i>Comments: Coordinates are based on Cycle 1 NIRCam photometry in teh Gaia DR3 reference frame</i> Category=Star Description=[O stars] Extended=NO</p>			
(17)	SSN-59	RA: 00 59 2.0575 (14.7585729d) Dec: -72 10 36.31 (-72.17675d) Equinox: J2000	Epoch of Position: 2016.0
<p><i>Comments: Coordinates are based on Cycle 1 NIRCam photometry in teh Gaia DR3 reference frame</i> Category=Star Description=[O stars] Extended=NO</p>			
(18)	SSN-62	RA: 00 59 5.8833 (14.7745137d) Dec: -72 10 28.95 (-72.17471d) Equinox: J2000	Epoch of Position: 2016
<p><i>Comments: Coordinates are based on Cycle 1 NIRCam photometry in teh Gaia DR3 reference frame</i> Category=Star Description=[O stars] Extended=NO</p>			
(19)	SSN-83	RA: 00 59 4.2785 (14.7678271d) Dec: -72 10 27.23 (-72.17423d) Equinox: J2000	Epoch of Position: 2016.0
<p><i>Comments: Coordinates are based on Cycle 1 NIRCam photometry in teh Gaia DR3 reference frame</i> Category=Star Description=[O stars] Extended=NO</p>			
(20)	SSN-105	RA: 00 59 6.6744 (14.7778100d) Dec: -72 10 28.83 (-72.17467d) Equinox: J2000	Epoch of Position: 2016.0
<p><i>Comments: Coordinates are based on Cycle 1 NIRCam photometry in teh Gaia DR3 reference frame</i> Category=Star Description=[O stars] Extended=NO</p>			
(21)	SSN-110	RA: 00 59 7.6012 (14.7816717d) Dec: -72 10 39.26 (-72.17757d) Equinox: J2000	Epoch of Position: 2016.0
<p><i>Comments: Coordinates are based on Cycle 1 NIRCam photometry in teh Gaia DR3 reference frame</i> Category=Star Description=[O stars] Extended=NO</p>			

Proposal 3855 - Targets - Catching stellar winds with the JWST: a NIRSpec study of O stars in the low-metallicity young cluster NGC...

(22)	SSN-13	RA: 00 58 57.3957 (14.7391488d) Dec: -72 10 33.65 (-72.17601d) Equinox: J2000	Epoch of Position: 2016.0
<p><i>Comments: Coordinates are based on Cycle 1 NIRCam photometry in teh Gaia DR3 reference frame</i> Category=Star Description=[O stars] Extended=NO</p>			
(23)	Group BRIGHT-STARS		
<p><i>Comments:</i> Target Selection=[1 SSN-7, 2 SSN-18, 4 SSN-9, 5 SSN-11, 6 SSN-15, 7 SSN-14, 22 SSN-13]</p>			
(101)	SSN-9-new	RA: 00 59 0.7583 (14.7531596d) Dec: -72 10 28.17 (-72.17449d) Equinox: J2000	Epoch of Position: 2016.0
<p><i>Comments: Coordinates are based on Cycle 1 NIRCam photometry in teh Gaia DR3 reference frame</i> Category=Star Description=[O stars] Extended=NO</p>			
(102)	SSN-11-new	RA: 00 59 0.0541 (14.7502254d) Dec: -72 10 37.97 (-72.17721d) Equinox: J2000	Epoch of Position: 2016.0
<p><i>Comments: Coordinates are based on Cycle 1 NIRCam photometry in teh Gaia DR3 reference frame</i> Category=Star Description=[O stars] Extended=NO</p>			
(103)	SSN-13-new	RA: 00 58 57.3957 (14.7391488d) Dec: -72 10 33.65 (-72.17601d) Equinox: J2000	Epoch of Position: 2016.0
<p><i>Comments: Coordinates are based on Cycle 1 NIRCam photometry in teh Gaia DR3 reference frame</i> Category=Star Description=[O stars] Extended=NO</p>			
(104)	SSN-14-new	RA: 00 59 5.9858 (14.7749408d) Dec: -72 10 33.84 (-72.17607d) Equinox: J2000	Epoch of Position: 2016.0
<p><i>Comments: Coordinates are based on Cycle 1 NIRCam photometry in teh Gaia DR3 reference frame</i> Category=Star Description=[O stars] Extended=NO</p>			
(105)	SSN-15-new	RA: 00 59 1.8181 (14.7575754d) Dec: -72 10 31.27 (-72.17535d) Equinox: J2000	Epoch of Position: 2016.0
<p><i>Comments: Coordinates are based on Cycle 1 NIRCam photometry in teh Gaia DR3 reference frame</i> Category=Star Description=[O stars] Extended=NO</p>			
(106)	SSN-17	RA: 00 59 2.9243 (14.7621846d) Dec: -72 10 34.94 (-72.17637d) Equinox: J2000	Epoch of Position: 2016.0
<p><i>Comments: Coordinates are based on Cycle 1 NIRCam photometry in teh Gaia DR3 reference frame</i> Category=Star Description=[O stars] Extended=NO</p>			

Proposal 3855 - Targets - Catching stellar winds with the JWST: a NIRSpec study of O stars in the low-metallicity young cluster NGC...

(107)	SSN-18-new	RA: 00 59 6.7525 (14.7781354d) Dec: -72 10 41.28 (-72.17813d) Equinox: J2000	Epoch of Position: 2016.0
<p><i>Comments: Coordinates are based on Cycle 1 NIRCam photometry in teh Gaia DR3 reference frame</i> Category=Star Description=[O stars] Extended=NO</p>			
(108)	SSN-22	RA: 00 59 6.2111 (14.7758796d) Dec: -72 10 33.59 (-72.17600d) Equinox: J2000	Epoch of Position: 2016.0
<p><i>Comments: Coordinates are based on Cycle 1 NIRCam photometry in teh Gaia DR3 reference frame</i> Category=Star Description=[O stars] Extended=NO</p>			
(109)	SSN-31	RA: 00 59 3.9789 (14.7665787d) Dec: -72 10 51.15 (-72.18088d) Equinox: J2000	Epoch of Position: 2016.0
<p><i>Comments: Coordinates are based on Cycle 1 NIRCam photometry in teh Gaia DR3 reference frame</i> Category=Star Description=[O stars] Extended=NO</p>			
(110)	SSN-34	RA: 00 59 1.8999 (14.7579162d) Dec: -72 10 43.37 (-72.17871d) Equinox: J2000	Epoch of Position: 2016.0
<p><i>Comments: Coordinates are based on Cycle 1 NIRCam photometry in teh Gaia DR3 reference frame</i> Category=Star Description=[O stars] Extended=NO</p>			
(111)	SSN-33	RA: 00 59 5.9069 (14.7746121d) Dec: -72 10 50.40 (-72.18067d) Equinox: J2000	Epoch of Position: 2016.0
<p><i>Comments: Coordinates are based on Cycle 1 NIRCam photometry in teh Gaia DR3 reference frame</i> Category=Star Description=[O stars] Extended=NO</p>			
(112)	SSN-43	RA: 00 59 6.3336 (14.7763900d) Dec: -72 10 32.43 (-72.17568d) Equinox: J2000	Epoch of Position: 2016.0
<p><i>Comments: Coordinates are based on Cycle 1 NIRCam photometry in teh Gaia DR3 reference frame</i> Category=Star Description=[O stars] Extended=NO</p>			
(120)	Group NewObs		
<p><i>Comments:</i> Target Selection=[101 SSN-9-new, 102 SSN-11-new, 103 SSN-13-new, 104 SSN-14-new, 105 SSN-15-new, 106 SSN-17, 107 SSN-18-new, 108 SSN-22, 109 SSN-31, 110 SSN-34, 111 SSN-33, 112 SSN-43]</p>			

Proposal 3855 - Observation 1 - Catching stellar winds with the JWST: a NIRspec study of O stars in the low-metallicity young cluster...

Mon Aug 26 18:00:18 GMT 2024

Observation	Proposal 3855, Observation 1 Diagnostic Status: Warning Observing Template: NIRSpec Fixed Slit Spectroscopy											
	(Visit 1:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.											
Fixed Targets	#	Name	Target Coordinates			Targ. Coord. Corrections			Miscellaneous			
	(23)	Group BRIGHT-STARS	Comments: Target Selection=[1 SSN-7, 2 SSN-18, 4 SSN-9, 5 SSN-11, 6 SSN-15, 7 SSN-14, 22 SSN-13]									
Acquisition	#	Target	TA Method	Subarray	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID	
	1	1 SSN-7	WATA	SUB32	F110W	NRSRAPID	3	1	1	0.08	138297	
Template	Slit				Subarray							
	S200A1				SUBS200A1							
Dithers	#	Primary Dither Positions					Sub-Pixel Pattern					
	1	2					SPECTRAL					
Spectral Elements	#	Grating/Filter	Slit	Readout Pattern	Groups/Int	Integrations/Exp	#	Autocal	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
	1	G395H/F290LP	S200A1	NRSRAPID	15	1	1	NONE	6	6	149.691	138297

Proposal 3855 - Observation 2 - Catching stellar winds with the JWST: a NIRspec study of O stars in the low-metallicity young cluster...

Mon Aug 26 18:00:18 GMT 2024

Observation	Proposal 3855, Observation 2: O-stars Diagnostic Status: Warning Observing Template: NIRSpec Fixed Slit Spectroscopy																																											
	(Visit 2:1) Warning (Form): Data Excess over lower threshold (Visit 2:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.																																											
Fixed Targets	<table border="1"> <thead> <tr> <th>#</th> <th>Name</th> <th>Target Coordinates</th> <th colspan="4">Targ. Coord. Corrections</th> <th colspan="4">Miscellaneous</th> </tr> </thead> <tbody> <tr> <td>(120)</td> <td>Group NewObs</td> <td></td> <td colspan="4"></td> <td colspan="4"></td> </tr> <tr> <td colspan="11"> <i>Comments:</i> <i>Target Selection=[101 SSN-9-new, 102 SSN-11-new, 103 SSN-13-new, 104 SSN-14-new, 105 SSN-15-new, 106 SSN-17, 107 SSN-18-new, 108 SSN-22, 109 SSN-31, 110 SSN-34, 111 SSN-33, 112 SSN-43]</i> </td> </tr> </tbody> </table>											#	Name	Target Coordinates	Targ. Coord. Corrections				Miscellaneous				(120)	Group NewObs										<i>Comments:</i> <i>Target Selection=[101 SSN-9-new, 102 SSN-11-new, 103 SSN-13-new, 104 SSN-14-new, 105 SSN-15-new, 106 SSN-17, 107 SSN-18-new, 108 SSN-22, 109 SSN-31, 110 SSN-34, 111 SSN-33, 112 SSN-43]</i>										
	#	Name	Target Coordinates	Targ. Coord. Corrections				Miscellaneous																																				
(120)	Group NewObs																																											
<i>Comments:</i> <i>Target Selection=[101 SSN-9-new, 102 SSN-11-new, 103 SSN-13-new, 104 SSN-14-new, 105 SSN-15-new, 106 SSN-17, 107 SSN-18-new, 108 SSN-22, 109 SSN-31, 110 SSN-34, 111 SSN-33, 112 SSN-43]</i>																																												
Acquisition	<table border="1"> <thead> <tr> <th>#</th> <th>Target</th> <th>TA Method</th> <th>Subarray</th> <th>Filter</th> <th>Readout Pattern</th> <th>Groups/Int</th> <th>Integrations/Exp</th> <th>Total Integrations</th> <th>Total Exposure Time</th> <th>ETC Wkbk.Calc ID</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>4 SSN-9</td> <td>WATA</td> <td>SUB32</td> <td>F110W</td> <td>NRSRAPID</td> <td>3</td> <td>1</td> <td>1</td> <td>0.08</td> <td>210004</td> </tr> </tbody> </table>											#	Target	TA Method	Subarray	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID	1	4 SSN-9	WATA	SUB32	F110W	NRSRAPID	3	1	1	0.08	210004											
	#	Target	TA Method	Subarray	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID																																	
1	4 SSN-9	WATA	SUB32	F110W	NRSRAPID	3	1	1	0.08	210004																																		
Template	<table border="1"> <thead> <tr> <th>Slit</th> <th>Subarray</th> </tr> </thead> <tbody> <tr> <td>S200A1</td> <td>FULL</td> </tr> </tbody> </table>											Slit	Subarray	S200A1	FULL																													
	Slit	Subarray																																										
S200A1	FULL																																											
Dithers	<table border="1"> <thead> <tr> <th>#</th> <th>Primary Dither Positions</th> <th>Sub-Pixel Pattern</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>2</td> <td>SPECTRAL</td> </tr> </tbody> </table>											#	Primary Dither Positions	Sub-Pixel Pattern	1	2	SPECTRAL																											
	#	Primary Dither Positions	Sub-Pixel Pattern																																									
1	2	SPECTRAL																																										
Spectral Elements	<table border="1"> <thead> <tr> <th>#</th> <th>Grating/Filter</th> <th>Slit</th> <th>Readout Pattern</th> <th>Groups/Int</th> <th>Integrations/Exp</th> <th>#</th> <th>Autocal</th> <th>Total Dithers</th> <th>Total Integrations</th> <th>Total Exposure Time</th> <th>ETC Wkbk.Calc ID</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>G395H/F290LP</td> <td>S200A1</td> <td>NRSIRS2RAPID</td> <td>16</td> <td>1</td> <td>1</td> <td>NONE</td> <td>6</td> <td>6</td> <td>1488.067</td> <td>210004</td> </tr> </tbody> </table>											#	Grating/Filter	Slit	Readout Pattern	Groups/Int	Integrations/Exp	#	Autocal	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID	1	G395H/F290LP	S200A1	NRSIRS2RAPID	16	1	1	NONE	6	6	1488.067	210004									
	#	Grating/Filter	Slit	Readout Pattern	Groups/Int	Integrations/Exp	#	Autocal	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID																																
1	G395H/F290LP	S200A1	NRSIRS2RAPID	16	1	1	NONE	6	6	1488.067	210004																																	