



## 9422 - An ALMA-JWST View of the Nested CW Tau Disk Wind

Cycle: 4, Proposal Category: GO

### INVESTIGATORS

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### OBSERVATIONS

<i>Folder</i>	<i>Observation</i>	<i>Label</i>	<i>Observing Template</i>	<i>Science Target</i>
NIRSpec IFU				
	1	CWTau	NIRSpec IFU Spectroscopy	(1) CWTau

### ABSTRACT

Planetary properties depend on the physical processes that control the evolution and dispersal of their protoplanetary disks. However, a detailed picture of how disks lose their mass - and thus when planet formation ends - has remained elusive. Recent theoretical and observational work has suggested that magnetohydrodynamic (MHD)-driven winds may be dominant in governing angular momentum transport in disks. These MHD winds present a powerful opportunity to assess these models, as they are predicted to have distinct features that can be tested with carefully-designed observations, namely, a nested structure comprised of an inner, collimated jet surrounded by a wider opening-angle molecular wind. Here, we

propose joint ALMA-JWST observations to map the morphology, kinematics, and gas excitation across a newly-discovered disk wind in the CW Tau disk. The confirmation of the nested wind structure - in line with predictions of MHD winds - in CW Tau would make this only the 2nd Class II disk with such a morphology and offer insights into the physics and origin of winds and how they influence disk evolution, lifetime, and planet-forming potential. This joint proposal is associated with ALMA proposal ID: 2025.1.01025.S.

### **OBSERVING DESCRIPTION**

These observations aim to spatially resolve the jet and disk wind in the inclined CW Tau protoplanetary disk to map the radial and vertical wind extent. We selected 3 high-resolution grating-filter combinations (G140H/F100LP, G235H/F170LP, G395H/F290LP) to detect multiple jet and wind diagnostic lines along with tracers of stellar accretion. We use the readout pattern NRSIRS2RAPID for optimization of SNR. Integration times of ~30 min per filter are based on successful, high SNR detections of jet/wind line in similar disk systems (e.g., Pascucci+25, Bajaj+25, JWST/ID1612). This is a joint proposal with ALMA, which will provide spatial mapping and gas excitation using multiple  $^{12}\text{CO}$  emission lines, which trace the molecular component of the disk wind.

## Proposal 9422 - Targets - An ALMA-JWST View of the Nested CW Tau Disk Wind

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
	(1)	CWTau	RA: 04 14 17.0043 (63.5708513d) Dec: +28 10 57.77 (28.18271d) Equinox: J2000	Proper Motion RA: 8.144 mas/yr Proper Motion Dec: -24.206 mas/yr Epoch of Position: 2000	
<p><i>Comments: This object was generated by the target selector and retrieved from the SIMBAD database.</i>  <i>Category=Star</i>  <i>Description=[Circumstellar gas, Herbig-Haro objects, Protoplanetary disks, T Tauri stars]</i></p>					

Proposal 9422 - Observation 1 - An ALMA-JWST View of the Nested CW Tau Disk Wind

Tue Jan 13 20:01:10 GMT 2026

<b>Observation</b>	<p><b>Proposal 9422, Observation 1: CWTau</b></p> <p><b>Diagnostic Status: Warning</b></p> <p>Observing Template: NIRSpec IFU Spectroscopy</p>											
<b>Diagnostics</b>	(Visit 1:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.											
<b>Fixed Targets</b>	<b>#</b>	<b>Name</b>	<b>Target Coordinates</b>			<b>Targ. Coord. Corrections</b>			<b>Miscellaneous</b>			
	(1)	CWTau	RA: 04 14 17.0043 (63.5708513d) Dec: +28 10 57.77 (28.18271d) Equinox: J2000			Proper Motion RA: 8.144 mas/yr Proper Motion Dec: -24.206 mas/yr Epoch of Position: 2000						
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<b>Template</b>	<b>TA Method</b>						<b>HFF Readout Mode</b>					
	NONE						false					
<b>Dithers</b>	<b>#</b>	<b>Dither Type</b>		<b>Size</b>	<b>Starting Point</b>			<b>Number of Points</b>	<b>Points</b>			
	1	SPARSE-CYCLING		MEDIUM					1,2,3,4,5			
<b>Spectral Elements</b>	<b>#</b>	<b>Grating/Filter</b>	<b>Readout Pattern</b>	<b>Groups/Int</b>	<b>Integrations/Exp</b>	<b>Leakcal</b>	<b>Dither</b>	<b>Autocal</b>	<b>Total Dithers</b>	<b>Total Integrations</b>	<b>Total Exposure Time</b>	<b>Optional ETC ID</b>
	1	G140H/F100LP	NRSIRS2RAPID	26	1	false	true	NONE	5	5	1969.5	
	2	G235H/F170LP	NRSIRS2RAPID	26	1	false	true	NONE	5	5	1969.5	
	3	G395H/F290LP	NRSIRS2RAPID	26	1	false	true	NONE	5	5	1969.5	