

Hands-On with the  
**ALMA Archive**



Follow Along!

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# The ALMA Archive Layout

The screenshot displays the ALMA Archive interface with several key components:

- Search Bar:** Located at the top left, containing a search input field and a magnifying glass icon.
- Field of View:** A large image showing the ALMA antenna array layout, with a central yellow diamond shape indicating the field of view. It includes coordinates like "00 00 0.661 -06 18 20.89" and "FoV: 176.55°".
- Molecular Line Catalogue:** A spectral plot showing intensity versus frequency (100-900 GHz). It features a grid of labeled molecular lines, including CO, HCO+, H<sub>2</sub>O, and CH<sub>3</sub>OH. A redshift of 0 is indicated.
- Download Selected Data:** A button in the top right corner for downloading data.
- Observation Results and Information:** A table at the bottom listing observation details for various sources.

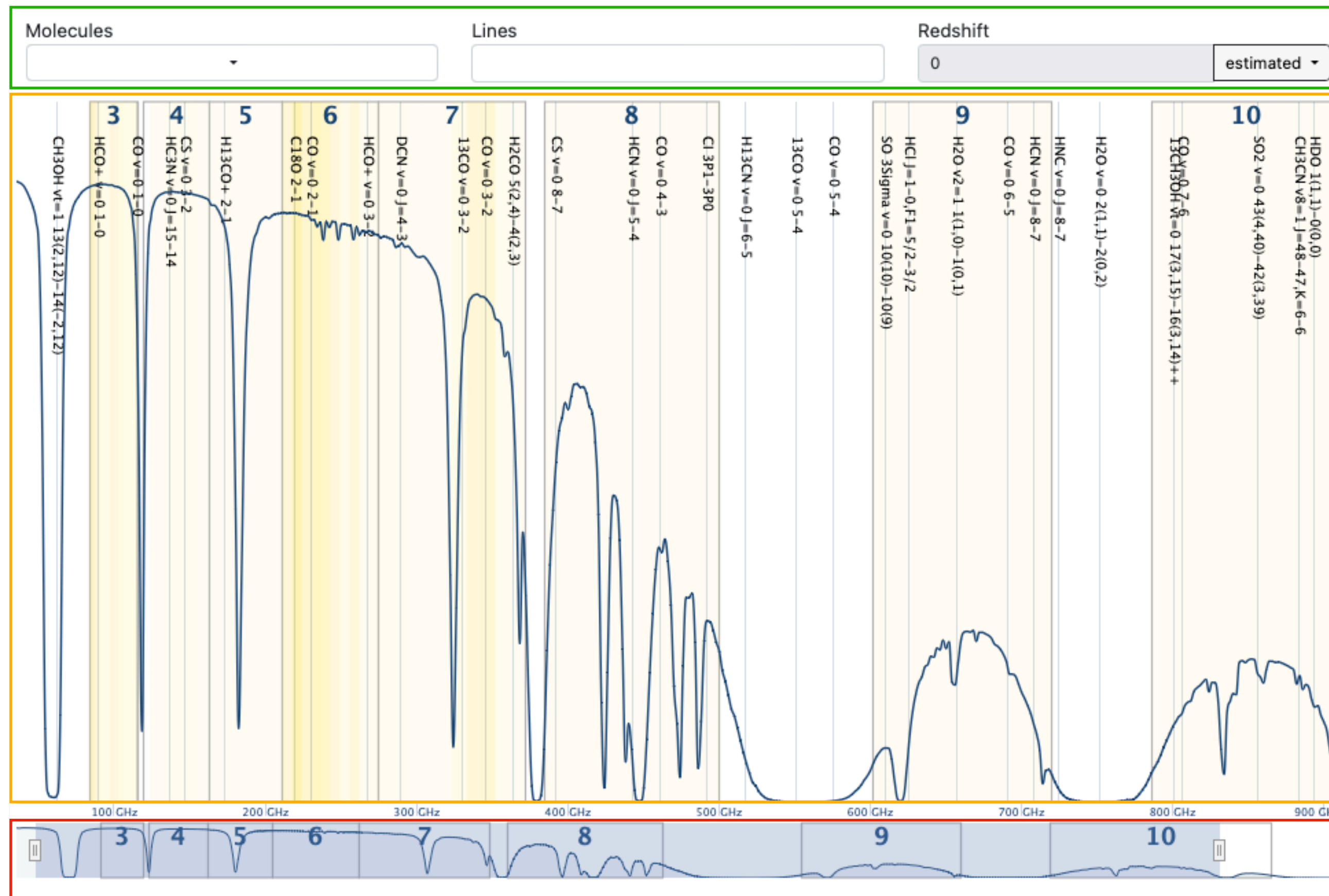
Project code	ALMA source name	RA	Dec	Band	Cont.sens. mJy/beam	Frequency support	Release date	Publicator	Ang.res. arcsec	Min.vel.res. km/s	Array	Mosaic	Max.reco.scale arcsec	FOV arcsec	Scientific category
2011.0.00191.S	Fomalhaut b	22:57:38.685	-29:37:12.616 7		0.1181	343.077..358.839 GHz	2012-12-06	2	1.047	0.816	12m		10.639	16.592	Disks and planet formation
2011.0.00131.S	R Scl	01:26:58.079	-32:32:36.42 7		0.9115	330.246..346.109 GHz	2012-12-06	5	1.043	0.846	12m	mosaic	11.517	62.007	Stars and stellar evolution
2011.0.00101.S	GRB021004	00:26:54.680	+18:55:41.60( 7		0.1136	337.009..353.001 GHz	2012-12-06	2	1.107	26.541	12m		9.257	16.878	Active galaxies
2011.0.00397.S	J061200.23-062209.6	06:12:00.230	-06:22:09.60( 7		0.5346	337.005..352.989 GHz	2012-12-20	3	1.183	26.541	12m		7.819	16.878	Active galaxies
2011.0.00397.S	J063027.81-212058.6	06:30:27.810	-21:20:58.60( 7		0.5346	337.007..352.992 GHz	2012-12-20	3	1.183	26.541	12m		8.015	16.878	Active galaxies
2011.0.00397.S	J041754.10-281655.9	04:17:54.100	-28:16:55.90( 7		0.4848	337.023..353.008 GHz	2012-12-20	3	1.118	26.541	12m		7.842	16.877	Active galaxies
2011.0.00397.S	J035448.24-330827.2	03:54:48.240	-33:08:27.20( 7		0.4848	337.026..353.011 GHz	2012-12-20	3	1.128	26.541	12m		7.950	16.877	Active galaxies
2011.0.00397.S	J054930.06-373940.1	05:49:30.060	-37:39:40.10( 7		0.4848	337.016..353.001 GHz	2012-12-20	3	1.156	26.541	12m		7.888	16.878	Active galaxies
2011.0.00397.S	J070257.20-280842.3	07:02:57.200	-28:08:42.30( 7		0.5346	337.006..352.991 GHz	2012-12-20	3	1.154	26.541	12m		8.053	16.878	Active galaxies
2011.0.00397.S	J043921.92-315908.3	04:39:21.920	-31:59:08.30( 7		0.4848	337.021..353.007 GHz	2012-12-20	3	1.122	26.541	12m		7.867	16.877	Active galaxies
2011.0.00397.S	J040937.67-183757.9	04:09:37.670	-18:37:57.90( 7		0.4848	337.021..353.007 GHz	2012-12-20	3	1.118	26.541	12m		7.810	16.877	Active galaxies
2011.0.00397.S	J030427.53-310838.3	03:04:27.530	-31:08:38.30( 7		0.4848	337.029..353.015 GHz	2012-12-20	3	1.142	26.541	12m		8.026	16.877	Active galaxies

# The ALMA Archive Search Bar

<p><b>Position</b></p> <p>Source name <input style="width: 90%;" type="text" value="Cen A, 20"/></p> <p>ALMA source name <input style="width: 90%;" type="text" value="Centaurus_A"/></p> <p>RA Dec <input style="width: 90%;" type="text" value="04:31:38.425 18:13:57.242, 0.1"/></p> <p>Galactic <input style="width: 90%;" type="text" value="172.10397239 -51.93358710, 5"/></p> <p>Target List <input style="width: 90%;" type="text"/></p> <p>Angular Resolution <input style="width: 90%;" type="text" value="Estimated average angular resolution of the observation."/></p> <p>Max. Recoverable Scale <input style="width: 90%;" type="text" value="Estimated largest angular scale on which features can be detected reliably."/></p>	<p><b>Energy</b></p> <p>Frequency <small>Observed frequency with respect to the Kinematic Local Standard of Rest (LSRK).</small></p> <p>Band <input style="width: 90%;" type="text"/></p> <p>Spectral resolution <small>Estimated median frequency resolution of all the spectral windows.</small></p> <p>Continuum sensitivity <small>Estimated noise in the aggregated continuum bandwidth.</small></p> <p>Line sensitivity (10 km/s) <small>Estimated noise for a 10km/s bandwidth.</small></p>	<p><b>Project</b></p> <p>Project code <input style="width: 90%;" type="text" value="ALMA Project Code."/></p> <p>Project Title <input style="width: 90%;" type="text" value="ALMA Project Title."/></p> <p>Project abstract <input style="width: 90%;" type="text" value="Abstract text as submitted by the PI."/></p> <p>PI Full Name <input style="width: 90%;" type="text" value="Full name of Principal Investigator."/></p> <p>Proposal authors <input style="width: 90%;" type="text" value="Full name(s) of Co-Investigators."/></p> <p>Science keyword <input style="width: 90%;" type="text"/></p> <p><small>Keywords of the proposal as provided by the PI.</small></p>	<p><b>Publication</b></p> <p>BibCode <input style="width: 90%;" type="text" value="The bibliography code of the publication, as provided by NASA ADS."/></p> <p>Publication Title <input style="width: 90%;" type="text" value="Title of the publication."/></p> <p>Abstract <input style="width: 90%;" type="text" value="Abstract of the publication."/></p> <p>First Author <input style="width: 90%;" type="text" value="First author of the publication."/></p> <p>Authors <input style="width: 90%;" type="text" value="First and/or Co-author(s) of the publication."/></p>	<p><b>Observation</b></p> <p>Observation Date <input style="width: 90%;" type="text" value="Start of the first data-taking of the observation."/></p> <p>Polarisation Type <input style="width: 90%;" type="text"/></p> <p>Member ous id <input style="width: 90%;" type="text"/></p> <p>Object type <input style="width: 90%;" type="text"/></p> <p><input type="checkbox"/> Public data only</p> <p><input type="checkbox"/> Calibration observations</p>
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<p>Names for the same object may have been spelled differently in different ALMA projects</p> <p>ALMA source name</p> <input style="width: 90%;" type="text" value="HL"/> <div style="border: 1px solid #ccc; padding: 2px; margin-top: 5px;"> <p>HL_Tau</p> <p>HL Tau</p> <p>HLTau</p> <p>HL_tau</p> </div>	<p>Currently Available ALMA Bands</p> <table style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 10px;">1</td><td>35..50 GHz</td></tr> <tr><td>3</td><td>84..116 GHz</td></tr> <tr><td>4</td><td>125..163 GHz</td></tr> <tr><td>5</td><td>163..211 GHz</td></tr> <tr><td>6</td><td>211..275 GHz</td></tr> <tr><td>7</td><td>275..373 GHz</td></tr> <tr><td>8</td><td>385..500 GHz</td></tr> <tr><td>9</td><td>602..720 GHz</td></tr> <tr><td>10</td><td>787..950 GHz</td></tr> </table>	1	35..50 GHz	3	84..116 GHz	4	125..163 GHz	5	163..211 GHz	6	211..275 GHz	7	275..373 GHz	8	385..500 GHz	9	602..720 GHz	10	787..950 GHz	<p>Frequency Searching</p> <p>Frequency <input style="width: 90%;" type="text" value="219.56"/></p> <p><small>A single frequency value returns all observations with spectral windows covering this frequency.</small></p> <p>Frequency <input style="width: 90%;" type="text" value="100..300"/></p> <p><small>A frequency range returns all observations with spectral windows overlapping that frequency range.</small></p> <p>Frequency <input style="width: 90%;" type="text" value="219.56   329.33"/></p> <p><small>Multiple frequencies and/or ranges can be given.</small></p>	<p>BibCode <input style="width: 90%;" type="text" value="2023ApJ...951....80"/></p> <p><small>Pro Tip: Click on the Bibcode on ADS to copy to your clipboard and paste in the BibCode search.</small></p> <p><input type="checkbox"/> Public data only</p> <p><small>Show only data that is publicly available. (out of proprietary period)</small></p> <p>Available polarization types</p> <p>Single <input type="checkbox"/> XX or YY</p> <p>Dual <input type="checkbox"/> XX YY</p> <p>Full <input type="checkbox"/> XX XY YX YY</p>	<p>Publication / Observation Searching</p> <p>Band <input style="width: 50%;" type="text"/> Project Title <input style="width: 50%;" type="text"/> Publication Title <input style="width: 50%;" type="text" value="eDisk"/> Polarisation Type <input style="width: 50%;" type="text"/></p> <p><small>an ordered envelopedisk transition in the massive protostellar source g339.881.26</small></p> <p>angular momentum loss in the envelopedisk transition region of the hh 111 protostellar system evidence for magnetic braking</p> <p>early planet formation in embedded disks edisk xvi. asymmetric dust disk driving a multicomponent molecular outflow in the young class 0 protostar gss30 irs3</p> <p>early planet formation in embedded disks edisk. i. overview of the program and first results</p> <p>early planet formation in embedded disks edisk. ii. limited dust settling and prominent snow surfaces in the edgemon class i disk iras 043022247</p> <p>early planet formation in embedded disks edisk. iii. a first highresolution view of submillimeter continuum and molecular line emission toward the class 0 protostar i1527 irs</p> <p>early planet formation in embedded disks edisk. iv. the ringed and warped structure of the disk around the class i protostar i1489 irs</p> <p>early planet formation in embedded disks edisk. ix. highresolution alma observations of the class 0 protostar r cra irs5n and its surroundings</p> <p>early planet formation in embedded disks edisk. v. possible annular substructure in a circumstellar disk in the ced110 irs4 system</p> <p>early planet formation in embedded disks edisk. vi. kinematic structures around the verylowmass protostar iras 162532429</p> <p style="text-align: center;"><small>Type a keyword from the publication that uses ALMA data</small></p>
1	35..50 GHz																					
3	84..116 GHz																					
4	125..163 GHz																					
5	163..211 GHz																					
6	211..275 GHz																					
7	275..373 GHz																					
8	385..500 GHz																					
9	602..720 GHz																					
10	787..950 GHz																					

# The ALMA Archive Line Query



Search interface for the ALMA Archive Line Query. It includes input fields for Molecules, Lines, and Redshift, along with a dropdown menu for Redshift (currently set to 'estimated').

**Molecules:** [Dropdown]

**Lines:** C180

**Redshift:** 0 [estimated]

**Lines:** CO v=0 2-1

**Lines:** HCO<sup>+</sup> | HCN

**Lines:** CO

Does not work because it is less than 3 alphanumeric characters.

**Redshift:** [manual]

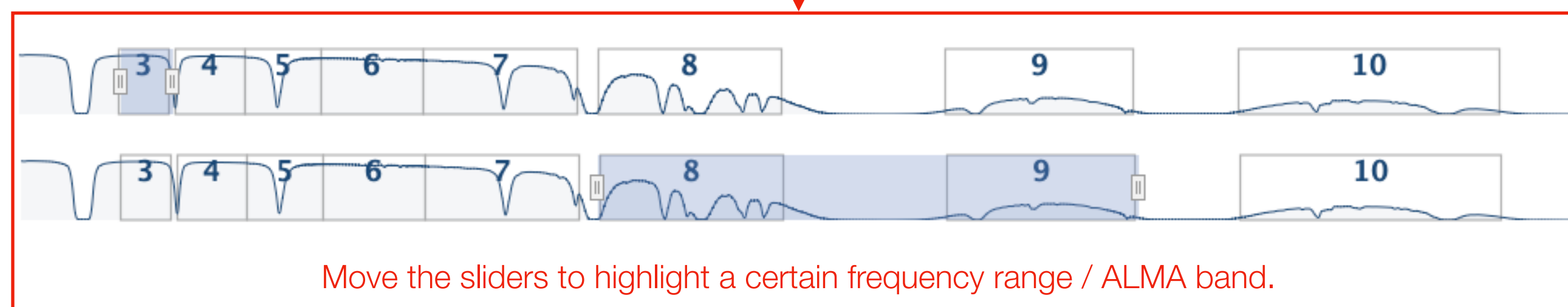
Please provide redshift information when submitting their proposals.

You can manually enter a redshift value to shift the frequencies shown.

## Splat details

**Species:** C18O  
**Name:** Carbon Monoxide  
**Transition:** 2-1  
**Frequency:** 219.56 GHz  
**Redshifted frequency:** 219.56 GHz

When hovering over the line with your mouse, some of the details from Splatologue will be shown.



Search for molecular lines and their properties using

# Splatalogue



# The ALMA Archive Results

For Example

ALMA source name

L1527\_IRS

Columns with filter fields (similar to filtering in the Search Bar, see Slide 3)

Observations (2) Projects (5) Publications (10)

Frequency support: 219.56 Min.vel.res.: <0.1 Array: 12m

Project code	ALMA source name	RA	h:m:s	Dec	d:m:s	Band	Cont.sens. mJy/beam	Frequency support	Release date	Publication	Ang.res. arcsec	Min.vel.res. km/s	Array	Mosaic	Max.reco.scale arcsec	FOV arcsec	Scientific category	Science keyword
2013.1.01086.S	L1527_IRS	04:39:53.910	+26:03:09.80	6	0.0470	219.528..234.975 GHz	2016-09-09	7	0.664	0.082	12m	6.374	25.623	Disks and planet formation	Disks around low-mass stars			
2013.1.01086.S	L1527_IRS	04:39:53.910	+26:03:09.80	6	0.0529	219.528..235.001 GHz	2016-12-04	7	0.185	0.082	12m	2.329	25.622	Disks and planet formation	Disks around low-mass stars			

Observations (9) Projects (5) Publications (10)

Project code	ALMA source name	RA	h:m:s	Dec	d:m:s	Band	Cont.sens. mJy/beam	Frequency support	Release date	Publication	Ang.res. arcsec	Min.vel.res. km/s	Array	Mosaic	Max.reco.scale arcsec	FOV arcsec	Scientific category	Science keyword	Int.Time s	Gal.lon.	Gal.lat.	Min.freq.res. kHz	Pol products	L5 BL
2013.1.01086.S	L1527_IRS	04:39:53.910	+26:03:09.80	6	0.0470	219.528..234.975 GHz	2016-09-09	7	0.664	0.082	12m	6.374	25.623	Disks and planet formation	Disks around low-mass stars	1451.520	173.823273	-13.524055	60.5804	XX YY	41.965			
2013.1.01086.S	L1527_IRS	04:39:53.910	+26:03:09.80	6	0.0529	219.528..235.001 GHz	2016-12-04	7	0.185	0.082	12m	2.329	25.622	Disks and planet formation	Disks around low-mass stars	1451.520	173.823273	-13.524055	60.5736	XX YY	114.821			
2016.1.01245.S	L1527_IRS	04:39:53.900	+26:03:10.00	3	0.0389	99.241..114.338 GHz	2018-03-15	1	2.105	0.371	12m	20.048	54.527	ISM and star formation	Low-mass star formation, Astro...	907.200	173.823204	-13.524048	141.1255	XX YY	28.392			
2019.1.01063.S	L1527_IRS	04:39:53.910	+26:03:08.68	6	3.2559	219.49..234.983 GHz	2021-04-16	4	6.118	0.091	7m	mosaic	38.214	144.518	ISM and star formation	Low-mass star formation	689.311	173.823518	-13.524253	70.5586	XX YY	7.480		
2022.1.00131.S	L1527_IRS	04:39:53.000	+26:03:09.00	3	0.0934	99.969..115.591 GHz	2024-05-03	0	1.085	0.366	12m	16.155	54.026	ISM and star formation	Outflows, jets and ionized winds...	4838.400	173.821208	-13.526815	141.1276	XX YY	36.709			
2022.1.00131.S	L1527_IRS	04:39:53.000	+26:03:09.00	6	0.8329	217.071..234.743 GHz	2024-06-28	0	5.289	0.183	7m	36.773	44.187	ISM and star formation	Outflows, jets and ionized winds...	725.760	173.821208	-13.526815	141.1179	XX YY	7.317			
2023.1.00592.S	L1527_IRS	04:39:53.875	+26:03:09.51	6	0.4753	213.517..233.006 GHz	2024-10-13	0	6.227	0.182	7m	37.546	44.711	ISM and star formation	Low-mass star formation, Astro...	2116.800	173.823251	-13.524206	141.1057	XX YY	7.816			
2023.1.00592.S	L1527_IRS	04:39:53.875	+26:03:09.51	6	0.0319	213.52..232.945 GHz	2024-12-26	0	0.175	0.182	12m	3.081	26.085	ISM and star formation	Low-mass star formation, Astro...	2600.640	173.823251	-13.524206	141.1190	XX YY	90.179			
2023.1.00592.S	L1527_IRS	04:39:53.875	+26:03:09.51	6	0.0468	213.52..232.933 GHz	2025-04-16	0	1.398	0.182	12m	13.890	26.085	ISM and star formation	Low-mass star formation, Astro...	695.520	173.823251	-13.524206	141.1292	XX YY	19.604			

1. Select observation
2. Center spectral coverage in Line Query viewer
3. Center sky for source
4. Show text-based similarity for source
5. Explore and download observation
6. Preview data for source

Project 2013.1.01086.S

Project title: Physical Properties in "Hot" Rings around Protostars

PI name: Koyamatsu, Shin

Proposal abstract: We propose the ALMA Cycle 2 observations toward three protostars to reveal the physical properties in "hot" ring regions. ALMA Cycle 0 observations with the angular resolution of 0.8 arcsec have revealed that SO emission shows PV diagram, which is explained by rotating ring. This feature is quite different from that of C18O emission, which shows Keplerian rotation at the innermost region. The SO molecules might be heated above the sublimation temperature by accretion shock. In the ALMA Cycle 2, we will observe three transitional lines of SO emission in Band 6 and 7, which allow us to perform LVG calculations to investigate the physical properties in the hot ring region. We can distinguish the hot ring from other region with the angular resolution of 0.2 arcsec. We will also observe C18O lines to derive column density toward these regions. C18O also provide the measurements of Keplerian rotation with better resolution. If the hot rings are actually in shock condition, it will be the first example for directly imaging the accretion shock region. ALMA Cycle 2 observations are the first opportunity for approaching the detailed physical conditions in protostellar envelopes.

Acknowledgement: This paper makes use of the following ALMA data: ADS/JAO.ALMA#2013.1.01086.S ALMA is a partnership of ESO (representing its member states), NSF (USA) and NINS (Japan), together with NRC (Canada), MOST and ASIAA (Taiwan), and KASI (Republic of Korea), in cooperation with the Republic of Chile. The Joint ALMA Observatory is operated by ESO, AUI/NRAO and NAOJ/in addition, publications from NA authors must include the standard NRAO acknowledgement: The National Radio Astronomy Observatory is a facility of the National Science Foundation operated under cooperative agreement by Associated Universities, Inc.

When hovering over the project code with your mouse, the Project Title, PI, Abstract and Acknowledgement will be shown.

How to tell if the project is publicly available?

↑ Release date

2024-12-26 → No outline means the data is publicly available

2025-04-16 → Red outline means the data is not publicly available

Frequency Support

Frequency	Resolution	Sensitivity 10K/s	Sensitivity native	Pol. Product	Type
219.53..219.59GHz	61.04kHz	0.81mJy/beam@10km/s	0.29uJy/beam@native	XX YY	line
219.92..219.98GHz	61.04kHz	0.81mJy/beam@10km/s	0.29uJy/beam@native	XX YY	line
220.37..220.42GHz	60.58kHz	0.81mJy/beam@10km/s	0.29uJy/beam@native	XX YY	line
230.51..230.56GHz	70.56kHz	0.81mJy/beam@10km/s	0.29uJy/beam@native	XX YY	line
231.29..231.35GHz	70.56kHz	0.81mJy/beam@10km/s	0.29uJy/beam@native	XX YY	line
232.99..234.98GHz	31250.00kHz	0.81mJy/beam@10km/s	0.05uJy/beam@native	XX YY	continuum

When hovering over the frequency support with your mouse, the Frequency, Resolution, Line Sensitivities, Polarization and Spectral Window Type will be shown.

Columns

Columns can be reordered by drag & drop

RA Right Ascension of the telescope pointing

Dec Declination of the telescope pointing

Band ALMA receiver band

All rows Only selected rows

VOTable CSV TSV

# The ALMA Archive Results

For Example

ALMA source name

L1527\_IRS

### Show the associated ALMA projects

Observations (9) **Projects (5)** Publications (10)

Project Code	Project Title	Type	Joint proposals	PI Name	Proposal authors	↑ Max. Release D	Publications	Observation: SB names
2013.1.01086.S	Physical Properties in ``Hot'' Rings around Protostars	S		Koyamatsu, Shin	Yen, Hsi-Wei; Tomisa...	2016-12-04	7	12 L1527_IR_a_06_TC, L1527_IR_a_06_TE
2016.1.01245.S	Laying the groundwork for future ALMA direct magnetic field detection	S		Cox, Erin	Tobin, John; Looney, ...	2018-03-15	1	21 IRAM_041_a_03_TM1, L1527_IR_a_03_TM1, Oph_MMS__a_03_TM1,...
2019.1.01063.S	The Kinematical Transition between the Envelope and Core around Young Embedded Protostars	S		Sai, Jinshi	Maret, Sébastien; Yen...	2021-04-16	4	10 IRAS_153_a_06_7M, L1489_IR_a_06_7M
2023.1.00592.S	Characterizing the sulfur family in low-mass protostars	S		van Gelder, Martijn	van Dishoeck, Ewine; ...	2025-10-30	0	47 L1527_IR_a_06_7M, L1527_IR_a_06_TM1, L1527_IR_a_06_TM2, Per-...
2022.1.00131.S	Outflows in Class 0/I Protostars with ALMA: A multi-scale approach	S		Plunkett, Adele	Tobin, John; Narayan...	2025-11-27	0	210 B335_a_03_7M, B335_a_03_TM1, B335_a_06_7M, B335_a_06_TP,...

### Show the associated publications using the ALMA observations

Observations (9) Projects (5) **Publications (10)**

BibCode	First Author	Journal	Year	Publication Title	↑ Max. Release D	Projects	Observation: Authors
2020ApJ...893...51S	Sai, Jinshi	ApJ	2020	Disk Structure around the Class I Protostar L1489 IRS Revealed by ALMA: A Warped-disk System	2016-12-04	1	12 Sai, Jinshi; Ohashi, Nagayoshi; Saigo, Kazuya; Matsumoto, Tomoaki; Aso, Yusuke; Takakuwa, Shigehisa;...
2018A&A...615A..83V	van 't Hoff, Merel L. ...	A&A	2018	Unveiling the physical conditions of the youngest disks. A warm embedded disk in L1527	2016-12-04	1	12 van 't Hoff, Merel L. R.; Tobin, John J.; Harsono, Daniel; van Dishoeck, Ewine F.
2022ApJ...933...23O	Ohashi, Satoshi	ApJ	2022	No Evidence of the Significant Grain Growth but Tentative Discovery of Disk Substructure in a Disk arou...	2017-10-21	2	17 Ohashi, Satoshi; Kobayashi, Hiroshi; Sai, Jinshi; Sakai, Nami
2024A&A...686A.143G	Guzmán Ccolque, E.	A&A	2024	Episodicity in accretion-ejection processes associated with IRAS 15398-3359	2021-04-16	2	26 Guzmán Ccolque, E.; Fernández López, M.; Vazzano, M. M.; de Gregorio, I.; Plunkett, A.; Santamaría-Mi...
2023ApJ...944..222S	Sai, Jinshi (Insa Choi)	ApJ	2023	Probing Velocity Structures of Protostellar Envelopes: Infalling and Rotating Envelopes within Turbulent ...	2021-04-16	3	38 Sai, Jinshi (Insa Choi); Ohashi, Nagayoshi; Yen, Hsi-Wei; Maury, Anaëlle J.; Maret, Sébastien
2024ApJ...966..192S	Sai, Jinshi	ApJ	2024	Multiple Outflows around a Single Protostar IRAS 15398-3359	2021-04-16	1	10 Sai, Jinshi; Yen, Hsi-Wei; Machida, Masahiro N.; Ohashi, Nagayoshi; Aso, Yusuke; Maury, Anaëlle J.; Mar...
2022ApJ...925...12S	Sai, Jinshi	ApJ	2022	Which Part of Dense Cores Feeds Material to Protostars? The Case of L1489 IRS	2021-04-16	1	10 Sai, Jinshi; Ohashi, Nagayoshi; Maury, Anaëlle J.; Maret, Sébastien; Yen, Hsi-Wei; Aso, Yusuke; Gaudel, ...
2023ApJ...951...8O	Ohashi, Nagayoshi	ApJ	2023	Early Planet Formation in Embedded Disks (eDisk). I. Overview of the Program and First Results	2023-07-20	7	173 Ohashi, Nagayoshi; Tobin, John J.; Jørgensen, Jes K.; Takakuwa, Shigehisa; Sheehan, Patrick; Aikawa, ...
2023A&A...676A...4C	Cacciapuoti, L.	A&A	2023	FAUST. IX. Multiband, multiscale dust study of L1527 IRS. Evidence for variations in dust properties wit...	3000-01-01	20	563 Cacciapuoti, L.; Macias, E.; Maury, A. J.; Chandler, C. J.; Sakai, N.; Tychoniec, Ł.; Viti, S.; Natta, A.; De S...
2019Natur.565..206S	Sakai, Nami	Nature	2019	A warped disk around an infant protostar	3000-01-01	2	21 Sakai, Nami; Hanawa, Tomoyuki; Zhang, Yichen; Higuchi, Aya E.; Ohashi, Satoshi; Oya, Yoko; Yamamoto...

# Downloading Data From The ALMA Archive

## For Example

ALMA source name

L1527\_IRS

## Step 1:

Log in to your ALMA account

Enter your Userid and Password

Userid

Password

Sign In

If the data is yours and still in the proprietary period, you will be able to download once logged in.

## Step 2: Select the data you want to download

### Types of files available for download:

**Products** are fits images/cubes produced from running the scriptForImaging.py during the data calibration pipeline.

**Auxiliary / Script** are any additional files and calibration / imaging scripts that are used for doing the pipeline calibration.

**Raw / Raw (semipass)** are the QA2 pass and QA2 semipass raw data, respectively, used in the pipeline calibration.

**Readme** is the readme file that contains information on the observations and some QA2 information.

### File selection and download:

Use the select buttons at the top to select which types of data you want to download, or manually select each the ones you want using the individual checkboxes.

Once the data is selected, press the green **Download** button in the top left corner of the page.

Download 453 MB Open legacy Request Handler

Select all Readme Product tar Auxiliary tar Raw tgz Raw (semipass) tgz External tar

Name	Size	Project	GOUS	MOUS
<input checked="" type="checkbox"/> uid__A002_Xaa5cf7_X5fc1.ms.split.cal.field4.contsub.spw0.clean.flux.fits.gz	(product) 607 MB	2013.1.01086.S	uid://A001/X13a/X14e	uid://A001/X13a/X14f
<input checked="" type="checkbox"/> 2013.1.01086.S_uid__A001_X13a_X14f_auxiliary.tar	(auxiliary, script) 108 MB	2013.1.01086.S	uid://A001/X13a/X14e	uid://A001/X13a/X14f
<input checked="" type="checkbox"/> member.uid__A001_X13a_X14f.README.txt	(readme) 14 kB	2013.1.01086.S	uid://A001/X13a/X14e	uid://A001/X13a/X14f
<input checked="" type="checkbox"/> 2013.1.01086.S_uid__A002_Xaa5cf7_X5fc1.asdm.sdm.tar	(raw) 31 GB	2013.1.01086.S	uid://A001/X13a/X14e	uid://A001/X13a/X14f
<input checked="" type="checkbox"/> uid__A002_Xaa5cf7_X5fc1.ms.split.cal.field4.contsub.spw0.clean.pbcor.fits	(product) 2 GB	2013.1.01086.S	uid://A001/X13a/X14e	uid://A001/X13a/X14f
<input checked="" type="checkbox"/> 2013.1.01086.S_uid__A001_X13a_X151_001_of_001.tar	(product) 453 MB	2013.1.01086.S	uid://A001/X13a/X14e	uid://A001/X13a/X151
<input checked="" type="checkbox"/> 2013.1.01086.S_uid__A002_Xa16f89_X3d53.asdm.sdm.tar	(raw) 28 GB	2013.1.01086.S	uid://A001/X13a/X14e	uid://A001/X13a/X151
<input checked="" type="checkbox"/> 2013.1.01086.S_uid__A001_X13a_X151_auxiliary.tar	(auxiliary, script) 358 MB	2013.1.01086.S	uid://A001/X13a/X14e	uid://A001/X13a/X151
<input checked="" type="checkbox"/> uid__A002_Xa16f89_X3d53.ms.split.cal.field4.contsub.clean.flux.fits.gz	(product) 27 MB	2013.1.01086.S	uid://A001/X13a/X14e	uid://A001/X13a/X151
<input checked="" type="checkbox"/> member.uid__A001_X13a_X151.README.txt	(readme) 12 kB	2013.1.01086.S	uid://A001/X13a/X14e	uid://A001/X13a/X151
<input checked="" type="checkbox"/> uid__A002_Xa16f89_X3d53.ms.split.cal.field4.contsub.clean.pbcor.fits	(product) 78 MB	2013.1.01086.S	uid://A001/X13a/X14e	uid://A001/X13a/X151

Band: 6  
Frequency range: 219.917..219.975  
Frequency resolution: 61.035 kHz  
Line sens. (10km/s): 0.946mJy/beam  
Line sens. (native): 0.335uJy/beam  
Polarizations: XX YY  
Array: 12m

## Bonus: Explore the product fits files before downloading!

uid\_\_A002\_Xaa5cf7\_X5fc1.ms.split.cal.field4.contsub.spw0.clean.pbcor.fits (product)

Band: 6  
Frequency range: 219.917..219.975  
Frequency resolution: 61.035 kHz  
Line sens. (10km/s): 0.946mJy/beam  
Line sens. (native): 0.335uJy/beam  
Polarizations: XX YY  
Array: 12m

open interactive preview

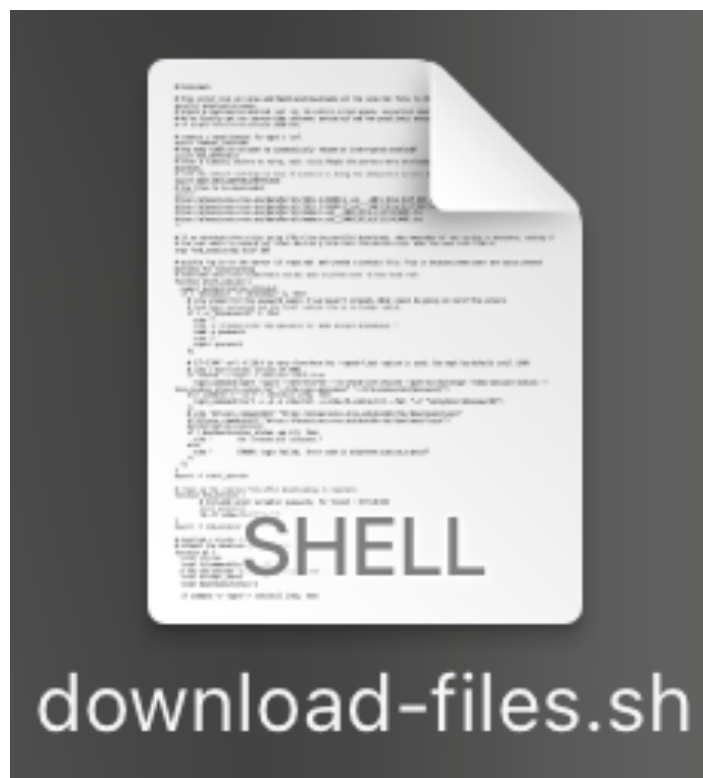
open in CARTA

# Downloading Data From The ALMA Archive

## Step 3a: Download using the modern interface



Clicking the **Download** button will download a file called **download-files.sh**



This script runs on Linux and MacOS and downloads all the selected files to the current working directory in up to 5 parallel download streams.

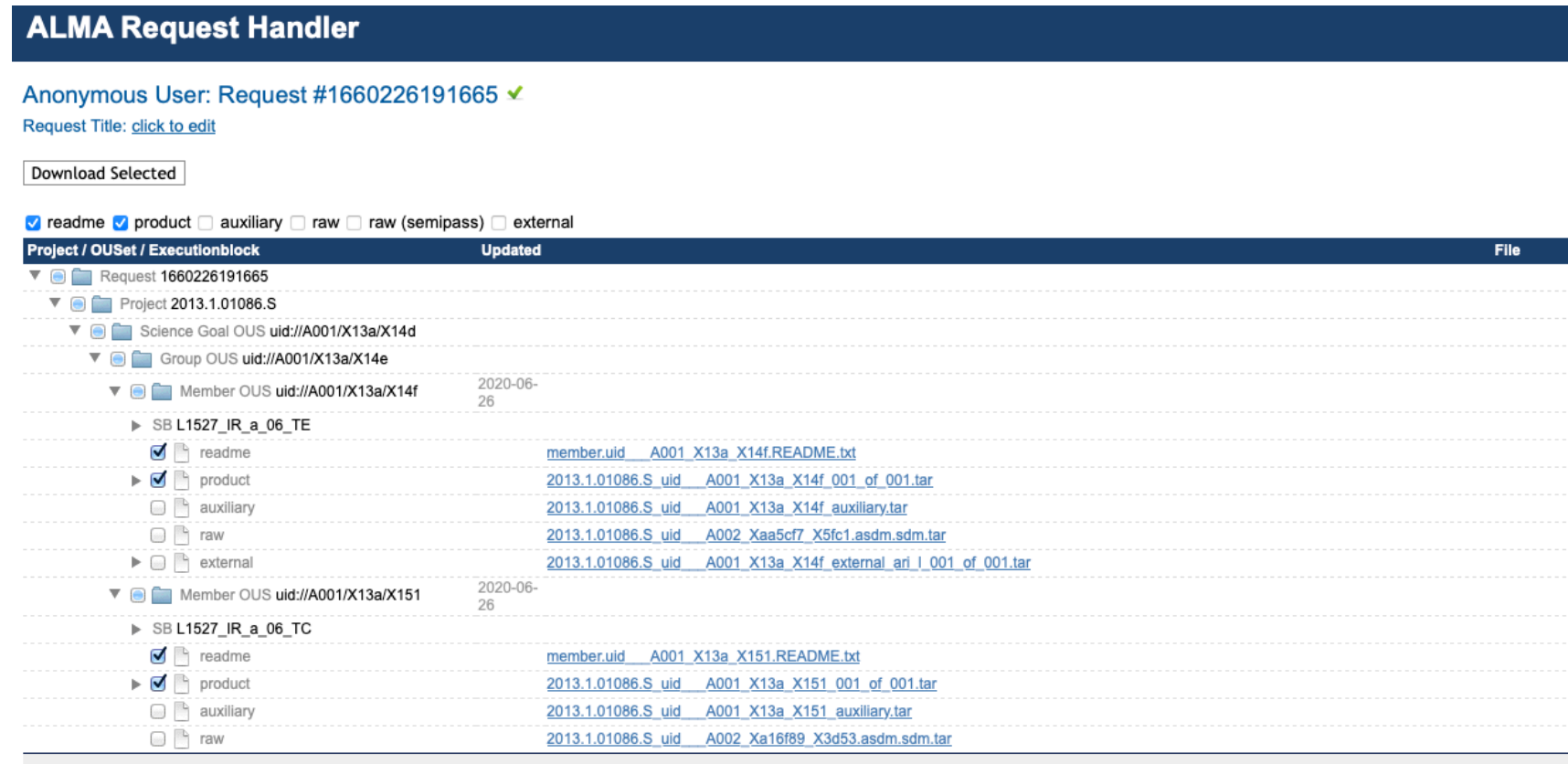
Should a download be aborted just run the entire script again, as partial downloads will be resumed.

### To run the script:

```
user@Computer % chmod u+x download-files.sh
```

```
user@Computer % ./download-files.sh
```

## Step 3b: Download using the legacy interface



Select the files you wish to download and click **Download Selected**.

### Choose one of the following download methods:

**Download Script**

The downloads are scripted for you. You just need to execute the script from the command line, after making it executable by typing `chmod u+x download*.sh`

**Java Download Manager**

ALMA's download manager had to be discontinued due to changes in java. Please use one of the other options instead.

**File List**

View a text file containing a list of URLs. This is useful for using third-party download manager's such as *DownThemAll*.

Choose between two main methods:

- 1) **Download Script** is the same as the method in Step 3a. It downloads a **download\*.sh** file which can be executed in your terminal.
- 2) **File List** takes you to a page that contains a list of download URLs, which is useful when downloading via third-party software.

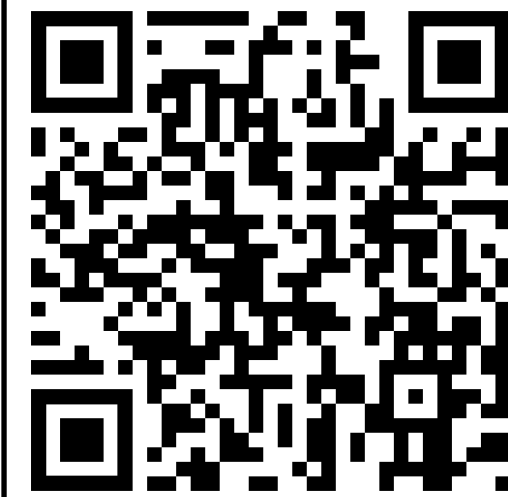
**Note:** the Java download manager method has been discontinued.

**Let's practice!**

# Access The ALMA Archive Using Python



astropy/astroquery



```
>>> from astropy import coordinates
>>> from astropy import units as u
>>> galactic_center = coordinates.SkyCoord(0*u.deg, 0*u.deg,
...                                       frame='galactic')
>>> alma = Alma()
>>> alma.archive_url = 'https://almascience.eso.org' # optional to make doctest work
>>> gc_data = alma.query_region(galactic_center, 1*u.deg)
>>> print(gc_data)
obs_publisher_did  obs_collection  facility_name  ...  scientific_category
-----
ADS/JA0.ALMA#2012.1.00133.S  ALMA  JA0 ...  ISM and star formatio
```

```
>>> from astroquery.alma.core import Alma
>>> from astropy import coordinates
>>> from astropy import units as u
>>> s255ir = coordinates.SkyCoord(93.26708333, 17.97888889, frame='fk5',
...                               unit=(u.deg, u.deg))
>>> alma = Alma()
>>> alma.archive_url = 'https://almascience.eso.org' # optional to make doctest work
>>> result = alma.query_region(s255ir, radius=0.034*u.deg)
>>> uid_url_table = alma.get_data_info(result['member_ous_uid'][0], expand_tarfiles=True)
>>> # downselect to just the FITS files
>>> fits_urls = [url for url in uid_url_table['access_url'] if '.fits' in url]
>>> filelist = alma.download_files(fits_urls[:5])
```

```
[1]: import alminer
import pandas
from astropy.io import ascii

[2]: myquery = alminer.target(['Orion KL', "AB Aur"])

=====
alminer.target results
=====
Target = Orion KL
-----
Number of projects = 23
Number of observations = 38
Number of unique subbands = 129
Total number of subbands = 160
18 target(s) with ALMA data = ['OMC1_NW', 'Orion-KL', 'orion_kl', 'BN-KL', 'OMC1_SE', '01

[3]: alminer.download_data(observations, fitsonly=True, dryrun=True, location='./data',
                           filename_must_include=['_sci', '.pbcor', 'cont', 'G31.41'],
                           print_urls=True)

=====
This is a dryrun. To begin download, set dryrun=False.
=====
Download location = ./data
Total number of Member OUSs to download = 3
Selected Member OUSs: ['uid://A001/X133d/X325', 'uid://A001/X133d/X327', 'uid://A001/X133d/X327']
Number of files to download = 4
Needed disk space = 48.9 MB
File URLs to download = https://almascience.eso.org/dataPortal/member.uid__A001_X133d_X325_G31.41p0.31_sci.spv
https://almascience.eso.org/dataPortal/member.uid__A001_X133d_X325_G31.41p0.31_sci.spv
https://almascience.eso.org/dataPortal/member.uid__A001_X133d_X327_G31.41p0.31_sci.spv
https://almascience.eso.org/dataPortal/member.uid__A001_X133d_X327_G31.41p0.31_sci.spv
https://almascience.eso.org/dataPortal/member.uid__A001_X133d_X327_G31.41p0.31_sci.spv
=====
```

A decorative header image showing a colorful nebula or galaxy with blue, red, and white hues.

# Thank you!

Any questions?