# Using the ALMA Archive

 Public and proprietary data are available from the ALMA archive. Public data can be downloaded anonymously.

https://almascience.nrao.edu/alma-data/archive

# Data format

Data for a project is delivered to the PI in one or more discrete deliveries. Each delivery corresponds to a related set of observations, and has its own release date. Deliveries are usually split into multiple tar files, **all of which need to be downloaded and untarred in the same directory in order to produce the full data directory tree.** 

The tar files of a delivery contain scripts and logs, calibration tables and representative images, as well as one or more README files.

Till date ALMA has observed and archived the following data

- Science Verification (to be downloaded from a separate link)
- Cycle 0
- Cycle 1
- Cycle 2 Observations are being carried out.
- Cycle 3 Call for proposals deadline 23<sup>rd</sup> April

Proprietary data is for **1 year (from release date)**, which means any data *released* before 1 year are available to all.

## Archive: You can see the images before downloading the data (data files are huge!!)

# http://jvo.nao.ac.jp/portal/top-page.do







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I am a guest

=> Location: Top Page > ALMA > ALMA Archive

### ALMA Archive

#### Using the data for publication

The following statement should be included in the acknowledgment of papers using the ALMA datasets obtained from the JVO portal:

"This paper makes use of the following ALMA data: ADS/JAO.ALMA#<Project code>. ALMA is a partnership of ESO (representing its member with the Republic of Chile. The Joint ALMA Observatory is operated by ESO, AUI/NRAO and NAOJ."

You can find the project code (e.g. 2011.0.01234.S) on the dataset info page where you download the data.

Please also include the following sentence on the title page as a footnote to the title or in the acknowledgment of the paper.

"[Part of] the data are retrieved from the JVO portal (http://jvo.nao.ac.jp/portal) operated by the NAOJ"

Ta	arget	Name Project Code (	Coords Frequency Des	ktop Viev
S	Sort by	: • target · coordinates Upda	ate	
	#	Target Name	Coords	# of Data
	1	113083	10h00m48.054715 +02d01m06.64360	1
	2	1374240	10h03m02.530788 +01d42m06.41200	1
	3	2dFGRS_S833Z022	04h14m37.481616 -22d48m25.60079	2
	4	2MASS_0444+2512	04h44m27.149158 +25d12m16.13999	3
	5	2MASS_J04182147+1658470	04h18m21.516406 +16d58m46.33201	2
	6	2MASS_J04242321+2650084	04h24m23.265230 +26d50m07.80961	2
	7	2MASS_J04314503+2859081	04h31m45.089422 +28d59m07.52881	2
	8	2MASS_J04403979+2519061	04h40m39.840674 +25d19m05.46121	2
	9	2MASS_J04420548+2522562	04h42m05.533661 +25d22m55.64161	2
	10	2MASS J16124119-1924182	16h12m41.194848 -19d24m18.38621	1
	11	2MASS_J16223757-2345508	16h22m37.582966 -23d45m50.93381	1
	12	2MASS_J16251469-2456069	16h25m14.698044 -24d56m06.98381	1
	13	2MASS J16275209-2440503	16h27m52.095074 -24d40m50.43461	1
	14	30 Doradus	05h38m47.434695 -69d04m42.31289	16
	15	47_Tuc_V1	00h24m12.723307 -72d06m40.06922	4
	16	47 Tuc V2	00h24m18.601394 -72d07m59.16601	4
	17	47 Tuo 1/2	00b2Em1E 002722 72d02mE4 00701	E

Find your target/ project/ coords etc and click on the name



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=> Location: Top Page > ALMA > Archive > Target Info

#### ALMA Archive : Target Info

#### Target Name : NGC3256

#### ▶ Filter by Frequency

#	dataset id	ra/dec (J2000)	size (arcmin2)	band	freq. range (GHz)	data type	3rd axis	Cube size (XxYxF) ?	image resol (arcsec)	freq. resol (MHz)	obs date	original fits name
1	ALMA01001371	10h27m51.2-43d54m16	2.16x2.16	Band3	112.376 112.502	intensity cube	velocity	432x432x17x1	0.30	7.388	2012-03-27	line_1_1660-1910.fits
2	ALMA01001372	10h27m51.2-43d54m16	2.16x2.16	Band3	112.376 112.502	intensity cube	velocity	432x432x17x1	0.30	7.388	2012-03-27	calibrated.ms.image.line.source4.spw1.chans1660-1910.fits
3	ALMA01001373	10h27m51.2-43d54m16	2.16x2.16	Band3	114.106 114.306	intensity cube	velocity	432x432x27x1	0.30	7.400	2012-03-27	NGC_cal_0_CO.fits
4	ALMA01001374	10h27m51.2-43d54m16	2.16x2.16	Band3	114.106 114.306	intensity cube	velocity	432x432x27x1	0.30	7.400	2012-03-27	calibrated.ms.image.line.source4.spw0.chans2000-2400.fits
5	ALMA01001375	10h27m51.2-43d54m16	2.16x2.16	Band3	112.037 112.177	intensity cube	velocity	432x432x19x1	0.30	7.368	2012-03-27	calibrated.ms.image.line.source4.spw1.chans970-1250.fits
6	ALMA01001376	10h27m51.2-43d54m16	2.16x2.16	Band3	112.037 112.177	intensity cube	velocity	432x432x19x1	0.30	7.368	2012-03-27	line_1_970-1250.fits
7	ALMA01001475	10h27m51.2-43d54m16	0.45x0.45	Band7	353.163 353.841	intensity cube	frequency	360x360x57x1	0.07	11.899	2012-06-04	N3256_b7_HCO+-4-3_clean.image.fits
8	ALMA01001476	10h27m51.2-43d54m16	0.45x0.45	Band7	342.073 343.088	intensity cube	frequency	360x360x88x1	0.07	11.534	2012-06-04	N3256_b7_CO_3-2_clean.image.fits
9	ALMA01001477	10h27m51.2-43d54m16	0.45x0.45	Band7	340.148 355.650	intensity map	frequency	360x360x1x1	0.07	15,501.786	2012-05-21	N3256_b7_cont_smooth_clean.image.fits
10	ALMA01000372	10h27m51.2-43d54m16	1.33x1.33	Band3	113.959 114.393	intensity cube	velocity	200x200x57x1	0.40	7.618	2011-12-29	NGC3256_B3_comp_CO_1-0_clean_cube.fits
11	ALMA01000373	10h27m51.2-43d54m16	1.33x1.33	Band3	114.305 114.313	intensity map	frequency	200x200x1x1	0.40	7.690	2011-12-29	NGC3256_B3_comp_CO_1-0_clean_mom0.fits
12	ALMA01000374	10h27m51.2-43d54m17	1.40x1.40	Band3	99.562 115.000	intensity map	frequency	200x200x1x1	0.42	15,437.000	2011-12-29	NGC3256_B3_comp_cont_smooth.ms_clean.fits
13	ALMA01000375	10h27m51.2-43d54m16	0.47x0.47	Band7	342.062 343.067	intensity cube	velocity	200x200x88x1	0.14	11.428	2012-01-24	N3256_b7_CO_3-2_clean.image.fits
14	ALMA01000376	10h27m51.2-43d54m16	0.47x0.47	Band7	343.045 343.057	intensity map	frequency	200x200x1x1	0.14	11.534	2012-01-24	N3256_B7_CO_3-2_comp_clean.image.mom0.fits
15	ALMA01000377	10h27m51.2-43d54m16	0.47x0.47	Band7	340.157 355.659	intensity map	frequency	200x200x1x1	0.14	15,502.145	2012-01-24	N3256_b7_cont_smooth_clean.image.fits
16	ALMA01000378	10h27m51.2-43d54m16	0.47x0.47	Band7	353.245 353.669	intensity cube	velocity	200x200x36x1	0.14	11.792	2012-01-24	N3256_b7_HCO_4-3_clean.image.fits
17	ALMA01000379	10h27m51.2-43d54m16	0.47x0.47	Band7	353.644 353.656	intensity map	frequency	200x200x1x1	0.14	11.899	2012-01-24	N3256_B7_HCO_4-3_comp_clean.image.mom0.fits

More or less all relevant information about your data are there in the table.

eg. to see the integrated intensity CO 1-0 line image, click on number 11.



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=> Location: Top Page > ALMA > Archive > Target Info > Dataset Info

### ALMA Archive : Dataset Info

Summary	Binning Data	Desktop V	iewer	Using the	data				
Target			Data	set ID					
NGC32	56		-	ALMA01000373					
- Coord (R4	(DEC. 12000)		- Date	of Observatio	ns				
10h27n	n51.2-43d54m16		Duit	2011-12-29	115				
- Image Size	(arcmin2)		- Imar	ne Recol (arcs	ec)				
1.33x1.	33		• mag	).40	66)				
- Band Nam	•		- Data	Type					
Band3	<b>c</b>			ntensity map					
Frog Bong			Cno	strum Bacal (	ALL-1				
114.30	5 114 313		<ul> <li>Spectrum Resol. (MH2) 7.690</li> <li>Original Filename</li> </ul>						
Cube Pix ?									
200x20	0x1x1		1	NGC3256_B3_0	omp_CO_1-0_	_clean_mom0	.fits		
3rd(4th) A	cis		Proj	ect Code					
frequer	ісу		-	2011.0.00525.S					
data id	image		spect	file size (byte)	Download	Web QL	Readme		
ALMA010003	373			227,520	Download	Web QL	Readme		

**Acknowledgement**: Results are based on data obtained from the Japanese Virtual Observatory, which is operated by the Astronomy Data Center, National Astronomical Observatory of Japan

#### Data Information

Data Set ID	Object Name	• R.A.	• Dec.	Observation Date (UTC)
ALMA01000373	NGC3256	10h27m51.40s	-43d54m18.400s	2012-01-29T18:57:51.001Z



To download a Science Verification data. In the ALMA archive page, Go to: https://almascience.nrao.edu/alma-data/archive Science Verification

## We will download the data for NGC 3256

About	You are here: Home > Data > Science Verification
Science	
Proposing	For general information on the Science Verification process as well as the status and future plans of Science
Observing	Verification projects, please use the link below:
Data	Science Verification Information
Archive	
Calibrator Catalogue	
Science Verification	Currently Available Science Verification Data:
ALMA Science	We now have several datasets available to demonstrate the early capabilities of ALMA. In some cases these projects were observed before 16 antennas
Verification	were available and while many of the subsystems were still being tested, so they should not be construed to represent the quality of the data that can be
Data Processing	expected from the system as it is today. They are provided here as a means for the user to become acquainted with the ALMA data structure, observing strategies and reduction techniques. Given that the data have been taken during the construction phase, there may be more idiosyncrasies present than
Documents & Tools	will be expected during full operations, so we ask the user to please review carefully the CASA guides provided with the datasets that represent unique observing modes or strategies, as indicated below.
Knowledgebase/FAQ	Note that only data with propaged CASA guides are kent up to date with the current CASA release. For the other data, please consult the following
	knowledge base article: "If my data were calibrated and imaged in CASA 3.3 and I want to redo it, are there resources to help?"
User Services at ARCs	For reference the list of Science Verification targets that was provided with the Cycle 0 Call for Proposals is given in Table 2 which indicates which
Helpdesk	observations have been completed or are in progress. We do not expect to observe the other sources on that list.
ALMA Calendars	1. TW Hya: Band 7, high spectral resolution. Many thanks to the following people for suggesting this source for ALMA Science Verification: Meredith
EU ARC	Hughes, Stuartt Corder, Chunhua Qi, Karin Oberg, Michiel Hogerheide, Andrea Isella, Dmitry Semenov.
NA ARC	Additional data on TW Hya is available (without a separate CASA guide) here: Band 3, Band 6.
EA ARC	2. NGC3256: Band 3, low spectral resolution. Many thanks to the following people for suggesting this source for ALMA Science Verification: Kazushi Sakamoto, Alison Peck Satoki Matsushita, Martin Zwaan.
	3. Antennae galaxies: Band 7, high spectral resolution. Many thanks to the following people for suggesting this source for ALMA Science Verification: Christine Wilson. Junko Ueda. Francois Boulanger. Nicole Nesvadba. Cinthva Herrera.

You can get more detail about the project by clicking on the link for NGC 3256.

# Scroll down to

#### Using the data for publication

The following statement should be included in the acknowledgment of papers using the datasets listed above:

"The Atacama Large Millimeter/submillimeter Array (ALMA), an international astronomy facility, is a partnership of Europe, North America and East Asia in cooperation with the Republic of Chile. This paper makes use of the following ALMA Science Verification data: ADS/JAO.ALMA#2011.0.00002.SV"

#### **Obtaining the Data**

The data products are contained in three downloadable files:

- · Uncalibrated data with tables for reduction
- Calibrated data
- Reference images
- and can be downloaded here: NGC3256 ALMA Science Verification Data

PLEASE make full use of the CASA Guides provided for this data set: NGC3256 Band 3 CASA Guide (This link will take you to an external web site, hosting the CASA Guides.)

NOTE: This script was developed in CASA version 3.3. It will not run in later version of CASA. For additional information see the following knowledge base article: "If my data were calibrated and imaged in CASA 3.3 and I want to redo it, are there resources to help?".

# Index of /almadata/sciver/NGC3256

Name	<u>Last modified</u>	<u>Size</u>	<u>Description</u>
Parent Directory		-	
00-README.TXT	01-Jun-2011 11:53	1.4K	
<u>Ol_NGC3256_Band3_CalibratedData.tgz.torrent</u>	01-Jun-2011 00:18	19K	
01 NGC3256 Band3 ReferenceImages.tgz.torrent	01-Jun-2011 00:18	2.1K	
01_NGC3256_Band3_UnCalibratedMSandTablesForReduction.tgz.torrent	01-Jun-2011 00:18	17K	
NGC3256_Band3_CalibratedData_CASA3.3.tgz	31-May-2011 23:23	482M	
NGC3256 Band3 CalibratedData CASA4.tgz	09-Nov-2012 05:00	563M	
NGC3256 Band3 ReferenceImages CASA3.3.tgz	31-May-2011 23:23	5.9M	
NGC3256 Band3 ReferenceImages CASA4.tgz	09-Nov-2012 05:00	5.9M	
NGC3256_Band3_UnCalibratedMSandTablesForReduction.tgz	31-May-2011 23:27	426M	
NGC3256_Band3_UnCalibratedMSandTablesForReduction/	13-Sep-2011 10:31	-	
<u>cksum list.txt</u>	18-Aug-2011 15:38	431	
<u>md5sums.txt</u>	12-Feb-2015 13:33	739	

# How to get a data set from Archive:

# 1. Go to

### https://almascience.nrao.edu/alma-data/archive



# 2. Go to Archive Query

ALMA Science Arc	hive Query		
Query Form Results Table			
Search Reset			Query Help
Position	Energy	Time	Polarisation
Source name (Sesame) Source name (ALMA) RA Dec	Frequency Bandwidth Spectral resolution Band	Observation date Integration time	Polarisation type
Observation	Project		Options
Water vapour	Project code Project title PI name		View: ● raw data ○ project ✓ public data only ✓ science observations only

# To download Cycle 0 or Cycle 1 data for NGC 3256

In the query form, insert the information you have about the object, in this case I wrote the name of the target: NGC 3256, and then click **Search** 



You can place the cursor on each input and learn more about them and also know the format In which the input should be given.

# ALMA Science Archive Query

Query	Form	Table							
Submit	download request	$\supset$					Results Bookm	ark Export Table Res	sults Help
Showing	6 rows (6 before filtering)							Mor	e columns
	Project code	Source name	RA	Dec	Band	Integration	Release date 🔺	Velocity resolution	Frequency support
Filter:								m/s	
	2011.0.00525.S	NGC3256	10:27:51.23	-43:54:16.6	3	473.064	2013-05-01T09:40:00.000	2729.75	99.56115.00GHz
	2011.0.00525.S	NGC3256	10:27:51.23	-43:54:16.6	3	518.19	2013-05-01T09:40:00.000	2729.75	99.56115.00GHz
	2011.0.00525.S	NGC3256	10:27:51.23	-43:54:16.6	3	474.359	2013-05-01T09:40:00.000	2729.75	99.56115.00GHz
	2011.0.00525.S	NGC3256	10:27:51.23	-43:54:16.6	3	518.341	2013-05-01T09:40:00.000	2729.75	<u>99.56115.00GHz</u>
	2011.0.00525.S	NGC3256	10:27:51.23	-43:54:16.6	3	516.898	2013-11-08T09:59:00.000	2729.75	99.56115.00GHz
	2011.0.00525.S	NGC3256	10:27:51.23	-43:54:16.6	3	454.137	2013-11-08T09:59:00.000	2729.75	<u>99.56115.00GHz</u>

Select the files and "submit download request"

"untar" the files and you will find the a directory like 2011.0.0052S. Enter the directory and find the README file which will explain how your data is arranged.

ALM	A Science	Archive	Query
Query	Form	Table	
Submi	t download reques	t	Results Bookmark Export Table Results He
Showing	6 rows (6 before filtering	J).	More colur
	Project code	Source name	😵 🗇 💷 csg@chandra: ~/Desktop/Molecular/alma-TM/datadir/2011.0.00525.S/sg_ouss_id/group_ou
Filter:			csg@chand 🗱 csg@chand 🗱 csg@chand 🗱 csg@chand 🗱 csg@chand 🗱 csg@chand 🗱
			2011.0.00525.5
$\checkmark$	2011.0.00525.S	NGC3256	2011.0.00525.S_2012-04-17_001_of_006.tar
	2011.0.00525.S	NGC3256	2011.0.00525.S_2012-04-17_002_of_006.tar
	2011.0.00525.S	NGC3256	2011.0.00525.S_2012-04-17_003_of_006.tar
<b>X</b>	2011.0.00525.S	NGC3256	2011.0.00525.5_2012-04-17_004_0T_006.tar
	2011 0 00525 S	NGC3256	2011.0.00525.S_2012-04-17_006_of_006.tar
	2011.0.00525.5	NGC3256	csg@chandra:~/Desktop/Molecular/alma-TM/datadir\$ cd 2011.0.00525.S/
	2011.0.00323.3	10003230	csg@chandra:~/Desktop/Molecular/alma-TM/datadir/2011.0.00525.S\$ ls
			<pre>csg@chandra:~/Desktop/Molecular/alma-TM/datadir/2011.0.00525.S\$ cd sg_ouss_id/ csg@chandra:~/Desktop/Molecular/alma-TM/datadir/2011.0.00525.S/sg_ouss_id\$ ls group_ouss_id csg@chandra:~/Desktop/Molecular/alma-TM/datadir/2011.0.00525.S/sg_ouss_id\$ cd gr oup_ouss_id/ csg@chandra:~/Desktop/Molecular/alma-TM/datadir/2011.0.00525.S/sg_ouss_id/group_ ouss_id\$ ls member_ouss_id1 member_ouss_id2 README csg@chandra:~/Desktop/Molecular/alma-TM/datadir/2011.0.00525.S/sg_ouss_id/group_ ouss_id\$ ls</pre>

Each of these directories contain the following directories: raw, calibrated, science, script, qa2, logs.

 'raw' contains the initial ms calibrated of WVR, Tsys and antenna positions, and split by science spectral windows.
 It also contains the calibration tables.

- 'calibrated' contains the fully calibrated ms.
- 'science' contains the fits file of the final images.
- 'script' contains the reduction script.
- 'qa' contains the qa2 report.

#####

- 'logs' contains the casa log files.



k

You will find the final product – the images in the **'science'** directory. The directory structure may vary from one cycle to another, but the README file will have all the information.



Here the **'science'** directory has the line and continuum images. This depends on what the PI had asked for. The data will be provided in fits files. If you want to reduce the data you can use the calibrated data in the **'calibrated'** directory.

# Slide borrowed from a talk by Mark Lacy on 'Archive and data packaging'.

https://science.nrao.edu/facilities/alma/naasc-workshops/alma\_dr/ALMAArchiveWorkshopTalk\_Feb12.pdf

# Summary

- Lots of good data from SV and publicly available in the ASA, with much more becoming public in the future.
- Data processing and delivery changing as software construction is progressing.
- ALMA data hierarchy is complicated but for good reasons! Most of the time you will not need to worry about it.



### Request #799779618 by Anonymous User <u>Click to edit</u>

Include raw Select All

**Download Selected** 

Deselect All

#### Requested Projects / OUSets / Executionblocks

	Data	entities 1-5 of 5		
Project / OUSet / Executionblock		File	Size	Access
Project 2011.0.00525.S				
□ □ Member OUS uid://A002/X31e326/X26				
		2011.0.00525.S 2012-04-17 001 of 006.tar	547.3MB	✓
		2011.0.00525.S 2012-04-17 002 of 006.tar	30.6GB	✓
		2011.0.00525.S 2012-04-17 003 of 006.tar	1.1GB	✓
		2011.0.00525.S 2012-04-17 004 of 006.tar	1.3GB	✓
		2011.0.00525.S 2012-04-17 005 of 006.tar	13.4GB	✓
		2011.0.00525.S 2012-04-17 006 of 006.tar	1.7GB	✓
E      Member OUS uid://A002/X391d0b/X196				$\frown$
⊞      ☐ Member OUS uid://A002/X391d0b/X198				(
	Data	entities 1-5 of 5		224.4G