## How to use ALMA Science Archive

Min-Young Lee (KASI)

# Why archival data?

- Check if data are already available for a target
- Check the feasibility of a project by looking for similar targets
- Extract unpublished information from existing data (e.g., finding additional spectral lines)
- Retrieve information on a single object but with different configurations (e.g., multi-frequency studies) or in different epochs (e.g., variability studies)
- Retrieve information on a larger sample of objects (e.g., statistical studies)

# Data Quality Assessment (QA)

## • ALMA QA is carried out on 4 levels

QA0: Near-real time verification of weather and hardware issues carried out immediately after the observation

QAI: Verification of longer-term observatory issues such as pointing and flux calibration

### QA2: Offline calibration and imaging

- Performed by ARC members with the help of a semi-automatic procedure
- Calibration/imaging can be done by pipeline or manually
- Limited to verify the achievement of PI requests
- Outputs are archived and sent to PI

QA3: (Optional) PI may request re-reduction

# What is in the archive?

- For each project, raw data, calibration/imaging scripts, and tables are delivered
  - Only data that passed QA2 are in the archive
  - Imaging products are delivered in some cases, as result of QA2 processing
- Imaging products in the archive could be used for science if they meet your requirements
- To prepare data that are best-suited for your science, running customized calibration and imaging scripts is recommended

## **ALMA** Science Archive

## Science Archive: https://almascience.nrao.edu/aq/?result\_view=observation



	Project code	ALMA source name	Ra	Dec	Band	Cont. sens.	Frequency support	↑ Release date	Publications	Ang. res.	Min. vel. res.	Array	Mosaic	Max. reco. scale	FOV	Scientific category	Science keyword
$\oplus \leftrightarrow$			h:m:s 🕶	d:m:s 🕶		mJy/beam ▼				arcsec 🕶	km/s ▼			arcsec 🕶	arcsec 🕶		
$\bigcirc \   \leftrightarrow \   \cdots$	2011.0.00191.S	Fomalhaut b	22:57:38.685	-29:37:12.616	7	0.1181	343.08358.84GHz	2012-12-06	2	1.047	0.816	12m		10.640	16.592	Disks and planet formati	Debris disks, Ex
$\bigcirc$ $\leftrightarrow$ $\cdots$	2011.0.00131.S	R Scl	01:26:58.079	-32:32:36.424	7	0.9115	330.25346.11GHz	2012-12-06	5	1.043	0.846	12m	mosaic	11.517	62.007	Stars and stellar evolution	Asymptotic Gia
$\bigcirc \oplus \longleftrightarrow \cdots$	2011.0.00101.S	GRB021004	00:26:54.680	+18:55:41.600	7	0.1136	337.01353.00GHz	2012-12-06	2	1.107	26.541	12m		9.257	16.878	Active galaxies	Starburst galaxi
$\bigcirc$ $\leftrightarrow$	2011.0.00397.S	J035448.24-330827.2	03:54:48.240	-33:08:27.200	7	0.4848	337.03353.01GHz	2012-12-20	3	1.128	26.541	12m		7.950	16.877	Active galaxies	Active Galactic
$\bigcirc \oplus \leftrightarrow \cdots$	2011.0.00397.S	J041754.10-281655.9	04:17:54.100	-28:16:55.900	7	0.4848	337.02353.01GHz	2012-12-20	3	1.118	26.541	12m		7.842	16.877	Active galaxies	Active Galactic
$\bigcirc$ $\leftrightarrow$	2011.0.00397.S	J063027.81-212058.6	06:30:27.810	-21:20:58.600	7	0.5346	337.01352.99GHz	2012-12-20	3	1.183	26.541	12m		8.015	16.878	Active galaxies	Active Galactic
$\bigcirc \oplus \leftrightarrow \cdots$	2011.0.00397.S	J061200.23-062209.6	06:12:00.230	-06:22:09.600	7	0.5346	337.00352.99GHz	2012-12-20	3	1.183	26.541	12m		7.819	16.878	Active galaxies	Active Galactic
$\bigcirc \Leftrightarrow \leftrightarrow \cdots$	2011.0.00397.S	J070257.20-280842.3	07:02:57.200	-28:08:42.300	7	0.5346	337.01352.99GHz	2012-12-20	3	1.154	26.541	12m		8.053	16.878	Active galaxies	Active Galactic
$\bigcirc \leftrightarrow \cdots$	2011.0.00397.S	J054930.06-373940.1	05:49:30.060	-37:39:40.100	7	0.4848	337.02353.00GHz	2012-12-20	3	1.156	26.541	12m		7.888	16.878	Active galaxies	Active Galactic

## Science Archive: https://almascience.nrao.edu/aq/?result\_view=observation



	Project code	ALMA source name	Ra	Dec	Band	Cont. sens.	Frequency support	↑ Release date	Publications	Ang. res.	Min. vel. res.	Array	Mosaic	Max. reco. scale	FOV	Scientific category	Science keyword
$\leftrightarrow$			h:m:s 🕶	d:m:s 🕶		mJy/beam ▼				arcsec -	km/s ▼			arcsec 👻	arcsec -		
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$\oplus$ $\leftrightarrow$	2011.0.00397.S	J041754.10-281655.9	04:17:54.100	-28:16:55.900	7	0.4848	337.02353.01GHz	2012-12-20	3	1.118	26.5 <mark>4</mark> 1	12m		7.842	16.877	Active galaxies	Active Galactic
$\bigcirc \   \longleftrightarrow \   \cdots$	2011.0.00397.S	J063027.81-212058.6	06:30:27.810	-21:20:58.600	7	0.5346	337.01352.99GHz	2012-12-20	3	1.183	26.541	12m		8.015	16.878	Active galaxies	Active Galactic
$\bigoplus \longleftrightarrow \cdots$	2011.0.00397.S	J061200.23-062209.6	06:12:00.230	-06:22:09.600	7	0.5346	337.00352.99GHz	2012-12-20	3	1 <mark>.</mark> 183	26.541	12m		7.819	16.878	Active galaxies	Active Galactic
$\bigoplus \leftrightarrow \cdots$	2011.0.00397.S	J070257.20-280842.3	07:02:57.200	-28:08:42.300	7	0.5346	337.01352.99GHz	2012-12-20	3	1.154	26.541	12m		8.053	16.878	Active galaxies	Active Galactic
$\bigcirc$ $\leftrightarrow$	2011.0.00397.S	J054930.06-373940.1	05:49:30.060	-37:39:40.100	7	0.4848	337.02353.00GHz	2012-12-20	3	1.156	26.541	12m		7.888	16.878	Active galaxies	Active Galactic



### 30 Doradus in the LMC

- Most extreme starburst in the local universe (more than 1000 OB and Wolf-Rayet stars)
- Observed in 2015 (2015.1.00217.S; PI: Melanié Chevance)

### Search data of your interest

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📰	2015.1.00217.S	30doradus	05:38:50.254	-69:04:23.749	6	0.0721	219.33232.80GHz	2017-07-26	0	0.534	0.158	12m	6.407	25.758
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▼ 📄 🚞 Project 2015.1.00217.S					
Science Goal OUS uid://A001/X2f7/X146					
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### Scheduling Block (SB): Minimum unit of observation

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Member: Can contain multiple Scheduling Block (SB) Scheduling Block (SB): Minimum unit of observation

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Group: Can contain several configurations to be combined in data processing Member: Can contain multiple Scheduling Block (SB) Scheduling Block (SB): Minimum unit of observation

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Project / OUSet / Executionblock	Updated	File	Size	Accessible	Actions
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external	2015.1.00217.S_uidA	01_X2f7_X14a_external_ari_I_001_of_001.tar	2 GB	⊻	

Science Goal: Sources in the same sky region that share the same calibration, spectral setup Group: Can contain several configurations to be combined in data processing Member: Can contain multiple Scheduling Block (SB) Scheduling Block (SB): Minimum unit of observation

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Project / OUSet / Executionblock	Updated	File	Size	Accessible	Actions
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Project / OUSet / Executionblock	Updated File	Size	Accessible	Actions
Request 1656172308145		472 MB	,	
🔻 📄 🚞 Project 2015.1.00217.S				
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Additional Representative Images for Legacy (ARI-L) aims to bring the reduction level of Cycles
 2-4 data to that of what is processed with the recent ALMA Imaging Pipeline

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🔻 📄 🚞 Group OUS uid://A0	001/X2f7/X147		0/ ((()/)		
🔻 🖲 🚞 Member OUS ui	id://A001/X2f7/X148 2020-04- 03	(Cube Analysis a	and Rendering Tool	for Astro	nomy)
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🗹 📔 readme	member.uid A001 X2f7 X148.R	ADME.txt	15 kB	✓	
V S product	2015.1.00217.S_uid	X148_001_of_001.tar	179 MB	⊻	
Product	member.uid A001 X2f7 X148.30	Dor.13CO21.flux.fits.gz	15 MB	⊻	
Product	member.uid A001_X2f7_X148.30	Dor.13CO21.image.pbcor.fits	43 MB	×	6
🕞 📑 product	member.uid	Dor.C18O21.flux.fits.gz	15 MB	×	
F product	member.uid	Dor.C18O21.image.pbcor.fits	43 MB	×	6
🔲 💾 product	member.uid A001X2f7X148.30	Dor.CO21.flux.fits.gz	14 MB	×	
🕞 💾 product	member.uid	Dor.CO21.image.pbcor.fits	43 MB		6
🕞 📑 product	member.uid	Dor.continuum.flux.fits.gz	338 kB	×	
🔲 💾 product	member.uid	Dor.continuum.image.pbcor.fits	1 MB	⊻	6
🕞 💾 product	member.uid	519-4546_bp.spw19.mfs.l.pb.fits.gz	141 kB	✓	
🕞 📑 product	member.uid A001X2f7X148.J0	519-4546_bp.spw19.mfs.l.pbcor.fits	369 kB	¥	۲
🔲 💾 product	member.uid A001 X2f7 X148.J0	519-4546_bp.spw25.mfs.l.pb.fits.gz	141 kB	✓	
📄 💾 product	member.uid	519-4546_bp.spw25.mfs.l.pbcor.fits	369 kB	✓	6
🔲 💾 product	member.uid	519-4546_bp.spw27.mfs.l.pb.fits.gz	141 kB	✓	
🖂 💾 product	member.uid	519-4546_bp.spw27.mfs.l.pbcor.fits	369 kB	✓	6
🔲 💾 product	member.uid	519-4546_bp.spw29.mfs.l.pb.fits.gz	141 kB	⊻	
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🔲 💾 product	member.uid	601-7036_ph.spw19.mfs.l.pb.fits.gz	154 kB	✓	
🕞 💾 product	member.uid A001_X2f7_X148.JC	601-7036_ph.spw19.mfs.l.pbcor.fits	369 kB	⊻	۲
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🗹 💾 auxiliary	2015.1.00217.S_uidA001_X2f7_	X148_auxiliary.tar	123 MB	✓	
🕞 💾 raw	2015.1.00217.S_uidA002_Xb3d	18f_X3a88.asdm.sdm.tar	6 GB	⊻	
🕨 📄 💾 external	2015.1.00217.S_uidA001_X2f7_	X148_external_ari_l_001_of_001.tar	7 GB	✓	