

# ALMA Data Products– what to expect after your observations are made



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Atacama Large Millimeter/submillimeter Array  
Expanded Very Large Array



## The Condensed Version

- Project tracking – SnooPI
- Data delivered after passing Quality Assurance (QA)
- The Pipeline Weblog–Calibration and Imaging Information
- Download data from *Archive Query* and *Request Handler* tools on the ALMA Science Portal
- Delivered data include:
  - Calibration tables and diagnostics
  - Preliminary images (better products may be possible with more careful continuum & non-default cleaning parameters)

**This talk will be available online for reference after this workshop.**

# Monitor Project Status: SnooPI

<https://asa.alma.cl/snoopi>

**SnooPI**


NAVIGATION


- Home
- My Projects
- My SchedBlocks

QUICK LINKS

- User Manual
- Science Portal
- Archive Query
- Helpdesk


John Smith  
Executive: EU; ARC: EU






5/8

PI Projects




9/9

PI Scheduling Blocks




22/34

Co-I Projects




58/60

Co-I Scheduling Blocks



0/2

Delegee Projects



0/2

Delegee Scheduling Blocks

**Since 2015-07-02** More news...

- 2015-10-23* ObsUnitSet **Member OUS (w51)** of project **2013.1.00308.S** is now Delivered
- 2015-08-30* All data taken for Scheduling Block **w51\_a\_06\_TE** of project **2013.1.00308.S**
- 2015-07-02* All data taken for Scheduling Block **SgrB2\_a\_03\_TE** of project **2013.1.00269.S**

Q Search Projects or Scheduling Blocks

Projects ▾

# Monitor Project Status: SnooPI

## QA Report:

- 2013.1.06789 ✓
- Observing the centre of the galaxy with ALMA
- ObsUnitSet
  - SC OUS (CH3CN 5-4 & isotopolog...
  - Group OUS
    - Member OUS (SgrB2)
      - SgrB2\_a\_03\_TP
      - Member OUS (SgrB2)
        - SgrB2\_a\_03\_TC
        - Member OUS (SgrB2)
          - SgrB2\_a\_03\_7M**
          - Member OUS (query)
            - 3c454.3\_SgrB2\_a\_03\_TP
            - Member OUS (SgrB2)
              - SgrB2\_a\_03\_TE

Scheduling Block Name	SgrB2_a_03_7M <span style="color: green;">✓</span> <a href="#">History</a>
Scientific Goal Name	7m observations of my most favourite objects in the whole Universe
Member ObsUnitSet	uid://A001/X121/X4bc <a href="#">History</a> <a href="#">Archive query</a>
Array	7m Array
Band	3
RA	17 <sup>h</sup> 47 <sup>m</sup> 19.438 <sup>s</sup>
Dec	-28° 23' 29.780"
Representative Frequency, GHz	91.28
Successful Executions	4 / 4

End time	Duration [min]	Execution Block UID	QA0
2014-07-03 05:59:44	64.07	uid://A002/X85dcf7/Xefe	<span style="color: green;">✓</span> <a href="#">Report</a>
2014-07-03 04:39:10	64.49	uid://A002/X85dcf7/Xc7c	<span style="color: green;">✓</span> <a href="#">Report</a>
2014-07-02 06:49:28	70.38	uid://A002/X85c183/X1434	<span style="color: green;">✓</span> <a href="#">Report</a>
2014-07-01 07:02:06	70.18	uid://A002/X85b7b2/Xb3	<span style="color: green;">✓</span> <a href="#">Report</a>

### Execution block uid://A002/X85dcf7/Xefe

Temperatures [°K]		Array
Average T <sub>sys</sub>	<b>41.79</b>	Number of antennas
σ	<b>21.35</b>	Shortest baseline
T <sub>sys,min</sub>	<b>N/A</b>	Longest baseline
T <sub>sys,max</sub>	<b>64.55</b>	Angular resolution
		Maximum Recoverable Scale

### Sources

Intent	Object	RA	Dec	Time [min]
Science Target	SgrB2	17 <sup>h</sup> 47 <sup>m</sup> 19.4 <sup>s</sup>	-28° 23' 29.8"	<b>26.21</b>
Amplitude Calibrator	J1733-130	17 <sup>h</sup> 33 <sup>m</sup> 2.7 <sup>s</sup>	-13° 4' 49.5"	<b>5.04</b>
Atmospheric Calibrator	J1733-130	17 <sup>h</sup> 33 <sup>m</sup> 2.7 <sup>s</sup>	-13° 4' 49.5"	<b>0.29</b>
Atmospheric Calibrator	J1700-2610	17 <sup>h</sup> 0 <sup>m</sup> 53.2 <sup>s</sup>	-26° 10' 51.7"	<b>0.29</b>
Atmospheric Calibrator	SgrB2	17 <sup>h</sup> 47 <sup>m</sup> 19.4 <sup>s</sup>	-28° 23' 29.8"	<b>0.58</b>
Bandpass Calibrator	J1700-2610	17 <sup>h</sup> 0 <sup>m</sup> 53.2 <sup>s</sup>	-26° 10' 51.7"	<b>10.08</b>
Flux Calibrator	J1733-130	17 <sup>h</sup> 33 <sup>m</sup> 2.7 <sup>s</sup>	-13° 4' 49.5"	<b>5.04</b>
Phase Calibrator	J1744-3116	17 <sup>h</sup> 44 <sup>m</sup> 23.6 <sup>s</sup>	-31° 16' 36.3"	<b>5.04</b>
Pointing Calibrator	J1700-2610	17 <sup>h</sup> 0 <sup>m</sup> 53.2 <sup>s</sup>	-26° 10' 51.7"	<b>2.02</b>

# Data Delivery Email

- Sent when an individual MOUS passes QA2
- Data are ingested into the archive and made available at all Regional Centers
- Triggers Start of Proprietary Period
  - Usually 12 months
- Only Sent to PI
- Included Metadata:
  - MOUS ID, Scheduling Block (SB) name, project title
- Included Instructions:
  - Downloading data
  - Delegating access for registered ALMA users
- Included Descriptions:
  - Proprietary period

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# Data Delivery Email

- Publication Requirements:
  - ALMA acknowledgement
  - ARC specific acknowledgement
- Additional Support:
  - Funded face-to-face reduction visits to your home ARC
  - Contact info for ARC Helpdesk

# Data Delivery Email –ADDED VALUE!

- NA PIs get two delivery emails
  1. From JAO with links:
    - Archive query for MOUS package
  2. From NAASC:
    - Fully-calibrated MS (North America Only)
    - Calibration and Imaging Report (Weblog)
    - ALMA Data Mining Toolkit (ADMIT) products
    - Knowledgebase Article: “Where can I get additional information for my NA added value data products?”
    - <https://help.almascience.org/index.php?/Knowledgebase/Article/View/412>

# Goals of Quality Assurance (QA) Process

- Ensure reliable final data product
  - Desired sensitivity (as specified by PI)
  - Desired resolution (as specified by PI)
- Ensure calibration and QA imaging free from major artifacts
- Warning: Errors in PI-supplied parameters are outside scope of QA process, including:
  - Incorrect source coordinates
  - Inadequate frequency specification
  - Inadequate sensitivity limits

See [ALMA Technical Handbook](#) for details.



## During Observations – QA0

- Monitoring of on-the-fly calibration and system performance
- Rapidly-varying parameters (~SB/EB timescales)
  - Atmospheric effects
  - Antenna issues
  - Front-end issues
  - Connectivity issues
  - Back-end issues
- Tolerances for each are explicitly laid out
  - No fewer than 34 antennas in 12m array
  - Bandpass calibrator is strong enough
- Quick reduction may be run to check flux measurements and phase stability

# Between Observations – QA I

- “Regular array maintenance” timescales
- Slowly Varying Parameters (~MOUS timescales)
- General array calibration
  - Baseline measurements
  - Delays
- Antenna Calibrations
  - All-sky pointing
  - Focus curves
  - Beam patterns, etc.
- Observatory Calibrator Surveys
  - Solar-system and quasar flux monitoring

## After Observations – QA2

- Calibration by pipeline (~70%) or DA/staff.
- Final QA checks include
  - RMS of complex antenna-based gains
  - Absolute flux calibration scale
  - $T_{\text{sys}}$  within acceptable range
  - Proper phase transfer cadence
  - Proper bandpass corrections
- Assessment of Imaging Products
  - Signal-to-noise and angular resolution
  - No strong artifacts
  - Performed on the reference source/spectra
- Information about QA review is aggregated for delivery in the QA2 Report

## After Delivery – QA3

- Additional QA stage possibly triggered by PI reporting any issues underlying:
  - Data, observing procedure, calibration
- Re-evaluation of calibrated data products
  - Only occurs if QA0 → QA2 miss something
- Likely results in fix being implemented and products re-ingested into ALMA archive
- Proprietary period extension (*within two months of delivery*)



- After two months, extension only until fix is delivered

# The Wonderous Weblog!

## Your guide to QA2



Pipeline Users Guide, Chapter 8 for more information.

Project Code

**Click EB for information on the observation**

### Observation Overview

Project	Project UID
Principal Investigator	PI Name
OUS Status Entity id	Project UID
Observation Start	2017-11-03 01:26:43 UTC
Observation End	2017-11-08 02:21:19 UTC

### Pipeline Summary

Pipeline Version	40896 (Pipeline-CASA51-P2-B) ( <a href="#">documentation</a> )
CASA Version	5.1.1-5 r40000
Pipeline Start	2017-11-10 13:12:52 UTC
Execution Duration	6:13:27

### Observation Summary

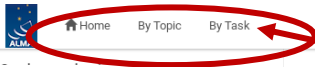
Measurement Set	Receivers	Num Antennas	Time (UTC)			Baseline Length			Size
			Start	End	On Source	Min	Max	RMS	
Observing Unit Set Status: uid://A001/X1296/X499 Scheduling Block ID: uid://A001/X1296/X47f									
Session: session_1									
Execution_UID.ms	ALMA Band 6	11	2017-11-03 01:26:42	2017-11-03 02:46:58	0:49:57	8.9 m	48.9 m	27.3 m	2.1 GB
Execution_UID_target.ms	ALMA Band 6	11	2017-11-03 01:44:53	2017-11-03 02:44:12	0:49:57	8.9 m	48.9 m	27.3 m	836.9 MB
Session: session_2									
Execution_UID.ms	ALMA Band 6	11	2017-11-04 01:30:20	2017-11-04 02:50:43	0:49:57	8.9 m	48.9 m	27.3 m	2.1 GB
Execution_UID_target.ms	ALMA Band 6	11	2017-11-04 01:48:32	2017-11-04 02:47:56	0:49:57	8.9 m	48.9 m	27.3 m	836.9 MB
Session: session_3									
Execution_UID.ms	ALMA Band 6	10	2017-11-08 01:01:01	2017-11-08 02:21:18	0:49:57	8.9 m	48.9 m	28.6 m	1.8 GB
Execution_UID_target.ms	ALMA Band 6	10	2017-11-08 01:19:12	2017-11-08 02:18:32	0:49:57	8.9 m	48.9 m	28.6 m	713.2 MB



# The Wonderful Weblog!



Pipeline Users Guide, Chapter 8 for more information.



**Click By Task for breakdown of pipeline tasks**

Project Code

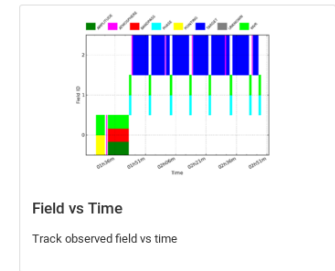
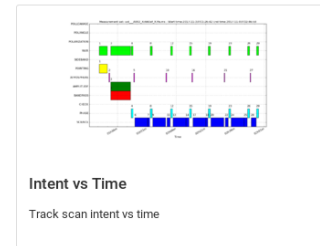
- Execution\_UID.ms
- Execution\_UID\_target.ms  
Session: session.2
- Execution\_UID.ms
- Execution\_UID\_target.ms  
Session: session.3
- Execution\_UID.ms
- Execution\_UID\_target.ms

## Overview of Execution\_UID.ms

### Observation Execution Time

Start Time	2017-11-03 01:26:42
End Time	2017-11-03 02:46:58
Total Time on Source	1:14:20
Total Time on Science Target	0:49:57

LISTOBS OUTPUT



### Spatial Setup

Science Targets	Sci Target
Calibrators	'J0019+2021' and 'J2253+1608'

### Spectral Setup

All Bands	'ALMA Band 6'
Science Bands	'ALMA Band 6'

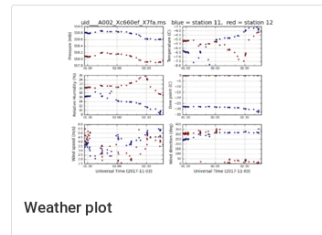
### Antenna Setup

Min Baseline	8.9 m
Max Baseline	48.9 m
Number of Baselines	55
Number of Antennas	11

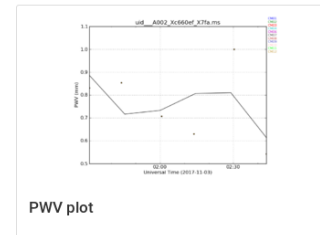
### Sky Setup

Min Elevation	44.37 degrees
Max Elevation	48.35 degrees

### Weather



### PWV



# The Wonderous Weblog!

Pipeline Users Guide, Chapter 8 for more information.

Click on a pipeline task for detailed information and plots



Task	QA Score
1. hfa_importdata: Register measurement sets with the pipeline	1.00
2. hfa_flagdata: ALMA deterministic flagging	1.00
3. hfa_fluxcalflag: Flag spectral features in solar system flux calibrators	1.00
4. hf_rawflagchans: Flag channels in raw data	1.00
5. hf_refant: Select reference antennas	1.00
6. hf_tryscal: Calculate Trays calibration	1.00
7. hfa_trysflag: Flag Trays calibration	1.00
8. hfa_antpos: Correct for antenna position offsets	1.00
9. hfa_wvrflag: Calculate and flag WVR calibration	No QA
10. hf_lowgainflag: Flag antennas with low gain	1.00
11. hf_setmodels: Set calibrator model visibilities	1.00
12. hfa_bandpassflag: Phase up bandpass calibration and flagging	1.00
13. hfa_spwphaseup: Spw phase offsets calibration	1.00
14. hfa_fluxscaleflag: Phased up flux scale calibration + flagging	1.00
15. hfa_fluxscale: Transfer fluxscale from amplitude calibrator	1.00
16. hfa_timegaincal: Gain calibration	X-Y deviation: 0.84
17. hf_applycal: Apply calibrations from context	0.99
18. hfa_imageprecheck: ImagePreCheck	1.00
19. hf_makeinlist: Set up image parameters for calibrator imaging	1.00
20. hf_makeimages: Make calibrator images	1.00
21. hf_checkproductsize: Check product size	1.00
22. hfa_exportdata: Prepare pipeline data products for export	1.00
23. hf_mstransform: Create science target MS	1.00
24. hfa_flagtargets: ALMA Target flagging	1.00
25. hf_makeinlist: Set up image parameters for target per-spw continuum imaging	1.00
26. hf_fndcont: Detect continuum frequency ranges	1.00
27. hf_uvcontfit: UV continuum fitting	1.00
28. hf_uvcontsub: UV continuum subtraction	1.00
29. hf_makeimages: Make target per-spw continuum images	1.00
30. hf_makeinlist: Set up image parameters for target aggregate continuum imaging	1.00
31. hf_makeimages: Make target aggregate continuum images	1.00
32. hf_makeinlist: Set up image parameters for target cube imaging	1.00
33. hf_makeimages: Make target cubes	1.00
34. hf_makeinlist: Set up image parameters for representative bandwidth target cube imaging	1.00
35. hf_makeimages: Make representative bandwidth target cube	1.00

CASA logs and scripts

- View, view in new tab or download casa-20171110-131234.log (12.1 MB)
- View, view in new tab or download casa\_commands.log (168.3 KB)
- View, view in new tab or download casa\_pipescripts.py (2.6 KB)
- View, view in new tab or download casa\_piperestorescript.py (245 bytes)



# The Wonderous Weblog!

Pipeline Users Guide, Chapter 8 for more information.



Let's try an imaging task

Examine calibrated phase and amplitude in different dimensions!



# The Wonderful Weblog!



Pipeline Users Guide, Chapter 8 for more information.

These are images of the calibrators. Later hif\_makeimages steps show the same layout for target continuum and line images.

- Home
  - By Topic
  - By Task
- Tasks in execution order
1. hifa\_importdata
  2. hifa\_flagdata
  3. hifa\_fluxcalflag
  4. hif\_rawflagchans
  5. hif\_refant
  6. h\_tsyscal
  7. hifa\_tsysflag
  8. hifa\_antpos
  9. hifa\_wvrgcalflag
  10. hif\_lowgainflag
  11. hif\_setmodels
  12. hifa\_bandpassflag
  13. hifa\_swpphaseup
  14. hifa\_gfluxscaleflag
  15. hifa\_gfluxscale
  16. hifa\_timegaincal
  17. hif\_applycal
  18. hifa\_imageprecheck
  19. hif\_makeimlist
  - 20. hif\_makeimages**
  21. hif\_checkproductsize
  22. hifa\_exportdata
  23. hif\_mstransform
  24. hifa\_flagtargets
  25. hif\_makeimlist
  26. hif\_fndcont
  27. hif\_uvcontfit
  28. hif\_uvcontsub
  29. hif\_makeimages
  30. hif\_makeimlist
  31. hif\_makeimages
  32. hif\_makeimlist
  33. hif\_makeimages
  34. hif\_makeimlist
  35. hif\_makeimages

## 20. Tclean/MakeImages

Make calibrator images

### Image Details

Field	Spw	Pol	Image details	Image result
J0019+2021 (PHASE)	16	I	<p>centre frequency of image 223.5004GHz (LSRK)</p> <p>beam 7.06 x 5.24 arcsec</p> <p>beam p.a. 86.4deg</p> <p>final theoretical sensitivity 0.0004 Jy/beam</p> <p>cleaning threshold 0.0034 Jy/beam Dirty DR: 8.7e+02 DR correction: 4.4</p> <p>clean residual peak / scaled MAD 6.28</p> <p>non-pbcor image RMS 0.00049 Jy/beam</p> <p>pbcor image max / min 0.344 / -0.00367 Jy/beam</p> <p>fractional bandwidth / nterms 0.89% / 1</p> <p>aggregate bandwidth 2 GHz (LSRK)</p> <p>score 1.00</p> <p>image file uid__A001_X1296_X499.s20_0_J0019+2021_ph.spw16.mfs.l.iter1.image</p>	<p>View other QA Images...</p>
J0019+2021 (PHASE)	18	I	<p>centre frequency of image 225.3654GHz (LSRK)</p> <p>beam 7.00 x 5.17 arcsec</p> <p>beam p.a. 85.9deg</p> <p>final theoretical sensitivity 0.00038 Jy/beam</p> <p>cleaning threshold 0.0034 Jy/beam Dirty DR: 9.1e+02 DR correction: 4.5</p> <p>clean residual peak / scaled MAD 6.74</p> <p>non-pbcor image RMS 0.00044 Jy/beam</p> <p>pbcor image max / min 0.343 / -0.00357 Jy/beam</p> <p>fractional bandwidth / nterms 0.89% / 1</p> <p>aggregate bandwidth 2 GHz (LSRK)</p> <p>score 1.00</p> <p>image file uid__A001_X1296_X499.s20_0_J0019+2021_ph.spw18.mfs.l.iter1.image</p>	<p>View other QA Images...</p>
J0019+2021 (PHASE)	20	I	<p>centre frequency of image 239.2502GHz (LSRK)</p> <p>beam 6.64 x 4.82 arcsec</p> <p>beam p.a. 85.8deg</p> <p>final theoretical sensitivity 0.00043 Jy/beam</p> <p>cleaning threshold 0.0033 Jy/beam</p>	<p>View other QA Images...</p>



# QA2 Data Products Package:

## Cycles 1-4 Packages

readme  product  auxiliary  raw  raw (semipass)  external

Project / OUSet / Executionblock	File
Request 1647190514457	
Project 2016.1.00484.L	
Science Goal OUS uid://A001/Xbd4641/X1e	
Group OUS uid://A001/Xbd4641/X1f	
Member OUS uid://A001/Xbd4641/X20	
SB GW_Lup_a_06_TM1	
<input checked="" type="checkbox"/> product	<a href="#">2016.1.00484.L_uid_A001_Xbd4641_X20_001_of_001</a>
<input type="checkbox"/> raw	<a href="#">2016.1.00484.L_uid_A002_Xc04da7_Xea.asdm.sdm</a>
<input type="checkbox"/> raw	<a href="#">2016.1.00484.L_uid_A002_Xc067f7_Xa6d.asdm.sdm</a>

Raw data tar balls.

Tar ball with the processed data.

# QA2 Data Products Package:

## Cycles 5-Present

▼	Group OUS uid://A001/X885/X19a	
▼	Member OUS uid://A001/X885/X19b	
▶	SB Pluto_a_06_TM1	
▶	<input checked="" type="checkbox"/> product	<a href="#">2016.1.01100.S uid A001 X885 X19b 001 of 001.tar</a>
▼	<input checked="" type="checkbox"/> auxiliary	<a href="#">2016.1.01100.S uid A001 X885 X19b auxiliary.tar</a>
	<input type="checkbox"/> auxiliary	<a href="#">member.uid A001 X885 X19b.PPR uid A001 X885 X19c.xml.tar</a>
	<input type="checkbox"/> auxiliary	<a href="#">member.uid A001 X885 X19b.README.txt.tar</a>
	<input type="checkbox"/> auxiliary	<a href="#">member.uid A001 X885 X19b.antennapos.csv.tar</a>
	<input type="checkbox"/> auxiliary	<a href="#">member.uid A001 X885 X19b.calimage.pipeline_manifest.xml.tar</a>
	<input type="checkbox"/> auxiliary	<a href="#">member.uid A001 X885 X19b.calimage.product_rename.txt.tar</a>
	<input type="checkbox"/> auxiliary	<a href="#">member.uid A001 X885 X19b.casa_commands.log.tar</a>
	<input type="checkbox"/> auxiliary	<a href="#">member.uid A001 X885 X19b.casa_piperestorescript.py.tar</a>
	<input type="checkbox"/> auxiliary	<a href="#">member.uid A001 X885 X19b.casa_pipescript.py.tar</a>
	<input type="checkbox"/> auxiliary	<a href="#">member.uid A001 X885 X19b.cont.dat.tar</a>
	<input type="checkbox"/> auxiliary	<a href="#">member.uid A001 X885 X19b.flux.csv.tar</a>
	<input type="checkbox"/> auxiliary	<a href="#">member.uid A001 X885 X19b.scriptForPI.py.tar</a>
	<input type="checkbox"/> auxiliary	<a href="#">member.uid A001 X885 X19b.session_3.caltables.tgz.tar</a>
	<input type="checkbox"/> auxiliary	<a href="#">member.uid A001 X885 X19b.weblog.tgz.tar</a>
	<input type="checkbox"/> auxiliary	<a href="#">uid A002 Xc4d618 X5750.ms.calapply.txt.tar</a>
	<input type="checkbox"/> auxiliary	<a href="#">uid A002 Xc4d618 X5750.ms.flagversions.tgz.tar</a>
	<input type="checkbox"/> auxiliary	<a href="#">uid A002 Xc4d618 X5750_flagtargetstemplate.txt.tar</a>
	<input type="checkbox"/> raw	<a href="#">2016.1.01100.S uid A002 Xc4d618 X5750.asdm.sdm.tar</a>

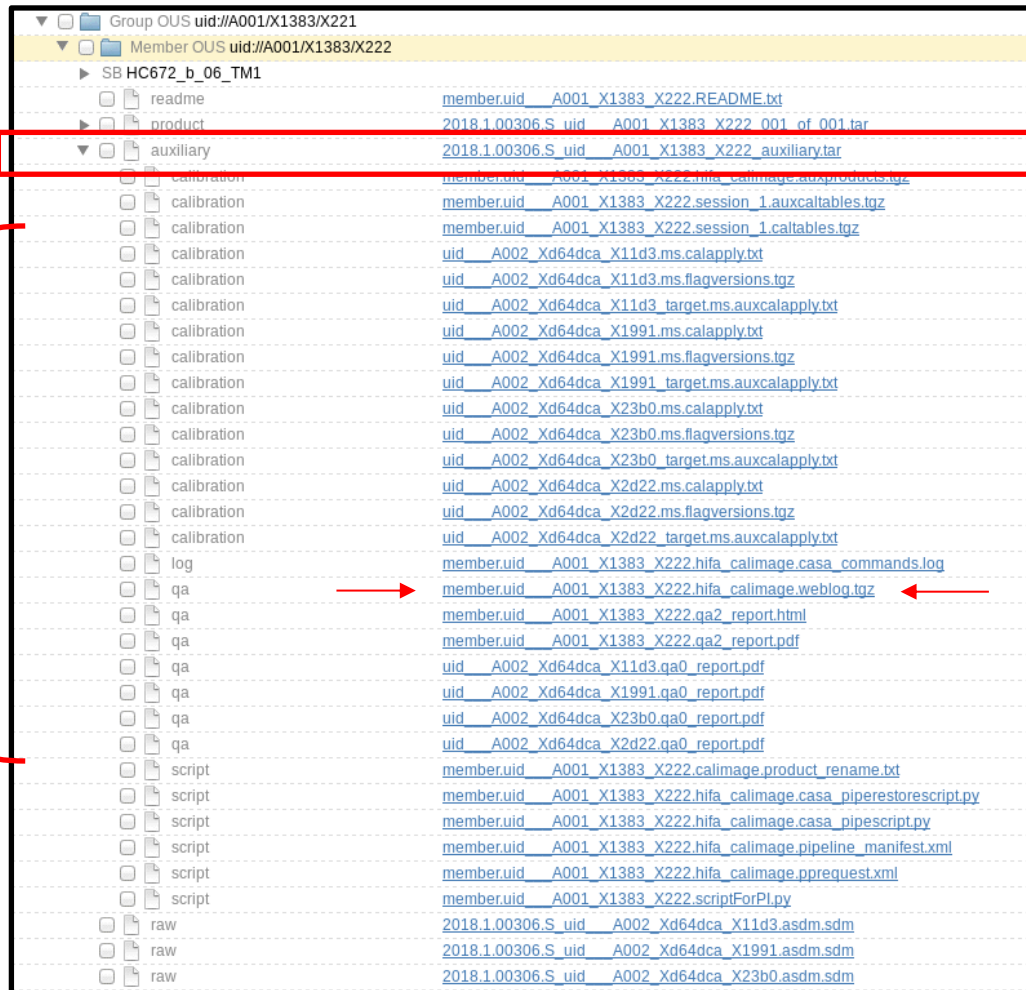
# QA2 Data Products Package:

## Cycles 5-Present: Auxiliary Tarball

Tar ball

OR

Individual  
file  
download



Group OUS uid://A001/X1383/X221

- Member OUS uid://A001/X1383/X222
  - SB HC672\_b\_06\_TM1
    - readme [member.uid\\_A001\\_X1383\\_X222.README.txt](#)
    - product [2018.1.00306.S\\_uid\\_A001\\_X1383\\_X222\\_001\\_of\\_001.tar](#)
    - auxiliary [2018.1.00306.S\\_uid\\_A001\\_X1383\\_X222\\_auxiliary.tar](#)
    - calibration [member.uid\\_A001\\_X1383\\_X222.hifa\\_calimage\\_auxproductsb.gz](#)
    - calibration [member.uid\\_A001\\_X1383\\_X222.session\\_1\\_auxcaltables.tgz](#)
    - calibration [member.uid\\_A001\\_X1383\\_X222.session\\_1.caltables.tgz](#)
    - calibration [uid\\_A002\\_Xd64dca\\_X11d3.ms.calapply.txt](#)
    - calibration [uid\\_A002\\_Xd64dca\\_X11d3.ms.flagversions.tgz](#)
    - calibration [uid\\_A002\\_Xd64dca\\_X11d3\\_target.ms.auxcalapply.txt](#)
    - calibration [uid\\_A002\\_Xd64dca\\_X1991.ms.calapply.txt](#)
    - calibration [uid\\_A002\\_Xd64dca\\_X1991.ms.flagversions.tgz](#)
    - calibration [uid\\_A002\\_Xd64dca\\_X1991\\_target.ms.auxcalapply.txt](#)
    - calibration [uid\\_A002\\_Xd64dca\\_X23b0.ms.calapply.txt](#)
    - calibration [uid\\_A002\\_Xd64dca\\_X23b0.ms.flagversions.tgz](#)
    - calibration [uid\\_A002\\_Xd64dca\\_X23b0\\_target.ms.auxcalapply.txt](#)
    - calibration [uid\\_A002\\_Xd64dca\\_X2d22.ms.calapply.txt](#)
    - calibration [uid\\_A002\\_Xd64dca\\_X2d22.ms.flagversions.tgz](#)
    - calibration [uid\\_A002\\_Xd64dca\\_X2d22\\_target.ms.auxcalapply.txt](#)
    - log [member.uid\\_A001\\_X1383\\_X222.hifa\\_calimage.casa\\_commands.log](#)
    - qa [member.uid\\_A001\\_X1383\\_X222.hifa\\_calimage.weblog.tgz](#)
    - qa [member.uid\\_A001\\_X1383\\_X222.qa2\\_report.html](#)
    - qa [member.uid\\_A001\\_X1383\\_X222.qa2\\_report.pdf](#)
    - qa [uid\\_A002\\_Xd64dca\\_X11d3.qa0\\_report.pdf](#)
    - qa [uid\\_A002\\_Xd64dca\\_X1991.qa0\\_report.pdf](#)
    - qa [uid\\_A002\\_Xd64dca\\_X23b0.qa0\\_report.pdf](#)
    - qa [uid\\_A002\\_Xd64dca\\_X2d22.qa0\\_report.pdf](#)
    - script [member.uid\\_A001\\_X1383\\_X222.calimage.product\\_rename.txt](#)
    - script [member.uid\\_A001\\_X1383\\_X222.hifa\\_calimage.casa\\_piperestorescript.py](#)
    - script [member.uid\\_A001\\_X1383\\_X222.hifa\\_calimage.casa\\_pipescript.py](#)
    - script [member.uid\\_A001\\_X1383\\_X222.hifa\\_calimage.pipeline\\_manifest.xml](#)
    - script [member.uid\\_A001\\_X1383\\_X222.hifa\\_calimage.pprequest.xml](#)
    - script [member.uid\\_A001\\_X1383\\_X222.scriptForPI.py](#)
    - raw [2018.1.00306.S\\_uid\\_A002\\_Xd64dca\\_X11d3.asdm.sdm](#)
    - raw [2018.1.00306.S\\_uid\\_A002\\_Xd64dca\\_X1991.asdm.sdm](#)
    - raw [2018.1.00306.S\\_uid\\_A002\\_Xd64dca\\_X23b0.asdm.sdm](#)

# QA2 Data Products Package:

## Cycles 5-Present: Product Tarball

Tar ball

OR

Individual  
file  
download

SB HC672_b_06_TM1	
readme	<a href="#">member.uid_A001_X1383_X222_README.txt</a>
product	<a href="#">2018.1.00306.S_uid_A001_X1383_X222_001_of_001.tar</a>
product	<a href="#">member.uid_A001_X1383_X222.141-1952_136-1955_sci.spw25.cube.l.mask.fits.gz</a>
product	<a href="#">member.uid_A001_X1383_X222.141-1952_136-1955_sci.spw25.cube.l.pb.fits.gz</a>
product	<a href="#">member.uid_A001_X1383_X222.141-1952_136-1955_sci.spw25.cube.l.pbcor.fits</a>
product	<a href="#">member.uid_A001_X1383_X222.141-1952_136-1955_sci.spw25.mfs.l.mask.fits.gz</a>
product	<a href="#">member.uid_A001_X1383_X222.141-1952_136-1955_sci.spw25.mfs.l.pb.fits.gz</a>
product	<a href="#">member.uid_A001_X1383_X222.141-1952_136-1955_sci.spw25.mfs.l.pbcor.fits</a>
product	<a href="#">member.uid_A001_X1383_X222.141-1952_136-1955_sci.spw25_27_29_31_33_35.cont.l.mask.fits.gz</a>
product	<a href="#">member.uid_A001_X1383_X222.141-1952_136-1955_sci.spw25_27_29_31_33_35.cont.l.pb.fits.gz</a>
product	<a href="#">member.uid_A001_X1383_X222.141-1952_136-1955_sci.spw25_27_29_31_33_35.cont.l.pbcor.fits</a>
product	<a href="#">member.uid_A001_X1383_X222.141-1952_136-1955_sci.spw27.cube.l.mask.fits.gz</a>
product	<a href="#">member.uid_A001_X1383_X222.141-1952_136-1955_sci.spw27.cube.l.pb.fits.gz</a>
product	<a href="#">member.uid_A001_X1383_X222.141-1952_136-1955_sci.spw27.cube.l.pbcor.fits</a>
product	<a href="#">member.uid_A001_X1383_X222.141-1952_136-1955_sci.spw27.mfs.l.mask.fits.gz</a>
product	<a href="#">member.uid_A001_X1383_X222.141-1952_136-1955_sci.spw27.mfs.l.pb.fits.gz</a>
product	<a href="#">member.uid_A001_X1383_X222.141-1952_136-1955_sci.spw27.mfs.l.pbcor.fits</a>
product	<a href="#">member.uid_A001_X1383_X222.141-1952_136-1955_sci.spw29.cube.l.mask.fits.gz</a>
product	<a href="#">member.uid_A001_X1383_X222.141-1952_136-1955_sci.spw29.cube.l.pb.fits.gz</a>
product	<a href="#">member.uid_A001_X1383_X222.141-1952_136-1955_sci.spw29.cube.l.pbcor.fits</a>
product	<a href="#">member.uid_A001_X1383_X222.141-1952_136-1955_sci.spw29.mfs.l.mask.fits.gz</a>
product	<a href="#">member.uid_A001_X1383_X222.141-1952_136-1955_sci.spw29.mfs.l.pb.fits.gz</a>
product	<a href="#">member.uid_A001_X1383_X222.141-1952_136-1955_sci.spw29.mfs.l.pbcor.fits</a>
product	<a href="#">member.uid_A001_X1383_X222.141-1952_136-1955_sci.spw31.cube.l.mask.fits.gz</a>
product	<a href="#">member.uid_A001_X1383_X222.141-1952_136-1955_sci.spw31.cube.l.pb.fits.gz</a>
product	<a href="#">member.uid_A001_X1383_X222.141-1952_136-1955_sci.spw31.cube.l.pbcor.fits</a>
product	<a href="#">member.uid_A001_X1383_X222.141-1952_136-1955_sci.spw31.mfs.l.mask.fits.gz</a>
product	<a href="#">member.uid_A001_X1383_X222.141-1952_136-1955_sci.spw31.mfs.l.pb.fits.gz</a>
product	<a href="#">member.uid_A001_X1383_X222.141-1952_136-1955_sci.spw31.mfs.l.pbcor.fits</a>
product	<a href="#">member.uid_A001_X1383_X222.141-1952_136-1955_sci.spw33.cube.l.mask.fits.gz</a>
product	<a href="#">member.uid_A001_X1383_X222.141-1952_136-1955_sci.spw33.cube.l.pb.fits.gz</a>
product	<a href="#">member.uid_A001_X1383_X222.141-1952_136-1955_sci.spw33.cube.l.pbcor.fits</a>
product	<a href="#">member.uid_A001_X1383_X222.141-1952_136-1955_sci.spw33.mfs.l.mask.fits.gz</a>

# QA2 Data Products Package: Directory Structure

After un-tarring the processed data we have a directory tree:

Science goal

```
2017.1.05267.S/
|-- science_goal.uid__A001_X1299_X2z
|  |-- group.uid__A001_X1299_X25
|     |-- member.uid__A001_X1299_X39
```

Project code

Member OUS: may co  
12-m array, ALMA Co  
Array (ACA), or Total P  
observation

Group OUS:  
combination of  
member OUS's

```
|-- calibration
|-- log
|-- member.uid__A001_X1299_X39.README.txt
|-- product
|-- qa
|-- script
```

Data delivery products...

# QA2 Data Products Package: The README

## Different format before Cycle 5

```
| -- member.uid__A001_X1299_X39.README.txt
```

### Cycle 0-4

Project code: 2015.1.02572.S  
PI name: Bob Hops  
Project title: A first look at Space  
Configuration: 0.241 km  
Proposed rms:  
Proposed beam size: 3.44"  
CASA version: 4.7.2  
Comments from Reducer:  
This scheduling block was manually calibrated and imaged.  
Several antennas were flagged for particularly high Tsys.  
Continuum images were produced using scriptForImaging.py. They include the entire bandwidth.  
Continuum:  
Beam= 4.33" by 2.59"  
RMS = 5.0 Jy/Beam over 7.5 GHz bandwidth

### Cycle 5

You can download the AQUA quality report for these observations from SnooPI using the following URL...

<https://asa.alma.cl/snoopi>

**If you are not on the project and need the QA2 report of the public data, submit HD ticket**

### Cycle 6-Now

Details about the quality of the data processing are in

[qa/member.uid\\_\\_A001\\_X135e\\_X8f.qa2\\_report.pdf](#) (or html)

Details about the processing are in

[qa/\\*weblog.tgz](#)

Details about the quality of the raw data are in

[qa/\\*qa0\\_report.pdf](#) (or html)

## QA2 Data Products Package:

```
-- calibration Pipeline Calibration Tables  
|  |-- member.uid___A001_X1299_X39.hifa_calimage.auxproducts.tgz  
|  |-- member.uid___A001_X1299_X39.session_1.auxcaltables.tgz  
|  |-- member.uid___A001_X1299_X39.session_1.caltables.tgz  
|  |-- uid___A002_Xc8ed15_X1a9.ms.calapply.txt  
|  |-- uid___A002_Xc8ed15_X1a9.ms.flagversions.tgz  
|  |-- uid___A002_Xc8ed15_X1a9_target.ms.auxcalapply.txt
```

calibration: **Manual Calibration Tables**

```
uid___A002_Xd81670_X867e.calibration.plots.tgz  
uid___A002_Xd81670_X8a51.calibration.plots.tgz  
uid___A002_Xd81670_X8d91.calibration.plots.tgz  
uid___A002_Xd81670_X867e.calibration.tgz  
uid___A002_Xd81670_X8a51.calibration.tgz  
uid___A002_Xd81670_X8d91.calibration.tgz
```

**All flags will be restored during calibration**



# QA2 Data Products Package: the processed data

## Pipeline Calibration Log and Products:

### CASA Log file (non-executable)

```
| -- log  
|   -- member.uid__A001_X1299_X39.hifa_calimage.casa_commands.log  
| -- member.uid__A001_X1299_X39.README.txt  
| -- product  
|   |-- member.uid__A001_X1299_X39.SOURCE_sci.spw25_27_29_31.cont.I.pb.fits  
|   |-- member.uid__A001_X1299_X39.SOURCE_sci.spw25_27_29_31.cont.I.pbcor.fits  
|   |-- member.uid__A001_X1299_X39.SOURCE_sci.spw25.cube.I.mask.fits  
|   |-- member.uid__A001_X1299_X39.SOURCE_sci.spw25.cube.I.pbcor.fits  
|   |-- member.uid__A001_X1299_X39.SOURCE_sci.spw25.cube.I.pb.fits.gz  
|   |-- member.uid__A001_X1299_X39.J0117p1418_ph.spw31.mfs.I.pbcor.fits  
|   |-- member.uid__A001_X1299_X39.J0117p1418_ph.spw31.mfs.I.pb.fits.gz
```

Calibration and Target images  
produced from QA2

# QA2 Data Products Package:

## MANUAL Calibration Log and Products:

### CASA Log file (non-executable)

log:

```
member.uid__A001_X122e_X2945.2018.1.05432.S_uid__A001_X122e_X2945.log.tgz  uid__A002_Xd81670_X867e.log.tgz
member.uid__A001_X122e_X2945.Imaging.log.tgz                               uid__A002_Xd81670_X8a51.log.tgz
```

product:

```
member.uid__A001_X122e_X2945.SOURCE_sci.spw13_15_17_19.mfs.A.pbcor.fits
member.uid__A001_X122e_X2945.SOURCE_sci.spw13_15_17_19.mfs.I.manual.pbcor.fits
member.uid__A001_X122e_X2945.SOURCE_sci.spw13_15_17_19.mfs.I.manual.pb.fits.gz
member.uid__A001_X122e_X2945.SOURCE_sci.spw13_15_17_19.mfs.IQUV.manual.mask.tgz
member.uid__A001_X122e_X2945.SOURCE_sci.spw13_15_17_19.mfs.IQUV.manual.pbcor.fits
member.uid__A001_X122e_X2945.SOURCE_sci.spw13_15_17_19.mfs.IQUV.manual.pb.fits.gz
member.uid__A001_X122e_X2945.J0348-2749_ph.spw13_15_17_19.mfs.I.manual.pbcor.fits
member.uid__A001_X122e_X2945.J0348-2749_ph.spw13_15_17_19.mfs.I.manual.pb.fits.gz
member.uid__A001_X122e_X2945.J0423-0120_pol.spw13_15_17_19.mfs.I.manual.pbcor.fits
member.uid__A001_X122e_X2945.J0423-0120_pol.spw13_15_17_19.mfs.I.manual.pb.fits.gz
```

**Calibration and Target images  
produced from QA2**

# QA2 Data Products Package: the processed data

## Pipeline Calibration Scripts and Weblog:

Weblog contains plots and images from reduction and imaging. Unpack this for lots of information!

```
| -- qa  
|   |-- member.uid__ A001_X1299_X39.hifa_calimage.weblog.tgz  
|-- script  
| |-- member.uid__ A001_X1299_X39.calimage.pipeline_manifest.xml  
| |-- member.uid__ A001_X1299_X39.calimage.product_rename.txt  
| |-- member.uid__ A001_X1299_X39.hifa_calimage.casa_piperestorescript.py  
| |-- member.uid__ A001_X1299_X39.hifa_calimage.casa_pipescript.py  
| |-- member.uid__ A001_X1299_X39.hifa_calimage.pprequest.xml  
| |-- member.uid__ A001_X1299_X39.scriptForPI.py
```

Run `scriptForPI.py` to restore calibration

Commands to re-run the pipeline

# QA2 Data Products Package: the processed data

## MANUAL Calibration Scripts and QA2 report:

```
qa:  
member.uid__A001_X122e_X2945.qa2_report.html  
uid__A002_Xd81670_X867e__qa2_part2.png uid__A002_Xd81670_X8d91.qa0_report.pdf  
uid__A002_Xd81670_X8d91__textfile.txt  
member.uid__A001_X122e_X2945.qa2_report.pdf  
uid__A002_Xd81670_X867e__qa2_part3.png uid__A002_Xd81670_X8d91__qa2_part1.png  
uid__A002_Xd81670_X867e.qa0_report.pdf  
uid__A002_Xd81670_X867e__textfile.txt uid__A002_Xd81670_X8d91__qa2_part2.png  
uid__A002_Xd81670_X867e__qa2_part1.png  
uid__A002_Xd81670_X8a51.qa0_report.pdf uid__A002_Xd81670_X8d91__qa2_part3.png
```

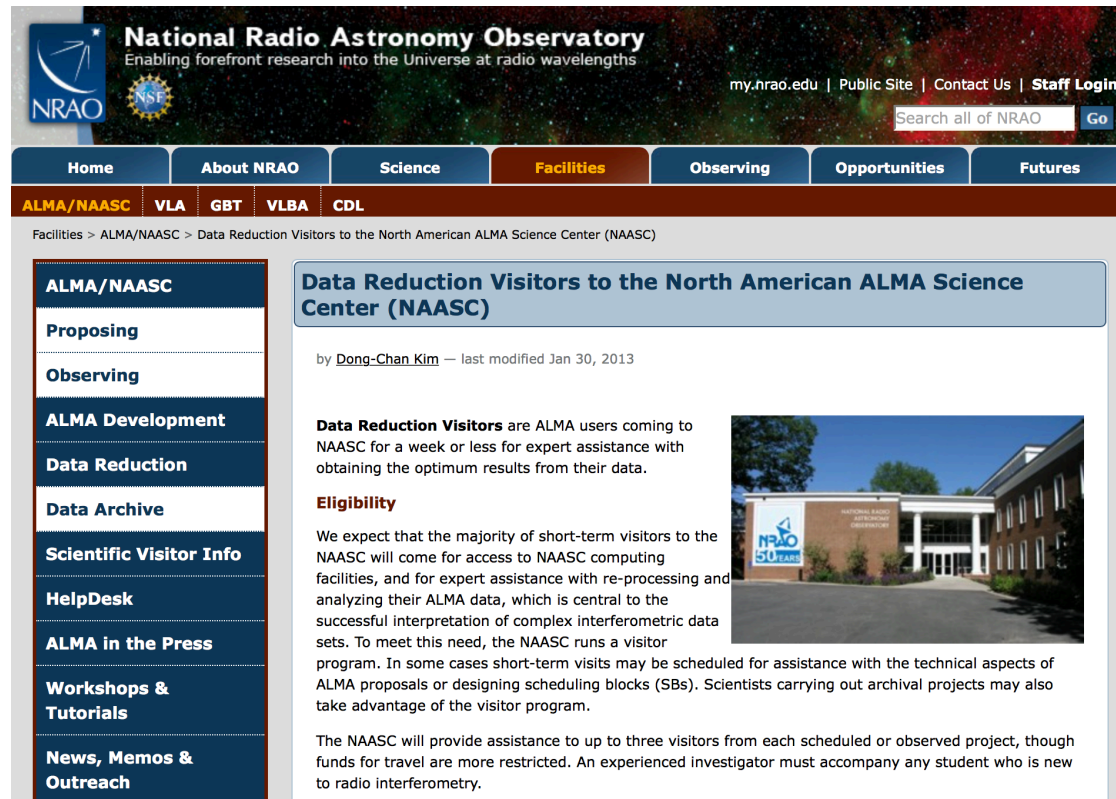
```
script:  
member.uid__A001_X122e_X2945.calimage.product_rename.txt  
member.uid__A001_X122e_X2945.scriptForPolCalibration.py  
uid__A002_Xd81670_X8a51.ms.wvrgcal.txt  
member.uid__A001_X122e_X2945.scriptForImagingPrep.py  
uid__A002_Xd81670_X867e.ms.scriptForCalibration.py  
uid__A002_Xd81670_X8d91.ms.scriptForCalibration.py  
member.uid__A001_X122e_X2945.scriptForImaging.py  
uid__A002_Xd81670_X867e.ms.wvrgcal.txt  
uid__A002_Xd81670_X8d91.ms.wvrgcal.txt  
member.uid__A001_X122e_X2945.scriptForPI.py ←  
uid__A002_Xd81670_X8a51.ms.scriptForCalibration.py
```

**QA2 reports contain  
plots and images from  
reduction and imaging.  
Not as much information  
as weblog...**

**Run scriptForPI.py to restore calibration**

# Resources After Delivery

- HelpDesk: [help.almascience.org](http://help.almascience.org)
- Face to Face visits in Charlottesville:  
[science.nrao.edu/facilities/alma/visitors-shortterm](http://science.nrao.edu/facilities/alma/visitors-shortterm)



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ALMA/NAASC VLA GBT VLBA CDL

Facilities > ALMA/NAASC > Data Reduction Visitors to the North American ALMA Science Center (NAASC)

**ALMA/NAASC**

- Proposing
- Observing
- ALMA Development
- Data Reduction
- Data Archive
- Scientific Visitor Info
- HelpDesk
- ALMA in the Press
- Workshops & Tutorials
- News, Memos & Outreach


### Data Reduction Visitors to the North American ALMA Science Center (NAASC)

by [Dong-Chan Kim](#) — last modified Jan 30, 2013

**Data Reduction Visitors** are ALMA users coming to NAASC for a week or less for expert assistance with obtaining the optimum results from their data.

**Eligibility**

We expect that the majority of short-term visitors to the NAASC will come for access to NAASC computing facilities, and for expert assistance with re-processing and analyzing their ALMA data, which is central to the successful interpretation of complex interferometric data sets. To meet this need, the NAASC runs a visitor program. In some cases short-term visits may be scheduled for assistance with the technical aspects of ALMA proposals or designing scheduling blocks (SBs). Scientists carrying out archival projects may also take advantage of the visitor program.



The NAASC will provide assistance to up to three visitors from each scheduled or observed project, though funds for travel are more restricted. An experienced investigator must accompany any student who is new to radio interferometry.



**For more info:**  
<https://almascience.nrao.edu/>

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. ALMA construction and operations are led on behalf of Europe by ESO, on behalf of North America by the National Radio Astronomy Observatory (NRAO), which is managed by Associated Universities, Inc. (AUI), and on behalf of East Asia by the National Astronomical Observatory of Japan (NAOJ). The Joint ALMA Observatory (JAO) provides the unified leadership and management of the construction and operation of ALMA. The Joint ALMA Observatory is operated by ESO, AUI/NRAO and NAOJ.