



EUROPEAN ARC  
ALMA Regional Centre

## I-TRAIN with the European ARC Network

# #1. Imaging with the ALMA Science Pipeline

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# Requirements

The training session will focus on how to run the [ALMA Science Pipeline](#) to perform imaging steps. To follow the tutorial we recommend the following:

- To be familiar with general imaging concepts and imaging in CASA
  - Install **CASA with the ALMA Science Pipeline**:
    - CASA version 5.6.1-8 is preferred  
(Note: CASA version 5.4.0-70 should also work but has not been tested for this tutorial)  
(Note: Mac OSX users should **avoid updating to macOS Big Sur**)
  - Install **Firefox and overcome its [security fix](#)**
  - Download the training materials: **4.9 GB** size → **Allow for plenty of time if you are on a wireless**
- [Link to Tutorial Data](#)
- Allow for a minimum of empty space in your computer of **~21 GB** (materials size + size of the output of the exercise)

*The next slides will provide you with instructions to fulfil the list of requirements*

# INSTRUCTIONS

The next steps will guide you to fulfil the requirements for this training session:

1. [Basic skills](#)
2. [CASA](#)
3. [Firefox](#)
4. [Dataset and disk space](#)
5. [Check your CASA installation](#)
6. [Check your Firefox installation and weblog](#)
7. [Final check list](#)

Contact us at [contact@nordic-alma.se](mailto:contact@nordic-alma.se) if you encounter any issues

# 1. Basic skills

The training will focus specifically on how to run [ALMA Science Pipeline](#) to perform imaging steps. We therefore recommend to be familiar with:

- General imaging concepts
- CASA and basic `tclean` imaging parameters

# 2. CASA

- Install CASA with the ALMA Pipeline:

- *CASA version 5.6.1-8 is preferred*

- (Note: CASA version 5.4.0-70 should also work but has not been tested for this tutorial)

- You can install CASA from the following link:

- [Download CASA](#)

- Mac OSX: Create symlinks to call CASA from terminal

- Create symbolic links to the CASA version and its executables (Administrator privileges are required), which will allow you to run casa, casaviewer, casaplotms, etc. from any terminal command line. To do so, run from a CASA prompt:

- `!create-symlinks`

- [\[more information\]](#)

- Mac OSX: **avoid updating to macOS Big Sur** to prevent CASA crashes (at least the viewer has been reported to crash).

# 3. Firefox

Install Firefox and overcome a security update:

- Install Firefox
- Overcome a security fix:
  - open "about:config" link in Firefox, find "privacy.file\_unique\_origin" property and change the property value to "false".
  - Then close Firefox and open it again.

You can find further details on this issue in this [ALMA Knowledgebase article](#)

# 4. Dataset and disk space

- Check you have a minimum of empty space in your computer:  
Minimum disk space required: **~21 GB** (dataset after untar + output of the exercise)
- Download training materials: **4.9 GB** size → **Allow plenty of time if you are on a wireless**  
[Link to Tutorial Data](#)

- Extract tar file:

```
tar -xvf 2018.1.01201.S.PLtutorial.tar.gz
```

It will create a folder 2018.1.01201.S/; you can delete the tar.gz file

# 5. Check your CASA installation

Check that CASA with the ALMA pipeline environment work as expected:

1. Launch CASA from the terminal with:  
`casapy --pipeline`  
# depends on your alias setup

2. Check your terminal output. It will inform you that pipeline tasks (h, hif, hifa, ...) have been loaded

```
$casapy -- pipeline
==>
=====
The start-up time of CASA may vary
depending on whether the shared libraries
are cached or not.
=====

IPython 5.4.0 -- An enhanced Interactive Python.

PIPELINE CASA 5.6.1-8 -- Common Astronomy Software Applications

Found an existing telemetry logfile: /Users/XXXX/.casa/
casastats-561-8-2702-4cf3304a422d-20201113-162938-PIPELINE.log
Telemetry initialized. Telemetry will send anonymized usage
statistics to NFAO.
You can disable telemetry by adding the following line to your
~/.casarc file:
EnableTelemetry: False
2020-11-14 17:08:31 INFO: Environment is not MPI enabled. Pipeline
operating in single host mode
2020-11-14 17:08:34 INFO: Environment variable FLUX_SERVICE_URL not
defined. Switching to backup url.
2020-11-14 17:08:34 INFO: Environment variable
FLUX_SERVICE_URL_BACKUP not defined.
2020-11-14 17:08:35 INFO: Pipeline version Unknown running on
MacBook-Pro.local
2020-11-14 17:08:35 INFO: Host environment: 16.0 GB memory, 4 x
Intel(R) Core(TM) i5-7360U CPU @ 2.30GHz running MacOS 10.15.7
2020-11-14 17:08:35 INFO:
2020-11-14 17:08:35 INFO: Loaded CASA tasks from package: h
2020-11-14 17:08:35 INFO: Loaded CASA tasks from package: hif
2020-11-14 17:08:35 INFO: Loaded CASA tasks from package: hifa
2020-11-14 17:08:35 INFO: Loaded CASA tasks from package: hifv
2020-11-14 17:08:35 INFO: Loaded CASA tasks from package: hsd
2020-11-14 17:08:35 INFO: Loaded CASA tasks from package: hsdn

There has been an error related to the numpy
API version used by CASA. This is related to uvmultifit
(which uses the API version of your system) and should
be *harmless*.

--> CrashReporter initialized.
Enter doc('start') for help getting started with CASA..
```



# 6. Check your Firefox installation and weblog

Check you can navigate the weblog:

1. Open Firefox

2. Descend to the weblog folder

```
cd 2018.1.01201.S/science_goal.uid__A001_X133d_X2c85/group.uid__A001_X133d_X2c86/  
member.uid__A001_X133d_X2c8b/calibrated/working/pipeline-20201105T143636/html
```

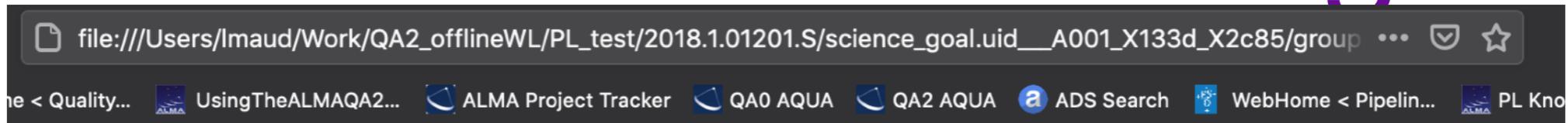
3. Print the name of the current working folder

```
[CASA <17>: pwd  
Out[17]: u'/Users/lmaud/Work/QA2_offlineWL/PL_test/2018.1.01201.S/science_goal.uid__A001_X133d_X2c85/group.uid__A001_X133d_X2c86/member.uid__A001_X133d_X2c8b/calibrated/working/pipeline-20201105T143636/html'
```

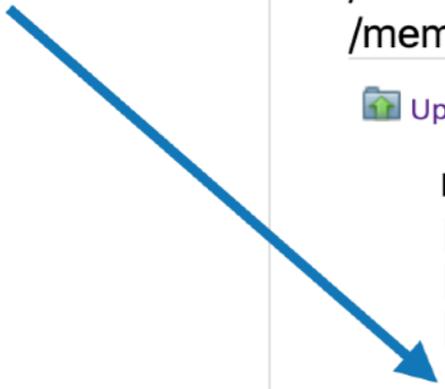


put the directory location in the web browser

# 6. Check your Firefox installation and weblog



open the weblog by clicking on "index.html"



Index of file:///Users/lmaud/Work/QA2\_offlineWL/PL\_test/2018.1.01201.S/science\_goal.uid\_\_A001\_X133d\_X2c85/group.uid\_\_A001\_X133d\_X2c86/member.uid\_\_A001\_X133d\_X2c8b/calibrated/working/pipeline-20201105T145041/html/

[Up to higher level directory](#)

Name	Size	Last Modified
<a href="#">casa-20201105-144952.log</a>	392 KB	05.11.20 16:09:21 CET
<a href="#">casa_commands.log</a>	3 KB	05.11.20 16:09:21 CET
<a href="#">casa_pipescript.py</a>	1 KB	05.11.20 16:09:21 CET
<a href="#">index.html</a>	11 KB	05.11.20 16:09:21 CET
<a href="#">resources</a>		21.02.20 12:10:43 CET
<a href="#">sessionsession_1</a>		05.11.20 16:01:03 CET
<a href="#">stage1</a>		05.11.20 15:59:33 CET
<a href="#">stage2</a>		05.11.20 16:01:48 CET
<a href="#">stage3</a>		05.11.20 16:04:43 CET
<a href="#">stage4</a>		05.11.20 16:09:21 CET
<a href="#">t1-1.html</a>	11 KB	05.11.20 16:09:21 CET
<a href="#">t1-2.html</a>	5 KB	05.11.20 16:09:21 CET
<a href="#">t1-3.html</a>	8 KB	05.11.20 16:09:21 CET
<a href="#">t1-4.html</a>	8 KB	05.11.20 16:09:21 CET
<a href="#">t2-1.html</a>	4 KB	05.11.20 16:09:21 CET
<a href="#">t2-3-1m.html</a>	7 KB	05.11.20 16:09:21 CET
<a href="#">t2-3-2m.html</a>	3 KB	05.11.20 16:09:21 CET
<a href="#">t2-3-3m.html</a>	4 KB	05.11.20 16:09:21 CET
<a href="#">t2-3-5m.html</a>	3 KB	05.11.20 16:09:21 CET
<a href="#">t2-3-6m.html</a>	3 KB	05.11.20 16:09:21 CET

# 6. Check your Firefox installation and weblog

Home By Topic By Task Project Code N/A

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## Observation Overview

Project	uid://A001/X12ed/X103
Principal Investigator	janehuang
Observation Start	2018-10-02 17:33:17 UTC
Observation End	2018-10-02 21:00:43 UTC

## Pipeline Summary

Pipeline Version	42254 (Pipeline-CASA54-P1-B) <a href="#">(documentation)</a>
CASA Version	5.4.0-70 <a href="#">(environment)</a>
Pipeline Start	2020-11-05 14:36:36 UTC
Execution Duration	0:21:30

## Observation Summary

Measurement Set	Receivers	Num Antennas	Time (UTC)			Baseline Length			Size
			Start	End	On Source	Min	Max	RMS	
<b>Observing Unit Set Status:</b> unknown <b>Scheduling Block ID:</b> uid://A001/X133d/X2c83									
<b>Session:</b> session_1									
<a href="#">uid__A002_Xd2b681_Xa1c2.ms</a>	ALMA Band 6	11	2018-10-02 17:33:17	2018-10-02 18:39:03	0:39:51	8.9 m	48.0 m	25.8 m	3.3 GB
<b>Session:</b> session_2									
<a href="#">uid__A002_Xd2b681_Xb99d.ms</a>	ALMA Band 6	12	2018-10-02 20:25:54	2018-10-02 21:00:42	0:16:09	8.9 m	48.9 m	26.7 m	2.2 GB

# 6. Check your Firefox installation and weblog



*Enjoy navigating the weblog and get familiar with it.*

We recommend becoming familiar with weblogs before the training. You can have a quick overview on weblogs at the following links:

[Italian ARC presentation](#)

[ERIS 2019 presentation](#)

# 7. Final check list

You should be able to tick on all the boxes in the list of requirements. You are/have:

- Familiar with general imaging concepts and imaging in CASA
- Installed **CASA with the ALMA Science Pipeline**:
  - CASA version 5.6.1-8 is preferred
  - (Note: CASA version 5.4.0-70 should also work but has not been tested for this tutorial)
- Installed **Firefox and overcome its [security fix](#)**
- Downloaded the training materials **4.9 GB** size  
[Link to Tutorial Data](#)
- Allowed for empty space in your computer: **~21 GB** (materials size + size of output of the exercise)
- Opened the weblog and explored its different tabs.



you are ready

Contact us at [contact@nordic-alma.se](mailto:contact@nordic-alma.se) if you encounter any issues