

Tools for ALMA

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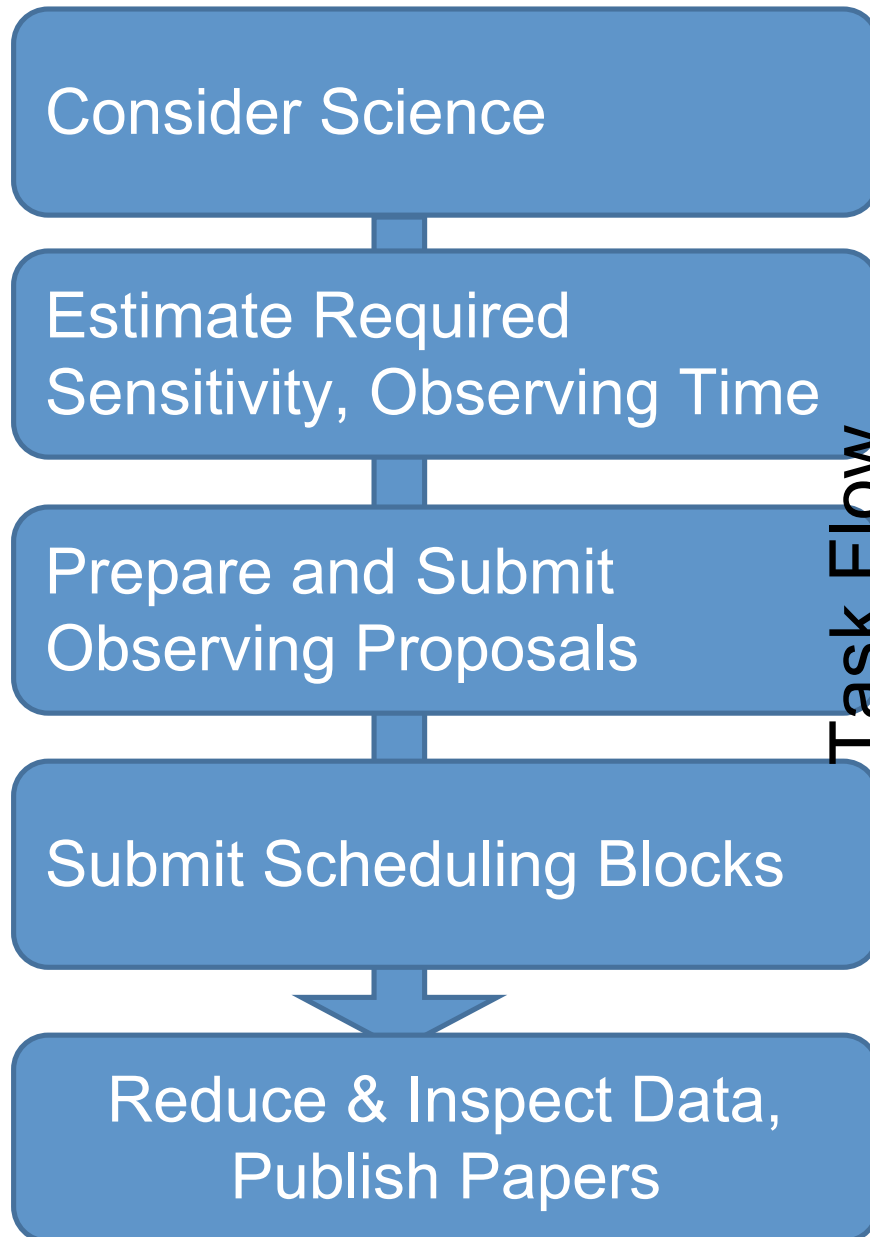


Four Major Software Tools for ALMA

1. CASA (Common Astronomy Software Applications)
2. OT (Observing Tool)
3. Splatalogue
4. User Portal, Helpdesk



ALMA Observations



Task Flow

CASA (simdata),
Splatalogue, Helpdesk

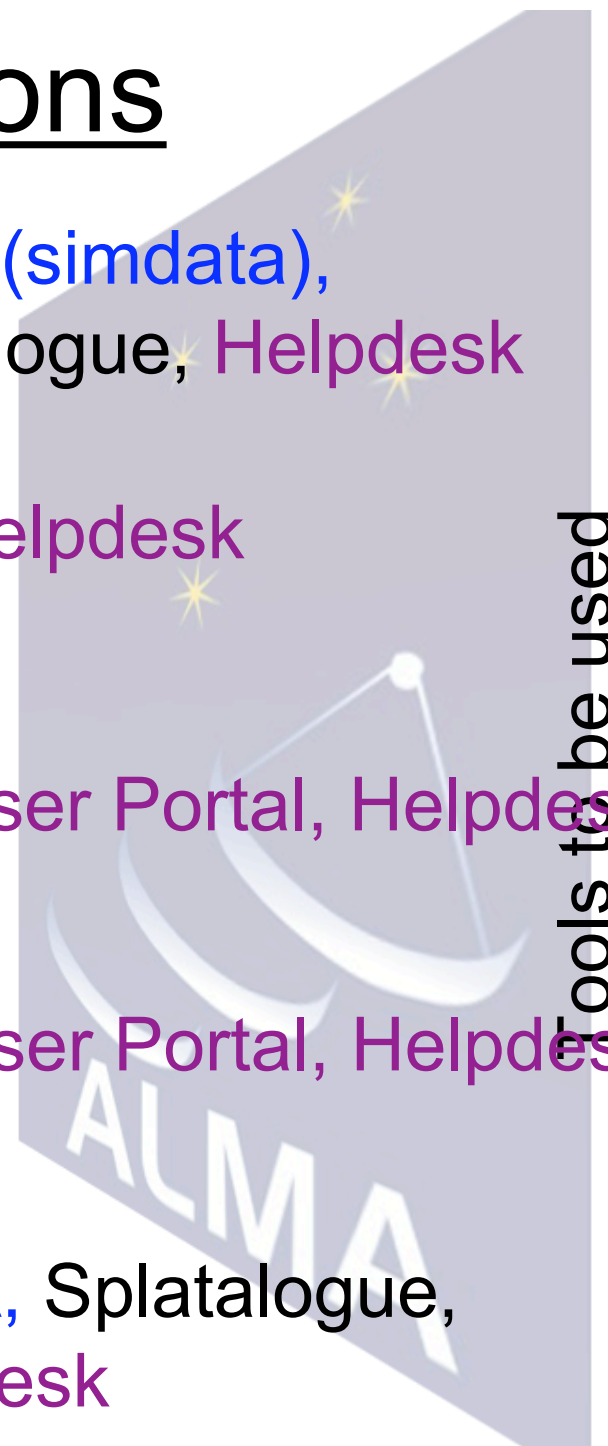
OT, Helpdesk

OT, User Portal, Helpdesk

OT, User Portal, Helpdesk

CASA, Splatalogue,
Helpdesk

Tools to be used



1. CASA

ALMA (& EVLA) Data Reduction Software + Observing Simulator (simdata)

Being developed by U.S.A. (NRAO)

for the interferometric part,

By Japan (NAOJ) for the single-dish part

Platform:

RedHat Enterprise Linux: 4 & 5 (32 bit and 64 bit),

Fedora Core Linux: 6, 7, 8 (32 bit and 64 bit), Ubuntu 8.0.4 (32 bit and 64 bit),

openSUSE 10.0, 11.0 (32 bit and 64 bit), Debian 4.0 (32 bit and 64 bit),

Mac OS 10.5 (Leopard), Mac OS 10.6 (Snow Leopard)

ALMA Data Reduction with CASA

Data Inspection
& Flagging

Tasks

plotms
flagdata
listobs

Passband &
Gain Calibration

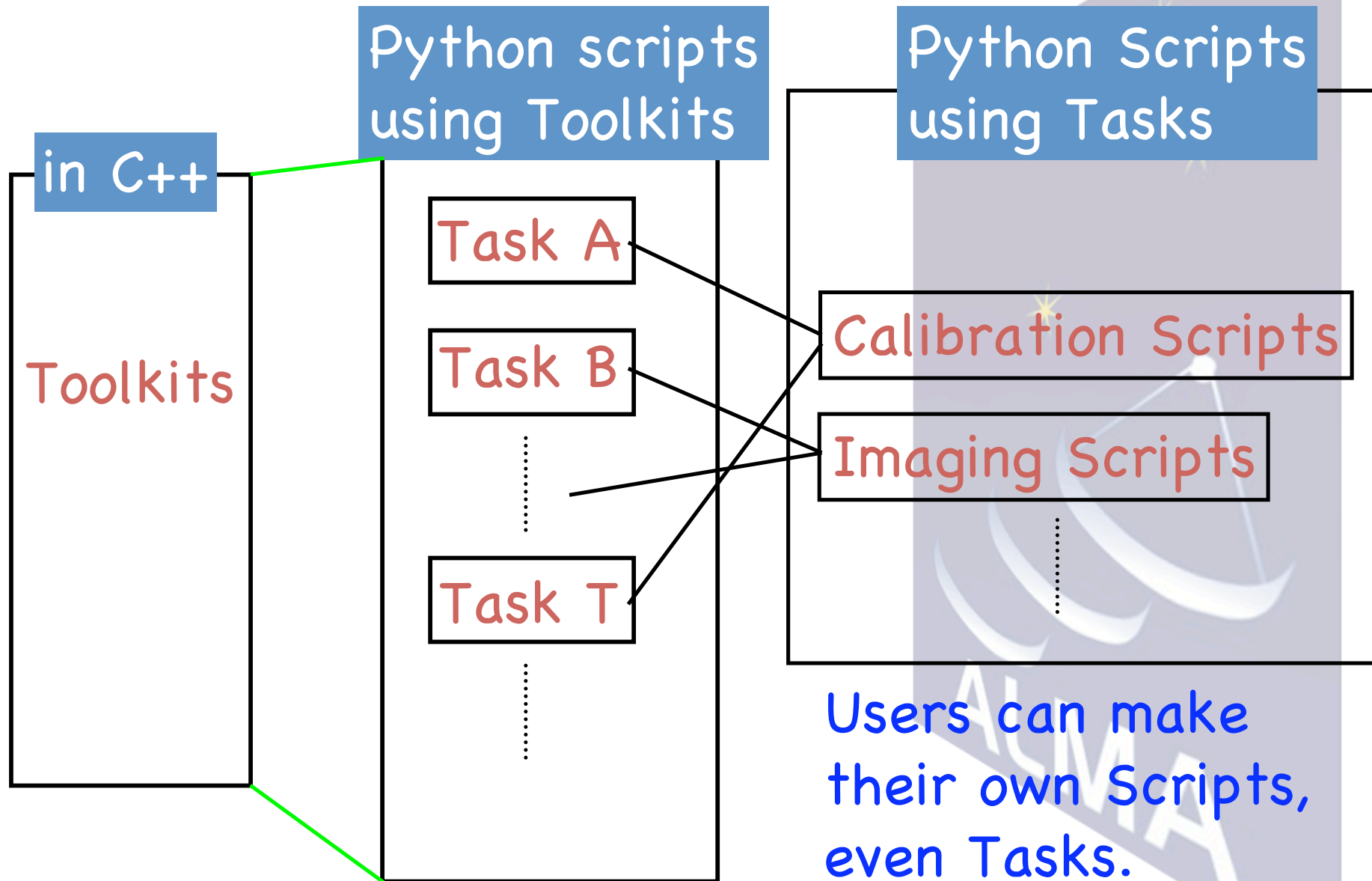
setjy
bandpass
gaincal
plotcal
fluxscale
applycal

Imaging,
Clean

clean
widefield
feather
Viewer
Immoments
Imfit...



Structure of CASA



Overview of CASA

The screenshot displays the CASA software interface with three main components:

- Main Window (on terminal):** Shows the CASA configuration environment. The prompt is `CASA <287>:`. The configuration includes:
 - `connection = False`
 - `async = False`
 - `inp_simdata` (highlighted in blue)
 - `inp(simdata)` (highlighted in blue)
 - `# simdata :: mosaic simulation task`
 - `modelimage = 'dm7_230_0'`
 - `ignorecoord = True`
 - `inbright = 'unchanged'`
 - `complist = ''`
 - `antennalist = 'test.cfg'`
 - `checkinputs = 'no'`
 - `project = 'sim'`
 - `refdate = '2012/05/21/22:05:00'`
 - `totaltime = '7200s'`
 - `integration = '10s'`
 - `scanlength = 5`
 - `startfreq = '230GHz'`
 - `chanwidth = '4000MHz'`
 - `nchan = 1`
 - `direction = ['J2000 00h00m00 -23d00m00']`
 - `pointingspacing = '1arcmin'`
 - `relmargin = 1.0`
 - `cell = '0.2arcsec'`
 - `imsz = [512, 512]`
 - `niter = 500`
 - `threshold = '0.01mJy'`
 - `psfmode = 'clark'`
 - `weighting = 'natural'`
 - `uvtaper = False`
 - `stokes = 'I'`
 - `noise_thermal = False`
 - `fidelity = True`
 - `display = True`
 - `verbose = False`
 - `async = False`

- Log Message:** A window titled "Log Messages (/Users/takakuwa/CASA/sim/casapy.log)" showing a list of messages with columns for Time, Priority, Origin, and Message. The messages include:
- 2010-02-05 09:52:47 INFO feather::imager::feather() feathering together high and low resolution images.
- 2010-02-05 09:52:47 INFO feather::im... Input and output
- 2010-02-05 09:52:47 INFO feather::im... Using primary beam
- 2010-02-05 09:52:47 INFO feather::im... Determining scaling
- 2010-02-05 09:52:47 SEVERE feather::im... Caught exception:
- 2010-02-05 09:52:47 SEVERE feather::im... Exception Reported
- 2010-02-05 09:52:47 INFO feather::im... feather::casa
- 2010-02-05 09:52:47 INFO feather::im... ##### End Task: f
- 2010-02-05 09:52:47 INFO feather::im... #####
- 2010-02-07 10:40:51 INFO viewer::casa
- Image Viewer (type viewer):** A window titled "Image Viewer" showing a plot of the simulated image. The plot axes are labeled "J2000 Right Ascension" (x-axis, ranging from 00h00m00.44 to 00h00m00.28) and "J2000 Declination" (y-axis, ranging from 53"8 to 55"8). A central bright spot is visible, with a scale bar indicating "0 km/s". The viewer includes navigation buttons (back, forward, etc.), a "Normal" vs "Blink" toggle, and a "Frame" slider.

You type commands on the Main Window

```
xterm
connection      =      False      # expression is given for infile (advanced).
                                     # (Optional) Return a connection object for
                                     # the newly opened viewer.
async           =      False      # If true the taskname must be started using
                                     # viewer(...)

CASA <287>: inp simdata
-----> inp(simdata)
# simdata :: mosaic simulation task:
modeimage       =      'u17_250_0' # input image name
ignorecoord     =      True        # scale model coordinates to output parameters
inbright        =      'unchanged' # set peak surface brightness in Jy/pixel or
                                     # "unchanged"
complist        =      ''          # componentlist table to observe
antennalist     =      'test.cfg'  # antenna position file
checkinputs     =      'no'        # graphically verify parameters [yes|no|only]
project         =      'sim'       # root for output files
refdate         =      '2012/05/21/22:05:00' # center time/date of observation *see help
totaltime       =      '7200s'     # total time of observation
integration      =      '10s'      # integration (sampling) time
scanlength      =      5           # number of integrations per pointing in the
                                     # mosaic
startfreq       =      '230GHz'    # frequency of first channel
chanwidth       =      '4000MHz'   # channel width
nchan           =      1           # number of channels
direction       =      '[ J2000.00h00m00 -23d00m00 ]' # mosaic center, or list of pointings
pointingspacing =      '1arcmin'   # spacing in between beams in mosaic
relmargin       =      1.0         # space btw. pointings and edge, relative to
                                     # pointingspacing
cell            =      '0.2arcsec' # output cell/pixel size.
imsize          =      [512, 512]  # output image size in pixels (x,y)
niter           =      500         # maximum number of iterations
threshold       =      '0.01mJy'   # flux level (+units) to stop cleaning
psfmode         =      'clark'     # method of PSF calculation to use during minor
                                     # cycles
weighting       =      'natural'   # weighting to apply to visibilities
uvtaper         =      False       # apply additional uv tapering of visibilities.
stokes          =      'I'        # Stokes params to image
noise thermal   =      False       # add thermal noise
fidelity        =      True        # Calculate fidelity images
display         =      True        # Plot simulation result images, figures
verbose         =      False       #
async           =      False       # If true the taskname must be started using
                                     # simdata(...)

CASA <288>: □
```

Task name & Tips

Bad parameter value

Parameter list

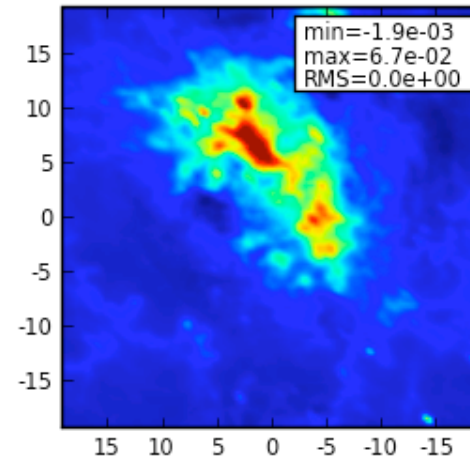
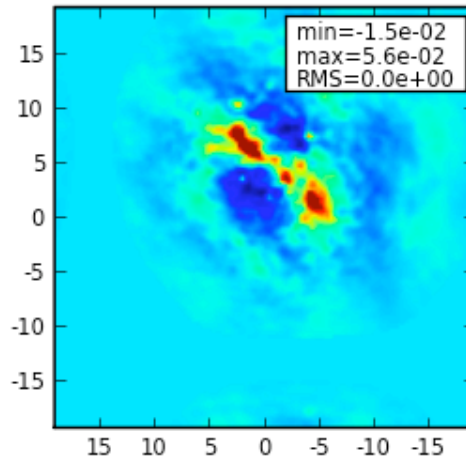
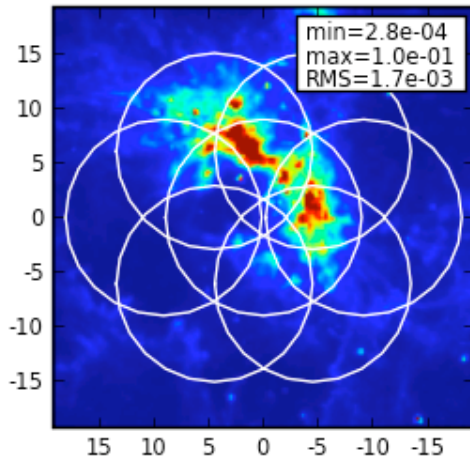


ALMA observing simulation:

task simdata

MODEL

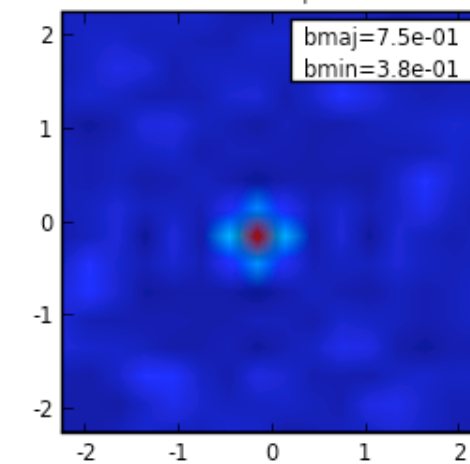
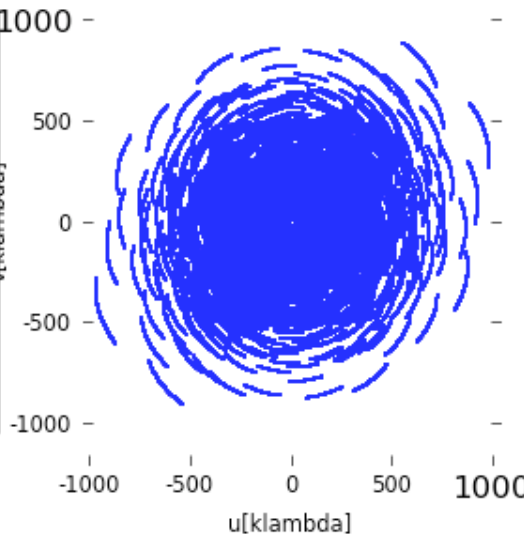
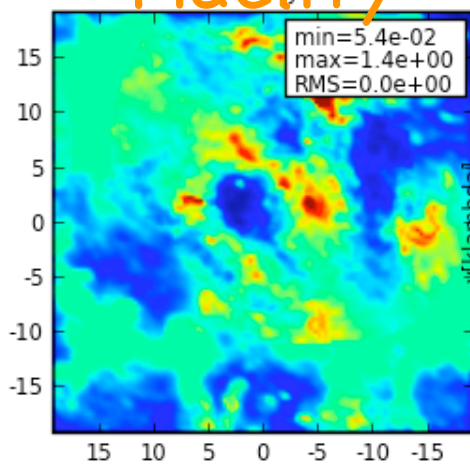
Simulated Obs. MODEL - Obs.



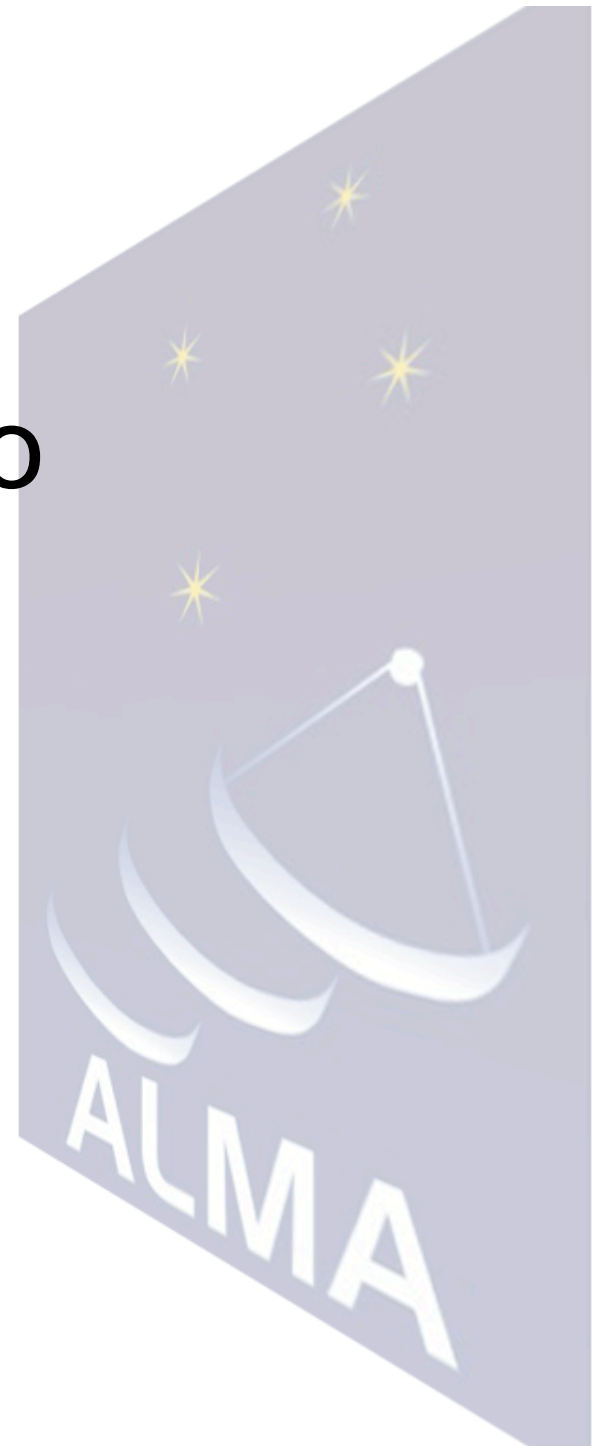
Fidelity

uv-track

Beam



Demo, demo



CASA Main Web

<http://casa.nrao.edu>

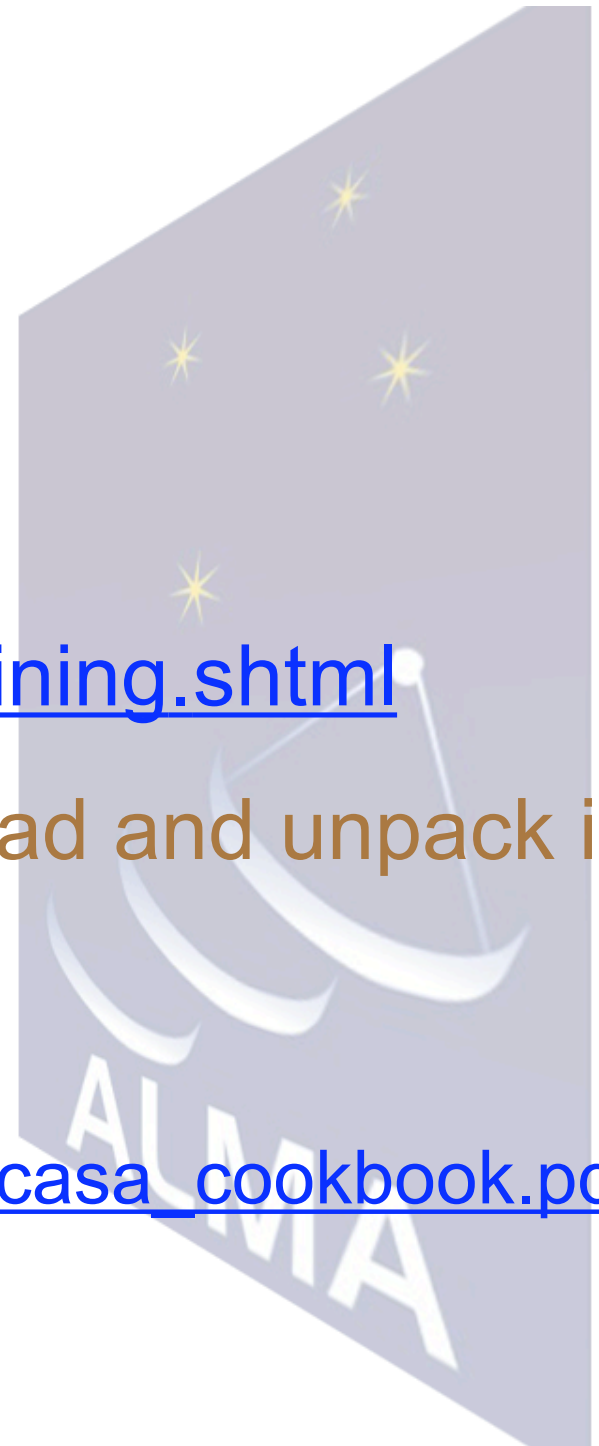
Installation of CASA

http://casa.nrao.edu/casa_obtaining.shtml

(In most cases) just download and unpack it.

CASA Cookbook

http://casa.nrao.edu/Doc/Cookbook/casa_cookbook.pdf



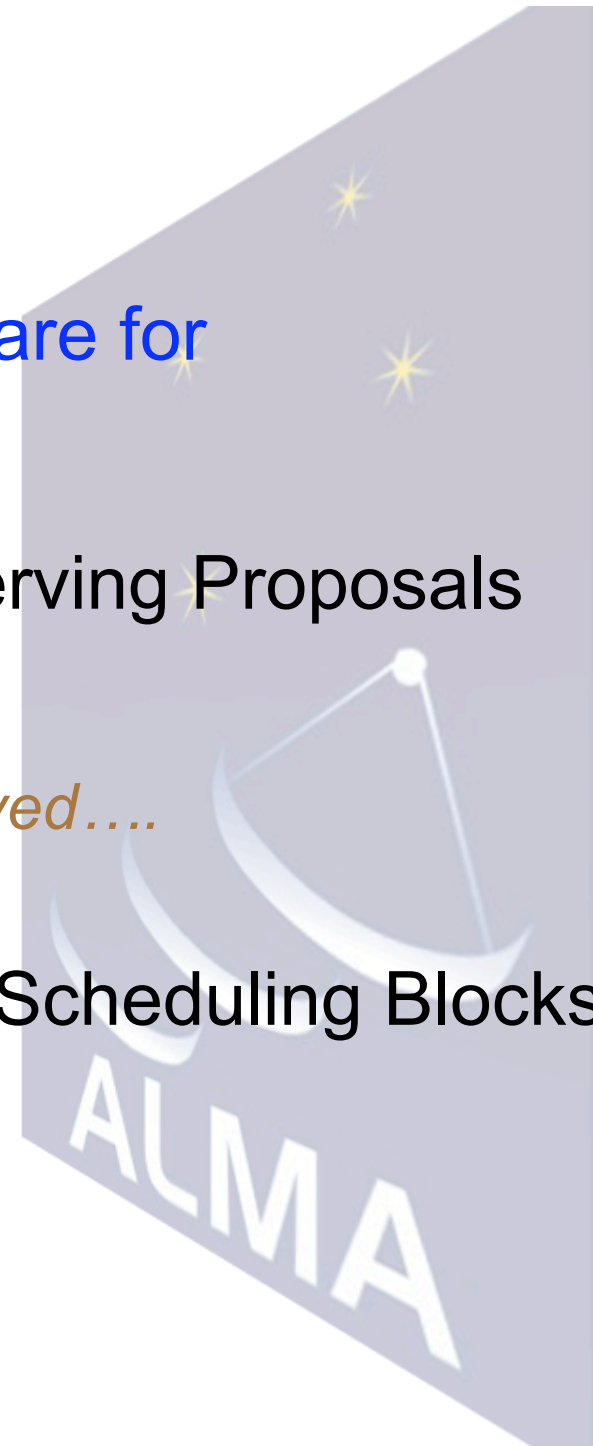
2. OT

A Java-based Application to Prepare for
the ALMA Observations

Prepare and Submit ALMA Observing Proposals
(Phase I)

After your proposal is approved....

& ALMA Observing Programs (“Scheduling Blocks”)
(Phase II)



Supported Platforms

- ✿ Sun/Solaris
- ✿ RedHat 7, 9, and RedHat Enterprise
- ✿ Linux Fedora and Scientific Linux
- ✿ Suse Linux versions 7, 9 and 10
- ✿ Windows XP and VISTA (Windows 7 ?)
- ✿ MAC OSX 10.6 (Leopard and Snow Leopard)
- ✿ Installing correct Java software is also required



Installation

<http://almasw.hq.eso.org/almasw/bin/view/OBSPREP/WebHome>

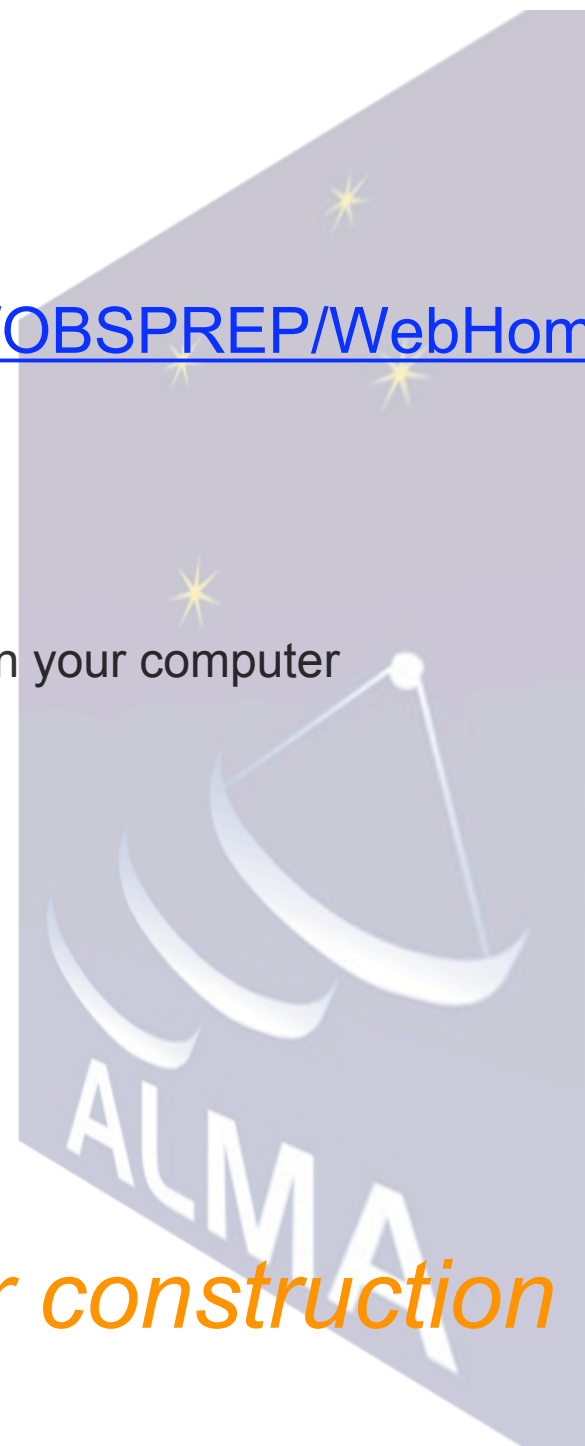
★ Webstart

- ★ The OT is installed and run automatically on your computer

★ Tarball

- ★ Download and install the OT manually

OT is still under construction



The OT Main GUI

Project (0) - ALMA Observing Tool UT7.0 for Chajnantor at 23.02S, 67.75W

File Edit Tool Search Options Help Perspective 1

Project Structure

Proposal Program

(unnamed project)

- Project (0)
 - Proposal

Editors

Spectral Spatial Forms Catalog

Feedback

Problems Information Log

Description	Suggestion	Resource
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Overview

Contextual Help

- Please ensure you and your co-Is are registered with the [ALMA user portal](#)
- Create a new proposal by
 - Selecting *File > New Proposal*
 - Click on the icon in the toolbar
 - Or click on this [link](#)
- Click on the [proposal](#) tree node and complete the relevant fields.

Phase I: Science Proposal

New Science Proposal → Create Science Goals → Validate Science Proposal → Submit Science Proposal

Phase II: Observing Program

Retrieve Science Proposal → Configure System Setup → Validate Observing Program → Submit Observing Program

Click on the overview steps to view the contextual help

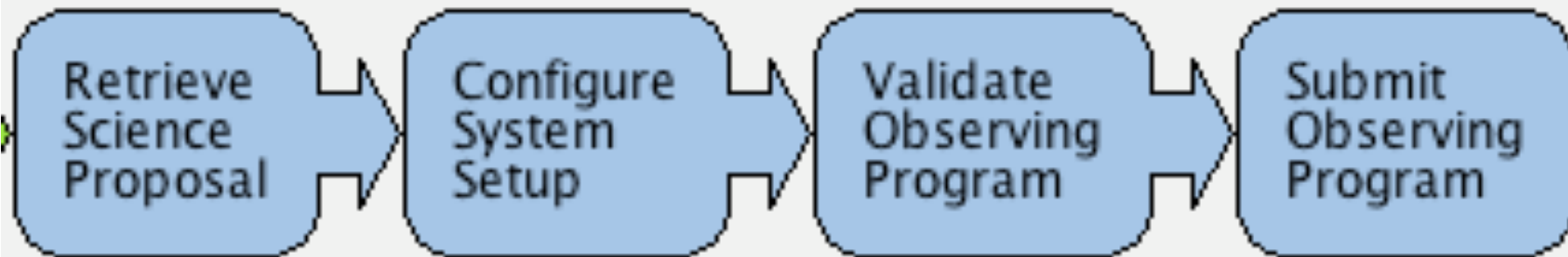
Importing And Exporting Need More Help?

Overview Steps

Phase I: Science Proposal



Phase II: Observing Program



Demodemo



3. Splatalogue

A Comprehensive Web-based Tool
to search for Atomic/Molecular Lines

You can check “what you can observe with ALMA”.

Just visit

<http://www.splatalogue.net/>



4. User Portal, Helpdesk

A Webbased User Interface;
To check the status of the project,
and ask questions (Helpdesk).

Kayako system
Japanese page

English page

The Japanese interface features a header with the 'eSupport' logo and 'サポートセンター' (Support Center). It includes six main service icons: '登録' (Registration), 'Knowledgebase', 'ニュース' (News), 'サポートチケット発行' (Submit Ticket), 'Troubleshooter', and 'ダウンロード' (Downloads). A search bar is located on the right. Below the icons is a table of '最新 Knowledgebase記事' (Latest Knowledgebase Articles) with columns for article title and '登録日' (Registration Date).

最新 Knowledgebase記事	登録日
独自ドメインでのお申し込みについて	25 Jul 2009 02:05 PM
お支払いについて	25 Jul 2009 02:01 PM
フリーメールでのお申し込みの際のご注意	25 Jul 2009 01:38 PM
マルチドメインプランでのドメイン追加及びディレクトリ	30 Jun 2009 12:45 AM

Footer: ホーム | 登録 | サポートチケット発行 | Knowledgebase | Troubleshooter | ニュース | ダウンロード
Help Desk Software by Kayako eSupport v3.30.02

The English interface features a header with the 'eSupport' logo and 'Support Center'. It includes six main service icons: 'Register', 'Knowledgebase', 'News', 'Submit a Ticket', 'Troubleshooter', and 'Downloads'. A search bar is located on the right. Below the icons is a table of 'Latest Knowledgebase Articles' with columns for article title and 'Date Added'.

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マルチドメインプランでのドメイン追加及びディレクトリ	30 Jun 2009 12:45 AM

Footer: Home | Register | Submit a Ticket | Knowledgebase | Troubleshooter | News | Downloads
Help Desk Software by Kayako eSupport v3.30.02

5. Other Useful Tools for ALMA

ALMA sensitivity calculator

<http://www.eso.org/sci/facilities/alma/observing/tools/etc/index.html>

Leiden Atomic and Molecular Database (LAMDA)

<http://www.strw.leidenuniv.nl/~moldata/>

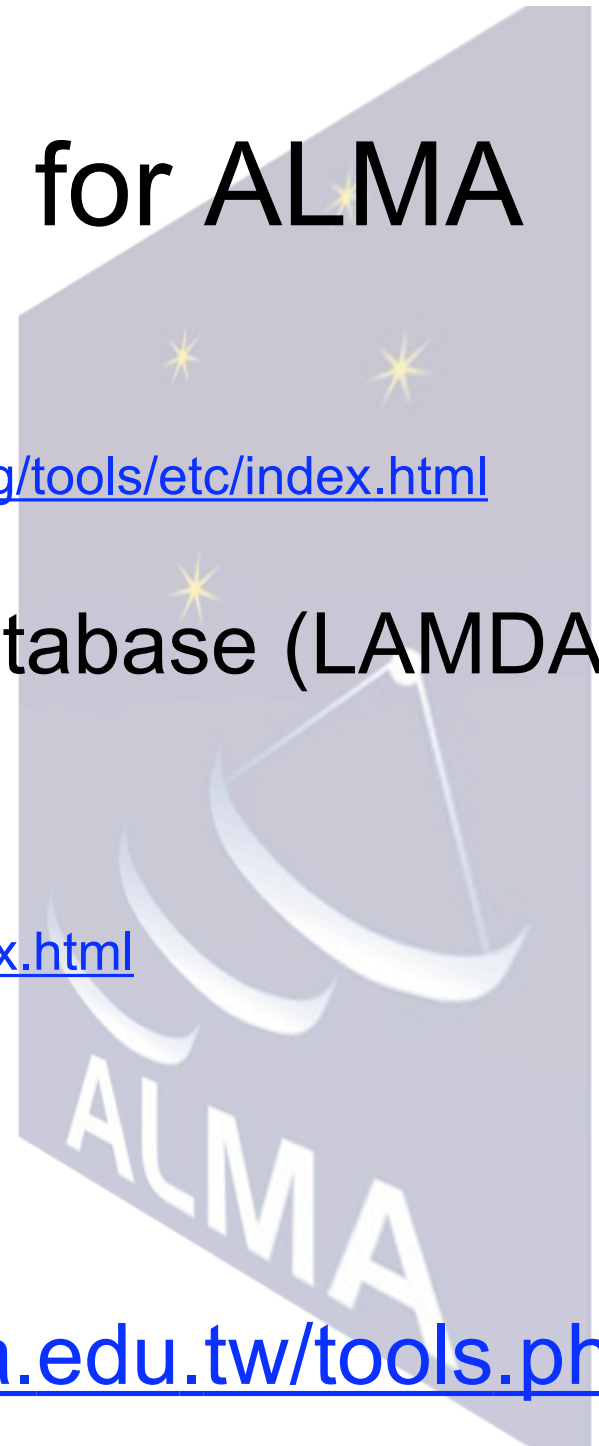
LVG (RADEX)

<http://www.strw.leidenuniv.nl/~moldata/radex.html>

Etc...

For summary

<http://alma.asiaa.sinica.edu.tw/tools.php>



**Visit those websites,
Install those Tools,
and Try them!**

