

EUROPEAN ARC  
ALMA Regional Centre

# ALMA Proposal Preparation and Submission

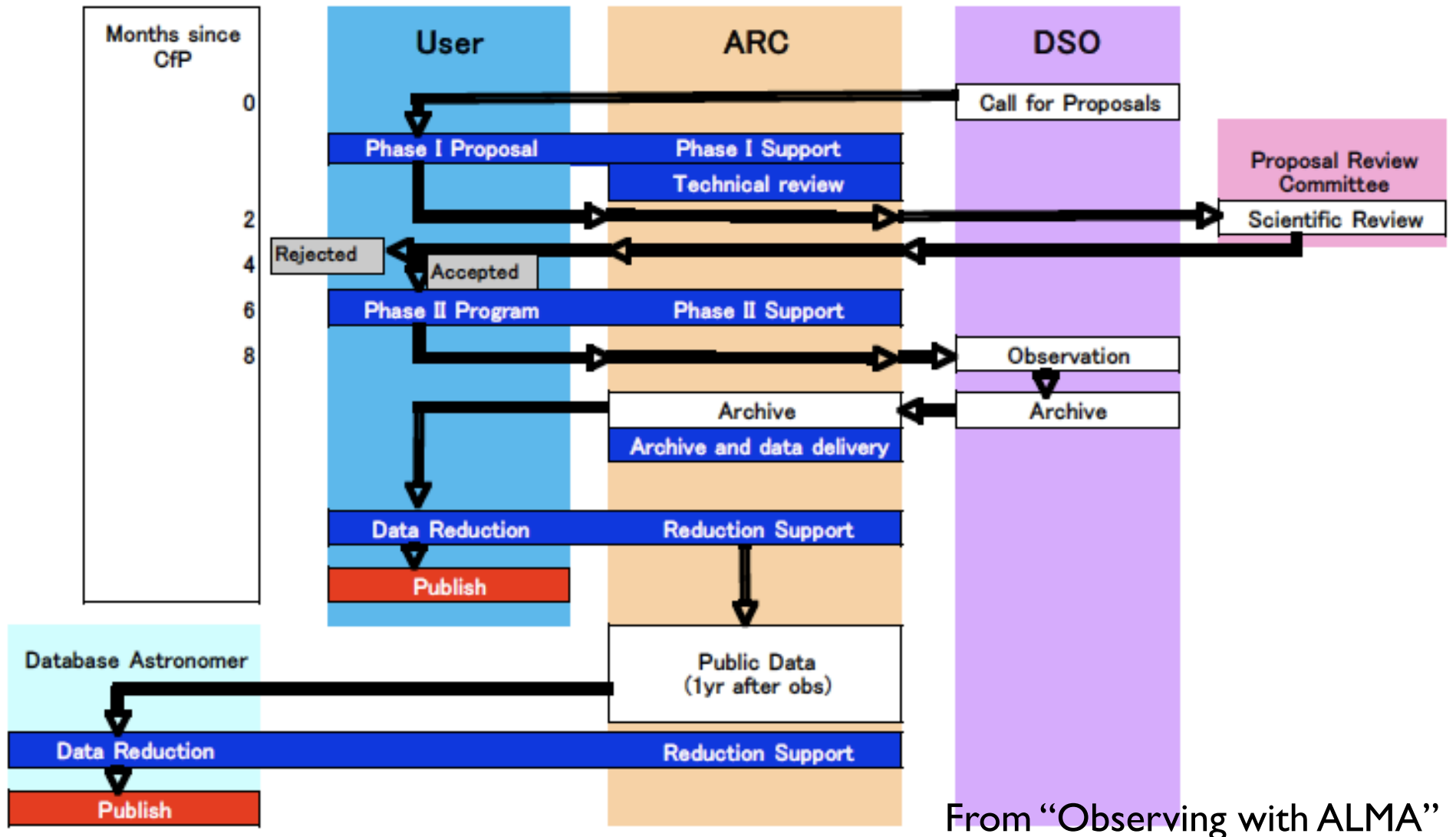
Liz Humphreys

European ALMA Regional Centre  
ESO, Garching



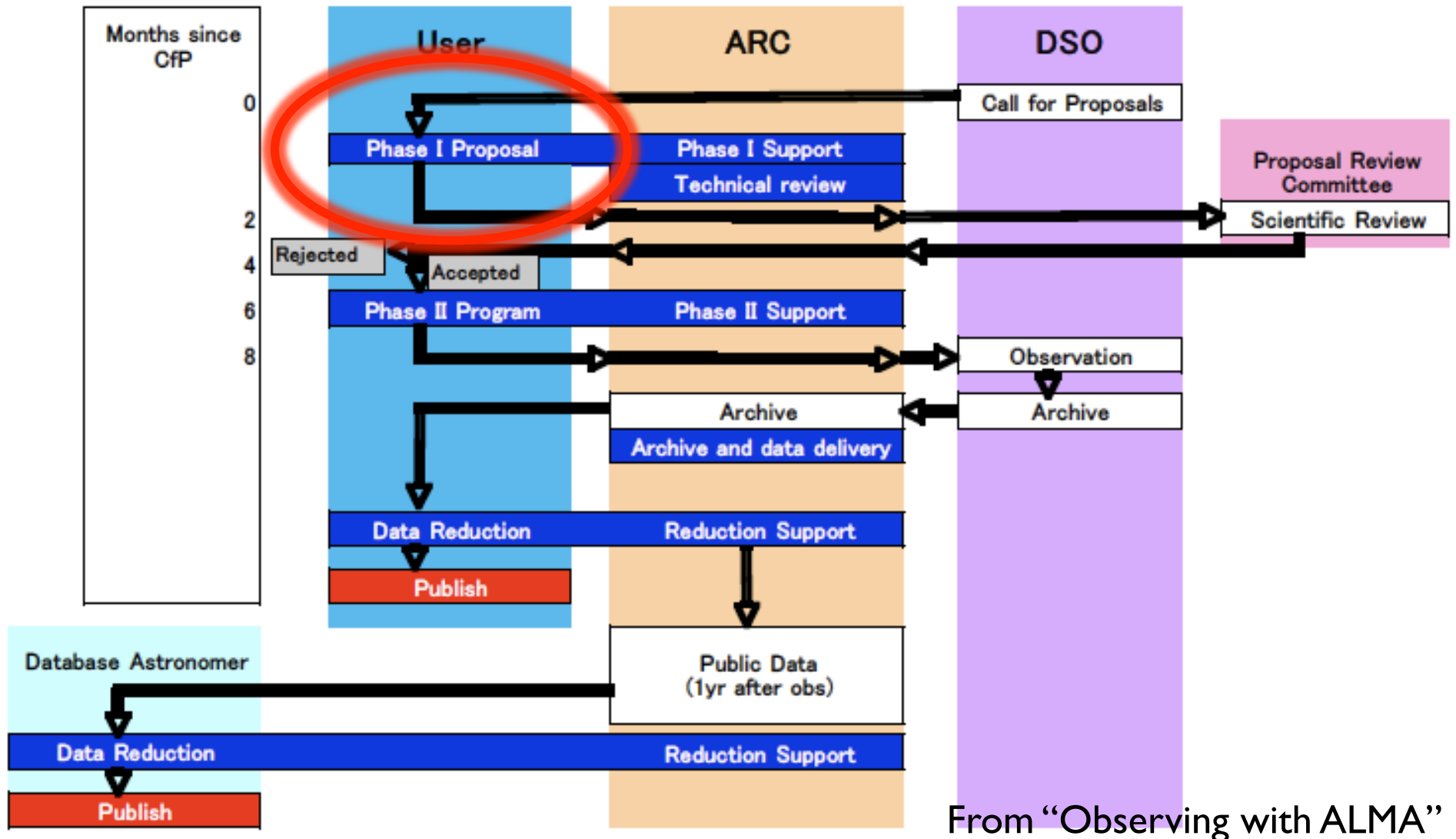
Thanks to Andy Biggs, Paola Andreani, Eelco van Kampen and Jan Brand for materials

# From Proposal to Data



From "Observing with ALMA"

# From Proposal to Data



# Phase I ALMA Software



# The ALMA Observing Tool

- Responsible for project **Proposal Preparation and Submission (Phase I)** and **Accepted Program Observation Preparation (Phase II)**
- Main requirements
  - Needs to run on “all” systems
  - Needs to support all observing modes
  - Needs to support “novice” and “expert” users
  - Needs to provide tools and feedback
- Implemented as a downloadable Java application
  - Connects to the ALMA system as appropriate (submission, user database, etc)
  - Version 7.1 just being released

# The OT Team

- Development of tool based in Edinburgh, UK
  - UK Astronomy Technology Centre (UK ATC)
  - Lead developer is Alan Bridger
- Work spread over three countries
  - 2 programmers in Edinburgh
  - 1 at ESO, Germany (50%)
  - 1 at NAOJ, Japan (20%)
  - Documentation compiled at ESO
  - ESO also provides 2 astronomers (Sub-System Scientist is Andy Biggs)

# Fundamentals

- Basic unit of ALMA observations is the Scheduling Block (SB)
  - Contains all information required to run the observing scripts (modes)
  - Most observations will consist of multiple SBs
- OT will create SBs from Science Goals
  - User need only enter minimal technical information
    - Fields, line frequencies, desired sensitivity, etc.
  - The OT does the rest!
- Lots of feedback is provided – project must validate!





# Observing Tool

NCC 253 CO (1a) - Alma Observing Tool [Aug-29, 14:00(CEST)]

File Edit Tool Search Options Help

Perspective

**Project Structure**

Overview Science Program System Setup

(unnamed project)

- NGC 253 CO (1a)
  - Observing Program
    - NGC 253-SFI
      - NGC 253 hi res
        - 4 Targets
          - J0050-094 (1 pointing, 2 BBCs (2, 1))
          - J0120-270 (1 pointing, 2 BBCs (2, 1))
          - J0051-068, 2 BBCs (2, 1))
          - NGC 253 (35 pointings, 2 BBCs (2, 1))
        - Resources
      - NGC 253 low res
        - 3 Targets
        - Resources

**Editors**

Spectral Spatial Forms Catalog

Frequency used 230.53799 GHz Refr

(source) Setup for CO(2-1):restFrequency

Antenna Diameter 12m 7m

Show Fov(circle) ☒

**Image Query**

Image Server Digitized Sky (Version II) at ESO

Image Size(arcmin) 10 Query

**Field Source Editor**

This FieldSource is used by 2 target.

Field Source

Name Primary

Source Name NGC 253 Resolve

Source Coordinates System J2000 Sexagesimal

**Feedback**

Log Problems Information

Description	Suggestion	Resource

reserved for future use



# Installation: 2 clicks

Alma Observing Tool

http://www.eso.org/~mschilli/UT Google

## ALMA Observing Tool - Installations

From the list below, pick the installation package that's most suitable for you.

### WebStart

[Click here to continue](#) With this, the OT is installed and run automatically on your computer.

### Tarball

[Click here to continue](#) With this you download and install the OT manually.


Observing Tool Web Start

http://www.eso.org/~mschilli/UT7.0/webstart.html Google

### Starting up

*Note: You will be warned strongly when the application is about to start that you should not run the application. This is due to the non-official security certificate we are currently using to authenticate the application. Please do not be worried (though in general you should be!) and run the application anyhow*

Click the OT Logo to start the ALMA OT. Be sure to read the OT User Guide for more information on using it.



See no logo? Click [here](#).

When you run the Observing Tool for the first time, it will create a folder `.almaot` in your home to hold your user preferences.

### User Guide

The OT User Guide is also available as online help within the program. You can invoke it through the Help menu or with the `F1` key.

# Overview

Project (0) - Observing Tool for ALMA (Early Science), version [Apr22,1500UTC]

File Edit Tool Search Options Help

Perspective 1

**Project Structure**

Proposal Program

(unnamed project)

- Project (0)
  - Science Plan

**Editors**

Spectral Spatial Forms Catalog

**Feedback**

Problems Information Log

Description	Suggestion	Resource
-------------	------------	----------

**Overview**

**Contextual Help**

Retrieve your science proposal from the ALMA server by

- Selecting File > Open Project > From ALMA Archive
- Or click on this [link](#)

**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

Project (0) - Observing Tool for ALMA (Early Science), version [Apr22,1500UTC] Perspective 1

File Edit Tool Search Options Help

**Project Structure**

Proposal Program

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**Editors**

Spectral Spatial Forms Catalog

**Feedback**

Problems Information Log

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Project (0) - Observing Tool for ALMA (Early Science), version [Apr22,1500UTC] Perspective 1

File Edit Tool Search Options Help

**Project Structure**

Proposal Program

(unnamed project)

- Project (0)
  - Science Plan

**Editors**

Spectral Spatial Forms Catalog

**Here is where to fill in project information**

**Feedback**

Problems Information Log

Description	Suggestion	Resource
-------------	------------	----------

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File Edit Tool Search Options Help

**Project Structure**

Proposal Program

(unnamed project)

- Project (0)
  - Science Plan

**Editors**

Spectral Spatial Forms Catalog

**Here is where to fill in project information**

**Feedback**

Problems Information Log

Description	Suggestion	Resource
<b>Here is where to get feedback e.g. error messages</b>		

**Overview**

**Contextual Help**

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**Phase I: Science Proposal**

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

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

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Importing And Exporting Need More Help?

# Overview

Project (0) - Observing Tool for ALMA (Early Science), version [Apr22,1500UTC] Perspective 1

File Edit Tool Search Options Help

**Project Structure**

Proposal Program

(unnamed project)

Project (0)

Science Plan

**Editors**

Spectral Spatial Forms Catalog

**Here is where to fill in project information**

**Project Overview Pane**

**Feedback**

Problems Information Log

Description Suggestion Resource

**Here is where to get feedback e.g. error messages**

**Overview**

Contextual Help

Retrieve your science proposal from the ALMA server by

- Selecting File > Open Project > From ALMA Archive
- Or click on this [link](#)

**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?

**Important pane – walks through the whole process**

ES+  
O  
+

Liz Humphreys, ALMA Community Day, Portugal, 23 June 2016

# Overview

**Project Structure**

Proposal Program

(unnamed project)

Project (0)

Science Plan

**Editors**

Spectral Spatial Forms Catalog

**Feedback**

Problems Information Log

Description Suggestion Resource

**Overview**

**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?

**Annotations:**

- Here is where to fill in project information
- Here is where to get feedback e.g. error messages
- Close/open panes by clicking on these arrows
- Important pane – walks through the whole process



Save at any point

# Overview

The screenshot shows the 'Project (0) - Observing Tool for ALMA (Early Science), version [Apr22,1500UTC]' window. The interface includes a menu bar (File, Edit, Tool, Search, Options, Help), a toolbar, and several panes. The 'Project Structure' pane on the left shows a tree view with 'Project (0)' and 'Science Plan'. The 'Editors' pane has tabs for 'Spectral', 'Spatial', 'Forms', and 'Catalog'. The 'Feedback' pane has tabs for 'Problems', 'Information', and 'Log'. The 'Overview' pane at the bottom displays a workflow diagram with two phases: 'Phase I: Science Proposal' and 'Phase II: Observing Program'. The workflow steps are: New Science Proposal, Create Science Goals, Validate Science Proposal, Submit Science Proposal, Retrieve Science Proposal, Configure System Setup, Validate Observing Program, and Submit Observing Program. There are also buttons for 'Importing And Exporting' and 'Need More Help?'. Annotations with red boxes and arrows point to specific features: 'Save at any point' points to the 'File' menu; 'Here is where to fill in project information' points to the 'Editors' pane; 'Here is where to get feedback e.g. error messages' points to the 'Feedback' pane; 'Close/open panes by clicking on these arrows' points to the panes' collapse arrows; and 'Important pane - walks through the whole process' points to the 'Overview' pane.

Project (0) - Observing Tool for ALMA (Early Science), version [Apr22,1500UTC]

File Edit Tool Search Options Help

Project Structure

Proposal Program

(unnamed project)

Project (0)

Science Plan

Editors

Spectral Spatial Forms Catalog

Here is where to fill in project information

Feedback

Problems Information Log

Description Suggestion Resource

Here is where to get feedback e.g. error messages

Overview

Phase I: Science Proposal

Phase II: Observing Program

New Science Proposal Create Science Goals Validate Science Proposal Submit Science Proposal 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?

Close/open panes by clicking on these arrows

Important pane - walks through the whole process

# Creating A Proposal

# Phase I: New Science Proposal

Project (0) - Observing Tool for ALMA (Early Science), version [Apr22,1500UTC]

File Edit Tool Search Options Help

Perspective 1

**Project Structure**

Proposal Program

(unnamed project)

Project (0)

Proposal

**Editors**

Spectral Spatial Forms Catalog

Proposal Information

Proposal Title

Proposal Cycle 2010.2

Edit

Abstract (max. 300 words)

Scientific Category Cosmology and the High Redshift Universe

Proposal Type Standard

Student Project

**Overview**

Contextual Help

1. Please ensure you and your co-Is are registered with the [ALMA user portal](#)
2. Create a new proposal by
  - Selecting **File > New Proposal**
  - Click on the icon in the toolbar
  - Or click on this [link](#)
3. 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?

# Phase I: New Science Proposal

Project (0) - Observing Tool for ALMA (Early Science), version [Apr22,1500UTC]

File Edit Tool Search Options Help

Perspective 1

**Project Structure**

Proposal Program

(unnamed project)

Project (0)

Proposal

**Editors**

Spectral Spatial Forms Catalog

Proposal Information

Proposal Title

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1. Please ensure you and your co-Is are registered with the [ALMA user portal](#)
2. Create a new proposal by
  - Selecting **File > New Proposal**
  - Click on the icon in the toolbar
  - Or click on this [link](#)
3. 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 → Retrieve Science Proposal

**Phase II: Observing Program**

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?

•Title  
•Abstract  
•Author Information  
•Scientific Justification

# Phase I: Create Science Goals

Project (0) - Observing Tool for ALMA (Early Science), version [Apr26,1300UTC]

File Edit Tool Search Options Help Perspective 1

**Project Structure**

- (unnamed project)
  - Project (0)
    - Proposal
      - Planned Observing
        - Science Goal (0)
          - Description
          - Field Setup
          - Calibration Setup Parameters
          - Spectral Setup
          - Control and Performance

**Editors**

Spectral Spatial Forms **Catalog**

Enter a text description for the purpose of this science goal.  
This text is optional but you may find it useful to keep a note.


Description (optional)

This science goal is to map the distribution of  $^{13}\text{CO}$  J=1-0 toward the central regions of NGC 1068.

Enable Editing Launch Editor


**Overview**

**Contextual Help**

- Create your science goals by
  - Selecting **Edit > New Phase-I Science Goal**
  - Click on the  icon in the toolbar
  - Or click on this [link](#)
- Complete the field set-up and spectral set-up, etc. More than one science goal may be added.

**Phase I: Science Proposal**

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

Click on the  icon to view the contextual help

Importing And Exporting Need More Help?

**Phase II: Observing Program**

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

# Create Science Goals: Field Setup

Image Display - jsky1219813541564676856.fits

File Edit Tool Search Options Help

Perspective 1

Project Structure

- (unnamed project)
  - Project (0)
    - Proposal
      - Planned Observing
        - Science Goal 0
          - Description
          - Field Setup
          - Calibration Setup
          - Spectral Setup
          - Control and Perfo

Editors

Spectral Spatial Forms Catalog

Target

ngc 1068

Source

Source Name: ngc 1068

Choose a Solar System Object? ☐ Name of object: Mercury

Source Coordinates

System: J2000 Sexagesimal display? ☒

RA: 02:42:40.831

Dec: -00:00:48.384

Proper Motion RA: 0.00000 mas/yr

Proper Motion Dec: 0.00000 mas/yr

Source Velocity: 1133.0 km/s hel OPTICAL z (optical) 0.003

Parallax: 0.00000 mas

Target Type: ☐ Single Point Field ☒ 1 rectangular field

Field Center Coordinates

Coords Type: ☐ ABSOLUTE ☒ RELATIVE

Offset[RA]: -0.71067 arcsec

Offset[Dec]: 2.13633 arcsec

Rectangle

Long: 74.57742 arcsec

Short: 111.93644 arcsec

Pitch: 54.96542 deg

1x 283, 159 6404.0

02:42:41.864, -00:03:08.76 (J2000)

image filename: jsky3/cache/jsky1219813541564676856.fits

Fov Parameters

Frequency used: 109.78644 GHz Refresh

(source) ceParameters:representativeFrequency

Antenna Diameter: ☒ 12m ☐ 7m

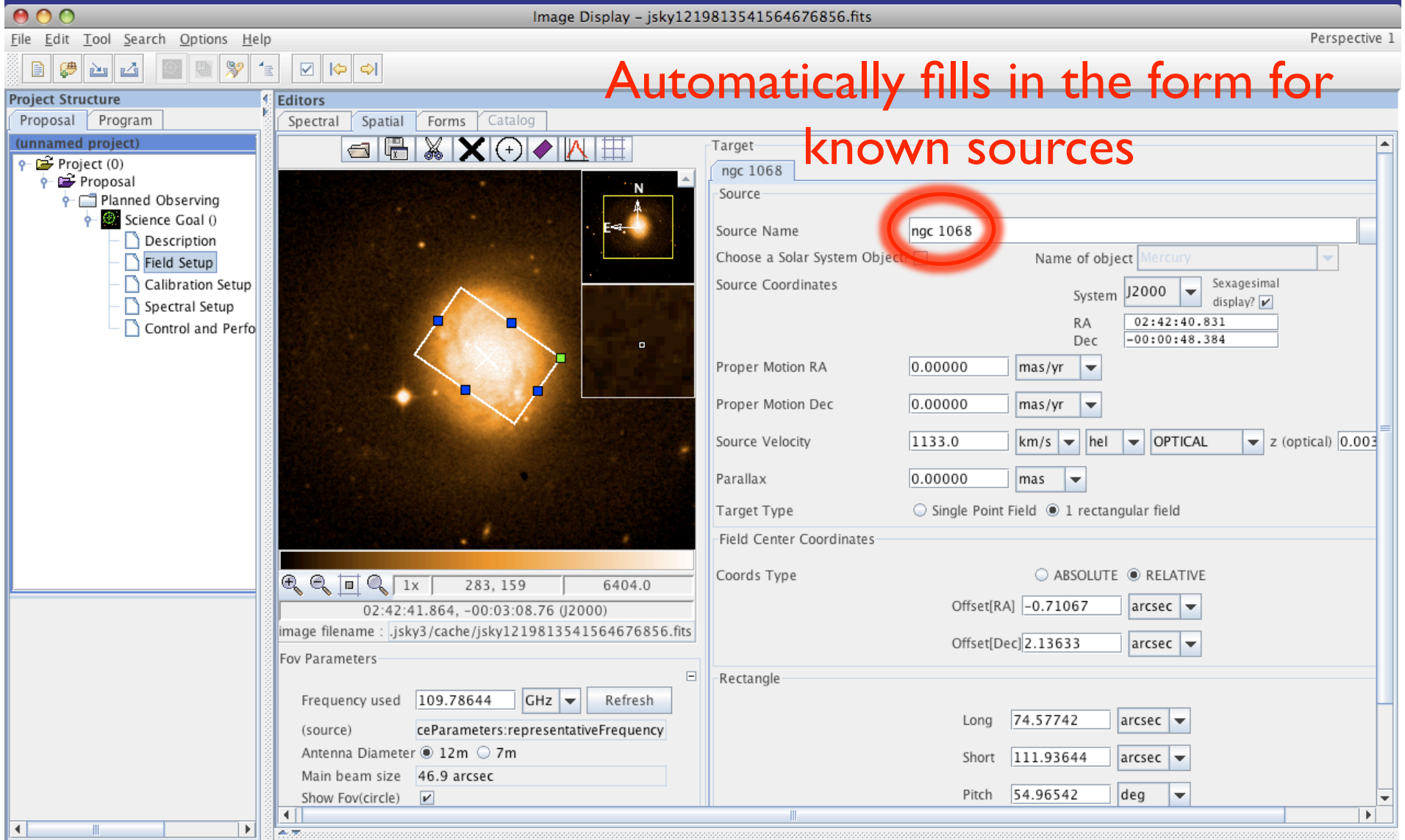
Main beam size: 46.9 arcsec

Show Fov(circle) ☒



# Create Science Goals: Field Setup

Automatically fills in the form for known sources



The screenshot shows the 'Image Display' software interface with the 'Field Setup' tab selected. The main window displays a grayscale image of a galaxy with a white rectangular field of view (FOV) overlaid. The 'Target' panel on the right is populated with data for 'ngc 1068'. The 'Fov Parameters' panel at the bottom left shows the frequency used (109.78644 GHz) and the main beam size (46.9 arcsec). The 'Project Structure' panel on the left shows the hierarchy of the project, including 'Science Goal 0' and 'Field Setup'.

**Target Panel Data:**

Parameter	Value
Source Name	ngc 1068
Source Coordinates	RA: 02:42:40.831, Dec: -00:00:48.384
Proper Motion RA	0.00000 mas/yr
Proper Motion Dec	0.00000 mas/yr
Source Velocity	1133.0 km/s
Parallax	0.00000 mas
Target Type	1 rectangular field
Field Center Coordinates	Offset[RA]: -0.71067 arcsec, Offset[Dec]: 2.13633 arcsec
Rectangle	Long: 74.57742 arcsec, Short: 111.93644 arcsec, Pitch: 54.96542 deg

**Fov Parameters Panel Data:**

Parameter	Value
Frequency used	109.78644 GHz
Antenna Diameter	12m
Main beam size	46.9 arcsec



# Create Science Goals: Field Setup

Automatically fills in the form for known sources

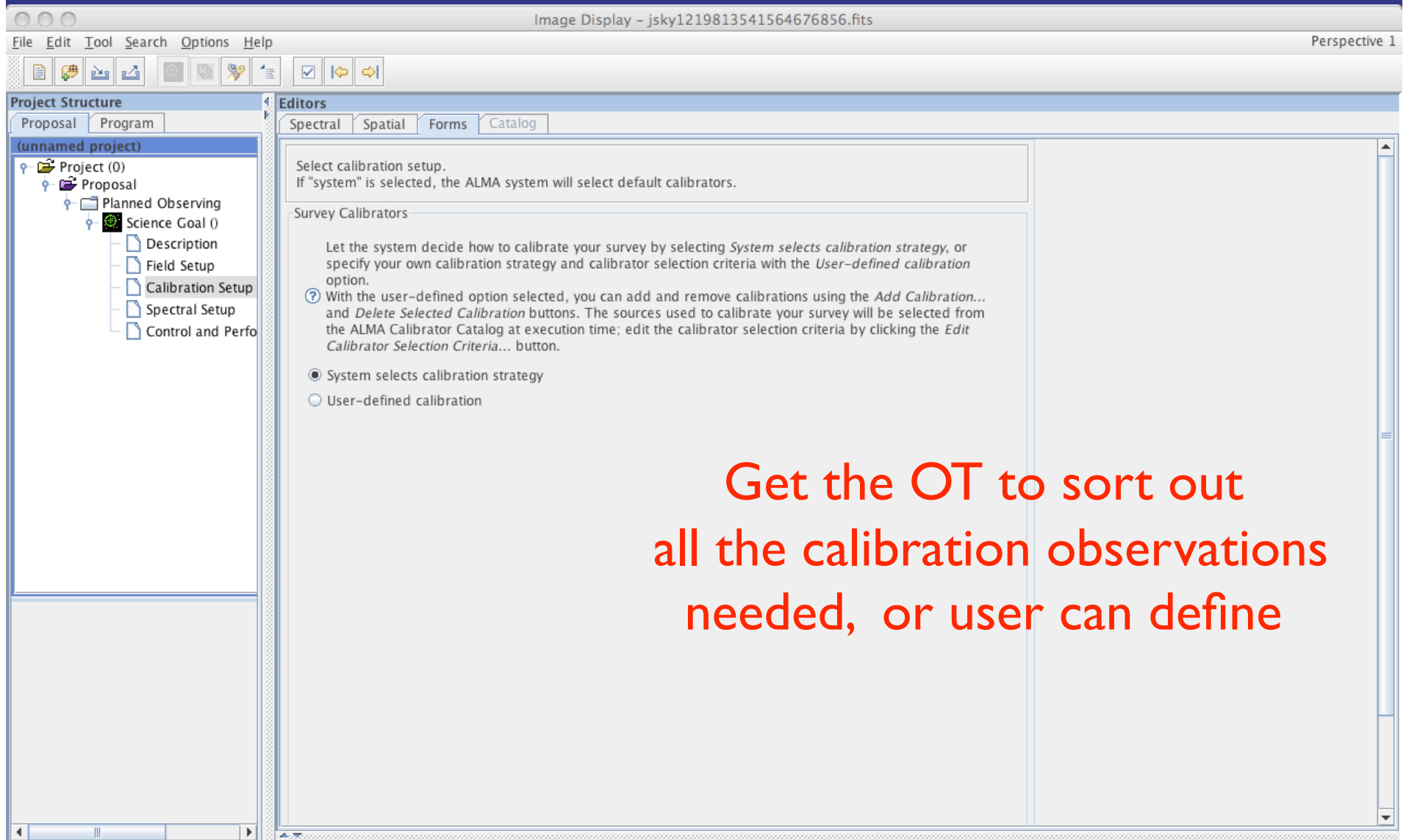
Shows image of source

Draw on region to be mapped

The screenshot displays the 'Image Display' software window, titled 'Image Display - jsky1219813541564676856.fits'. The interface is divided into several panels:

- Project Structure:** A tree view on the left showing the project hierarchy: 'Project (0)' > 'Proposal' > 'Planned Observing' > 'Science Goal 0'. Under 'Science Goal 0', the 'Field Setup' option is selected and highlighted.
- Editors:** A central panel with tabs for 'Spectral', 'Spatial', 'Forms', and 'Catalog'. The 'Spatial' tab is active, showing a grayscale image of a celestial source. A white rectangular box is drawn on the source, indicating the region to be mapped. A zoom level of '1x' and coordinates '283, 159' and '6404.0' are displayed below the image.
- Target:** A panel on the right containing a form for setting up the target. The 'Source' section is filled with data for 'ngc 1068'. The 'Source Name' field is circled in red. Other fields include 'Choose a Solar System Object' (set to 'Mercury'), 'Source Coordinates' (J2000 system, RA: 02:42:40.831, Dec: -00:00:48.384), 'Proper Motion RA' (0.00000 mas/yr), 'Proper Motion Dec' (0.00000 mas/yr), 'Source Velocity' (1133.0 km/s), 'Parallax' (0.00000 mas), and 'Target Type' (set to '1 rectangular field').
- Field Center Coordinates:** A section below 'Target' with 'Coords Type' set to 'RELATIVE'. It includes 'Offset[RA]' (-0.71067 arcsec) and 'Offset[Dec]' (2.13633 arcsec).
- Rectangle:** A section at the bottom right with 'Long' (74.57742 arcsec), 'Short' (111.93644 arcsec), and 'Pitch' (54.96542 deg) fields.
- Fov Parameters:** A section at the bottom left showing 'Frequency used' (109.78644 GHz), 'Antenna Diameter' (12m), 'Main beam size' (46.9 arcsec), and a 'Show Fov(circle)' checkbox.

# Create Science Goals: Calibration Setup



Get the OT to sort out  
all the calibration observations  
needed, or user can define

# Create Science Goals: Spectral Setup

Image Display - jsky1219813541564676856.fits

File Edit Tool Search Options Help

Perspective 1

Project Structure

- (unnamed project)
  - Project (0)
    - Proposal
      - Planned Observing
        - Science Goal 0
          - Description
          - Field Setup
          - Calibration Setup
          - Spectral Setup
          - Control and Perfo

Editors

Spectral Spatial Forms Catalog

Visualisation

Observed Frequency

100|00 200|00 300|00 400|00 500|00 600|00 700|00

03 06 07 09

LO1

(13)CO v=0 J=1-0 (ngc 1068)

Frequency in Target Frame

☒ Receiver Bands ☒ Transmission ☐ Other Transitions

Select Other Transitions Pan To Line Zoom To Band Reset

Spectral Type

☒ Up to 4 spectral elements/windows

☐ More than 4 spectral elements/windows

☐ Single continuum (average frequency)

☐ Spectral scan

Polarization ☐ SINGLE\_X ☐ SINGLE\_Y ☒ DOUBLE ☐ FULL

Up to 4 spectral elements/windows

Center Freq Rest	Center Freq Sky	Transition	Bandwidth, Resolution	Continuum
110.20135 GHz	109.78644 GHz	(13)CO v=0 J=1-0	62.5MHz, 15.259KHz (0.042 km/s)	<input type="checkbox"/>

Select Lines Add Delete

Feedback

# Spectral Line Tool

Select Spectral Lines

Filter / Species  
CO

ALMA Band  
1 2 3 4 5 6 7 8 9 10

Frequency (GHz)  
Min 84 Max 116

Search Online

Available		
Transition	Frequency (GHz)	Catalogue
(13)CO v=0 J=1-0	110.201	CDMS
c-H <sub>2</sub> COCH <sub>2</sub> 6(2,4)-6(1,5)	84.283	CDMS
c-H <sub>2</sub> COCH <sub>2</sub> 8(5,4)-8(4,5)	84.505	CDMS
c-H <sub>2</sub> COCH <sub>2</sub> 11(9,2)-11(8,3)	84.536	CDMS
c-H <sub>2</sub> COCH <sub>2</sub> 7(4,4)-7(3,5)	84.58	CDMS
c-H <sub>2</sub> COCH <sub>2</sub> 12(2,10)-11(5,7)	84.599	CDMS
c-H <sub>2</sub> COCH <sub>2</sub> 9(4,6)-8(7,1)	84.611	CDMS
c-H <sub>2</sub> COCH <sub>2</sub> 12(3,10)-11(4,7)	84.681	CDMS
c-H <sub>2</sub> COCH <sub>2</sub> 16(10,6)-16(9,7)	84.754	CDMS
c-H <sub>2</sub> COCH <sub>2</sub> 6(3,4)-6(2,5)	85.062	CDMS
c-H <sub>2</sub> COCH <sub>2</sub> 22(3,19)-23(2,...)	85.113	CDMS
c-H <sub>2</sub> COCH <sub>2</sub> 9(6,4)-9(5,5)	85.331	CDMS
c-H <sub>2</sub> COCH <sub>2</sub> 5(1,4)-5(0,5)	85.425	CDMS
c-H <sub>2</sub> COCH <sub>2</sub> 17(12,5)-17(11,...)	85.579	CDMS
c-H <sub>2</sub> COCH <sub>2</sub> 5(2,4)-5(1,5)	85.592	CDMS
c-H <sub>2</sub> COCH <sub>2</sub> 15(11,4)-15(10,...)	85.611	CDMS
c-H <sub>2</sub> COCH <sub>2</sub> 13(10,3)-13(9,4)	85.689	CDMS
c-H <sub>2</sub> COCH <sub>2</sub> 28(4,24)-29(3,...)	86.662	CDMS
c-H <sub>2</sub> COCH <sub>2</sub> 19(13,6)-19(12,...)	87.006	CDMS
c-H <sub>2</sub> COCH <sub>2</sub> 10(8,3)-10(7,4)	87.094	CDMS
c-H <sub>2</sub> COCH <sub>2</sub> 9(8,2)-9(7,3)	87.363	CDMS
c-H <sub>2</sub> COCH <sub>2</sub> 10(7,4)-10(6,5)	87.574	CDMS
c-H <sub>2</sub> COCH <sub>2</sub> 35(7,29)-34(8,...)	87.639	CDMS
c-H <sub>2</sub> COCH <sub>2</sub> 8(8,0)-8(7,1)	88.819	CDMS
c-H <sub>2</sub> COCH <sub>2</sub> 29(5,24)-28(8,...)	88.896	CDMS
c-H <sub>2</sub> COCH <sub>2</sub> 29(6,24)-28(7,...)	88.896	CDMS
c-H <sub>2</sub> COCH <sub>2</sub> 20(13,7)-20(12,...)	89.232	CDMS
c-H <sub>2</sub> COCH <sub>2</sub> 8(8,1)-8(7,2)	89.929	CDMS
c-H <sub>2</sub> COCH <sub>2</sub> 23(4,19)-22(7,...)	90.504	CDMS
c-H <sub>2</sub> COCH <sub>2</sub> 23(5,19)-22(6,...)	90.504	CDMS
c-H <sub>2</sub> COCH <sub>2</sub> 2(2,1)-1(1,0)	90.548	CDMS
c-H <sub>2</sub> COCH <sub>2</sub> 11(6,5)-11(5,6)	90.842	CDMS
c-H <sub>2</sub> COCH <sub>2</sub> 21(14,7)-21(13,...)	91.161	CDMS

Add

Selected		
Transition	Frequency (GHz)	Catalogue
(13)CO v=0 J=...	110.201	CDMS

Remove

Done

# Science Goal: Control/Performance Setup

Image Display - jsky1219813541564676856.fits

File Edit Tool Search Options Help

Perspective 1

Project Structure

- Proposal
- Program
- (unnamed project)
  - Project (0)
    - Proposal
      - Planned Observing
        - Science Goal 0
          - Description
          - Field Setup
          - Calibration Setup
          - Spectral Setup
          - Control and Perfo

Editors

Spectral Spatial Forms Catalog

Input your control and performance parameters.

Single Field Control Parameters

Representative Frequency 109.78644 GHz

Antenna Beamsize ( $\lambda/D$ ) 12m 46.9 arcsec 7m 80.5 arcsec

Angular Resolution 0.0 arcsec

Largest Scale 0.0 arcsec

Desired Sensitivity per Beam 0.00000 Jy equivalent to 0.00000 mK

Sensitivity Calculator Time Estimate

Dynamic Range 0.0

Peak Flux Density 0.0 Jy

Polarisation Percentage

Line Width km/s

Request ACA Obs. ☐ Yes ☒ No

Is Time Constrained ☐ Yes ☒ No

Suggest

Values in red are unacceptable

Use the OT sensitivity calculator to work out time required

The OT will suggest whether the compact array is also required

# ALMA Sensitivity Calculator

**Sensitivity Calculator**

**Common Parameters**

Dec	-12:34:56.700	
Polarization	Dual	▼
Observing Frequency	350.0	GHz ▼
Bandwidth per Polarization	8.0	GHz ▼
Water Vapour Column Density	Calculator Chooses ▼	
tau/Tatm	tau=0.228, Tatm=59.335 K	
Tsys	207.026 K	

**Individual Parameters**

	12m Array	7m Array	Total Power Array
Number of Antennas	50	12	4
Resolution	0.05 arcsec ▼	5.889203 arcsec	14.723008 arcsec
Sensitivity(rms)	.01 mJy ▼	1 mJy ▼	1 mJy ▼
	0.01101 K ▼	0.00032 K ▼	0.00003 K ▼
Integration Time	7.46255 h ▼	7.17734 min ▼	42.47564 min ▼

Integration Time Unit Option: Automatic ▼

Also available on the web at ESO ALMA pages: <http://www.eso.org/sci/facilities/alma>

# Project Validation & Submission

Image Display - jsky1219813541564676856.fits

File Edit Tool Search Options Help

Perspective 1

**Project Structure**

- (unnamed project)
  - Project (0)
    - Proposal
      - Planned Observing
        - Science Goal 0
          - Description
          - Field Setup
          - Calibration Setup
          - Spectral Setup
          - Control and Parameters

**Editors**

Spectral Spatial Forms Catalog

Sci.Goal Name	Source Name	Field Type	RA	Dec	Spec.Type	Trans.	Frequency	Resolution	Sensitivity	Cal.
	ngc 1068	Rectangle	02:42:40.831	-00:00:48.384	full	(13)CO v=0...	109.78644 GHz	1.0 arcsec	0.0 Jy	sys...

**Feedback**

Problems Information Log

Project FAILED validation with 6 errors and 0 warnings

Description	Suggestion	Resource
No Principal Investigator specified	Select the top level Project node in the tree and fill in the Principal	ObsProject[eid=1065223778, name=nul...
No Project Name specified	Select the top level Project node in the tree and fill in the Project Name	ObsProject[eid=1065223778, name=nul...
Abstract appears to be empty	Select the proposal node in the Proposal tab and edit your abstract	obsproposal.ObsProposal[name=null, eid...
No documents found - you must at least add a	Select the proposal node in the Proposal tab and add your documents	obsproposal.ObsProposal[name=null, eid...
Desired sensitivity is too small	Select the Control Parameters in the Science Goal and enter a valid	obsproject.PerformanceParameters[name...
Expected line width is too small	Select the Control Parameters in the Science Goal and enter a valid	obsproject.PerformanceParameters[name...

**Go back and fix any problems.....then submit!**

**Overview**

**Contextual Help**

- Validate your science proposal by
  - Selecting **File > Validate**
  - Click on the ☒ icon in the toolbar
  - Or click on this [link](#)
- Look at the **Feedback** panel and view the list of reported problems. Please fix the reported problems before attempting to submit your science proposal.

**Phase I: Science Proposal**

```

graph LR
    A[New Science Proposal] --> B[Create Science Goals]
    B --> C[Validate Science Proposal]
    C --> D[Submit Science Proposal]
    D --> E[Retrieve Science Proposal]
    E --> F[Configure System Setup]
    F --> G[Validate Observing Program]
    G --> H[Submit Observing Program]
    
```

Click on the overview step **to view the contextual help**

**Phase II: Observing Program**

Importing And Exporting Need More Help?



# Project Validation & Submission

Image Display - jsky1219813541564676856.fits

File Edit Tool Search Options Help

Perspective 1

**Project Structure**

- (unnamed project)
  - Project (0)
    - Proposal
      - Planned Observing
        - Science Goal 0
          - Description
          - Field Setup
          - Calibration Setup
          - Spectral Setup
          - Control and Parameters

**Editors**

Spectral Spatial Forms Catalog

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**Phase I: Science Proposal**

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    E --> F[Configure System Setup]
    F --> G[Validate Observing Program]
    G --> H[Submit Observing Program]
    
```

Click on the overview step **to view the contextual help**

Importing And Exporting Need More Help?

# Proposal preparation (phase I)

- OT captures all relevant info and submits to archive in Santiago
- Scientific justification and figures attached as pdf files
- Links to a central database for user information
- A number of tools are available
  - Sensitivity Calculator
  - Spectral Line Catalogue (Splatalog) search tool
  - Template Library
- User only needs fill in technical details as Science Goals
- Provides a complete printable record of proposal

# Observing preparation (phase II)

- Re-use Science Goals from Phase I
- Observing mode scripts provided by project
  - On-the-fly, mosaicing, single-field interferometry, etc.
- Technical details/observing scripts editable by expert users/staff
- Other tools include:
  - Calibrator selection tool (OT can choose calibrators if required)
  - ACA necessity estimator (early version)
- User submits SBs to the archive in Santiago

A photograph of an ALMA radio telescope dish, showing its complex metal structure and the large white parabolic reflector, set against a dark blue sky.

# Documentation

- Available on-line or within the OT are:
  - User Manual
  - Reference Guide
  - Cookbook
- ARCs will also be writing their own documentation e.g., “Quick Start” Guides

A photograph of an ALMA radio telescope dish, showing its complex metal structure and the large white parabolic reflector, set against a clear blue sky.

# Preparing the OT for Early Science

- Tests are held regularly (twice a year)
  - Testers usually come from within ALMA project
- Testing using the archive in Chile was performed in 2010
- Beta-testing was 2 weeks ago - some external testers
- “Public Preview” of OT this July
- ARCs to use OT for training and documentation May-Sep
- Version for first CfP ready Oct 2010

# Inputs, Training & Getting Help



# Proposal Planning


- What frequency?
  - Spectral line, continuum emission
  - Tradeoff between resolution, FOV, surface brightness sensitivity
  - Noise level in flux density/beam area
- What baseline?
  - Resolution ( $\lambda/B_{\text{max}}$  maximum B)
  - Maximum spatial scale ( $\lambda/B_{\text{min}}$  minimum B)
- Field of View?
  - Primary Beam ( $\lambda/D$ )
  - Mosaic of many pointings?
- Spectral Resolution?
  - Compromise between bandwidth and resolution set by maximum # of correlator channels setup
- How Long?
  - Signal-to-noise ratio
  - Image fidelity
- More Advanced Considerations
  - Polarization, more configuration, +ACA...




# ALMA Sensitivity Calculator

ESO - Observing Tools and Services


http://www.eso.org/sci/facilities/alma/observing/tools/etc/ RSS alma primer

 European Southern Observatory



Observing with ALMA

ESO — Reaching New Heights in Astronomy



ESO Home User Portal Contact Site Map Search Go!

Science Users Information > Future Facilities > ALMA > Observing with ALMA > Tools and Services > Sensitivity Calculator 28 Oct 2009

**ALMA**

News and Events

ALMA Newsletter

About ALMA

Description and Concepts

Science with ALMA

Observing with ALMA

ALMA Basics

System Specifications

Tools and Services

**Sensitivity Calculator**

Observing Tool

Data Reduction: CASA

Policies and Procedures

ALMA Regional Centre

ALMA Scientific Meetings

Publications

Internal Access Only

Public

**ALMA Sensitivity Calculator**

This tool will calculate the necessary integration times for a given sensitivity, or vice versa, for your ALMA observing project. Input and output parameters **are explained below**. You can also get additional information on the valid range for each parameter by hovering your mouse pointer over each field in the calculator applet.

To run the calculator you need the Java Plug-in installed. If you do not see the calculator then it is likely that you do not have it installed. Instructions for installing the plugin will vary depending on your browser and operating system. A plugin compatible with the Java Development Kit version 1.6 (or Java6) is recommended (version 1.5 should work at the moment). Please contact your IT department for installation help if necessary.

**Common Parameters**

Sensitivity Type	Point Source detection
RA	00:00:00.000
Dec	00:00:00.000
Effective Bandwidth	16.0 GHz
Frequency (GHz)	345.0
Observatory site	Chajnantor
Water Vapour Column Density	ETC Chooses
Sensitivity Unit	mJy

**Individual Parameters**

**Parameters**

**Common Parameters**

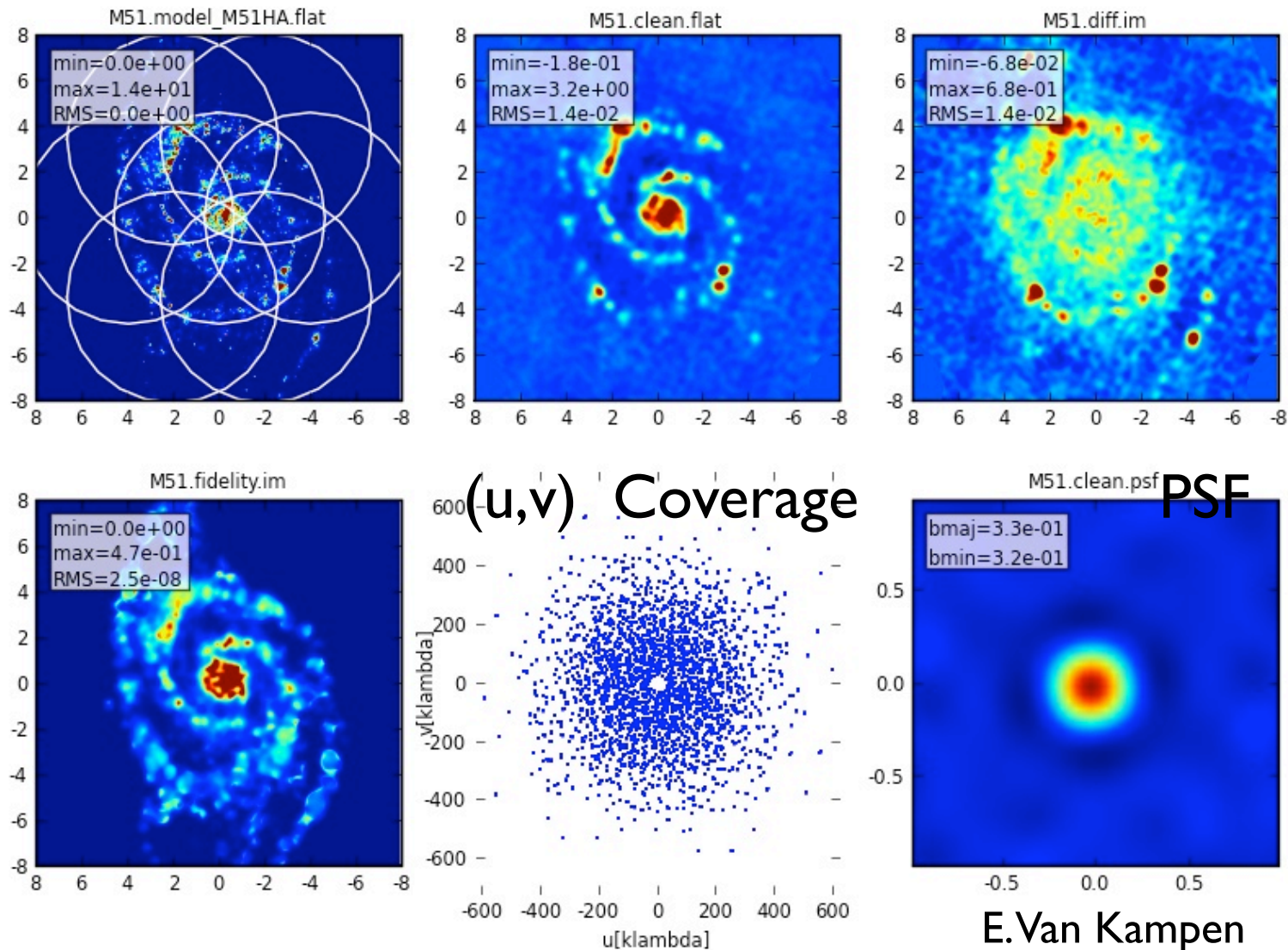
**Sensitivity Type:**  
Choose between a point-like or extended source.

**RA/Dec:**  
Coordinates of the observation target.

**Effective Bandwidth:** The standard observing mode will be using two polarizations.

# Proposal Planning: The CASA ALMA Simulator

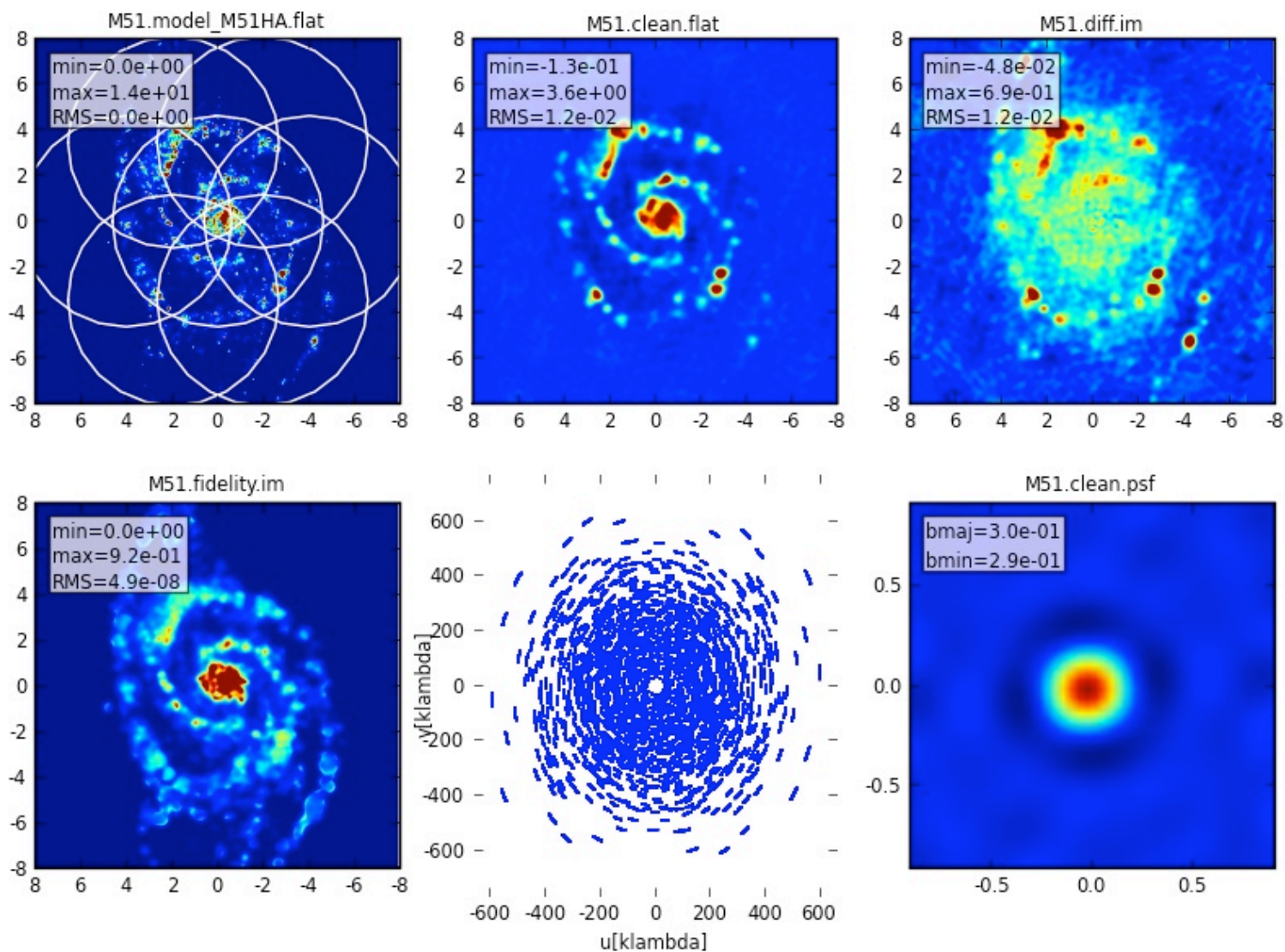
## ALMA (u,v) coverage $t=2$ min



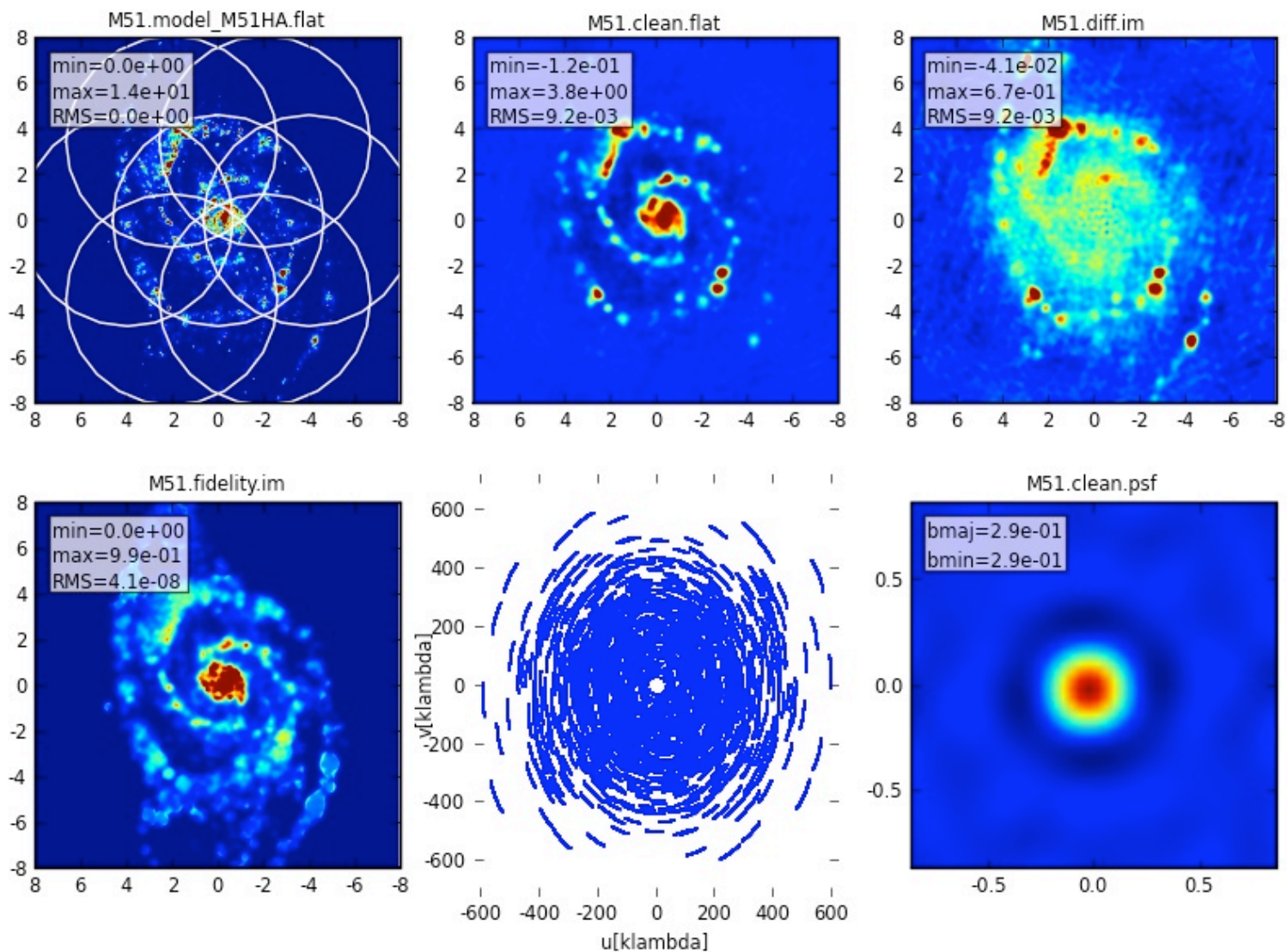


# ALMA (u,v) Coverage

$t=30$  min

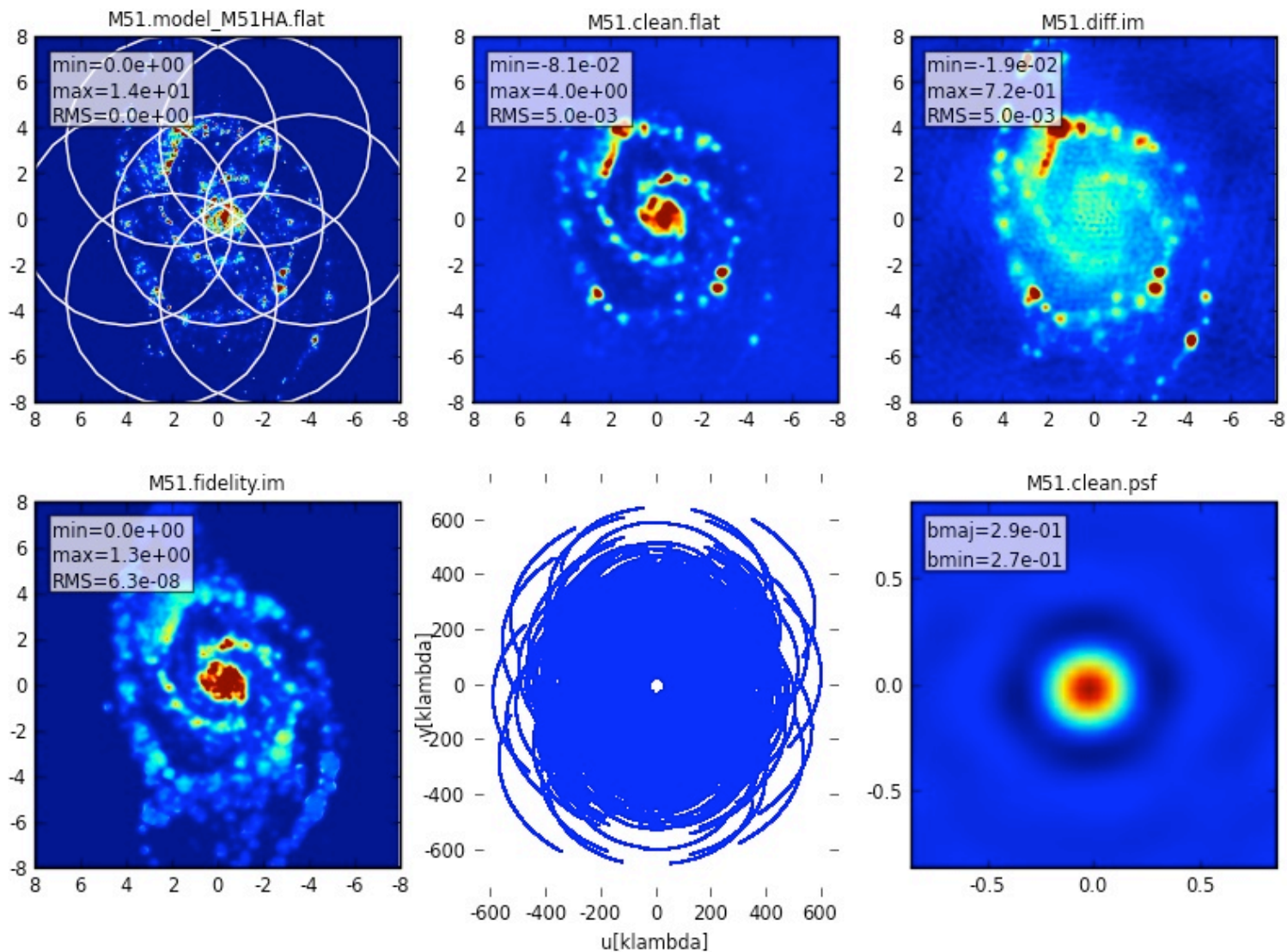


# ALMA (u,v) Coverage $t=1$ hr

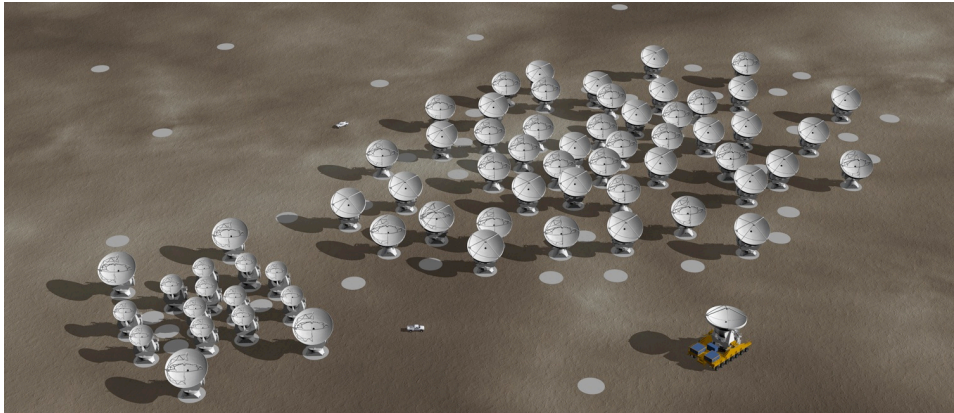




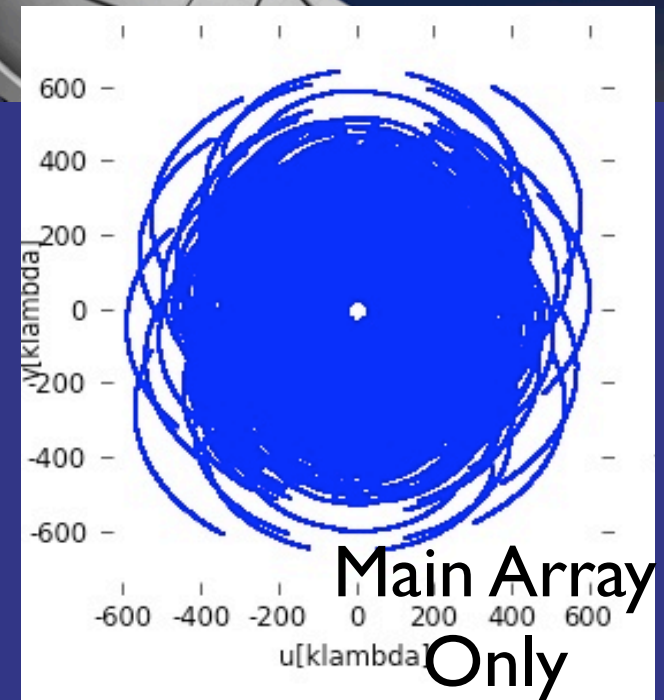
# ALMA (u,v) Coverage $t=5$ hr



# Proposal planning: Adding in the ACA ?



- Supplement the 12-m array with
  - Short baseline data (7 m antennas)
  - Total power data (12m antennas)
- Enhance fidelity of ALMA images (overcome the “missing flux” problem)
- Essentially one configuration
- Stand alone mode of operation
  - available for target of opportunity observations, wide field surveys etc



J. Brand



# Training for the OT and Simulator


- The ALMA Regional Centres are already providing training via workshops, tutorials, community days and schools
- For European activities, check the ESO web pages at:  
<http://www.eso.org/sci/facilities/alma/arc/>

# Proposal Preparation: Getting Help

ALMA - Europe - Powered by Kayako SupportSuite Helpdesk Software


http://kayako-test.cv.nrao.edu/index.php


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**EUROPEAN ARC**  
ALMA Regional Centre


18 Jun 2010



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# Proposal Preparation: Getting Help

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 **EUROPEAN ARC**  
ALMA Regional Centre


18 Jun 2010



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EUROPEAN ARC  
ALMA Regional Centre

18 Jun 2010

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If you can't find a solution to your problem in our [knowledgebase](#), you can submit a ticket by selecting the appropriate category below.

**Select Category**

- ☐ General Queries (ESO)
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- ☒ Data Reduction - CASA (ESO)
- ☐ Scheduling Block Generation (ESO)
- ☐ Proposal Submission (ESO)
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**Submit a Ticket**

If you can't find a solution to your problem in our [knowledgebase](#), you can fill in the fields below with as much detailed information as possible and send it to our agents.

**General Information**

Priority: Default

**CASA Information****Version: \***

CASA version you are using (e.g., 3.0.0; can be obtained from the first line of logger messages after startup)

**Operating System: \***





The operating system on which you are running CASA

**Message Details****Subject: \***

Help, I am at an ALMA School in Onsala trying to reduce some SMA data and I don't know how to do imaging in CASA

**Knowledgebase suggestions**


The following articles from our knowledgebase might be relevant to what you're looking for. Please take the time to read them before submitting your ticket.


-  Reducing ALMA data in other software packages  
Relevance: 100.00%
-  interpretation of data flagging codes by CASA  
Relevance: 31.14%
-  ALMA Pipeline and BP Oil Spill  
Relevance: 30.70%
-  if x else y, do z  
Relevance: 21.48%

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# OT Demo

# Demo Project

- Project from ALMA Design Reference Science Plan (DRSP)
- <http://www.eso.org/sci/facilities/alma/science/drsp>
- $^{12}\text{CO}$  J=2-1 observations of AGN NGC 1068 (Schinnerer)
- Single field interferometry
- Angular Scales reqd: 0.06 to 20 arcsec
- Rms 0.2 mJy/beam, 5 km/s channels, 1200 km/s linewidth
- Using OT v7.1



# ALMA Useful Links

<http://www.almaobservatory.org/>

EU ARC: <http://www.eso.org/sci/facilities/alma/arc/>

East Asia ARC: <http://alma.mtk.nao.ac.jp/EA-ARC/>

North American ALMA Science Center:

<http://www.cv.nrao.edu/naasc/>

CASA Download & Tutorials: <http://casa.nrao.edu/>

ALMA Sensitivity Calculator:

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

ALMA Simulations Pages:

[http://www.cv.nrao.edu/naasc/alma\\_simulations.shtml/](http://www.cv.nrao.edu/naasc/alma_simulations.shtml/)

<http://iram.fr/IRAMFR/ARN/may01/node7.html/>

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

Observing With ALMA Primer:

<http://www.almatelescope.ca/Workshop/ALMAPrimer.pdf/>

