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# European ALMA Regional Center

**Proposition for a Science  
Support Center  
at IRAM Grenoble**

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# IRAM



Funding agencies:  
CNRS (France), MPG (Germany), IGN (Spain)

Plateau de Bure interferometer

Pico Veleta 30 m





# IRAM



- About 1000 users from 20 countries
  - Open to all European countries within FP6 TNA
- Large experience in mm radioastronomy user support
  - GILDAS software (CLASS, CLIC, MAPPING, etc.)
  - “Support center” for the Plateau de Bure at Grenoble



# ALMA @ IRAM



## Hardware

- *Band 7 (280—360 GHz) development and pre-production → production...*
- *Receiver common optics*
- *Calibration*
- *Backend samplers*

## Software

- Scientific Software Requirements Group
- Real-time calibration pipeline
- Tests of prototype antennas



# ARC @ IRAM



## (1) Advanced data reduction operations

- Face-to-face user support
  - For data calibration and analysis
  - For project preparation (e.g. simulations)
  - For special projects
- Similar to current Plateau de Bure face-to-face support (in place since 15 years)



# ARC @ IRAM



## (2) Scientific Support

- Millimeter-interferometry school series
  - 4<sup>th</sup> school held in November 2004 (55 participants)
  - Session on ALMA
  - Presentations + proceedings available on-line
  - Proceedings will be updated & printed (June 2005)
  - Also: Single-dish mm techniques school series (Granada)
- Long visits of PhD students or post-docs at IRAM
- Dedicated workshops: calibration, polarization...

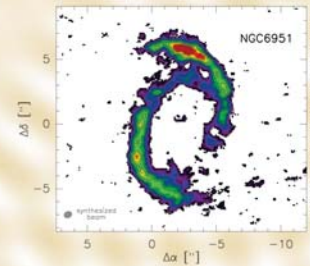


## Fourth IRAM Millimeter Interferometry School

Institut de Radio Astronomie Millimetrique

Grenoble, November 22th to 27th, 2004

- Millimeter Interferometers
- The Plateau de Bure Interferometer
- The ALMA Project
- Receivers, Signal Transport and Correlators
- Atmospheric Effects and Data Calibration
- Data Analysis and Imaging



### Scientific Organizing Committee:

D. Downes  
M. Grewing  
F. Gueth (chairman)  
S. Guilloteau  
(Obs. de Bordeaux)  
R. Neri  
J. Pety  
(Obs. de Paris/IRAM)  
T.L. Wilson  
(ESO Garching)

### Local Organizing Committee:

C. Berjaud  
M. Bremer  
A. Castro-Carrizo  
H. Wiesemeyer (chairman)  
J.M. Winters



# ARC @ IRAM



## (3) Software developments

- User feedback → update/improve pipeline recipes and techniques
- Specialized tools e.g.: GILDAS imaging simulator for ALMA and PdBI
  - Distributed with GILDAS
  - Available on-line very soon

JAVA XMLBased GUI  
Java Applet Window

SIC Window GREG MAPPING

Help Log

LOG

Java Applet Window

```

Using user defined logical name table /home/gildas1/www/
Absent section EXTREMA
Absent section NOISE
Header successfully updated
extrema completed successfully
contour levels are :
20.00 30.00 40.00 50.00
70.00 80.00 90.00 100.0
120.0
new (or updated) file alma-only-ninp.gdf
new (or updated) file alma-only-outp.gdf
extrema running, logfile is
/home/gildas1/www/.gag/logs/extrema.gildas
Using user defined logical name table /home/gildas1/www/

```

MAPPING Send

News Downloads Software Hard

GuiBuilder

Wait a few seconds for  
To close the session clo  
Don't close this window  
Trying to launch GuiB

ALMA+ACA Simulation (email: alma-simulation@iram.fr)

Java Applet Window

Close Help

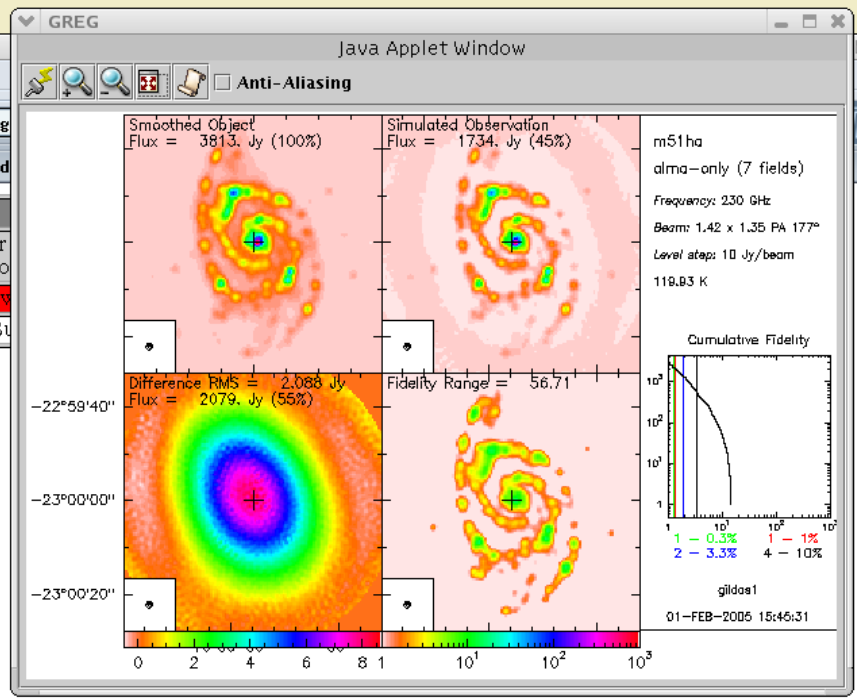
LOAD COMPUTE COMPARE DISPLAY EXPERT

Input model file /users/softs/gildas/gildas/gildas-exe-feb05/demo/m51ha.g

Output directory name

Simulation kind ALMA only

- Observation Setup DefaultPanel
- Configuration Setup DefaultPanel
- Pointing Errors DefaultPanel
- Amplitude conditions DefaultPanel
- Phase conditions DefaultPanel
- Deconvolution setup COMPUTE
- Display results DISPLAY
- Expert setup EXPERT
- File location DefaultPanel





# ARC @ ALMA



## (4) Software developments (contracts)

- Long-term support of ALMA software, e.g. real-time calibration pipeline
  - ESO/ALMA contract
- Developments of new techniques (e.g. OTF, Short-Spacings, Atmospheric phase calibration)
  - FP6/FP7?



# Collaborations



Long-standing cooperation on software with many expert groups

- IEM-CSIC (Madrid) → ATM
- LERMA (Paris)
- Obs. Bordeaux
- MPIfR (Bonn)
- Obs. Grenoble / JMMC
- CDS (Strasbourg)



# Collaborations



Envisaged collaborations with other ARC nodes

- NRW Interferometry Competence Cluster  
Bonn/Cologne/Bochum
  - Long-standing collaborations with these groups
- UK ARC
  - Many discussions over the last years
  - Possible collaborations identified (e.g. Atmospheric phase correction)



# ARC audience



- IRAM funding agencies
  - CNRS (France)
  - MPG (Germany)
  - IGN (Spain)
- Other countries:
  - Switzerland has expressed an interest in participating
- The IRAM-based ARC node is expected to serve a large fraction of the European Community



# Manpower/Timescale



- Incremental effort on the top of current IRAM support activities
- Additional manpower:
  - 3 FTEs (~5 persons) needed
  - As of today: 2.5 FTEs
- Timescale:
  - Several activities are already in place
  - Top priority: **formation of young scientists in mm interferometry**