

# **IRAM Information Flow**

**IRAM & Jérôme Pety** 

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## **Towards a modern information flow at IRAM**

Bits and pieces have been prepared for the last 15+ years.

Next step To nimbly glue all this together.

A manageable amount of additional resources (manpower, internet bandwidth) is required because of all the preparatory work.

This presentation Available bits and pieces with an emphasis on the current and future work.

**Timescales** Regular releases over the next 5 years. Additional IRAM manpower (1 software engineer) will speed things up.

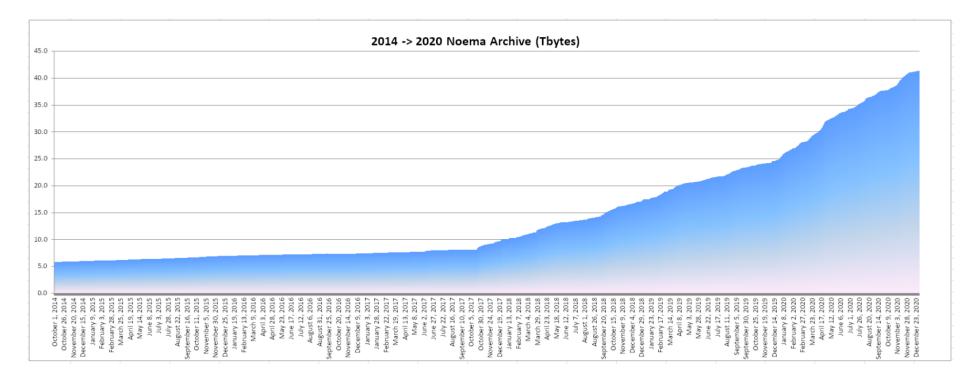
### **Data rates**

### NOEMA

Data rate about 40 TiB per year, still increasing.

Data rate About 28 TiB per year.

**30M** 



## **Observation Management System: I. Goals**

### Handling of IRAM projects

**Proposals** More than 200 proposals every 6 months. **Observations** 24/24 hours, 7/7 days operation on 2 sites.

### State before OMS

- Various independent prototypes developed by astronomers.
- Much manual housekeeping.

### **OMS** aims

- Optimize the end-to-end handling of science projects.
- Gather and rationalize prototypes with new implementation by software engineers.
- Automate as many tasks as possible.
- Minimize maintenance and simplify upgrades  $\Rightarrow$  keep room for innovation.



## **Observation Management System: II. Overview**

### Set of independent tools (databases)

- Multi-user environment.
- Factorized tools.
- Web interface with similar look and feel.
- Interfact with GILDAS astronomical engines.

### Already in operation

### **Proposal Management System**

- Proposal submission and program committee.
- NOEMA & 30m.

### Setup Management System

- Preparation of observing procedures.
- NOEMA.

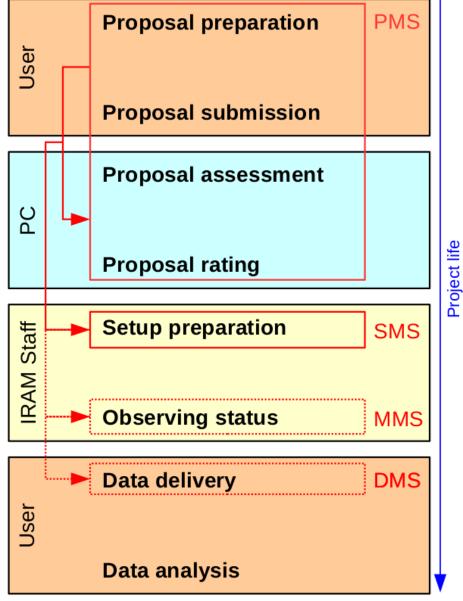
### **Monitoring Management System**

- Schedule and monitor observations.
- 30m.

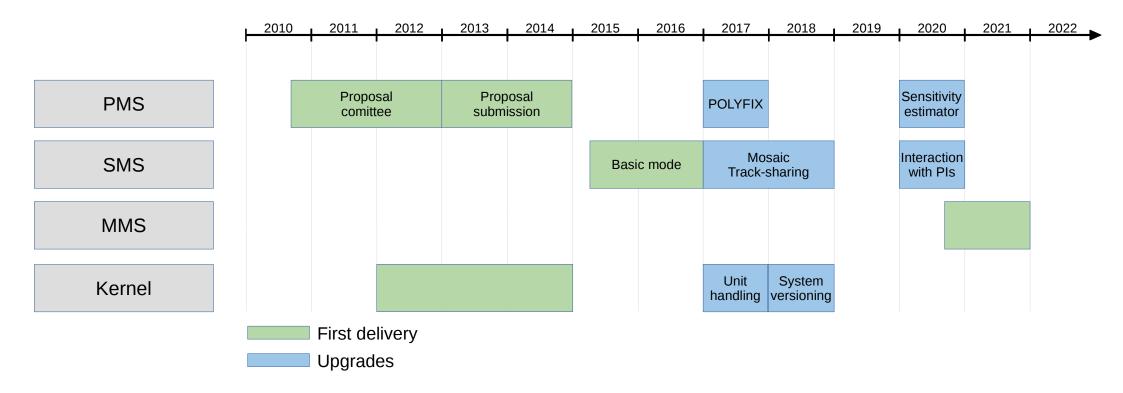
## **Existing prototypes** that still need to be collected in the same professional framework.

### **Data Management System**

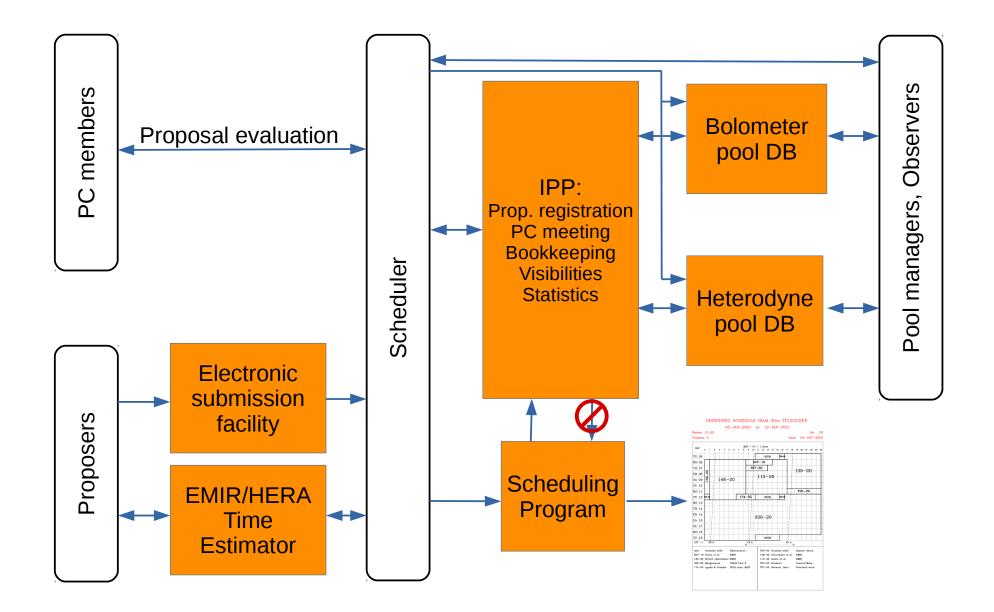
- Database of actual observations and associated calibration reports.
- Import and expand the searchable index on all completed observations currently existing at CDMS (Strasbourg).



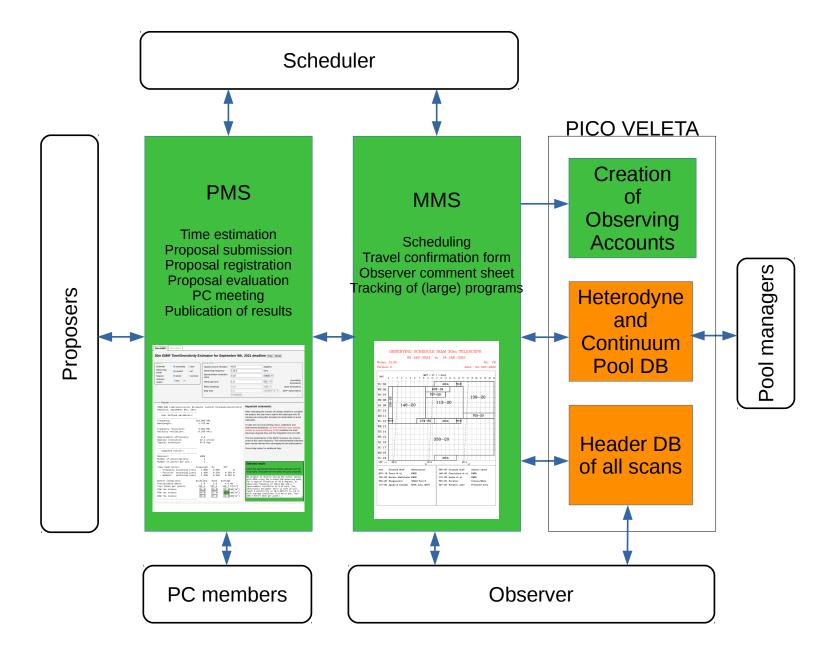
## Observation Management System: III. Timescales



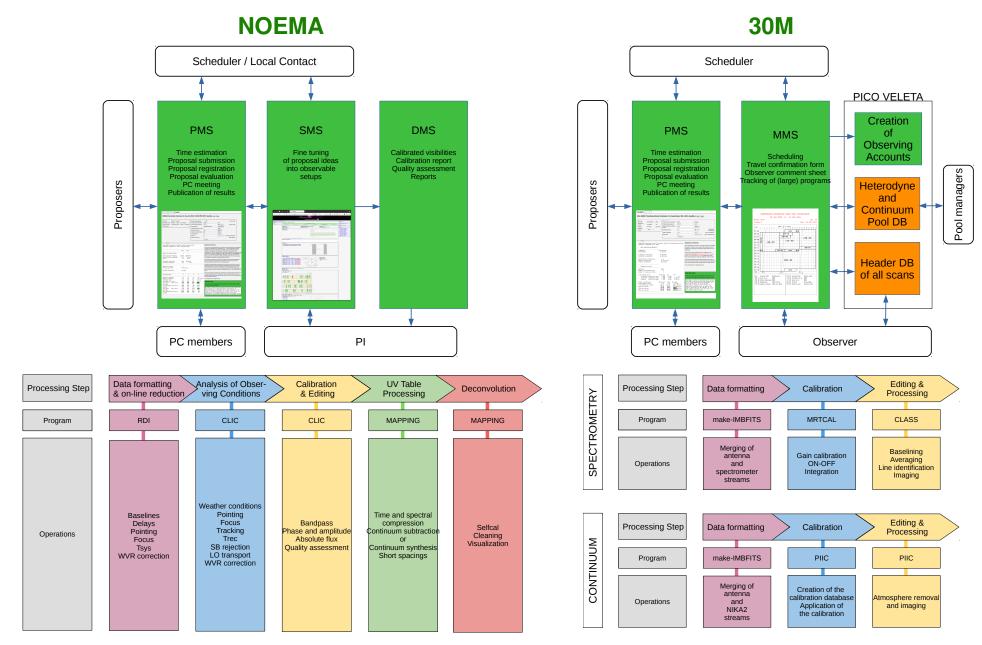
## 30m status before OMS, ie, before 2010



## 30m status at end of 2021



## **Two imbricated workflows**



IRAM Information Flow

**Project** 

Data

### Assessment and evaluation of data

### NOEMA

### Calibration and quality assessment

pipeline reports are stored with the data.

### **30M**

- **Observers** are invited to log useful information.
- **Operators and AODs** reports technical problems during the observations.
- On-line calibration results are stored in TAPAS.
- **Continuum processing** delivers a calibration database that is shipped with the software  $\Rightarrow$  Automatic selection of good data.

### **Data formats**

### **NOEMA**

Raw data

IPB and HPB since 1990.

### **Calibrated data**

UV tables since 1990.

### **Deconvolved data**

LMV cubes in GDF since 1990?

⇒ Institute-defined binary containers But final products can be easily converted into FITS files.

### **30M**

Raw data IMBFITS since 2007. Calibrated spectral data 30m CLASS files since 1987. Calibrated continuum data

FITS format since 2005.

⇒ A combination of institute-defined and FITS binary containers

All calibrated data can still be read today! We are going towards using only FITS for science-ready data products.

## Metadata, and data reuse

### Metadata

- IRAM has documented and standardized metadata.
- IRAM ensures that all instruments comply with these standards.

### Data reuse

- Standard procedures to get data from the archive.
- But it still requires human operations.

## Data discovery, identification, interoperability

### Data discovery

- A catalog of all IRAM observations is available at CDS.
- All NOEMA observation from 1990-on and all 30m observations from Oct. 2009 are available.
- IRAM Large Program Database IRAM will soon get a VO-compliant gateway.

### Identification

- All data are tagged by their unique project number.
- IRAM recommends that the community cite the project number in publications.
- This number is not (yet) a digital object identifier (DOI).

### Interoperability

- Automatic exchange of metadata between IRAM databases.
- Well-defined APIs that can be automatically tested when new functionality is added to one of the databases.

## **Data curation**

### Integrity and authenticity

- Archive mirroring.
- Checksum of files.
- Provider ID is checked for the submission of (large program) reduced products.

### Data quality

- Once the raw data is stored, it is never edited to preserve integrity. Additional metadata are archived in different data files to add a posteriori calibration information. These are automatically ingested by the software when reprocessing the raw data.
- At NOEMA, quality assessment is applied to all calibrated data and (only) good visibilities with detailed reports on the calibration and filtering are distributed to the PI.
- At the 30m, all observation comments are stored in a database.
- Work is being done to compare different versions of the processed data.
- No mechanism is (yet) provided to link articles using the data.

## Infrastructure organization

### Licenses

• No license. Is it a problem?

### **Confidentiality/Ethics**

- Access to databases needs authentication. It is based on role (PI, local contacts, AODs, schedulers, ...)
- No other sensitive data.

### **Expert advise**

- SAC.
- CDS advise for VO port ( $\Rightarrow$  link with IVOA).

### **Continuity access**

• IRAM partner agreement up to 2034.

### Governance and business model

- IRAM has resources to acquire, process, and archive data.
- No complete business model yet for the FAIR distribution of data. But
  - One additional software engineer will be recruited.
  - IRAM participates in ACME proposal to next EU infrastructure call.

**IRAM Information Flow** 

## **Sensitivity Estimation**

| Options   | Parameters                      | 0.0.0   |  | (for line cath)   |   |
|---|---------------------------------|---|--|---|---|
| - Winter - Summer   | Number of polarizations         |   |  | (for line only)   |   |
| Observing mode <ul> <li>single</li> <li>mosaic</li> <li>track-sharing</li> </ul> <ul> <li>observing mode</li> <li>tuning</li> <li>overhead</li> </ul>   | Representative frequency        | 100.0   | GHz  |   |   |
| Expert mode   | At intermediate frequency       | 6000.0  | MHz USB 🗸  | (expert mode)   |   |
|   | Configurations                  | A C D   | Uncheck all  |   |   |
|   | Targeted angular resolution     |   | arcsec   |   |   |
|   | Spectral resolution             | 1.0   | MHz 🗸  |   |   |
|   | Typical source declination      | 20  | degrees  |   |   |
|   | Telescope time                  | 8   | hr v   |   |   |
|   |                                 |   |  |   |   |
|   | Map area                        | 2.0   | arcmin^2 ✓   | (mosaic observations)   |   |
|   | Number of sources               | 1   |  | (track sharing)   |   |
|   |                                 | Compute   |  |   |   |
| IRAM-NOEMA sensitivity estimator (winter single-<br>Deadline: September 09, 2021, 05:00:00 PM CEST  |                                 | computed for the summer   | ameters, the sensitivity a semester). This allows  | you to compare the achie  |   |
| Deadline: September 09, 2021, 05:00:00 PM CEST  | <br>                            | For every set of input par<br>computed for the summer<br>PMS, you will also have t<br>define the targeted angula<br>to this desired angular res<br>To take into account tunin<br>elapsed time and the on-   | ameters, the sensitivity a<br>semester). This allows<br>o define the percentage<br>ar resolution you actually<br>solution.<br>g, pointing, focus, calibra<br>source integration time.  | you to compare the achie<br>of time that you wish to s<br>wish to achieve during y<br>ation and instrumental de   | vable sensitivity at the typically achieved angular resolution of each available array configuratio<br>end in each selected configuration to fully set your project. In the PARAMETERS panel, you o<br>ur project. This will in turn provide an additional column in the output, giving the sensitivity ass<br>dtimes, the time estimator already includes several efficiency factors between the total telesco   |
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## **Proposal Management System**

History → Data Management System / Show programs / ORION-B / 124-16

Print Save as PDF Resubmit this proposal

#### Proposal 124-16 (pdf)

Title: ORION B: The anatomy of a Giant Molecular Cloud

#### PIs: Jérôme Pety, Maryvonne Gerin

CoIs: Emeric Bron, Viviana Guzman Veloso, Jan Orkisz, Sebastien Bardeau, Javier R. Golcoechea, Pierre Gratier, Franck Le Petit, François Levrier, Harvey Liszt, Karin Öberg, Nicolas Peretto, Evelyne Roueff, Albrecht Sievers, Pascal Tremblin

#### Total requested time: 550.0 (Emir)

Continuation: 019-13, 022-14, 145-14, 122-15, 018-16

#### Proposal history:

The proposal committee granted us about 300 hours of IRAM 30-meter time to map slightly more than 1.5 square degree in the western edge of the Orion D molecular cloud (projects 019-13, D22-14, 145-14, 122-15, and 018-16) from 72 to 80 GHz and 84 to 116 GHz, i.e., almost all the 3 mm band. A first set of 4 papers analyzing the cata set acquired in 2013 and 2014 are either published or submitted. The first results were presented in the ISM symposium in Zermatt on September 2015, EWASS on July 2016, Exceter on August 2016, and we will continue to advertise them in the coming year. These works made high use of the number of detected species and the high spectral resolution. The region mapped up to now is strongly illuminated in far UV with a mean GC = 45 (ISRF. Habing 1968), since massive stars illuminate the molecular cloud both from the outside and from the inside. The reached conclusions are thus biased towards such conditions. To order to broaden our conclusions, we now propose to observe the same frequency ranges in both filamentary structures (1.5 square degree) and translucent gas (another 1.5 square degree) that are in much quieter regions with a typical CO - 4. This will help improve our understanding of the chemistry and physics at stake in the Grion B molecular cloud.

#### Abstract:

Molecular amission often provides the best and sometimes only constraints on the physical processes that govern star formation. Common molecules like CO (isotopologues), HCO+, HCN, M2H+, CH3OH, H2CO, DCO+, M2D+, DCN provide constraints on density, temperature and illumination structures. The utility of these molecular probes is currently limited, however, by lack of comprehensive data sets that connects emission patterns with shall and large-scale physical structures quantitatively. To address this we have acquired a 3 mm spectral-image cube of the vv illuminated western edge of the vrion B molecular cloud, we here propose to extend the spatial coverage from 15 to 45% of Orion B, in order to sample the full range of physical conditions characterizing high-mass star forming regions, instead of being biased towards the high UV illumination of the western edge. The ultimate goal of this project is to develop Orion B as a template for galactic and extra-galactic studies by correlating chemical and physical structures across the full 3mm hand. This will allows us to calibrate popular molecular probes, developing their full potential as tools to understand star formation, near and far

|            | nd setups<br>Download sou |                 |           |                   |                    |                 |                  |                           |               |                |              |           |   |      |   |
|------------|---------------------------|-----------------|-----------|-------------------|--------------------|-----------------|------------------|---------------------------|---------------|----------------|--------------|-----------|---|------|---|
| lorsehead  |                           | RA<br>:40:54.27 | 70 -02:28 | EC<br>00.000      | Visr (km/s)<br>10. |                 |                  |                           |               |                |              |           |   |      |   |
| echnical s | sheets:                   |                 |           |                   |                    |                 |                  |                           |               |                |              | 1         |   |      |   |
|            |                           |                 |           |                   |                    | Emir            |                  |                           |               |                |              | Rec. time |   |      |   |
|            | 50.00 hours               |                 |           |                   |                    |                 |                  |                           |               |                |              | 550.0     | А | view |   |
| Setup      | Band [?]                  | Species         | /Transit  | ion <sup>Fr</sup> | equency [?]<br>GHz | Receiver ban    | r [5] p          | "▲ <sup>*</sup> [?]<br>mK | Rms [?]<br>mK | ΔV [?]<br>km/s | Backends [?] |           |   |      |   |
| 1          | L E0 (3mm)                | Any             |           |                   | 76.5               |                 | LI >             | <ul> <li>360.0</li> </ul> | 120.0         | 0.764          | FTS200       |           |   |      |   |
| 2          | 2 E0 (3mm)                | Any             |           |                   | 90.0               |                 | LI >             | > 300.0                   | 103.0         | 0.65           | FTS200       |           |   |      |   |
| 3          | 0 E0 (3mm)                | Any             |           |                   | 97.5               |                 | LI >             | > 300.0                   | 102.0         | 0.G            | FTS200       |           |   |      |   |
| Observ     | ing parame                | ters:           |           |                   |                    |                 |                  |                           |               |                |              |           |   |      |   |
| Setup      | Observing                 | g mode          | Size X    | Size Y            | Switch mod         | e PWV [?]<br>mm | Time [?<br>hours | Rep                       | elition [?]   | Remar          | k.           |           |   |      |   |
| 1          | L                         | OIF             | 103.9     | 103.9             | P5                 | 5W 4            | 130.             | .0                        | 1             | L              |              |           |   |      |   |
| 2          | 2                         | OTF             | 103.9     | 103.9             | ) PS               | Sw 4            | 180.             | .0                        | 1             | L              |              |           |   |      |   |
| 3          | 5                         | OIF             | 103.9     | 103.9             | ) PS               | 5W 4            | 220.             | .0                        | 1             | L              |              |           |   |      |   |
| Numbe      | r of receive              | r tunina:       | s: 40     |                   |                    |                 |                  |                           |               |                | _            |           |   |      |   |
|            |                           |                 |           |                   |                    |                 |                  |                           |               |                |              |           |   |      | , |

2016 - 30m Large program

Session: Winter Proposal category: Scientific category: High-mass star formation, Intermediate-mass star formation, Low-mass star formation, Pre-stellar cores, Infra-Red Dark Clouds (IRDC), Astrochemistry, Inter-Stellar Medium (ISM)/Molecular clouds, Photon-Dominated Regions (PDR)/X-Ray Dominated Regions (XDR), HII regions

#### Scheduling constraints:

We definitely need stable weather and we thus ask to avoid foggy spring afternoons when the snow melts.

#### PI note:

This project is part of the PhD thesis of Jan Orkisz under the direction of Jérôme Pety and Maryvonne Gerin. Emeric Bron and Viviana Guzman are two post-doce who devote a significant fraction of their time on the project.

#### Date: 2016-09-15 12:26:36

Back

## Monitoring Management System: Scheduling a two-weeks period

 Back
 Previous
 Next
 Save as PDF
 Create a scheduling unit
 Add a marker
 Update public version
 Refresh graphic
 Edit

#### Sep 28 - Oct 12, 2021

From: 2021-09-28 10:30:00 To: 2021-10-12 10:30:00 Semester: Summer 2021 Comment: Imported from data/mms/sched30m/21/wk39v1.dat Missing hours: 0.0

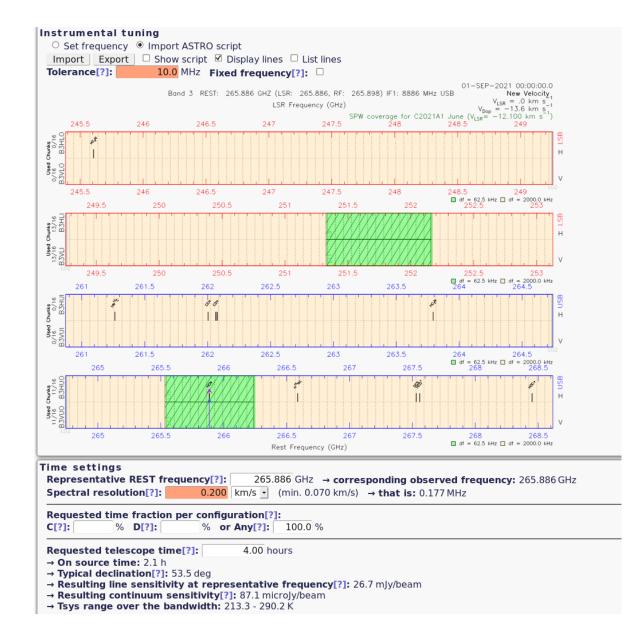
#### OBSERVING SCHEDULE IRAM 30m TELESCOPE

| ersion | : 1                                    |                       |                                      | Date: 29-SEP-202      |
|--------|--|-----------------------|--------------------------------------|-----------------------|
| DAY    | 01234547                               | MEST = UT<br>6 9 10 1 |                                      | 7 18 19 20 21 22 23 2 |
| TU 28  |  | Î Î I                 | mtn 🏎                                | 017-21                |
| WE 29  | 036-2                                  |                       | T07-20                               | 017-61                |
| TH 30  | 5 000-0                                | \$1                   | V                                    | 01-21                 |
| FR 01  | 01-8 087-21                            |                       |                                      |                       |
| SA 02  |  | V01-                  | -21                                  | 1                     |
| SU 03  | •                                      |                       | 077 04                               | 016-21                |
| MO 04  | 150 J                                  | -21                   | 077-21                               | 010-21                |
| TU 05  | 3                                      | 1                     | mtn                                  |                       |
| WE 06  |  |                       | <b>m</b> aa a4                       |                       |
| TH 07  |  | 11                    | T20-21                               |                       |
| FR 08  |  |                       |                                      |                       |
| SA 09  |  |                       |                                      |                       |
| SU 10  | 101 <i>0</i> 01 <i>0</i> 0             | E                     | T06-21                               | 033-21                |
| MO 11  | 016-2                                  | 1                     |                                      |                       |
| TU 12  | 0                                      | Π                     |                                      |                       |
| LST →  | 00 h                                   | 08 h                  | 16                                   | h                     |
| 017-21 | Chi Yan EMIR                           |                       | min Granada stat                     |                       |
|        | Granada staff                          |                       | T07-20 Granada stat                  |                       |
|        | Riviere-Marichalar EMIR                |                       | V01-21 UNKNOWN                       | UNENDWN               |
|        | Agudo, Casadio EMIR<br>Hily-Blant EMIR |                       | 021-21 Ferrer Asens<br>077-21 Jachym | io EMIR<br>EMIR       |
|        | Granada staff                          |                       | 033-21 Yan                           | EMIR                  |
|        | Granada staff                          |                       |                                      |                       |

### Scheduling units Edit slots[?]:

| Project <sup>†</sup> | Unit   | Hours | Status [?] | Observer | Observing<br>mode | Funding | Mission<br>sent [?] |             |
|----------------------|--|-------|------------|----------|-------------------|---------|---------------------|-------------|
| mtn                  | on Tuesday<br>28 (from<br>10:30 to<br>16:00)               | 5.5   | Validated  |          |                   |         |                     | edit/delete |
|                      | on Tuesday<br>5 (from<br>10:30 to<br>16:00)                | 5.5   | Validated  |          |                   |         |                     | edit/delete |
| 016-21               | from<br>Sunday 3<br>(16:30) to<br>Tuesday 5<br>(01:30)     | 18.0  | Validated  |          |                   |         |                     | edit/delete |
|                      | from<br>Saturday 9<br>(01:00) to<br>Tuesday 12<br>(10:30)  | 42.5  | Validated  |          |                   |         |                     | edit/delete |
| 017-21               | from<br>Tuesday 28<br>(17:00) to<br>Thursday<br>30 (01:00) | 17.5  | Validated  |          |                   |         |                     | edit/delete |
| 021-21               | from<br>Sunday 3<br>(08:00) to<br>Tuesday 5                | 24.5  | Validated  |          |                   |         |                     | edit/delete |

## Setup Management System: Fine tuning



### **IRAM Information Flow**

## Setup Management System: Workflow Local Contact - Scientific Validator - Scheduler

| mer 2021 - NOEMA<br>roposals |  |  |  |  |  |  |  |  |  |
|------------------------------|--|--|--|--|--|--|--|--|--|
| ut                           | Send message only Re-open to SV Validate setup Duplicate Show setup  |  |  |  |  |  |  |  |  |
| act us                       | Setup S21AA001   |  |  |  |  |  |  |  |  |
| ributors                     |  |  |  |  |  |  |  |  |  |
|                              | Project: S21AA     Observing mode: Detection     Local contact: Jeremie Boissier       PMS proposal: S21AA     PDF file (5MB max): pdf     Do source time (h): 2.08     Local contact: Jeremie Boissier       PLetter: s21aa.html     On source time (h): 2.08     Scientific validator: Nathan Roth   |  |  |  |  |  |  |  |  |
|                              | Setup comment[?]:  |  |  |  |  |  |  |  |  |
|                              | Cometary Observations. Check time constraint and calibrators please.   |  |  |  |  |  |  |  |  |
|                              | Message history:   |  |  |  |  |  |  |  |  |
|                              | Scientific Validator Local Contact   |  |  |  |  |  |  |  |  |
|                              | [2021/06/08 17:42, Open to SV]<br>→ Hi Nathan,<br>Here is a new version with a corrected spectral setup, I think the CS line<br>was missed in the original one.<br>If this is fine for you I will proceed.   |  |  |  |  |  |  |  |  |
|                              | Jeremie  |  |  |  |  |  |  |  |  |
|                              | [2021/06/09 00:55, Cancel open to SV]  |  |  |  |  |  |  |  |  |
|                              | $\rightarrow$ I take back the setup to put CH3OH instead of CS   |  |  |  |  |  |  |  |  |
|                              | → I take back the setup to put CH3OH instead of CS<br>[2021/06/09 00:56, Open to SV]<br>→ New version uses original spectral setup   |  |  |  |  |  |  |  |  |
|                              | → I take back the setup to put CH3OH instead of CS [2021/06/09 00:56, Open to SV] → New version uses original spectral setup [2021/06/09 18:30, Validate]  |  |  |  |  |  |  |  |  |
|                              | → I take back the setup to put CH3OH instead of CS<br>[2021/06/09 00:56, Open to SV]<br>→ New version uses original spectral setup   |  |  |  |  |  |  |  |  |
|                              | → I take back the setup to put CH3OH instead of CS          [2021/06/09 00:56, Open to SV]         → New version uses original spectral setup         [2021/06/09 18:30, Validate]         Message:       Send message only         Re-open to SV       Validate setup         Sources   |  |  |  |  |  |  |  |  |
|                              | → I take back the setup to put CH3OH instead of CS          [2021/06/09 00:56, Open to SV]         → New version uses original spectral setup         [2021/06/09 18:30, Validate]         Message: Send message only Re-open to SV Validate setup         Sources         Add a source       Validate         Save catalog as         Day: 07-JUN-2021       15         Upload sources       Validate         Save catalog as       Day: 07-JUN-2021         9       12         12       15         15       18         21       15         12       15         12       15         12       15         13       12         14       15         15       18         21       15         12       15         13       18         21       15         21       10         21       10         21       10         21       10         21       10         21       21         21       21         21       21         21       21         21  |  |  |  |  |  |  |  |  |
|                              | $\rightarrow I \text{ take back the setup to put CH3OH instead of CS}$ $[2021/06/09 00:56, Open to SV]$ $\rightarrow \text{New version uses original spectral setup}$ $[2021/06/09 18:30, Validate]$ Message: Send message only Re-open to SV Validate setup $\boxed{Sources}$ Add a source Upload sources Validate Save catalog as $\boxed{\frac{9 + 12}{9} \frac{15}{18} \frac{11.5}{210} \frac{10.55428.500}{9} \frac{44.3802.000}{3} \frac{6}{6}}{\frac{100}{12} \frac{15}{9} \frac{11.5}{18} \frac{210}{210} \frac{100}{9} \frac{54428.500}{12} \frac{44.3802.000}{9} \frac{6}{12} \frac{100}{12} \frac{100}{12$ |  |  |  |  |  |  |  |  |
|                              | $ \rightarrow I \text{ take back the setup to put CH3OH instead of CS} $ $ [2021/06/09 00:56, Open to SV] $ $ \rightarrow \text{New version uses original spectral setup} $ $ [2021/06/09 18:30, Validate] $ Message: Send message only Re-open to SV Validate setup<br>$ \hline Sources $ Add a source Upload sources Validate Save catalog as<br>$ \hline \hline \hline 221 Epoch RA DEC Visr (km/s) \\ \hline \hline \hline A1-14-jun J2000 10:33:27.890 54:40:22.400 0.0 \\ \hline \hline \hline 221 Epoch RA DEC Visr (km/s) \\ \hline \hline \hline \hline \hline 121 IS UISC 2000 10:33:27.890 54:40:22.400 0.0 \\ \hline \hline \hline \hline 121 IS UISC 2000 10:33:27.890 54:40:22.400 0.0 \\ \hline \hline \hline \hline 121 IS UISC 2000 10:33:27.890 54:40:22.400 0.0 \\ \hline \hline \hline \hline 121 IS UISC 2000 10:33:27.890 54:40:22.400 0.0 \\ \hline \hline \hline \hline 121 IS UISC 2000 10:33:27.890 54:40:22.400 0.0 \\ \hline \hline \hline \hline 121 IS UISC 2000 10:33:27.890 54:40:22.400 0.0 \\ \hline \hline \hline 121 IS UISC 2000 10:33:27.890 54:40:22.400 0.0 \\ \hline \hline \hline 121 IS UISC 2000 10:33:27.890 54:40:22.400 0.0 \\ \hline \hline \hline 121 IS UISC 2000 10:33:27.890 54:40:22.400 0.0 \\ \hline \hline \hline 121 IS UISC 2000 10:33:27.890 54:40:22.400 0.0 \\ \hline \hline 121 IS UISC 2000 10:33:27.890 54:40:22.400 0.0 \\ \hline \hline 121 IS UISC 2000 10:33:27.890 54:40:22.400 0.0 \\ \hline \hline 121 IS UISC 2000 10:33:27.890 54:40:22.400 0.0 \\ \hline \hline 121 IS UISC 2000 10:33:27.890 54:40:22.400 0.0 \\ \hline \hline 121 IS UISC 2000 10:33:27.890 54:40:22.400 0.0 \\ \hline \hline 121 IS UISC 2000 10:33:27.890 54:40:22.400 0.0 \\ \hline \hline 121 IS UISC 2000 10:33:27.890 54:40:22.400 0.0 \\ \hline \hline 121 IS UISC 2000 10:33:27.890 54:40:22.400 0.0 \\ \hline \hline 121 IS UISC 200 10:33:27.890 54:40:22.400 0.0 \\ \hline \hline 121 IS UISC 200 10:33:27.890 54:40:22.400 0.0 \\ \hline \hline 121 IS UISC 200 10:33:27.890 54:40:22.400 0.0 \\ \hline \hline 121 IS UISC 200 10:33:27.890 54:40:22.400 0.0 \\ \hline \hline 121 IS UISC 200 10:33:27.890 54:40:22.400 0.0 \\ \hline \hline 121 IS UISC 200 IS UIS$   |  |  |  |  |  |  |  |  |
|                              | $\rightarrow I \text{ take back the setup to put CH3OH instead of CS}$ $[2021/06/09 00:56, Open to SV] \rightarrow \text{New version uses original spectral setup}$ $[2021/06/09 18:30, Validate]$ Message: Send message only Re-open to SV Validate setup $\boxed{Sources}$ Add a source Upload sources Validate Save catalog as $\frac{\varphi_{e}=0853}{\varphi_{e}=0.00}$ $\frac{\varphi_{e}=0.00}{\varphi_{e}=0.00}$ $\frac{\varphi_{e}=0.00}{\varphi_{e}=0.00}$ $\frac{\varphi_{e}=0.00}{\varphi_{e}=0.00}$  |  |  |  |  |  |  |  |  |
|                              | $\rightarrow 1 \text{ take back the setup to put CH3OH instead of CS}$ $[2021/06/09 00:56, Open to SV] \rightarrow \text{New version uses original spectral setup}$ $[2021/06/09 18:30, Validate]$ Message: Send message only Re-open to SV Validate setup $\boxed{Sources}$ Add a source Upload sources Validate Save catalog as $\frac{1}{9} = 12 \text{ for } 07-004-2021 \text{ for } 005-05-428.500 \text{ for } 38-02.000 \text{ for } 99-12 \text{ for } 005-05-428.500 \text{ for } 38-02.000 \text{ for } 99-12 \text{ for } 005-05-428.500 \text{ for } 38-02.000 \text{ for } 99-12 \text{ for } 12 \text{ for } 005-05-428.500 \text{ for } 44-38.02.000 \text{ for } 99-12 \text{ for } 12 \text{ for } 005-05-428.500 \text{ for } 44-38.02.000 \text{ for } 99-12 \text{ for } 12 \text{ for } 12 \text{ for } 005-05-428.500 \text{ for } 44-38.02.000 \text{ for } 99-12 \text{ for } 12 \text{ for } 12 \text{ for } 005-05-428.500 \text{ for } 44-38.02.000 \text{ for } 99-12 \text{ for } 12 \text{ for } 12 \text{ for } 005-05-428.500 \text{ for } 44-38.02.000 \text{ for } 12 \text{ for } $  |  |  |  |  |  |  |  |  |
|                              | $\rightarrow 1 \text{ take back the setup to put CH3OH instead of CS} \\ [2021/06/09 00:56, Open to 5V] \\ \rightarrow \text{ New version uses original spectral setup} \\ \hline \\ $   |  |  |  |  |  |  |  |  |
|                              | → I take back the setup to put CH3OH instead of CS          [2021/06/09 00:56, Open to SV]         → New version uses original spectral setup         [2021/06/09 18:30, Validate]         Message:       Send message only         Re-open to SV       Validate setup         Sources       Add a source         Add a source       Upload sources         Validate       Save catalog as   |  |  |  |  |  |  |  |  |
|                              | → I take back the setup to put CH3OH instead of CS<br>[2021/06/09 18:30, Validate]          [2021/06/09 18:30, Validate]         Message: Send message only Re-open to SV Validate setup         Sources         Add a source       Upload sources         Validate       Save catalog as  |  |  |  |  |  |  |  |  |
|                              | → I take back the setup to put CH3OH instead of CS          [2021/06/09 00:56, Open to SV]         → New version uses original spectral setup         [2021/06/09 18:30, Validate]         Message:       Send message only         Re-open to SV       Validate setup         Sources       Add a source         Add a source       Upload sources         Validate       Save catalog as   |  |  |  |  |  |  |  |  |
|                              | → I take back the setup to put CH3OH instead of CS<br>[2021/06/09 18:30, Validate]          [2021/06/09 18:30, Validate]         Message: Send message only Re-open to SV Validate setup         Sources         Add a source       Upload sources         Validate       Save catalog as  |  |  |  |  |  |  |  |  |
|                              | → I take back the setup to put CH3OH instead of CS<br>[2021/06/09 00:56, Open to SV]<br>→ New version uses original spectral setup<br>[2021/06/09 18:30, Validate]<br>Message: Send message only Re-open to SV Validate setup<br>Sources<br>Add a source Upload sources Validate Save catalog as<br>+ 222 Epoch RA DEC Visr (km/s)<br>+ 222 Epoch RA 000 10:33:27.890 54:40:22.400 0.0<br>+ 212 Epoch RA 000 10:33:27.890 54:40:22.400 0.0<br>+ 212 Epoch RA 000 10:33:55.140 46:22.500 0.0<br>+ 212 Epoch RA 000 10:35:55.140 46:20:200 0.0<br>+ 212 Epoch 10:35:55.140 46:20:200 0.0<br>+ 212:20:200 10:35:55.140 46:20:200 0.0<br>+ 212:20:200 10:20:25:51.140 46:20:23:200 0.0<br>+ 212:20:200 10:20:25:51.140 46:20:23:200 0.0<br>+ 212:20:200 10:31:42:28:00 30:24:35:600 0.0<br>+ 212:20:2  |  |  |  |  |  |  |  |  |
|                              | → I take back the setup to put CH3OH instead of CS<br>[2021/06/09 00:56, Open to SV]<br>→ New version uses original spectral setup<br>[2021/06/09 18:30, Validate]<br>Message: Send message only Re-open to SV Validate setup<br>Sources<br>Add a source Upload sources Validate Save catalog as<br>* ?? Epoch RA DEC Visr (km/s)<br>* A1:14-jun J2000 10:33:27.890 54:40:22.400 0.0<br>* A1:20-jun J2000 10:31:06.950 53:32:43.900 0.0<br>* A1:01-jul J2000 10:39:15.510 46:20:51.900 0.0<br>* A1:14-jul J2000 10:39:55.5140 46:20:51.900 0.0<br>* A1:14-jul J2000 10:35:55.140 46:20:51.900 0.0<br>* A1:0-nov J2000 12:28:00 32:02 33:02:00.100 0.0<br>* A1:00-nov J2000 12:28:00 32:02 33:02:00.100 0.0<br>* A1:00-nov J2000 12:28:00 30:24:35.600 0.0<br>* A1:00-nov J2000 10:31:42:28:00 30:24:35.600 0.0<br>* A1:00-nov J2000 10:31:42:28:00 30:00 0.0<br>* A1:00-no  |  |  |  |  |  |  |  |  |
|                              | → I take back the setup to put CH3OH instead of CS<br>[2021/06/09 00:56, Open to SV]<br>→ New version uses original spectral setup<br>[2021/06/09 18:30, Validate]<br>Message: Send message only Re-open to SV Validate setup<br>Sources<br>Add a source Upload sources Validate Save catalog as<br>* ?? Epoch RA DEC Visr (km/s)<br>* A1-14-jun J2000 10:33:27.890 54:40:22.400 0.0<br>* A1-20-jun J2000 10:33:55.60 49:06:48.400 0.0<br>* A1-20-jun J2000 10:33:55.60 49:06:48.400 0.0<br>* A1-10-ipul J2000 10:33:55.60 49:06:48.400 0.0<br>* A1-10-ipul J2000 10:33:55.61 46:20:51.900 0.0<br>* A1-10-ipul J2000 10:33:55.60 49:06:48.400 0.0<br>* A1-20-ipul J2000 10:33:55.60 49:06:48.400 0.0<br>* A1-20-ipul J2000 10:33:55.60 49:06:48.400 0.0<br>* A1-20-ipul J2000 10:33:55.60 30:24:35.600 0.0<br>* A1-10-nov J2000 12:28:00:30:20:100 0.0   |  |  |  |  |  |  |  |  |

### **IRAM Information Flow**

## **Next step: Data Management System**

### Indexation/visualization/distribution of data products

- First version will deliver science ready data products of completed IRAM Large Programs.
- Collaboration with Obs. de Paris to use the YAFITS tool.
- Started early 2021.
- To be delivered this year.

| Show programs     | × +   |                                      |        |                      |                            |
|-------------------|---|--------------------------------------|--------|----------------------|----------------------------|
| $\rightarrow$ G   | A https://oms.iram.fr/dev/?dms=showprograms&pageId=11   |                                      |        | 90% 2                |                            |
| Most Visited 🔞    | ADS 🗠 CDS 🕘 IRAM 🔮 GRR 📙 Kelio 🎝 GILDAS 🎝 SOG 🦹 rq-ip 🔞 ord   | chid 🔜 ORION-                        | B 🤊 Ho | rsehead 📅 PHANGS 🖉 F | PAWS >> 🗅 Other Bookman    |
|                   |   |                                      |        |                      | # NOT IN PRODUCTION MODE # |
|                   |   |                                      |        |                      |                            |
|                   | iram 🖊 Institut de Radioastronomie Millimétrique  |                                      |        |                      |                            |
|                   |   |                                      |        |                      |                            |
|                   | DEV Data Management   | System (D                            | MS)    |                      |                            |
|                   |   |                                      |        |                      |                            |
| wse<br>w programs | History → Data Management System / Show programs  |                                      |        |                      | Current user               |
| a dataset         | Large programs  |                                      |        |                      | Logout                     |
| files             | Project   | <b>Release</b> ↓                     | PMS    | # dataset            | Search:                    |
|                   | ORION-B (Outstanding Radio-Imaging of OrioN-B)  | 2022-06-01<br>2022-01-12             | 006-17 | 92                   |                            |
|                   | GEMS (Gas phase elemental abundances in molecular clouds)   |                                      |        | 1                    | Go                         |
|                   | CLAWS (CO Line Atlas within the Whirlpool galaxy Survey)  | 2021-05-19                           |        | 21                   |                            |
|                   | BASSCO (The BAT AGN Spectroscopic Survey in CO)   | 2020-06-23                           |        | 0                    |                            |
|                   | CALYPSO (Continuum and Lines in Young ProtoStellar Objects)<br>EMPIRE (EMIR Multiline Probe of the ISM Regulating Galaxy Evolution) | 2020-02-04 U052<br>2019-06-11 206-14 |        | 161 186              |                            |
|                   | PHIBSII (Molecular Gas at the Peak Epoch of Galaxy Formation)   | 2019-06-11                           |        | 540                  |                            |
|                   | ORION A CO  | 2019-03-03                           |        | 2                    |                            |
|                   | XCOLDGASS (a legacy survey of molecular gas in the local Universe)  | 2017-10-20                           |        | 869                  |                            |
|                   | ASAI (Astrochemical Surveys At IRAM)  | 2017-06-30                           |        | 36                   |                            |
|                   | M33 CO (The complete CO(2-1) map of M33)  | 2016-03-03                           | 225-10 | 5                    |                            |
|                   | PAWS (PdBI Arcsecond Whirlpool Survey)  | 2013-08-13                           | T057   | 25                   |                            |
|                   | W43HERO (W43 Hera/EmiR Observations)  | 2013-06-14                           |        | 11                   |                            |
|                   | PHIBSI (Star Forming Histories and Gas Fractions of Galaxies from z=1-3   | ) 2013-03-21                         | UODE   | 181                  |                            |
|                   | COLDGASS (CO Legacy Database for GASS)  | 2012-09-26                           |        | 367                  |                            |
|                   | HERACLES (HERA CO Line Extragalactic Survey)  | 2011-12-15                           |        | 193                  |                            |
|                   | ILS (IRAM Lensing Survey)   |                                      | тосс   | 1                    |                            |
|                   | Standard programs   |                                      |        |                      |                            |
|                   | Project   Release   PMS   #   | dataset                              |        |                      |                            |
|                   | NUGA (NUclei of GAlaxies) 2018-03-26  | 33                                   |        |                      |                            |
|                   | M31 CO (Molecular Gas in the Andromeda galaxy) 2012-01-31   | 3                                    |        |                      |                            |
|                   | AGB ATLAS   | 2                                    |        |                      |                            |
|                   |   | 2                                    |        |                      |                            |

## DMS: Search for "young stellar objects"

History ---> Data Management System / Find Files / Search

#### **Projects:**

Previous Next Expand First Last P

| Project   | SMS project | Status  | # dataset |
|---|-------------|---------|-----------|
| ASAI (Astrochemical Surveys At IRAM)                        |             | created | 36        |
| CALYPSO (Continuum and Lines in Young ProtoStellar Objects) |             | created | 161       |
| W43HERO (W43 Hera/EmiR Observations)                        |             | created | 11        |

Back

## DMS: Search for "ISM"

| History> Data Management System / Find Files / | Search      |         |           |
|--|-------------|---------|-----------|
| Projects:                                      |             |         |           |
| Previous Next Expand First Last 🖉              |             |         |           |
| Project  | SMS project | Status  | # dataset |
| ORION-B (Outstanding Radio-Imaging of OrioN-B) |             | created | 92        |
| PAWS (PdBI Arcsecond Whirlpool Survey)         |             | created | 25        |

## DMS: Search for "M51"

| History → Data Management System / Find Files / <mark>Search</mark>  |             |         |           |  |  |
|--|-------------|---------|-----------|--|--|
| Projects:  |             |         |           |  |  |
| Previous Next Expand First Last 🔎                                    |             |         |           |  |  |
| Project  | SMS project | Status  | # dataset |  |  |
| CLAWS (CO Line Atlas within the Whirlpool galaxy Survey)             |             | created | 21        |  |  |
| EMPIRE (EMIR Multiline Probe of the ISM Regulating Galaxy Evolution) |             | created | 186       |  |  |
| PAWS (PdBI Arcsecond Whirlpool Survey)                               |             | created | 25        |  |  |

Back

## DMS: Search for "redshift"

| Projects:  |             |         |           |
|--|-------------|---------|-----------|
| Previous Next Expand First Last 🖉  |             |         |           |
| Project  | SMS project | Status  | # dataset |
| BASSCO (The BAT AGN Spectroscopic Survey in CO)                          |             | created | 0         |
| PHIBSII (Molecular Gas at the Peak Epoch of Galaxy Formation)            |             | created | 540       |
| XCOLDGASS (a legacy survey of molecular gas in the local Universe)       |             | created | 869       |
| PHIBSI (Star Forming Histories and Gas Fractions of Galaxies from z=1-3) |             | created | 181       |
| COLDGASS (CO Legacy Database for GASS)                                   |             | created | 367       |
| ILS (IRAM Lensing Survey)  |             | created | 1         |
| HERACLES (HERA CO Line Extragalactic Survey)                             |             | created | 193       |

Back

## DMS: Indexation based on standardized FITS and VO keywords

| F               | its header              |
|-----------------|-------------------------|
| SIMPLE          | 1                       |
| BITPIX          | -32                     |
| NAXIS           | 3                       |
| NAXIS1          | 325                     |
| NAXIS2          | 434                     |
| NAXIS3          | 80                      |
| EXTEND          | 1                       |
| DATAMIN         | -1.8345071              |
| DATAMAX         | 65.57428                |
| BUNIT<br>CTYPE1 | K (Tmb)<br>RAARC        |
| CRVAL1          | 85.226125               |
| CDELT1          | -0.002499999938946      |
| CRPIX1          | 290.2036383598          |
| CROTA1          | 14                      |
| CUNIT1          | deg                     |
| CTYPE2          | DECARC                  |
| CRVAL2          | -2.466666666666         |
| CDELT2          | 0.002499999938946       |
| CRPIX2          | 131.4116126225          |
| CROTA2          | 14                      |
| CUNIT2          | deg                     |
| CTYPE3          | VRAD                    |
| CRVAL3          | 10500                   |
| CDELT3          | 500                     |
| CRPIX3          | 40.5                    |
| CROTA3          | 0                       |
| CUNIT3          | m                       |
| OBJECT          | ORION-B                 |
| RADESYS         | FK5                     |
| RA              | 85.226125               |
| EOUINOX         | 2000                    |
| ALTRPIX         | 40.5                    |
| ALTRVAL         | 115267164714.9          |
| LINE            | 12CO(1-0)               |
| RESTFREQ        | 115271202000            |
| IMAGFREQ        | 92228430704.19          |
| VELREF          | 257                     |
| SPECSYS         | LSRK                    |
| BMAJ            | 0.008611110970294       |
| BMIN            | 0.008611110970294       |
| BPA             | 0                       |
| TELESCOP        | 30M                     |
| ORIGIN          | GILDAS CUBE             |
| DATE            | 2023-02-28T11:35:42.428 |

| ١                   | VO header   |
|---------------------|---|
| software_version    | dev   |
| dataproduct_type    | cube  |
| dataproduct_subtype | ???   |
| calib_level         | 3   |
| access_format       | image/fits  |
| access_estsize      | 44078   |
| target_name         | ORION-B   |
| s_ra                | 85.48280605537744   |
| s_dec               | -2.180881551542907  |
| s_fov               | 1.351999714865601   |
| s_region            | ICRS (Polygon 86.0 -2.6 85.2 -2.8 85.0<br>-1.8 85.7 -1.6) |
| s_xel1              | 325   |
| s_xel2              | 434   |
| s_resolution        | 30.99999949305836   |
| s_pixel_scale       | 8.999999780205600   |
| em_ucd              | em.freq   |
| em_min              | 115263608058.9960   |
| em_max              | 115278795941.0040   |
| em_res_power        | 599584.916000000  |
| em_xel              | 80  |
| pol_states          | /I/   |
| facility_name       | IRAM  |

## DMS: Workflow between PI team and IRAM to import dataset and document them

| it Attach file Full screen  |                               |  |                                      |                                   |   |   |                 |  |  |
|---|-------------------------------|--|--------------------------------------|-----------------------------------|---|---|-----------------|--|--|
| created   | >                             | edited                                     |                                      |                                   | ask for publishing  | > | published       |  |  |
|   |                               |  | <b>PIs:</b> Jér<br>https://v         | ôme Pety<br>www.iran              | utstanding Radi<br>, Maryvonne Gerin<br>h.fr/~pety/ORION-B<br>(DR1) - 2022 June | _ | ing of OrioN-B) |  |  |
|   |                               |  |                                      |                                   |   |   |                 |  |  |
| roject<br>ontacts: Jérôme Pety, M<br>mails: pety@iram.fr, mai<br>arge program proposa   | ryvonne.gerii<br>1: 124-16    | n@observat                                 |                                      |                                   |   |   |                 |  |  |
| ontacts: Jérôme Pety, M<br>mails: pety@iram.fr, ma  | ryvonne.gerii<br>1: 124-16    | n@observat                                 |                                      |                                   |   |   |                 |  |  |
| ontacts: Jérôme Pety, M<br>mails: pety@iram.fr, ma<br>arge program proposa<br>rototype proposal(s):   | the ORION-B<br>nes over a fie | 15, 145-14,<br>first public<br>d of view o | , 022-14,<br>data rele<br>of 0.9 squ | , 019-13<br>ease. The<br>are degr | ee towards the portion  |   |                 |  |  |
| ontacts: Jérôme Pety, M<br>mails: pety@iram.fr, mai<br>arge program proposal<br>rototype proposal(s):<br>• Abstract<br>These data represent<br>velocity cubes of 18 lin | the ORION-B<br>nes over a fie | 15, 145-14,<br>first public<br>d of view o | , 022-14,<br>data rele<br>of 0.9 squ | , 019-13<br>ease. The<br>are degr | ee towards the portion  |   |                 |  |  |

## **DMS: Automated link with proposal information**

History → Data Management System / Show programs / ORION-B / 124-16

Print Save as PDF Resubmit this proposal

#### Proposal 124-16 (pdf)

Title: ORION B: The anatomy of a Giant Molecular Cloud

#### PIs: Jérôme Pety, Maryvonne Gerin

CoIs: Emeric Bron, Viviana Guzman Veloso, Jan Orkisz, Sebastien Bardeau, Javier R. Golcoechea, Pierre Gratier, Franck Le Petit, François Levrier, Harvey Liszt, Karin Öberg, Nicolas Peretto, Evelyne Roueff, Albrecht Sievers, Pascal Tremblin

#### Total requested time: 550.0 (Emir)

Continuation: 019-13, 022-14, 145-14, 122-15, 018-16

#### Proposal history:

The proposal committee granted us about 300 hours of IRAM 30-meter time to map slightly more than 1.5 square degree in the western edge of the Orion B molecular cloud (projects 019-13, 022-14, 145-14, 122-15, and 010-16) from 72 to 80 GHz and 84 to 116 GHZ, 1.e., almost all the 3 mm band. A first set of 4 papers analyzing the data set acquired in 1/1/3 and 2014 are either published or submitted. The first results were presented in the ISM symposium in Zermatic on September 2015, SWASS on July 2016, Exceter on August 2016, and we will continue to advertise them in the coming year. These works made high use of the number of detected species and the high spectral resolution. The region mapped up to now is strongly illuminated in far UV with a mean GC = 45 (ISRF. Habing 1968), since massive stars illuminate the molecular cloud both from the outside and from the inside. The reached conclusions are thus biased towards such conditions. In order to broaden our conclusions, we now propose to observe the same frequency ranges in both filamentary stake in the Crion B molecular cloud.

#### Abstract:

Molecular amission often provides the best and sometimes only constraints on the physical processes that govern star formation. Common molecules like CO (isotopologues), HCO+, HCN, H2H+, CH2OH, H2CO, DCO+, NDD+, DCN provide constraints on density, temperature and illumination structures. The utility of these molecular probes is currently limited, however, by lack of comprehensive data sets that connects emission patterns with shall and Large-scale physical structures quantitatively. To address this we have acquirent as imm spectral-image cube by the uvil illuminated western edge of the urion is molecular clouder to sample the full range of physical conditions characterizing high-mass star forming regions, instead of being biased towards the high UV illumination of the western edge. The ultimate questern edge of this project is to develop Orion B as a template for galactic and extra-galactic studies by correlating chemical and physical structures across the full 3mm hand. This will allows us to calibrate popular probes, developing the; full potential as tools to understand star formation, near and far.

| RA C<br>40:54.270 -02:24<br>selups:<br>Species/Transil | Energy Provide State   | Emir<br>Beceiver ban   | nd [?]  | ?] Rms [?]<br>mK  | ΔV [?]<br>km/s   | kends [?]   | Rec. time<br>550.0  |  | view  |
|--|--|--|---|---|--|---|---|--|---|
| Species/Transit  | GHz  | Receiver ban   | nd [?] T <sub>A</sub> * [<br>mK   | ?] Rms [?]<br>mK  | ΔV [?]<br>km/s   | kends [?]   | 550.0   |  | view  |
| Species/Transit  | GHz  | Receiver ban   | nd [?]  | ?] Rms [?]<br>mK  | ΔV [?]<br>km/s   | kends [?]   | 550.0   |  | view  |
| Species/Transit  | GHz  |  | nd [?] T <sub>A</sub> * [<br>mK   | ?] Rms [?]<br>mK  | ΔV [?]<br>km/s   | kends [?]   |   | А  | view  |
| <u> </u>   | GHz  |  | nd [?] TA* [<br>mK  | ?] Rms [?]<br>mK  | AV [?] Bac   | kends [?]   |   |  |   |
| \ny  | 76   | -  |   |   |  |   |   |  |   |
|  | /0   | .5   | LI > 360  | 0.0 120.0   | 0.764 FTS  | 00  | 1   |  |   |
| Any  | 90   | .0   | LI > 300  | 0.0 103.0   | 0.65 FTS2  | 00  |   |  |   |
| Any  | 97   | .5   | LI > 300  | 0.0 102.0   | 0.6 FTS2   | 00  | J   |  |   |
| ers:   |  |  |   |   |  |   |   |  |   |
| mode Size X  | Size Y Switch m  | ode PWV [?]  | Time [?]<br>hours R   | epetition [?]   | Remark   |   |   |  |   |
|  |  | PSW 4  | 130.0   | 1   | L  |   |   |  |   |
| OTF 103.9  | 103.9  | PSw 4  | 180.0   | 1   | L  |   |   |  |   |
| OTF 103.9  | 103.9  | PSW 4  | 220.0   | 1   | L  |   |   |  |   |
| n  | Size X           01F         103.9           0TF         103.9           0TF         103.9           0TF         103.9 | Size X         Size Y         Switch m           OIF         103.9         103.9           OTF         103.9         103.9           OIF         103.9         103.9 | Size X         Size Y         Switch mode         PWV [?]<br>mm           OIF         103.9         103.9         PSw         4           OTF         103.9         103.9         PSw         4 | Size X         Size Y         Switch mode         PWV [?] mm         Time [?] hours         R           OIF         103.9         103.9         PSw         4         130.0           OTF         103.9         103.9         PSw         4         180.0           OTF         103.9         103.9         PSw         4         220.0 | Size X         Size Y         Switch mode         PWV [?]<br>mm         Time [?]<br>hours         Repetition [?]           OIF         103.9         103.9         PSw         4         130.0         1           OTF         103.9         103.9         PSw         4         180.0         1           OIF         103.9         103.9         PSw         4         220.0         1 | Size X         Size Y         Switch mode         PWV [?] mm         Time [?] hours         Repetition [?]         Remark           OIF         103.9         103.9         PSw         4         130.0         1           OTF         103.9         103.9         PSw         4         180.0         1           OTF         103.9         103.9         PSw         4         220.0         1 | Size X         Size Y         Switch mode         PWV [?]<br>mm         Time [?]<br>hours         Repetition [?]         Remark           OIF         103.9         103.9         PSw         4         130.0         1           OTF         103.9         103.9         PSw         4         180.0         1           OTF         103.9         103.9         PSw         4         220.0         1 | Size X         Size Y         Switch mode         PWV [?]   Time [?] hours         Repetition [?]         Remark           OIF         103.9         103.9         PSw         4         130.0         1           OTF         103.9         103.9         PSw         4         180.0         1           OTF         103.9         103.9         PSw         4         220.0         1 | Size X         Size Y         Switch mode         PWV [?] mm         Time [?] hours         Repetition [?]         Remark           OIF         103.9         103.9         PSw         4         130.0         1           OTF         103.9         103.9         PSw         4         180.0         1           OTF         103.9         103.9         PSw         4         220.0         1 |

Session: Winter Proposal category 2016 - 30m Large program

Proposal category: High-mass star formation, Intermediate-mass star formation, Low-mass star formation, Pre-stellar cores, Infra-Red Dark Clouds (IRDC), Astrochemistry, Inter-Large program Stellar Medium (ISM)/Molecular clouds, Photon-Dominated Regions (PDR)/X-Ray Dominated Regions (XDR), HII regions

J.Petv. 2023

#### Scheduling constraints:

We definitely need stable weather and we thus ask to avoid foggy spring afternoons when the snow melts.

#### PI note:

This project is part of the PhD thesis of Jan Orkisz under the direction of Jérôme Pety and Maryvonne Gerin. Emeric Bron and Viviana Guzman are two post-docs who devote a significant fraction of their time on the project.

#### Date: 2016-09-15 12:26:36

Back

## **DMS: PI can link publication DOIs**



#### ORION-B (Outstanding Radio-Imaging of OrioN-B)

PIs: Jérôme Pety, Maryvonne Gerin https://www.iram.fr/~pety/ORION-B

First data release (DR1) - 2022 June 1st

#### Project

Contacts: Jérôme Pety, Maryvonne Gerin Emails: pety@iram.fr, maryvonne.gerin@observatoiredeparis.psl.eu Large program proposal: 124-16 Prototype proposal(s): 018-16, 122-15, 145-14, 022-14, 019-13

- Abstract
- Methods
- Acknowledgments
- References

The observing strategy, data reduction, and associated data products are described in the following peer-reviewed article(s):

#### Pety et al., 2017, Astronomy and Astrophysics

These data were used in at least the following peer-reviewed studies:

Gaudel et al., 2023, Astronomy and Astrophysics Bron et al., 2021, Astronomy and Astrophysics Gratier et al., 2021, Astronomy and Astrophysics Roueff et al., 2021, Astronomy and Astrophysics Orkisz et al., 2019, Astronomy and Astrophysics Bron et al., 2018, Astronomy and Astrophysics Gratier et al., 2017, Astronomy and Astrophysics Orkisz et al., 2017, Astronomy and Astrophysics

#### Other related articles:

Lombardi et al., 2014, Astronomy and Astrophysics Schneider et al., 2013, The Astrophysical Journal

#### **IRAM Information Flow**

## **DMS: List of products for potential downloads**



#### **ORION-B** (Outstanding Radio-Imaging of OrioN-B)

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Abstract

Methods

Acknowledgments

References

[?] line ≓ product ♂

#### 12cn10

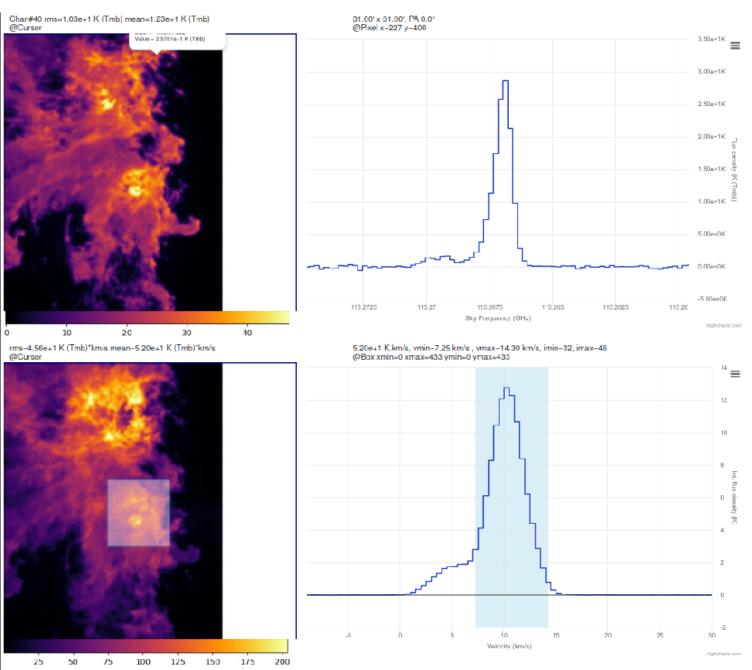
| Key 1              | Object  | Line      | Freq.          | Cdelt3    | Beam    | Telescope | Unit       | Size   |                 |
|--------------------|---------|-----------|----------------|-----------|---------|-----------|------------|--------|-----------------|
| cube               | ORION-B | 12CN(1-0) | 113.490970 GHz | 500.0 m/s | 31.00 " | 30M       | K (Tmb)    | 43 MB  | download/header |
| moment-area-noise  | ORION-B | 12CN(1-0) | 113.490970 GHz |           | 31.00 " | 30M       | K (Tmb).km | 557 kB | download/header |
| moment-area-noise  | ORION-B | 12CN(1-0) | 0.000000 Hz    |           | 31.00 " | 30M       | K (Tmb).km | 557 kB | download/header |
| moment-area-signal | ORION-B | 12CN(1-0) | 0.000000 Hz    |           | 31.00 " | 30M       | K (Tmb).km | 557 kB | download/header |
| moment-area-signal | ORION-B | 12CN(1-0) | 113.490970 GHz |           | 31.00 " | 30M       | K (Tmb).km | 557 kB | download/header |

#### 12co10

| Keyt               | Object  | Line      | Freq.          | Cdelt3    | Beam    | Telescope | Unit       | Size   |                 |
|--------------------|---------|-----------|----------------|-----------|---------|-----------|------------|--------|-----------------|
| cube               | ORION-B | 12CO(1-0) | 115.271202 GHz | 500.0 m/s | 31.00 " | 30M       | K (Tmb)    | 43 MB  | download/header |
| moment-area-noise  | ORION-B | 12CO(1-0) | 115.271202 GHz |           | 31.00 " | 30M       | K (Tmb).km | 557 kB | download/header |
| moment-area-noise  | ORION-B | 12CO(1-0) | 0.000000 Hz    |           | 31.00 " | 30M       | K (Tmb).km | 557 kB | download/header |
| moment-area-signal | ORION-B | 12CO(1-0) | 0.000000 Hz    |           | 31.00 " | 30M       | K (Tmb).km | 557 kB | download/header |
| moment-area-signal | ORION-B | 12CO(1-0) | 115.271202 GHz |           | 31.00 " | 30M       | K (Tmb).km | 557 kB | download/header |

### **IRAM Information Flow**

## **DMS:** Interactive pre-visualization $\Rightarrow$ **YAFITS**



#### **IRAM Information Flow**