



# Réunion annuelle ASOV 2022


OSUG : Laurent Bourgès, Guillaume Mella,  
OSUL : Antoine Kaszczyc,  
OCA : Nicolas Bruot, David Salabert  
& nos collègues scientifiques

# Tour d'horizon JMMC ...

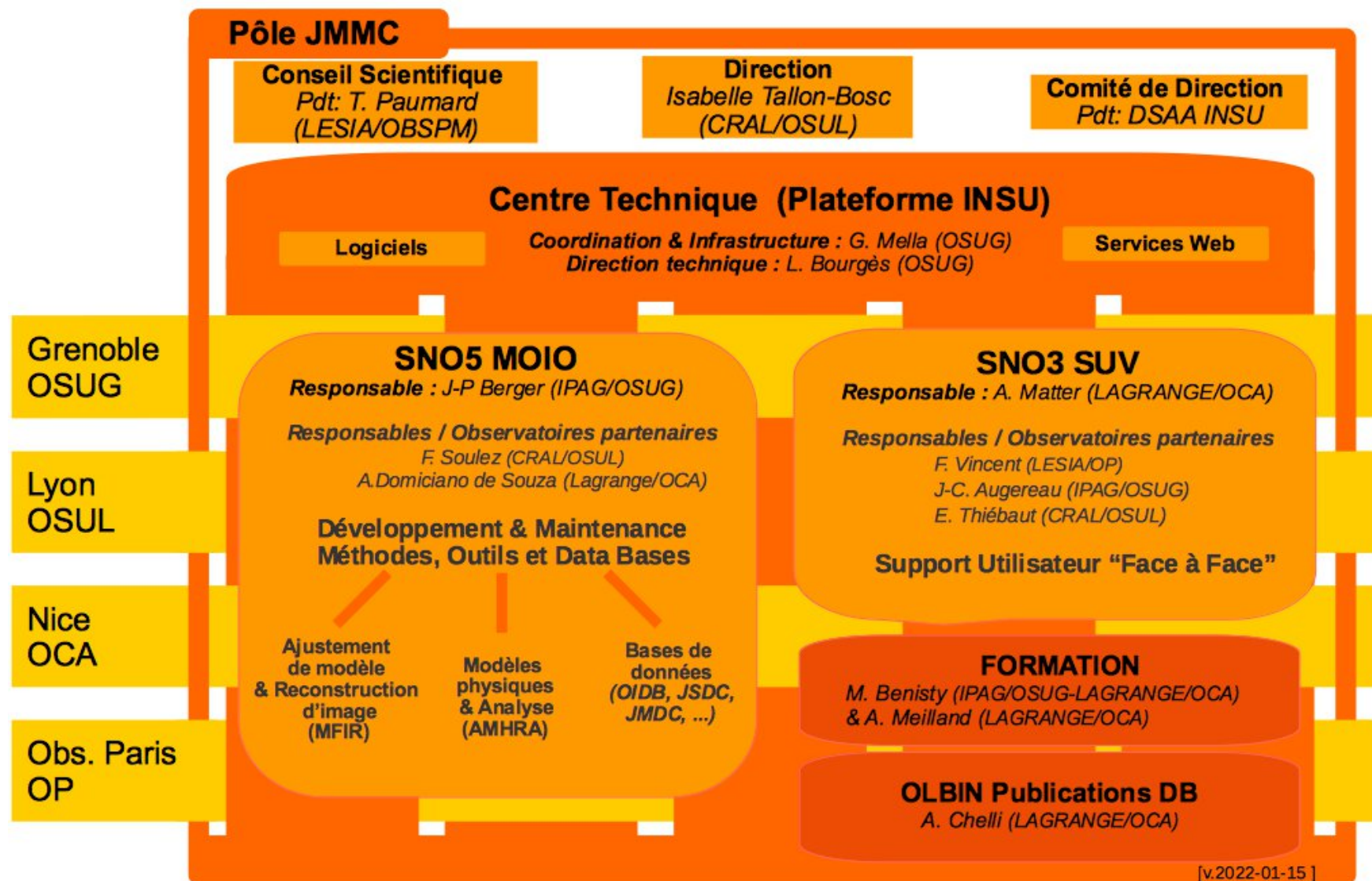
- ✦ Le JMMC
- ✦ Ses missions, ses outils
- ✦ Nos développements récents

... sous l'angle technique / VO

# Le JMMC : aujourd'hui / a 22 ans

- + Le **Centre Jean-Marie Mariotti** est le **Pôle Thématique National des données en interférométrie visible et infrarouge** qui coordonne 2 ANO
  - + ANO5 Méthodes et Outils pour l'Interférométrie
  - + ANO3 Service aux Utilisateurs du VLTI
  - + nouveau ( ) : plus d'info en français [sur le site web](#)
- + Sa raison d'être est l'exploitation optimale des interféromètres optiques accessibles à la communauté française
- + Ouvert à tous, l'ensemble des services du JMMC est reconnu par la communauté internationale

# Le JMMC / son organisation et sa gouvernance

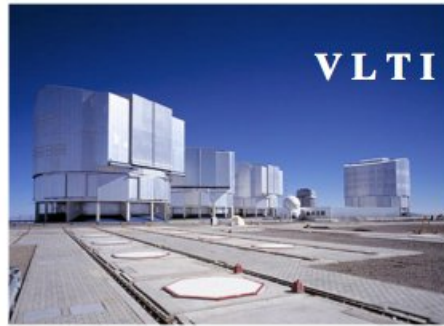


# Le JMMC : ses missions

- ✦ Fournir les outils logiciels et assurer le support aux utilisateurs pour l'exploitation des grands interféromètres optiques et infrarouges
- ✦ Aider à la formation, en particulier des non-spécialistes
- ✦ Participer à la prospective des nouveaux instruments

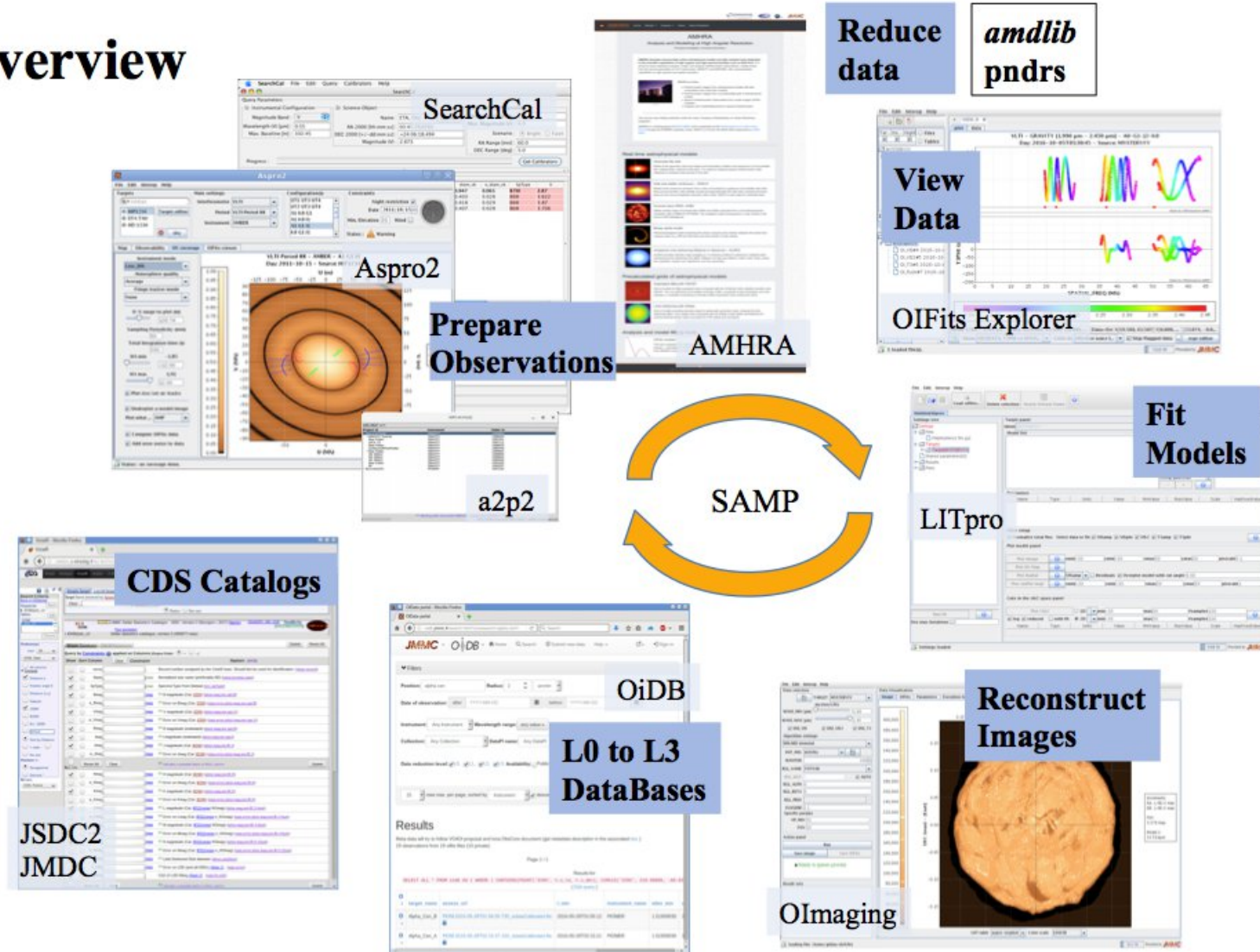
# Le JMMC / des services

## JMMC Service overview



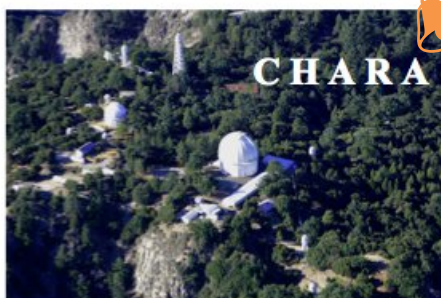
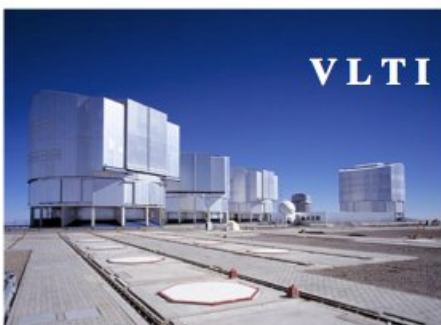
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User Support

- + TRAINING
- + OLBIN Publications DB



# Le JMMC / des services en permanente évolution

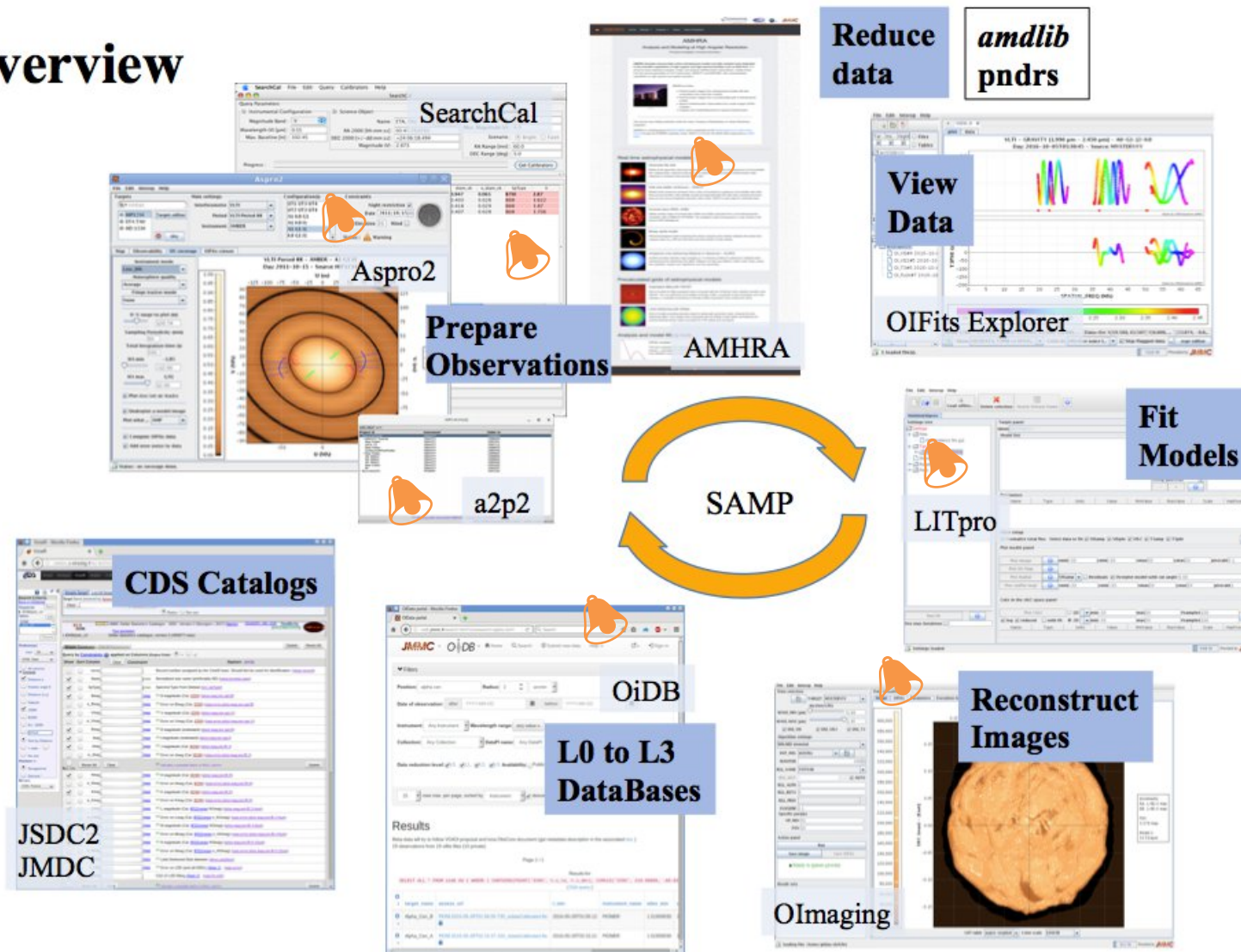
## JMMC Service overview



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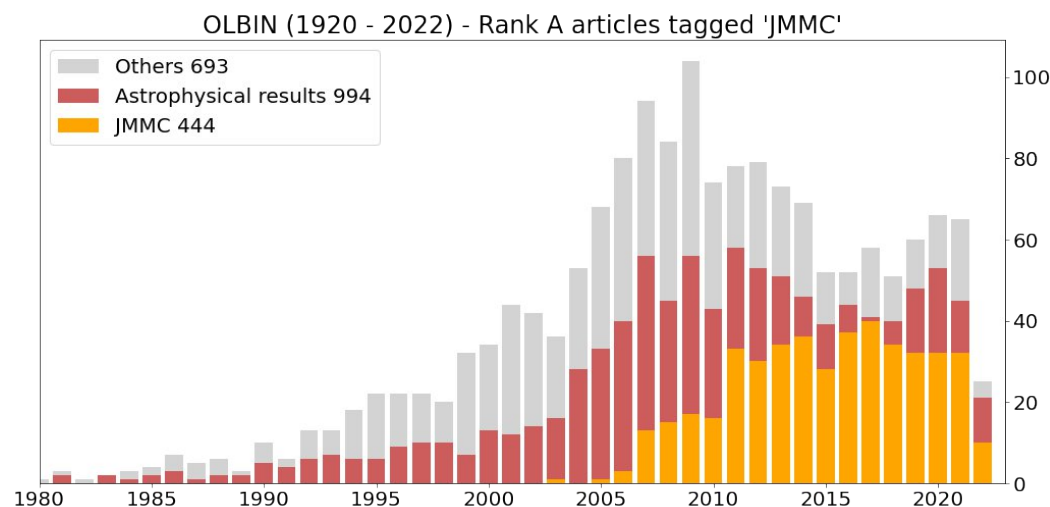
+ TRAINING

+ OLBIN Publications DB



# OLBIN publication database

- Le JMMC gère publications.olbin.org depuis 2010
- Amélioration de l'aide à l'alimentation
  - recherches automatiques
  - synchronisation des tags avec des library ADS
  - gestion d'une "blocklist" pour ne plus revenir sur les faux-positifs
  - **Merci ADS** pour son API !!
- Mise en ligne en 2022 d'un nouveau site web
  - Plus de plots, liens vers portail ADS
- Prochain objectif : ConeSearch bibliographique



Homepage Contacts & Credits

## Database of Publications in Stellar Optical Interferometry

Quick index for papers: [Pre-2012](#) | [2013](#) | [2014](#) | [2015](#) | [2016](#) | [2017](#) | [2018](#) | [2019](#) | [2020](#) | [2021](#) | [2022](#)

You can search papers by keywords ( years, titles, author names , part of bibcodes ), or/and by using tags from the list.  [Tag List](#)

The OLBIN interactive interferometry publication database includes all refereed papers related to optical long baseline interferometry referenced in ADS and aims at being as complete as possible. If you notice that a paper is missing please [send the ADS bibcode to the webmaster](#) and any other useful information.

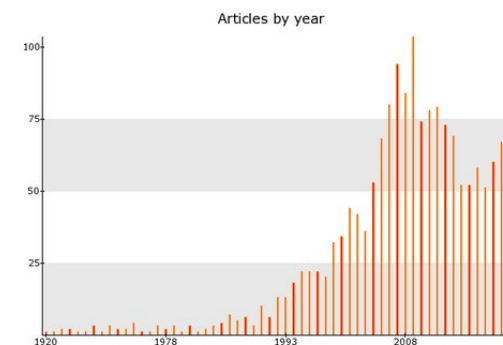
Basic information from ADS (title, list of authors, year of publication) is enriched by tags such as the category of the publication (Astrophysical results, Catalogs, Instrumentation, Review papers, Theory and predictions, Related papers), the name of the interferometer facility, the name of the instrument, the type of object observed, etc. Just click on the "Tag List" button for the complete list of tags.

OLBIN refereed papers get its [own ADS library](#). If you get an ADS account you can subscribe to some lists and be notified on future updates, by an email notification ([visit OLBIN library](#)).

All the database contents can be downloaded as one [spreadsheet file](#), in CSV format for your own use (e.g. for plotting graphics).

### Histograms and other Graphics

Series of automatic displays that illustrate the current content of the database.



To get new plots, please select the data below :

Select data for histogram plot.  or Select category for pie plot.

Other graphics are provided by external tools for visualizing the distribution of the publications over different criteria:





# TRAINING : JMIMC réactif

- 40h sur 2 semaines
- 10/12 personnes mobilisées
- Visios (jusqu'à 67 p.)
- Salles virtuelles
  - Cours
  - TPs
  - Posters
  - Plage & co :)
- Infra « éphémère » OpenStack Nova@GRICAD ♻️:
  - 20 postes 32GB de RAM
  - écrans/claviers partagés
- **Réutilisation** des recettes de build des précédentes écoles pour déployer l'ensemble des outils.

The 10th VLT School of Interferometry

Introducing MATISSE  
the new mid-Infrared Instrument at VLT1  
and with emphasis on  
interferometry for planetology

June 7-18, 2021, Online

openstack vltischool mellag

Project / Compute / Overview

Overview

Limit Summary Compute

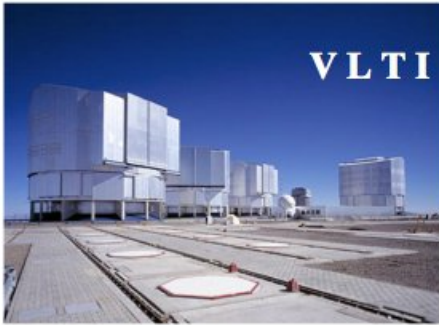
Resource	Used	Total
Instances	22 of 22	
VCPUs	352 of 352	
RAM	704GB of 720GB	
Volumes		
Volume Snapshots		
Volume Storage		

Practice room 1

Question S

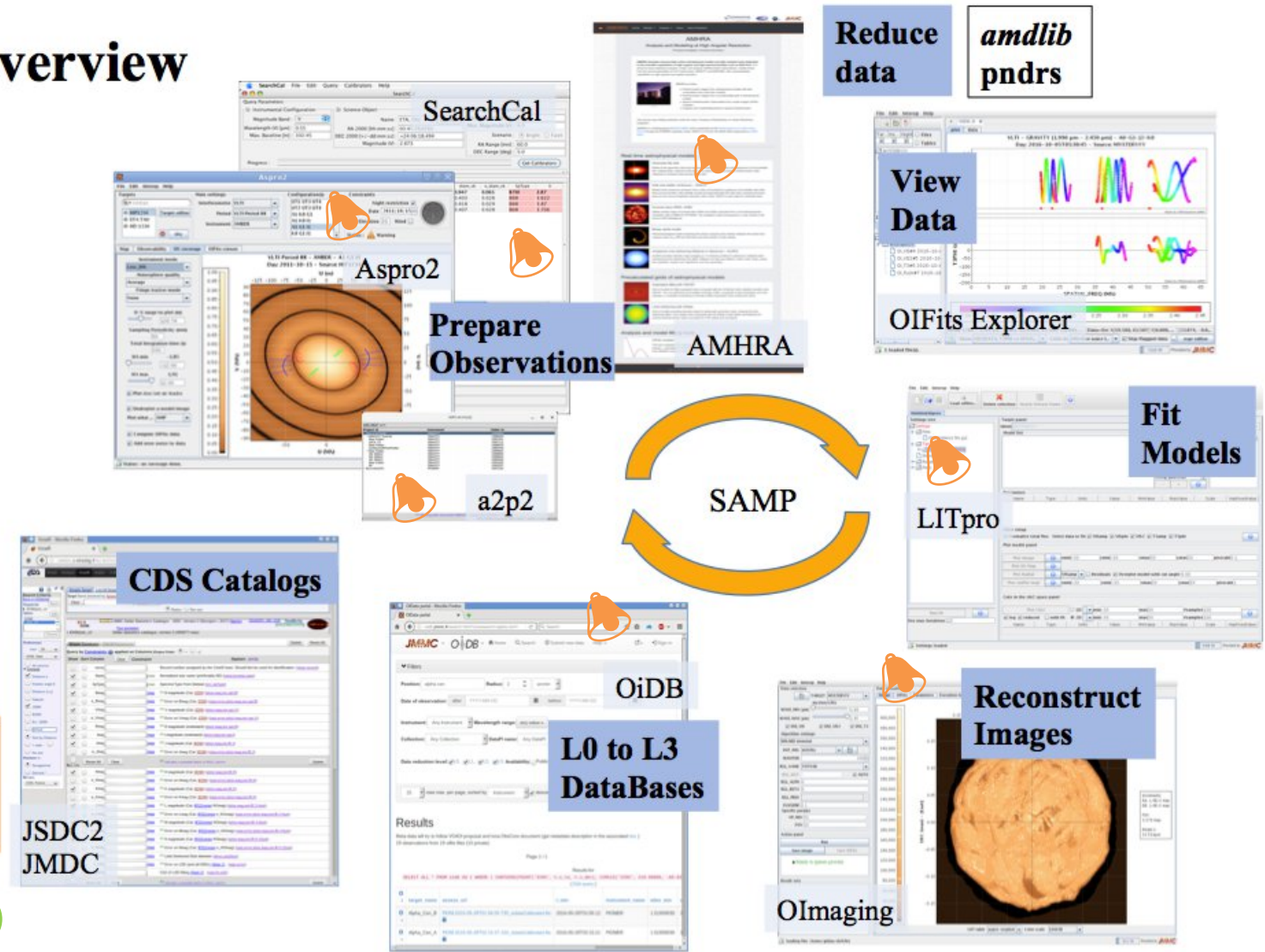
# Le JMMC / des services en permanente évolution

## JMMC Service overview



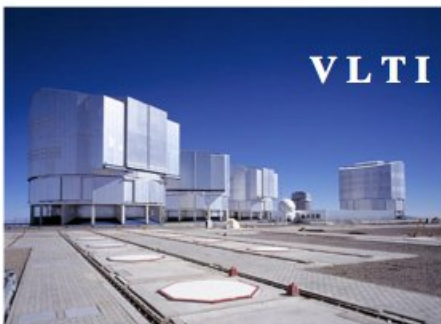
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## JMMC Service overview



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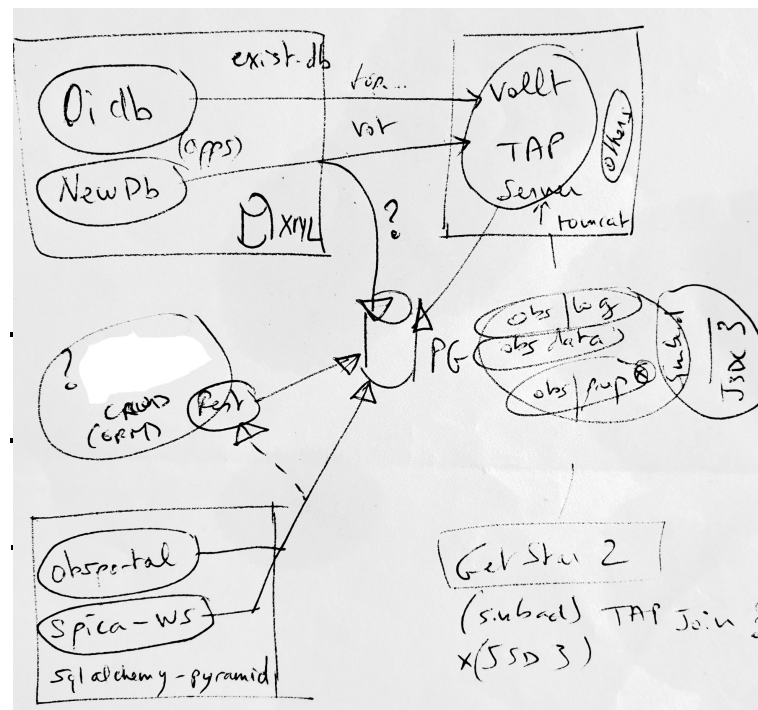
De la préparation d'observations  
 d'étoile(s) par un utilisateur  
 vers  
 la préparation et le suivi de survey  
 d'une équipe

# SPICA-DB Project @ JMMC

SPICA: instrument "Stellar Parameters and Images with a Cophased Array" visible (6T)  
à venir sur CHARA

SPICA-DB est la base de données pour gérer

- large programs (survey) + proposals
- observation logs + quality flags
- index raw / OIFITS files



Besoin d'une interface web (+ API) pour gérer les programmes d'observation, leur suivi et les résultats (L0 -> L3) intégrés avec SPICA night scheduling / DRS ...

# SPICA validation sur le ciel en cours...

## ... première lumière fin avril !



Premier instrument interférométrique ayant un **programme de relevé systématique de plusieurs milliers de sources à traiter de manière homogène**

# SPICA-DB@JMMC en 2021-2022

- + Intégration au nouveau serveur TAP/VOLLT JMMC:
  - + Catalogue SURVEY-SPICA (1500+ étoiles, 8 programmes, 200 nuits)
  - + Catalogue de calibrateurs primaires
- + Mise à jour du contenu : catalogAPI (WS + python wrapper/a2p2 ) & votable2tap WS
- + Description des catalogues : <http://oidb.jmmc.fr/exist/apps/catalogs/index.html>
- + Transfert de modèles analytiques du SURVEY(*JSON*) vers Aspro2(*XML*)
- + Prototype de collectes des obs. log pour CHARA/SPICA en complément des logs ESO-VLTI
- + Les mots clés : **automatisation / intéropérabilité**
- + Utilisation de **notebooks** python pour faciliter la validation des concepts et interfaces

( *points prévus pour le Semi Hackathon* )

# SPICA-DB en action aujourd'hui

Quoi, pour qui, quand, comment, ...  
Chaines, numérique, JSON

TAP

SPICA-NSS TOOL

Date (YYYY-MM-DD) 2022-04-06 2022-04-06

Buttons: QUERY\_JMMC, APPLY\_FILTERS, RESET, SEND2ASPRO, FAKE\_DRS, QUIT

Workpackages: [ ]

Modes: [ ]

Priority\_final: 1, 2, 3

Declination: DEC\_MIN -30 DEC\_MAX 90.0

Magnitude: VMAG\_MIN -3.0 VMAG\_MAX 8.0

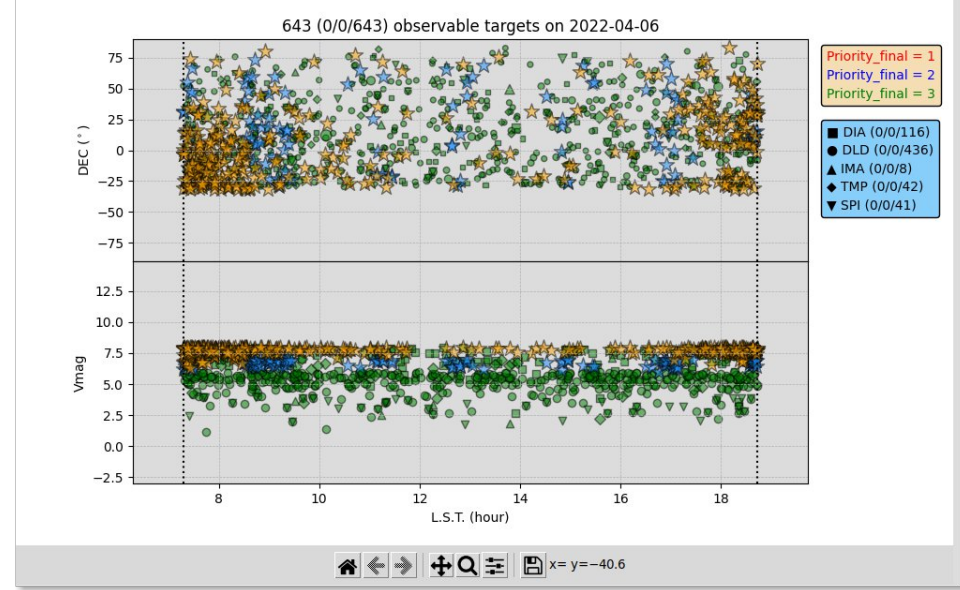
Primary calibrators: RA range (min) 60 DEC range (deg) 5 Vmag range 2 GO

Secondary calibrators: RA range (min) 60 DEC range (deg) 2 Vmag range 0 GO

Max. LDD Chi2 2 Max. rel. error (%) 10 Min. vis2 0.9 GO

Log

SAMP



http://obs.jmmc.fr

VOTABLE

Aspro2 - S06.aspro[c1]

File Edit Interop Help

Targets: Q Simbad

Main settings: Interferometer CHARA, Period CHARA Future, Instrument SPICA

Fixed: S1 S2 W1 W2 E1 E2

Current: S1(1) S2(2) W1(2) W2(5) E1(2) E2(3)

Notebook Map Observability UV coverage OIFits viewer

Instrument mode: LR

AO setup: 1.00

CHARA Future - SPICA - S1(1)-S2(2)-W1(2)-W2(5)-E1(2)-E2(3)

Day: 2021-10-01 - Moon = 18.8%

U (m) - East

V (m) - East

U (MA · 10<sup>-6</sup>/rad)

V (MA · 10<sup>-6</sup>/rad)

Time: L.S.T. [ ] Night only [ ] Baseline limits [ ] Details [ ] Filters: [ ] Show groups [ ] Hide calibrators [ ] Groups: [ ] Show related [ ] Scroll view [ ]

OIFits done.

Début 2023 : coupler Aspro2 au système de pilotage des observations CHARA (SAMP / a2p2)

# Aspro2 : news

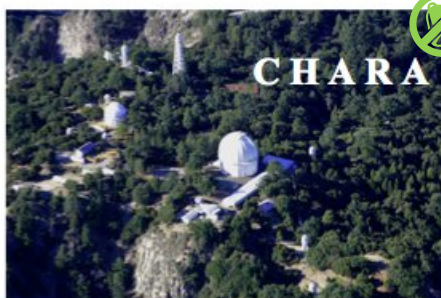
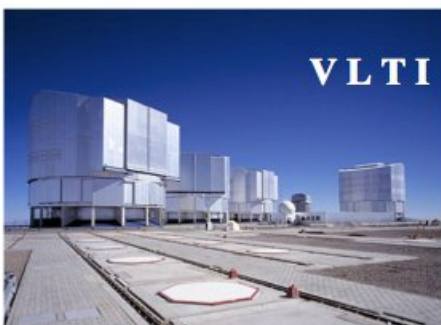
- + Amélioration de l'import des sources (modèle et extra-information) en VOTable
- + Meilleure gestion des spécificités de l'interferomètre CHARA
  - + Objectif: fournir des simulations les plus fidèles et une assistance indiquant les meilleures configurations d'observation
- + Gestion de la configuration (interféromètres et instruments) accessible aux utilisateurs avancés (fichiers XML) pour le projet CHARA 7th telescope:
  - + Taille des telescopes, positions des stations, chemins optiques
  - + Description des instruments, détecteurs, atténuations/bruits

<https://github.com/JMMC-OpenDev/aspro-conf>
- + Reception d'images FITS de modèles utilisateurs par SAMP (AMHRA)



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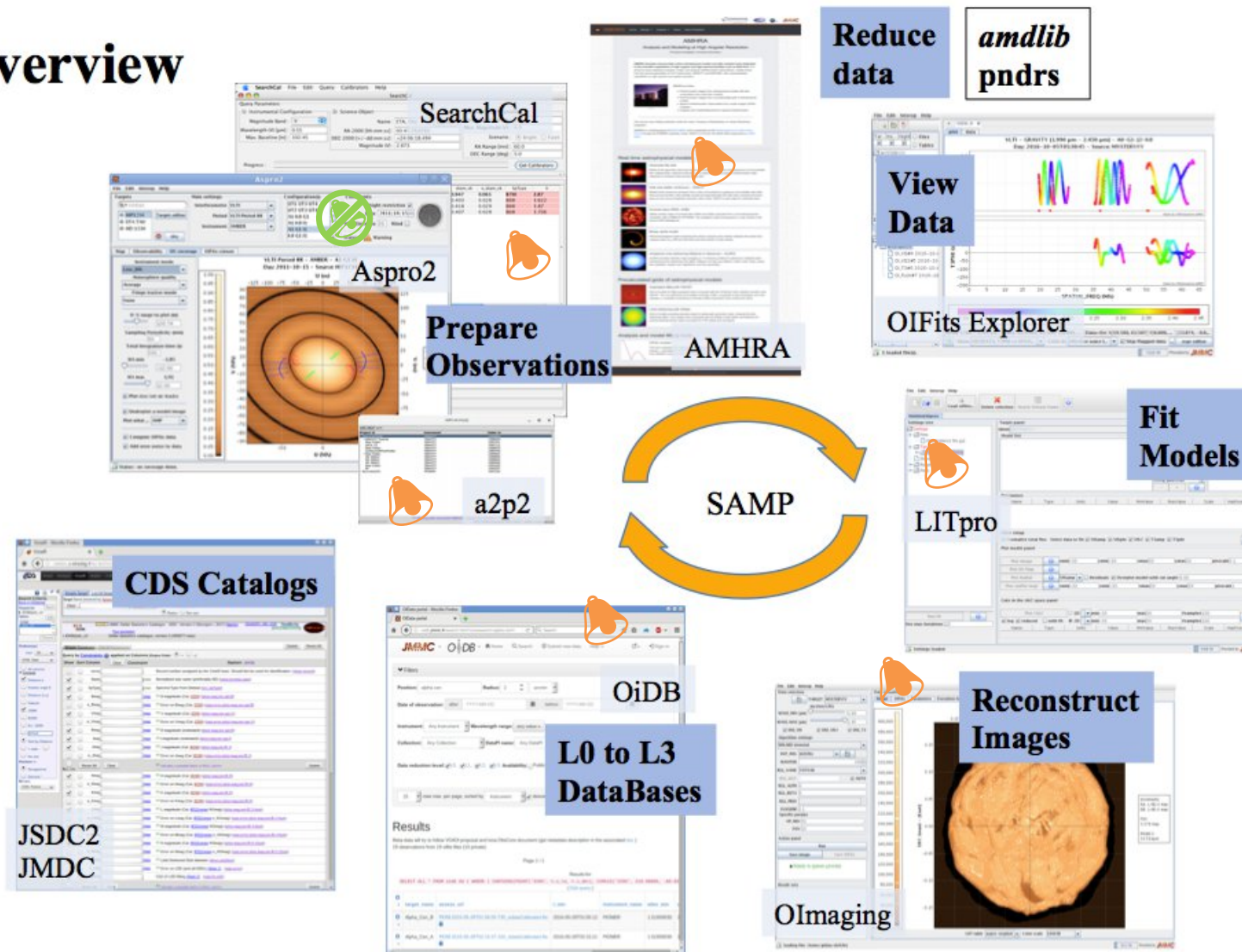
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# AMHRA : news

AMHRA develops and provides online astrophysical models and data analysis tools dedicated to the scientific exploitation of high angular and high spectral facilities such as ESO-VLTI

- ✦ Nouveaux modèles astrophysiques et grilles <https://amhra.oca.eu>
- ✦ Transfert SAMP vers Aspro2/application supportant 'image.load.fits'

**Kinematic Be disk result**

Status  
Your request terminated with the following status: Success

Download result VO tools

Download correspondance Send to Aspro2 Unregister from SAMP Hub

Logs  
The calculation returned the following log:

Main log:  
\*\*\* running idl code \*\*\*  
reading parameters files :  
/tmp/tomcat8-tomcat8-tmp/amhra6293558121295700213/  
dim=long(256)

**Target Editor**

Targets Models Groups

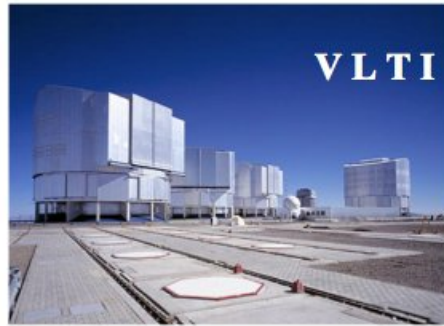
Model  
Mode:  Analytical  User Model  
State:  enabled  disabled  
File: /home/bourgesi/ASPRO2/fits/tmp/output\_Be\_1649337558655.fits  
Scale: 9.1391E-3  
Rotation: 0.00

Fits Image  
Color scale: 3.2E-4 to 2.0E-5  
Coordinates: RA: 00:00:00 DE: +00:00:00  
Increments: RA: 9.14E-3 mas DE: 9.14E-3 mas  
Image FOV: 2.34 mas  
Pixels: 256 x 256  
Image: 26/51  
Model 1: 2.166 μm

Send data to an application  
AppLauncher, the JMMC VO Dock for Astronomers, is an application launcher that lets you choose and start VO tools.  
Alternatively, you may directly download and install any of the following relevant applications:  
• Aladin  
• Aspro2  
• Olmaging  
• SAOImage DS9  
• gaia

# Le JMMC / des services en permanente évolution

## JMMC Service overview



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SearchCal

Aspro2

Prepare Observations

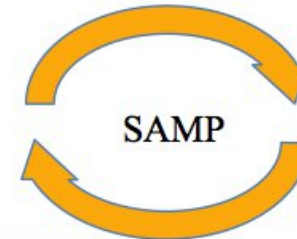
AMHRA

a2p2

Reduce data  
*amdlib*  
*pndrs*

View Data

OIFits Explorer



Fit Models

LITpro

CDS Catalogs

JSDC2  
JMDC

OiDB

L0 to L3  
DataBases

Reconstruct Images

OImaging

# Calliper ou IPER (tout dépend comment on l'appelle)

- + Outil rapide d'estimation d'un diamètre de disque uniforme
  - + En bêta test, basé sur **LITpro & Algos génétiques**
  - + Attend un fichier de donnée OIFITS en entrée
  - + Indique si le **modèle est adapté ou pas**, le **diamètre ajusté & barre d'erreur** et un **chi2**
- + Déclinaison en **webservice** : résultat en *JSON*
- + **Wrapper python** intégré à notre package a2p2
  - + `from a2p2.jmmc.services import calliper`

mellag@pcgm: ~/git/gricad/JMMC

Fichier Édition Affichage Rechercher Terminal Aide

```
>>>
(science) mellag@pcgm:~/git/gricad/JMMC-OpenDev/jmmc-python-snippets/scratch$ python
Python 3.8.5 (default, Jun 15 2021, 17:36:38)
[GCC 8.3.0] on linux
Type "help", "copyright", "credits" or "license" for more information.
>>> from a2p2.jmmc.services import calliper
INFO - a2p2.jmmc.catalogs - 2022-04-07T20:13:30
INFO - a2p2.jmmc.webservices - 2022-04-07T20:13:30
>>> from pprint import pp as pp
>>> pp(calliper.runDiskFit("HAEb..."))
INFO - a2p2.jmmc.utils - 2022-04-07T20:13:30
{'target': 'HD17081',
 'diameter': 0.375497,
 'e_diameter': 0.0339111,
 'diameter_unit': 'mas',
 'reduced_chi2': 0.115645,
 'date_obs': '2013-01-26',
 'em_min': '1.60267950377602',
 'em_min_unit': 'um',
 'em_max': '1.77261483713664',
 'em_max_unit': 'um',
 'filename': '2013-01-25_SCI_HD17081_oiDataCalib.fits',
 'fitter_name': 'genfit',
 'fitted_data': ['vis2'],
 'run_duration': 1,
 'run_date': '2022-04-07T20:13:30',
 'made': 'with love by JMMC'}
>>>
```

Disk fit result

apps.jmmc.fr/~mellag/LITproV

**Fit of a uniform disk**

target: HD17081  
diameter: 0.375497 +/- .03 [mas]  
reduced chi2: 0.115645  
date-obs: 2013-01-26  
lambda: 1.60267950377602...1.77261483713664 [um]  
filename: 2013-01-25\_SCI\_HD17081\_oiDataCalib.fits  
fitter name: genfit  
fitted data: vis2  
run duration: 1 [s]

Not a disk ?  
or more options necessary...  
use

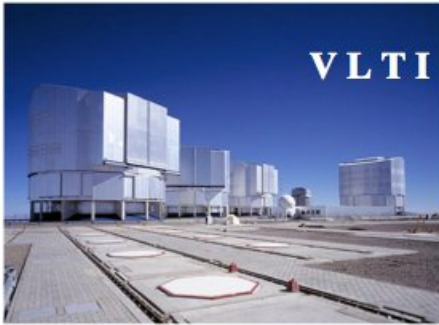
LITpro  
JMMC

Click onto a figure to zoom in or right click get the save menu.

<https://github.com/JMMC-OpenDev/jmmc-python-snippets/blob/main/compare-ud-fitter-on-oidb-data.ipynb>

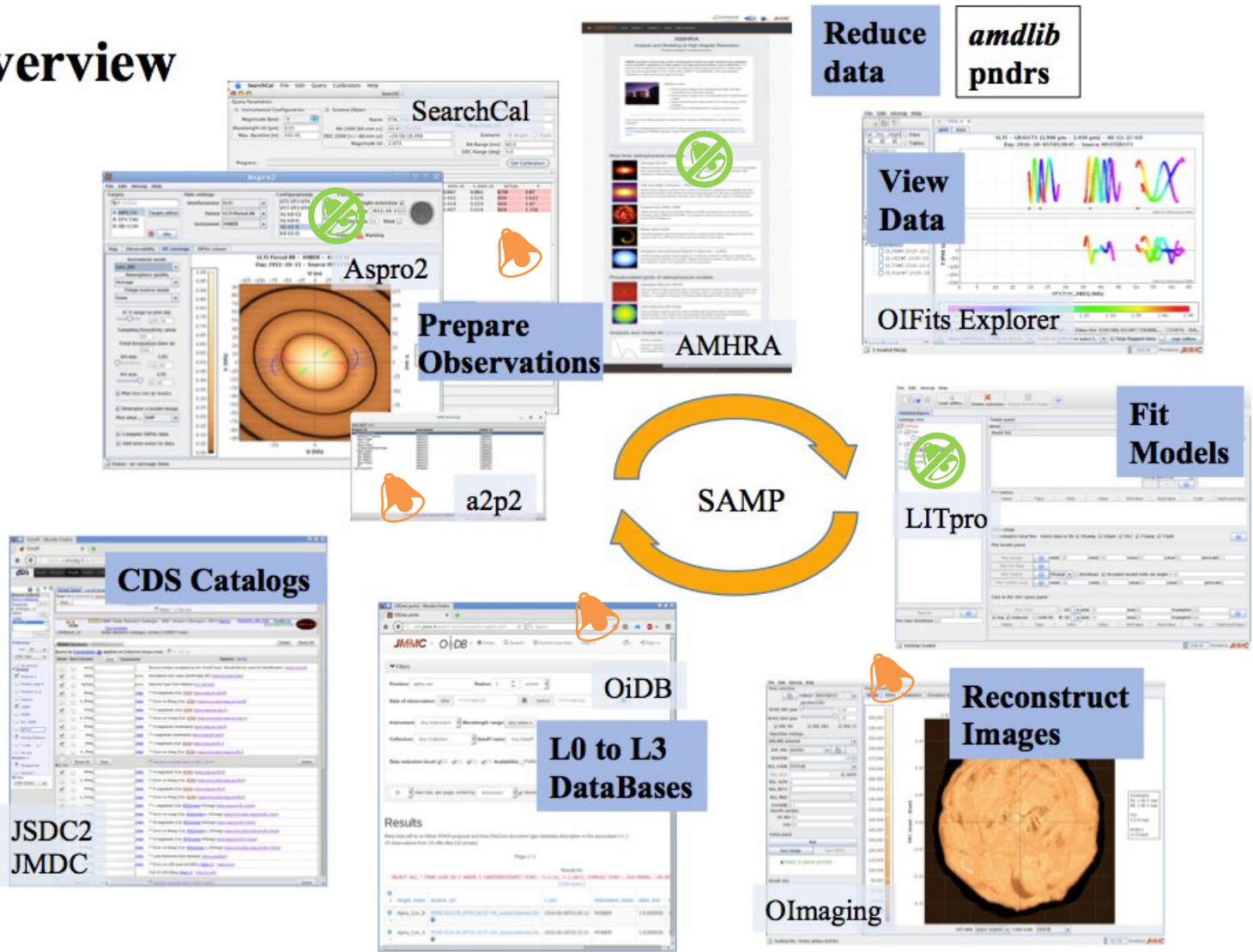
# Le JMMC / des services en permanente évolution

## JMMC Service overview



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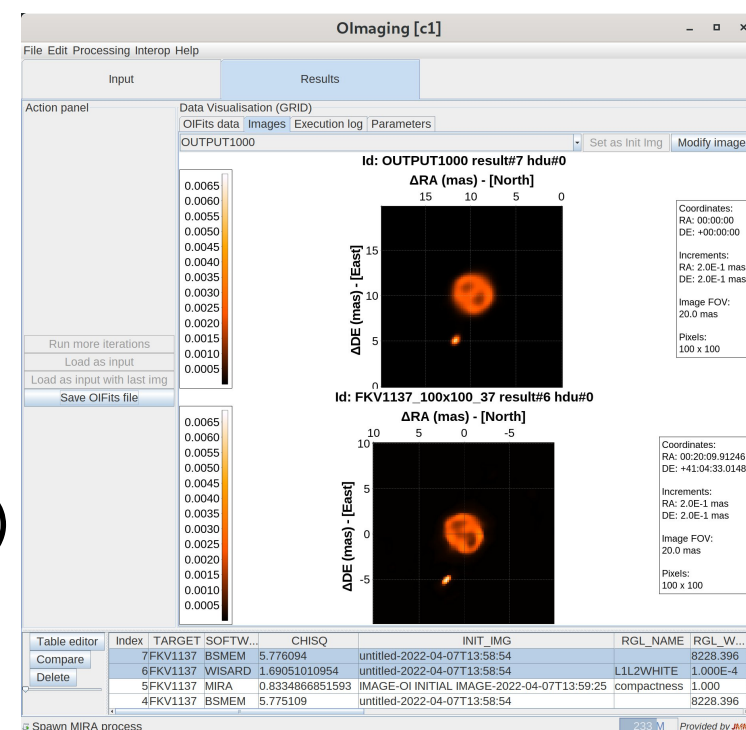
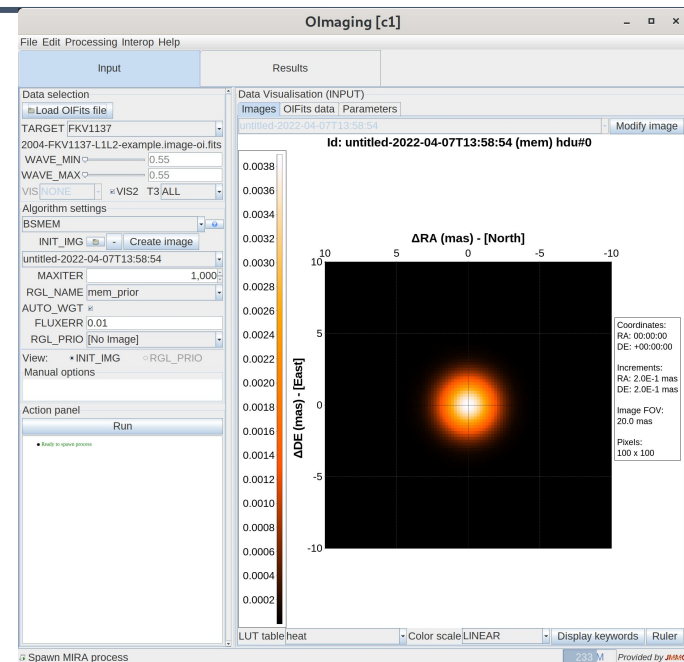
- + TRAINING
- + OLBIN Publications DB



# OImaging

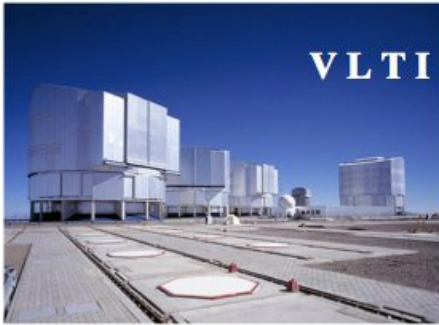
Interface pilotant des logiciels de reconstruction d'images

- ✦ Améliorations GUI (100+ PullRequests)
  - ✦ image viewer (ruler, cube)
  - ✦ grille d'images (comparaison)
  - ✦ table de résultats
  - ✦ create / modify image (fov, sampling)
  - ✦ interopérabilité SAMP (fits, image)
- ✦ Meilleur support du standard "Image-OI"
- ✦ Mise à jour des (4) logiciels scientifiques ( docker/UWS)



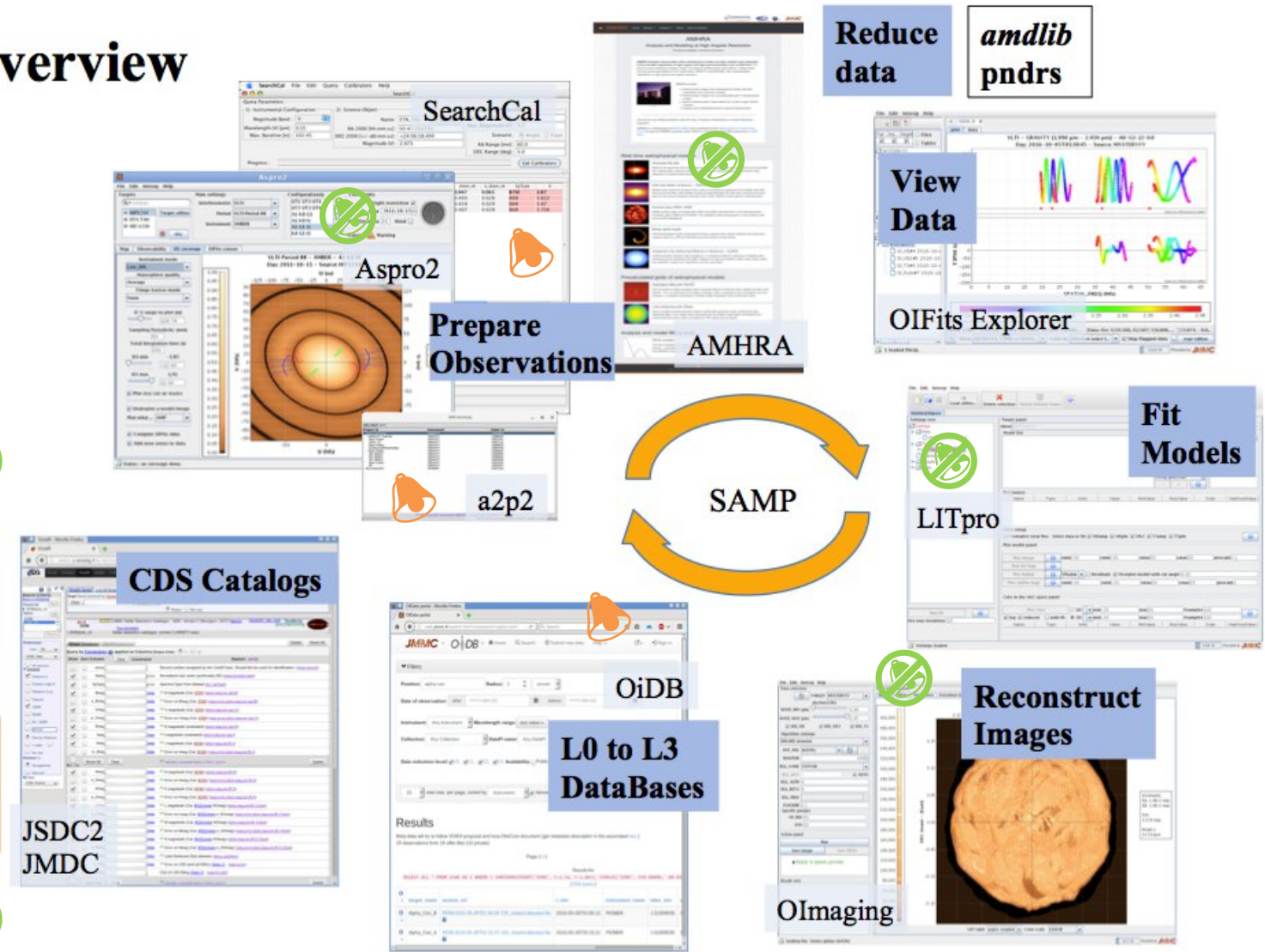
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# OiDB : Portail d'accès au données

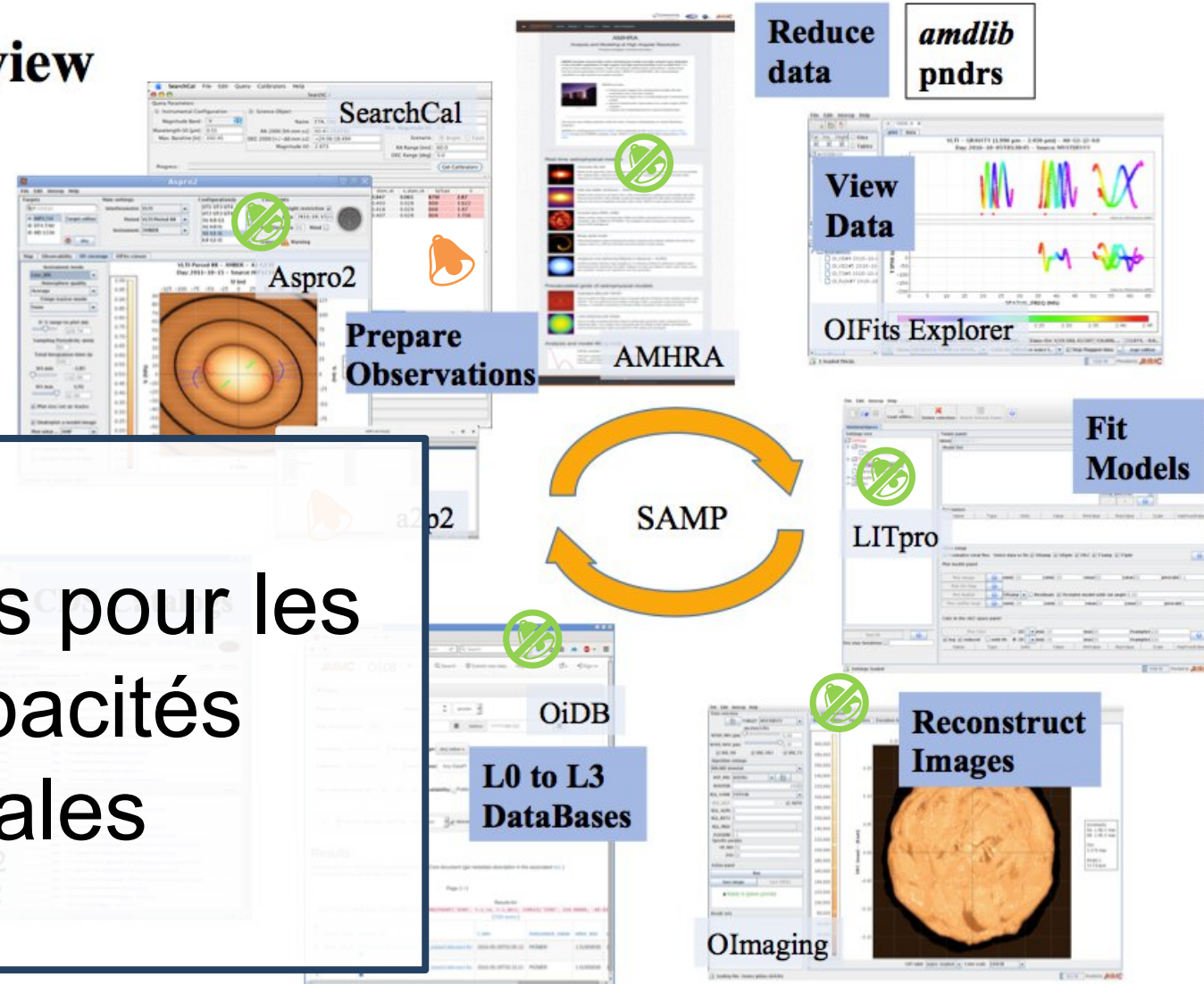
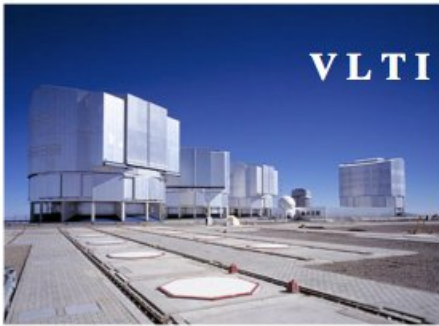
des logs d'observation (L0) aux données calibrées publiées (L3)

- ✦ De nouvelles données au format OIFits 2
- ✦ 1ère collection de données L1 MATISSE
- ✦ Prêt à référencer les données SPICA qui seront stockées à l'OCA
  
- ✦ S'appuie sur TAP ( Merci VOLLT ! )



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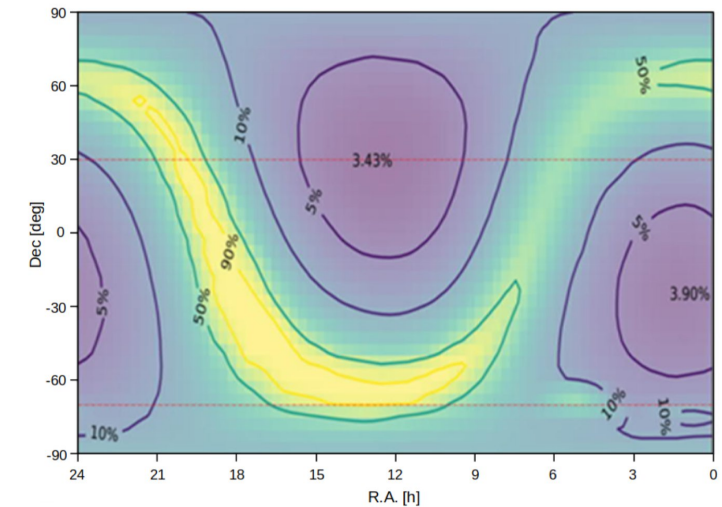
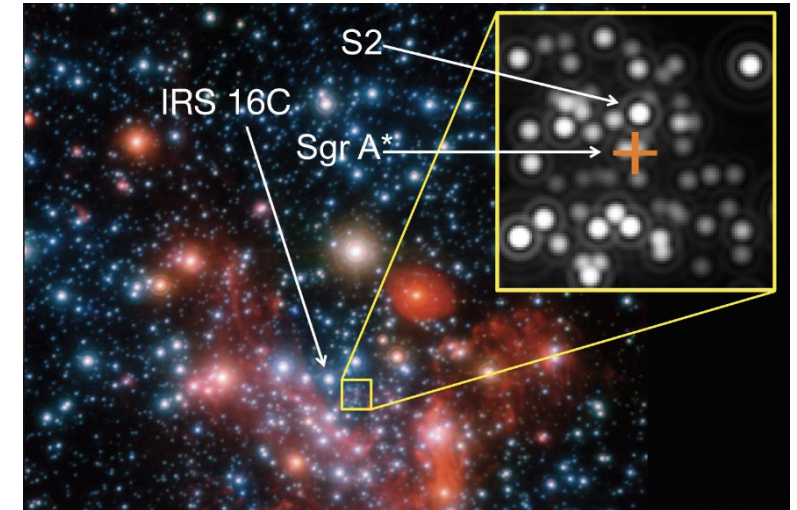


Fournir des outils pour les nouvelles capacités instrumentales

# GRAVITY WIDE / VLTI

Des observations remarquables du centre galactiques accessibles à une plus grande couverture du ciel.

Expression du besoin de l'instrument:  
Recherche d'étoiles de référence pour le cophasage du VLTI dans un champ de 1' autour d'objets aussi faibles que  $m_K < 17.5$



**Fig. 12:** Sky coverage for laser guide star adaptive optics supported off-axis fringe tracking with a fringe tracking star as faint as  $m_K = 13$ , and an isoplanatic angle of 30 arcsec.

# SearchFTT

- + Génération de requêtes ADQL à la volée
- + Présentation des retours TAP
  - + Simbad + crossmatch GAIA : GAVO & ESAC
- + Affichage champs de vue AladinLite
- + Rebond possible vers Aspro2 par SAMP
- + Rapid Agile Development :
  - + Démonstrateur en ligne en 2 heures,
  - + Itérations, validation et mise en ligne 3 jours après
  - + 250 lignes de code

<https://searchftt.jmmc.fr>

The screenshot shows the SearchFTT web interface. At the top, there's a search bar with the text "HD224803, HD123, DH38". Below the search bar, there are three result sections. The first section is for "HD224803" and shows a table of search results. The second section is for "HD123" and shows a message: "Sorry, no fringe tracking star found for HD 123 in Simbad." The third section is for "DH38" and shows a message: "Can't get position from Simbad, please check your identifier." At the bottom right, there are logos for "powered by existab JMIMC", "Simbad", "GAVO", and "Aladin".

**GRAVITY-wide: finding off-axis fringe tracking targets.**

This newborn tool is in its first version and is subject to various changes in its early development phase.

**Underlying method:**

You can query one or several Science Targets. For each of them, three results of Fringe Tracker Targets will be given using following research methods:

1. Simbad for sources that are suitable for fringe tracking
2. GAIA DR2 catalogues with its external catalogues cross-match through ESA archive center.
3. The Astrophysical Parameters from Gaia DR2, 2MASS & ARIWISE catalog through the GAVO DC.

Each query is performed within 30" of the Science Target. A magnitude filter is applied on every Fringe Tracker Targets according to the best limits offered in P110 for UT (MACAO) OR AT (NAOMI) respectively (  $K < 11$  AND  $V < 15$  ) OR (  $K < 10$  AND  $R < 12.5$  ). When missing, the V and R magnitudes are computed from the Gaia G, Grb and Grp magnitudes. The user must refine its target selection to take into account VLT Adaptive Optics specifications before we offer a configuration selector in a future release.

- Enter name, the resolution of which is relied on Simbad, in the Text Box below.
- To send a target to Aspro2 (already open), click on the icon in the GetStar column, then press 'Send Votable'.
- Please fill a report for any question or remark.

HD224803, HD123, DH38

HD224803 - 0.20702433180999996 36.78009900429

1. Simbad Name	dist_as [arcsec]	ra [deg]	dec [deg]	pmra [mas.yr <sup>-1</sup> ]	pmdec [mas.yr <sup>-1</sup> ]	G	K	V	R	otype_txt	GetStar
BD+35_5153B	15.38	0.203	36.778	-25.179	-21.605	10.379	8.82	10.22	*		

2. Simbad link	dist_as [arcsec]	ra [deg]	dec [deg]	pmra [mas.yr <sup>-1</sup> ]	pmdec [mas.yr <sup>-1</sup> ]	mag_g [mag]	mag_v [computed]	mag_r [computed]	h_mag [mag]	k_mag [mag]	tmass_dist [arcsec]	2MASS J	GetStar
<a href="#">HD 224803</a>	0.515	0.207	36.78	-24.51	-22.217	8.044	8.264	7.785	6.23	6.181	0.145	00004	
BD+35_5153B	15.893	0.203	36.777	-24.919	-21.424	10.378	10.526	10.146	8.949	8.82	0.142	00004	

3. Simbad link	dist_as [arcsec]	ra [deg]	dec [deg]	mag_g [mag]	mag_ks [mag]	mag_v [computed]	mag_r [computed]	GetStar
BD+35_5153B	15.447	0.203	36.777	10.378	8.82	10.526	10.146	
HD 224803	0.077	0.207	36.78	8.044	6.181	8.264	7.785	

View original votable @ GAVO (<COOSYS xmlns="http://www.ivoa.net/xml/VOTable/v1.3" ID="system" epoch="J2015.0" system="ICRS"/>)

HD123 - 1.565892167945309 58.43672797620039

1. Sorry, no fringe tracking star found for HD 123 in Simbad.
2. Sorry, no fringe tracking star found for HD 123 in <https://pea.esac.esa.int/archive/>.
3. Sorry, no fringe tracking star found for HD 123 in the GAVO's gdr2ap catalogue.

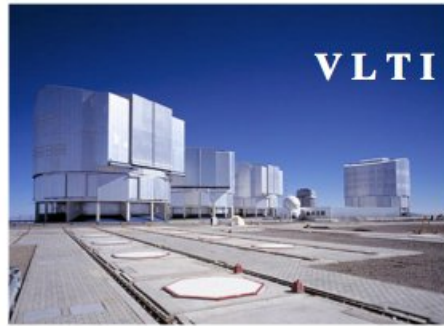
DH38 -  
Can't get position from Simbad, please check your identifier.

Show more information

powered by existab JMIMC Simbad GAVO Aladin

# Le JMMC / des services en permanente évolution

## JMMC Service overview



**French Expertise Center**  
User Support

+ TRAINING

+ OLBIN Publications DB

SearchCal

Aspro2

Prepare Observations

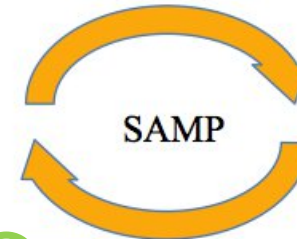
AMHRA

a2p2

Reduce data  
*amdlib*  
*pndrs*

View Data

OIFits Explorer



Fit Models

LITpro

CDS Catalogs

JSDC2  
JMDC

OiDB

L0 to L3  
DataBases

Reconstruct Images

OImaging

# Mais aussi depuis l'an dernier

- ✦ Plus de dépôts (27) <https://github.com/JMMC-OpenDev/>
  - ✦ collaborations avec stagiaires (clone et PR)
  - ✦ des board/issues/milestones pour structurer les projets
- ✦ Un mini-registry plus lisible <https://voar.jmmc.fr>
- ✦ Des notebooks python
- ✦ ...

VO Application Registry Home Help

application registry

This web portal shows the AppLauncher registry and aims to:

- list the VO applications supporting SAAMP interoperability
- index the whole VO application list or a subset into your web page
- advertise the AppLauncher and SAMF applications

Filter registered applications

Filter by category:  Essential  Interoperability  WikiApps

Output format:

View All Applications

Table

	Python	Java	ECDF	JS	AppLauncher_Web	ECDF	JS	Web	JS	JS	JS	JS	JS	JS	JS	JS	JS	JS
client.enu.get			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
coord.get.sky	X																	
coord.pointAt.sky	X				X		X			X								
dist.get					X													
dist.restricted.get					X													
dist.restricted.set					X													
dist.set					X													
!jmmc.aspro.load.observation													X					
!jmmc.astro.load.usermodel															X			
!jmmc.astro.start.setting															X			
!jmmc.searchcal.start.query																		X
image.load.fits	X				X		X											X
script.aladin.send	X																	
snapshot.get.jpg	X																	
spectrum.load.ssa-generic		X	X	X			X				X							

# Et pour la fois prochaine ?

- + Plus de dépôts github (60+ SVN) et plus d'issues
- + Un visualisateur de données OIFITS amélioré
- + Une jouvence d'un service d'analyse en UWS
- + Aspro2 simulant les nouveaux modes d'observation VLTI OFF-AXIS ( étoiles de science, suiveur de franges, étoile de guidage, optique adaptative ...)
- + Un serveur de catalogues unifiés:
  - + JSDC V3, badcal, JMDC...
- + La fin de simcli au JMMC ?
- + ??? **mais toujours dans l'objectif d'offrir un écosystème complet et interopérable** pour des services autour du cycle de vie des données recherche, mise en forme, analyse (modélisation/ajustement et reconstruction d'image)

Merci !

