



Status of COLIBRI

S. BASA (UAR Pytheas/OHP/LAM)





Technical Activities







Status of the development

Our last meeting was in October 2024, in Ensenada

Many activities since then:

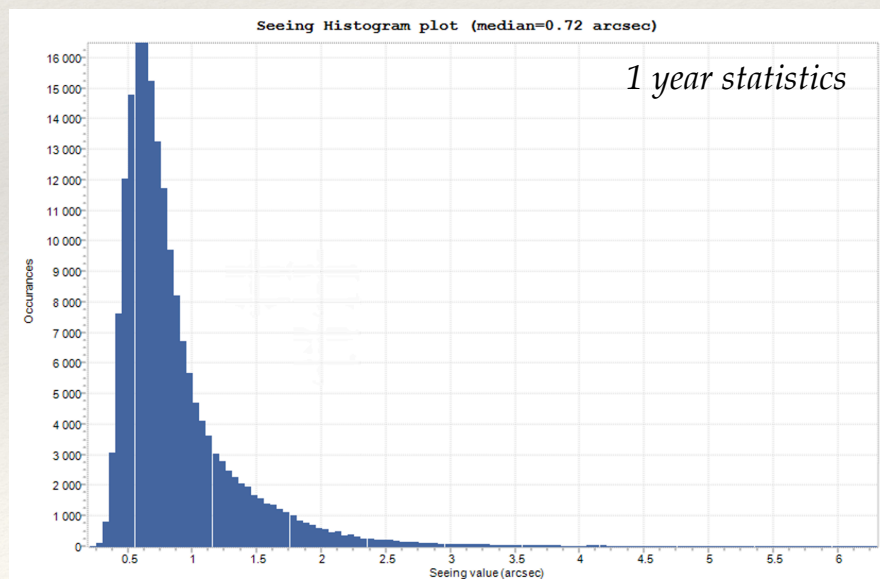
- Installation of DDRAGO (visible cameras): December 2024. Working from February 2025 with one channel, second channel operational in August 2025.
- Progress on CAGIRE.
- Beginning of the scientific exploitation: > 1st of January, 2025.



Performances of the site, OAN, Mexico

Really excellent astronomical performances of the site:

- Median seeing = about 0.7 arcs.
- About 80% of clear skies.





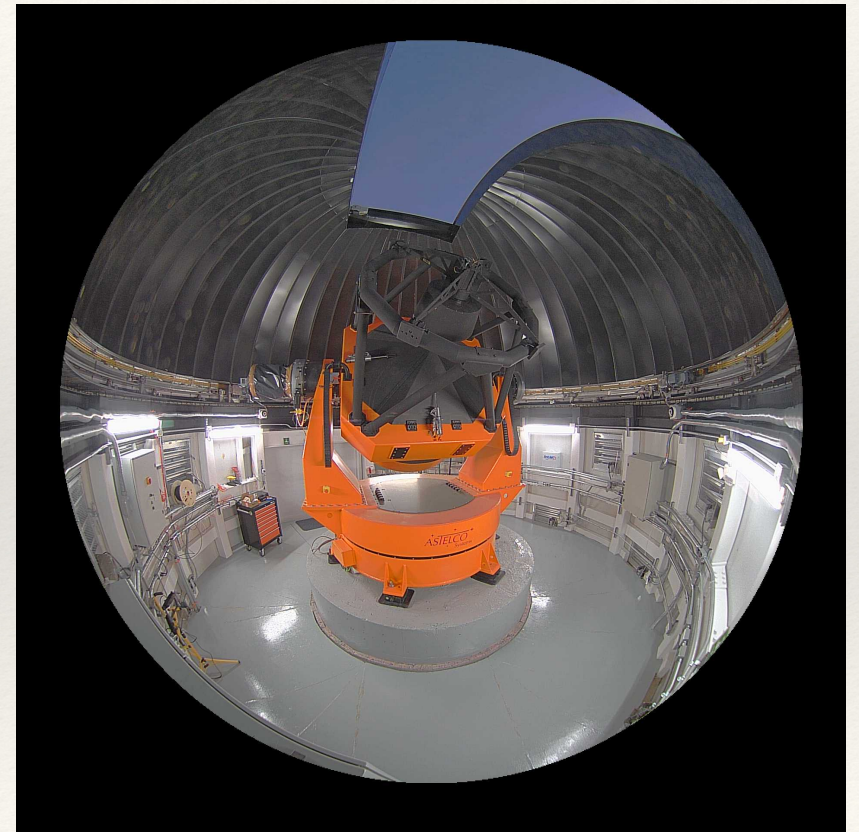
Telescope and dome

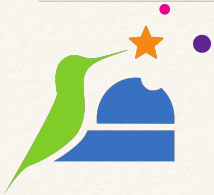
Telescope provided by Astelco, Germany,
and mirrors polished in France
(AstroOptics Cardoen and Winlight).

Current performances:

- Image quality of about 150 nm RMS: ongoing mission to improve the alignment.
- Very good pointing speed and damping performances: starting of the observation in less than 15 sec after alert reception.

No major issues during the first year of operation.





Maintenance, November 2025

- Mechanically (pointing, tracking), the performance are as expected and satisfactory
- Optically: astigmatism is not corrected as well as at was at OHP. It can be improved (need to come back in April 2026, TBC)

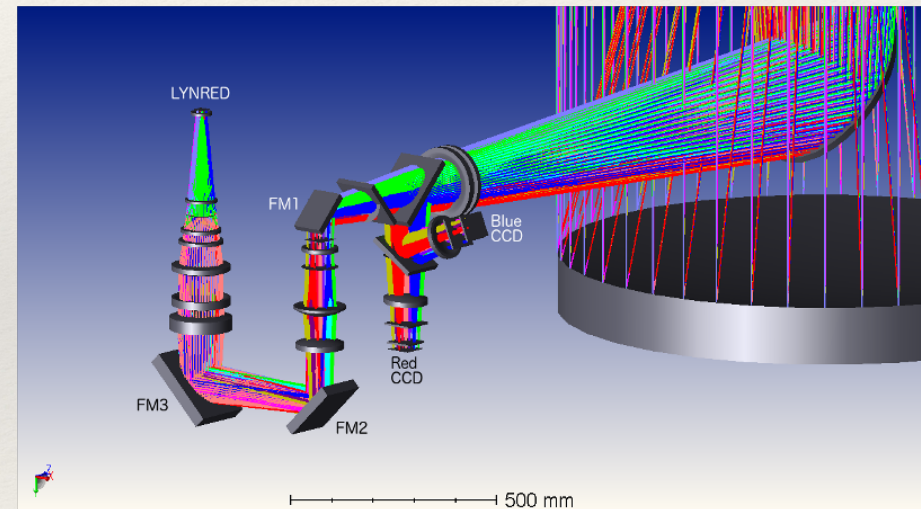
Requirement	Description	Value measured	Compliance
GFT-REQ-31	Diffraction limited at 500nm at the center of the FoV, seeing limited beyond 5 arcmin	$<\lambda/4$ at the center $>\lambda/3$ in field	PC
GFT-REQ-32	$d80 < 0.75''$	$d80 \text{ max}=1.3''$	NC (work in progress)
GFT-REQ-132	Circular FoV >26 arcmin	$>26'$	C
GFT-REQ-143	Distortion: scale constant $\pm 5\%$	0.2%	C
GFT-REQ-149	In ready state, on target in <30 sec	<30 sec	C
GFT-REQ-208	Stability of focusing	Focus variation dominated by seeing	C
GFT-REQ-216	Observations between 15° and 89° in elevation	Manuel check	C
GFT-REQ-217	Observations between 0° and 540° in azimuth	Manuel check	C
GFT-REQ-218	Absolute pointing acc. <2.5 arcsec.	Pointing $<2.5''$ Repeatability $<2.5''$	C
GFT-REQ-220	After pointing, optimal obs. in <1 sec	0.5 sec	C
GFT-REQ-221	Tracking accuracy: 0.45 arcsec over 30 min, 0.25 arcsec over 10 min, 0.18 arcsec over 90 sec.	$<0.6''$ over 27 min, $<0.25''$ over 10 min, $<0.18''$ over 90 sec	PC (but not a concern)



DDRAGO, the visible camera

Descubriendo Destellos de Rayos Gamma en el Óptico:

- Designed and built in Instituto de Astronomía UNAM (Mexico City).
- Two channel imager:
 - Two 4k x 4k deep-depleted back-illuminated CCDs.
 - Field of view 26 arcmin with 0.38 arcsec pixels.
 - Blue channel < 700 nm: *B, g, r, i, gri*
 - Red channel > 700 nm: *z, y, zy*



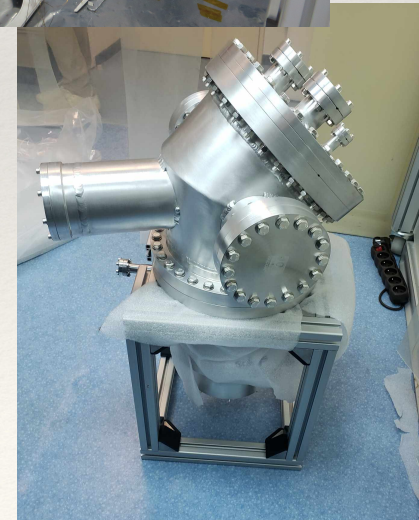
Integrated in November 2024, fully operational from September 2025.



CAGIRE, the IR camera

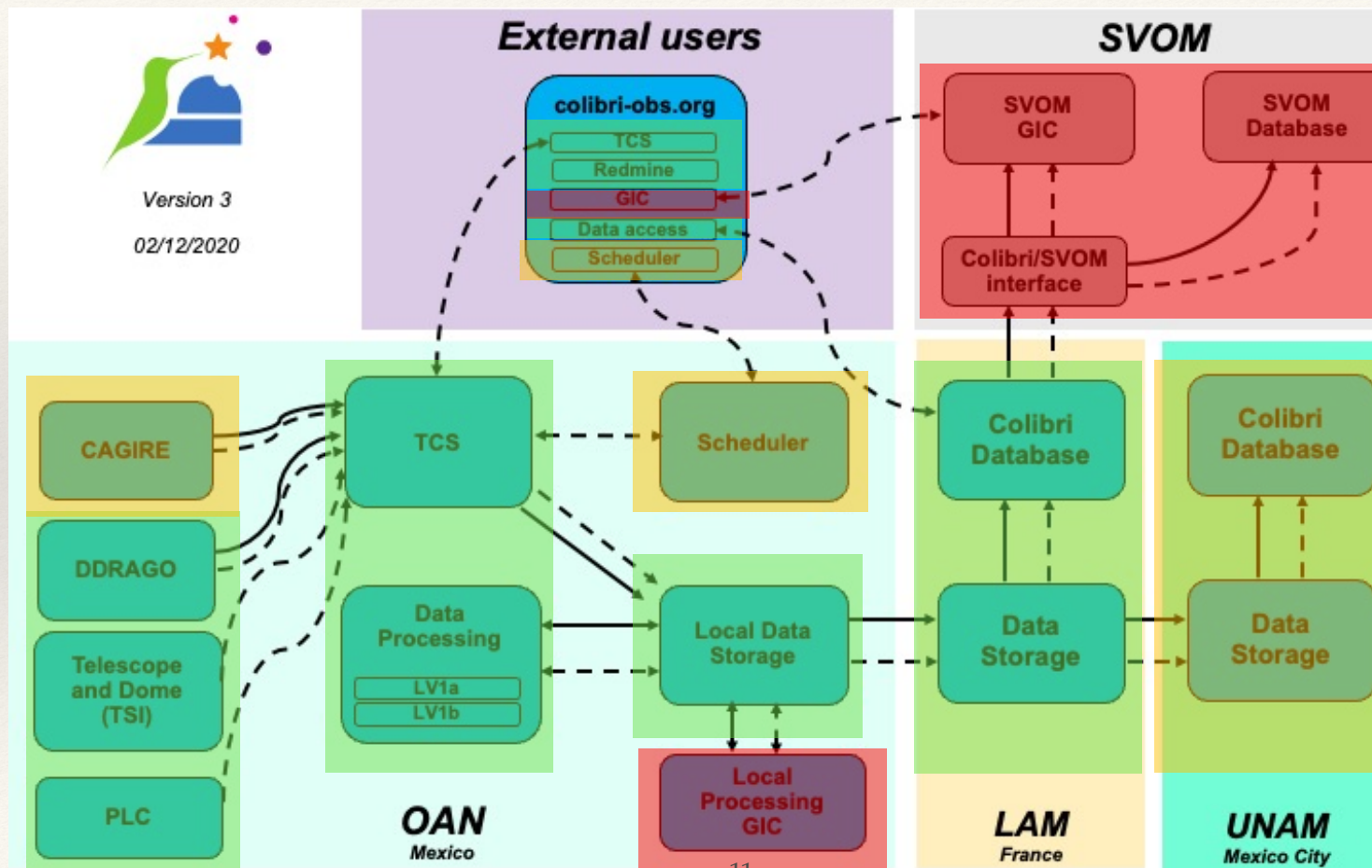
- Designed and developed by IRAP (Toulouse), with contributions from CPPM and CEA.
 - 2kx2k ALFA sensor developed by Lynred, France.
 - Field of view 23 arcmin with 0.67 arcsec pixels.
 - Two bands: J and H.
-
- Long delay on the Warm Optical Bench (WOB) due to problems with lens procurement.

Arrival of CAGIRE expected for Spring 2026.
Installation of the WOB by the fall 2026.





Control Center





Latest and next operations

Operations in 2025:

- September: UPS replacement, new UPS for the seeing monitor, work on the DDRAGO filter wheel, cleaning / ranging of the observatory, etc.
- November: fine mirror alignment.

Maintenance operations in 2026:

- Mirrors alignment: April 2026 (TBC).
- Mirrors coating: June 2026.
- Arrival of CAGIRE: Spring 2026 (TBC).
- Installation of the WOB: Fall 2026 (TBC).



Final Assessment Review

- 18 November 2025 -

Review committee

Patrick CAILLIER, David HIRIART, Florence LAURENT, Denis MOURARD (Chair), Clara NICOLAS

Outcome of the Final Assessment Review

The committee warmly thanks the COLIBRI team for their commitment to the project and for the preparation of the documentation for the Final Assessment Review. The team has done excellent work over the past two years. Despite significant challenges, the system is now on-sky and has achieved a clear leadership position in the fields of time-domain astronomy and the astrometric and photometric follow-up of events. More than 140 circulars have been issued, and nearly all SVOM alerts have been followed up, with reaction times on the order of 30 seconds. Preliminary scientific results have already been presented, and a series of publications is being considered for the near future. The committee commends the team for their dedication in the construction, operation, and exploitation phases.

While the review identified several remaining issues, the committee's overall conclusion is that the Final Assessment Review is successful.

The charge to the committee was organized around three main questions:



Final Assessment Review

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1. Are the observatory performances in line with the initial requirements?

The short answer is probably yes, given the status and the first successes of the telescope. However, the review highlighted a lack of detailed and quantitative information needed for a complete performance assessment. The committee nevertheless emphasizes several points:

- Static optical aberrations are significantly higher than what was identified during the OHP test phase. While the focus issue has been correctly handled, spherical aberration (linked to M1 tilt) and astigmatism (linked to M1 translation) are still degrading encircled-energy performance across the field. The problem now appears well understood and modeled and should be resolved soon through renewed on-sky engineering activities.
- The fast dome motion continues to limit alert-response performance. The issue is understood, and support from ASTELCO should allow the team to close it in the coming months.
- The committee notes a lack of information on DDRAGO's actual performance. More connections and feedback loops between operations and exploitation are essential in these early operational phases. The validation plan should be more broadly shared throughout the project, and alongside the focus on initial scientific results, the team should systematically treat returning data as engineering data to establish a first performance baseline. Resolving these remaining issues will place COLIBRI in an excellent position worldwide and will support stronger communication of performance results, benefiting exploitation and the broader opening of the telescope.



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2. Is the project ready to integrate and operate the CAGIRE infrared camera?

The committee was pleased to observe substantial progress on CAGIRE. The current AIT/V phase at IRAP is critical, already demonstrating good performance indicators and a solid implementation level.

The committee stresses the following major points:

- Transport-related risks remain insufficiently anticipated. Customs issues are not yet fully resolved, and the stringent requirement to minimize the duration of warm-temperature transport (maximum of a few weeks) is not adequately addressed. Guarantees must be secured through a specialized logistics provider well aware of these constraints. If the shipment is to occur before spring, a concrete solution must be put in place in the coming weeks. All possible efforts should be made to secure this.
- The committee strongly supports holding an acceptance review of CAGIRE prior to shipment. Since the instrument will become property of the observatory upon arrival, it is critical to document its status comprehensively (AIT/V report) and to obtain all required and mandatory documentation beforehand.
- The committee expresses concern regarding the warm optics bench (WOB). Installing CAGIRE in the first semester without the WOB and installing the WOB only at the end of 2026 will result in significant technical work and operational instability for COLIBRI+DDRAGO during 2026, given that CAGIRE requires the WOB for proper operation. The committee would have appreciated a more extensive discussion on this topic and urges the project to revisit integration and operations planning with this aspect in mind.



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3. Is the observatory ready to be opened to the national communities?

The short answer is yes, assuming a shared-risk mode in 2026.

However:

- The scheduler is not yet integrated into the Telescope Control Software (TCS). Manual programming and operations will therefore still be required. Depending on the number and complexity of external programs, this could represent a significant additional workload for the team.
- The process for the delivery and accessibility of science products to PIs was not fully addressed during the review. Completing the performance assessment and publishing it will greatly facilitate a smooth and well-structured opening of the telescope to the broader community.



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Conclusion

The committee wishes to reiterate that the project continues to suffer from a shortage of resources and a heavy workload concentrated on a small number of individuals. It is likely to be too late in the project lifecycle to expect major structural changes, despite the committee's recurrent recommendations in previous reviews. However, given the current situation, the committee strongly urges the team to seek dedicated funding to hire young researchers to support scientific exploitation. Support from the institutes is essential to maximize the return on the substantial long-term investments made in this project.



The close future

TEQUILA

- Proposed by UNAM to measure the polarimetry of all the transients' alerts, GRBs included, in their early phase:
- Based on a Sony CMOS-based polarization imaging sensors, a sensor which integrated patterned wire grid polarizers on-chip onto the pixels.
- Will provide a unique window for polarimetry measurements (in less than a minute) for all the bright ($r < 17$) transients' alerts.



Scientific Activities



Ongoing publications

An already active scientific activity:

- 12 on-going publications: very first paper submitted by Camila Angulo (PhD).
- Weekly meeting: every Tuesday.



Opening to the scientific communities

According to the MoU, 55% of the time allocated to the scientific communities (22.5% for France, 22.5%+10% for Mexico):

- France: 2026B: Early Science Observations on COLIBRÍ call submitted through SF2A(<https://www.colibri-obs.org/early-science-observations-on-colibri/>)
- Mexico: 4 proposals received from the TAC for 2026A
- France: 3 proposals received from the TAC for 2026B



<https://www.colibri-obs.org/>