

# First reflections on the COLIBRI observation program

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# A small clarification

**These are the very first discussions.**

**Time allocation is officially defined in the MoU (Nov. 2018):**

- 10% to the observatory for the hosting of COLIBRI.
- 45% to the French and Mexican scientific communities (equally divided).
- **45% to the consortium (time SVOM including here).**

# The main scientific motivations

## **Our official commitment (i.e. what we cannot avoid):**

- Follow-up of the GRBs triggered by SVOM.

## **The other subjects « easily » identified:**

- Follow-up of the DDOTI triggers.
- Follow-up of the Astroparticles triggers: ANTARES (but in the Northern hemisphere), ICECUBE, GWs, etc.
- Follow-up of LSST&ZTF triggers.
- Etc.

**➔ *But now it is time to the Mexican and French communities to suggest new exciting ideas!***

# Time budgets - Some hypothesis -

<b>Clear night ratio</b>	<b>0,8</b>		Fraction of clear nights over one year
<b>Colibri overall efficiency</b>	<b>0,9</b>		Includes the hardwares and soft issues, servicing, etc. (see the FPRDs)
<b>Average night duration at OAN</b>	<b>10,8</b>	hours	Assume nautical night (sun below 12 degrees). Averaged
<b>Number of clear nights available</b>	<b>262,8</b>	per year	Include the clear night ratio and the Colibri overall
Number of clear hours available	2838,24	per year	
Number of clear hours allocated to the consortium	1277,208	per year	Based on the 45% allocated to the consortium as defined in the MoU

# SVOM time budget

<b>Number of SVOM GRB alerts</b>	<b>70</b>	per year
<b>Time spent for the follow-up of a GRB</b>	<b>10,8</b>	hours
Fraction of SVOM GRBs observable in real time	17,0 %	
Fraction of SVOM GRBs observable with a delay	48,0 %	
<b>TOTAL fraction of the consortium time used by SVOM</b>	<b>About 40 %</b>	

## FRACTION of the consortium time used by SVOM



Hyp : 1277 hours allocated to the consortium for the Transient Sky Program

	Rate/year	Colibri visibility/year	Obs sequ (night)	ObsTime (h)	Alloc.%
GRB	70	Prompt : $70 \times 0.17 = \mathbf{12}$	$2 \times 0.5$	120	~ 10
		Delayed : $70 \times 0.65 - 12 = \mathbf{30}$	$1 \times 0.5$	150	~ 10
ToO EX	1/month	$12 \times 0.5 = \mathbf{6}$	$2 \times 0.5$	60	~ 5
ToO MM	1/week	$50 \times 0.5 \times 0.2 = \mathbf{5}$	1	50	~ 5
Margin					10
Total					<b>~40</b>

- ToO MM :Event in this category only if we have correlated detections between the SVOM space segment and Colibri. Let's assume a rate of 20% for these correlated observations, which gives 5/year
- In all these cases (GRB, ToO EX, ToO MM) the Colibri scientific products are sent to the SVOM Data Base and are covered by the SVOM Science Management Plan

# The remaining time budget...

**If we decide to use the remaining time (about 60% of the Consortium time) for targets in ToO, that leaves:**

- *About 1600 ToOs of 30 min each (more with shortest exposures time of course).*
- *About 6 ToOs per observable night.*

**It is now necessary to identify the needs for the other scientific cases:**

- *It is now necessary to identify the needs for the other scientific cases: astroparticles, LSST&ZTF, GWs, etc.*

***Please note that extra applications can also be made on open time!***

# Observations of the Alerts with Colibrí

## Context

In July 2018, the French and Mexican partners signed a Memorandum of Understanding (MoU) on the development and use of Colibrí

**Article 4.1c of the MoU** defines the figure of a *PI* and describes their responsibilities. The PI is currently Stéphane Basa.

**Article 6b of the MoU** assigns 45% of the time to the PI for observations of alerts delivered by facilities dedicated to the transient sky, including SVOM.

**Article 5c of the MoU** states that alerts delivered by SVOM have the highest priority and may interrupt any observation, that other alerts observed under the responsibility of the PI have the next priority, and may interrupt any observation except alerts delivered by SVOM.

**Article 7a of the MoU** states that the data rights for observations that form part of the scientific exploitation of SVOM will belong to the SVOM scientific community and will follow the rules defined in the SVOM science management plan. It also assigns responsibility to the PI to resolve conflicts with respect to these data.

**Article 7b of the MoU** states that the proprietary period for data obtained as part of observations assigned by the French and Mexican time allocation committees is 1 year, with the possibility of an extension at the discretion of the PI.



# Observations of the Alerts with Colibrí

## Definitions

- **SVOM alerts** are automated alerts triggered by the ECLAIRs or GRM instruments. The events may also trigger other instruments (e.g., BAT, GBM, LIGO/Virgo/Kagra, ZTF, LSST, KM3NeT, or IceCube), but provided they trigger ECLAIRs or GRM, they are considered to be SVOM alerts.
- **COLIBRI transient program** is the COLIBRI program dedicated to the transient sky.
- **Consortium time** is the 45% of the time assigned to the PI by article 6b of the MoU.
- **SVOM alerts time** is the portion of the Consortium time used to observe the SVOM alerts (about 40 % of the Consortium time).
- **COLIBRI transient program time** is the portion of the Consortium time used to conduct the COLIBRI transient program (about 60 % of the Consortium time).

# Observations of the Alerts with Colibrí

## SVOM alerts

- SVOM alerts will be the *only* alerts observed by Colibrí at the highest priority, as required by article 5c.
- The data from SVOM alerts will be the *only* data considered to be related to the SVOM mission, in the sense of article 7a of the MoU.

# Observations of the Alerts with Colibrí

## COLIBRI transient program 1/2

The PI will invite members of the French and Mexican scientific communities to form COLIBRI scientific teams around different aspects of the transient sky. Membership of these teams will be open to all professional research astronomers (those with permanent or temporary research positions, including post-doctoral researchers) at French and Mexican institutions and their current students.

Permanency in the COLIBRI scientific teams will require active participation. Implicitly, the PI will be a permanent member of all teams. The teams should make every effort to involve all relevant persons in both communities and to avoid duplication of effort.

The teams will organize their own activities. Decisions within the teams should be taken by consensus between the members who are professional research astronomers.

The teams will then propose observations using COLIBRI alert time to the PI. The PI will decide which observations are approved and assign relative priorities. However, in order to have an operational functioning, the PI will be able to rely on a core team of 2-3 scientists to assist him in this task

# Observations of the Alerts with Colibrí

## COLIBRI transient program 2/2

The teams will be able to request additional time for their observations from the French and Mexico time allocation committees. However, these observations will have a lower priority than those in alert time, according to article 5c of the MoU.

The proprietary period for data obtained in COLIBRI alert time will be 1 year. Normally, after that the data will be public. However, teams will be able to request an extension from the PI.

The PI will hold proprietary rights for data obtained in COLIBRI alert time, but will delegate them to the proposing team. However, any publication within 9 months of the observation will require the approval of all members of the proposing team who are professional research astronomers.

The teams will be able to invite external collaborators to participate in their planning, analysis, and publications on a case-by-case basis.

*In case of conflict in the interpretation of this agreement, the COLIBRI PI will attempt to find a consensus. If no consensus can be reached, the COLIBRI PI will propose a decision to the COLIBRI Management Board.*

# The next step

**Finalizing the agreement within the consortium.**

**Present this agreement to the COLIBIR Board** (date of the next meeting still to be fixed).

**Setting up of the scientific teams.**

Please, never forget the criteria: « Permanency in the COLIBRI scientific teams will require active participation. ».