

# Fast detection and follow-up of high energy transients with COLIBRI

S. Lombardo, S. Basa, W. Lee, F. Dolon, J.-L. Atteia, A. Watson,

D. Dornic, P. Gallais, S. Ronayette

The large error boxes provided in the positions on sky of high energy events (e.g., gravitational waves and gamma-ray bursts) and the fast-decaying low luminosity of the optical emission, are among the major difficulties in detecting their optical counterpart (when expected). This is why it is fundamental to increase the number of surveys that can quickly detect the target as soon as the alert is issued and start the multi-messenger follow-up.

COLIBRI is one of the ground follow-up telescopes under French responsibility especially developed for the SVOM mission, for the gamma-ray burst science and transient exploration. This 1.3 m telescope comes from a collaboration between France and Mexico and it will be commissioned and installed at the Observatorio Astronómico Nacional (Mexico) by the end of 2022/beginning 2023. It will have an optical camera with two branches and a near-infrared camera, to detect the transient in three bands simultaneously.

The strength of COLIBRI relies on its unique combination of speed and multi-band sensitivity. It will be able to point from any position on the sky at any other position in less than 20 s with an absolute accuracy better than 2.5 arcsec. This, combined with its fast pre-processing pipeline, will allow to detect transient sources and obtain their photometric redshift estimates in less than 5 min from the receipt of the alert from SVOM.

These characteristics makes it the ideal machine to quickly follow-up the most interesting transients, from SVOM or any other survey. It will be also possible to trigger observations of larger telescopes and spectroscopic follow-up more rapidly, which is fundamental for the GRB science.

Additionally, the near-infrared channel of COLIBRI will make it sensitive to the high redshift or highly dust-obscured events. The French community will greatly benefit by having access to ~25% of the observing time (through the standard INSU call for observations). I will present the telescope, its construction status and measured performances.