SVOM and INAF connection for GRB science (SI-GRB)

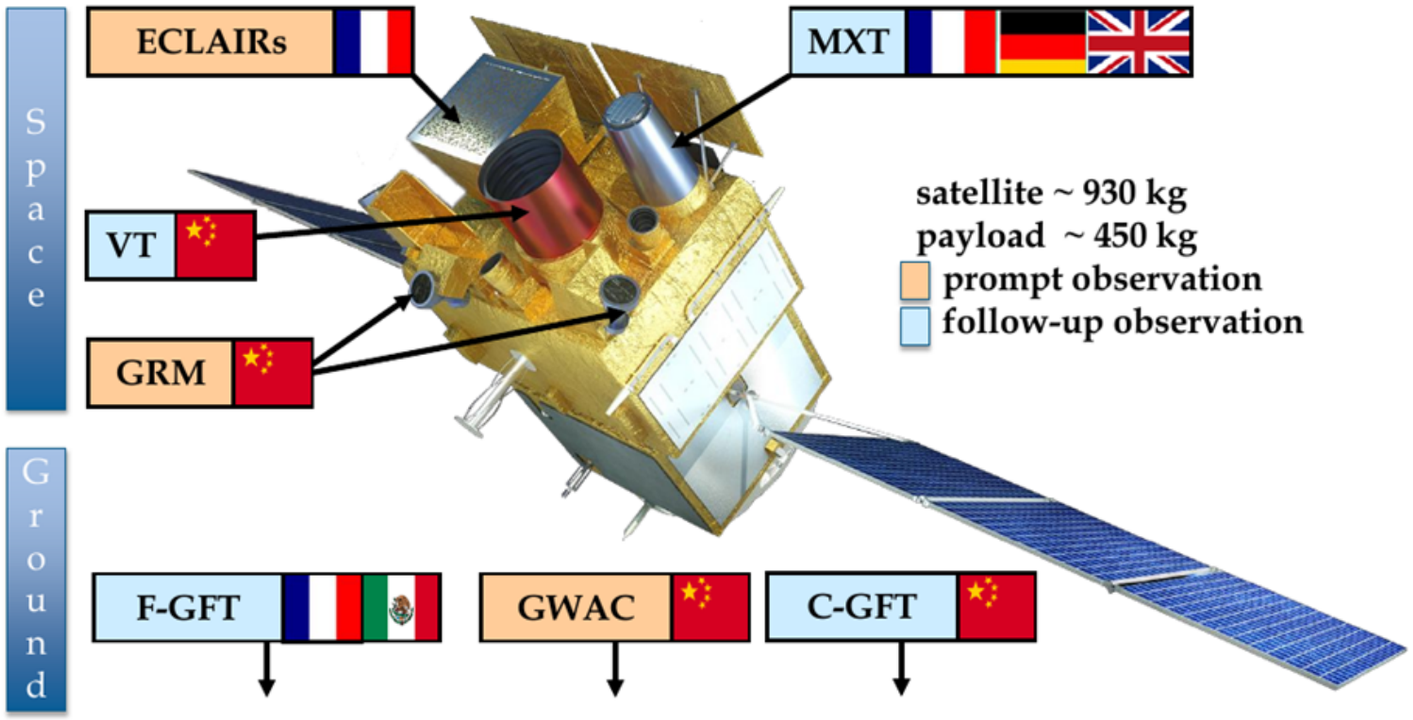
PI: Maria Grazia Bernardini

INAF, Osservatorio Astronomico di Brera

Mini-grant RSN4 (18 k€)

FTE: 0.2/yr

Collegato alla scheda: The Space-based multi-band astronomical Variable Objects Monitor (SVOM), PI: M.G. Bernardini

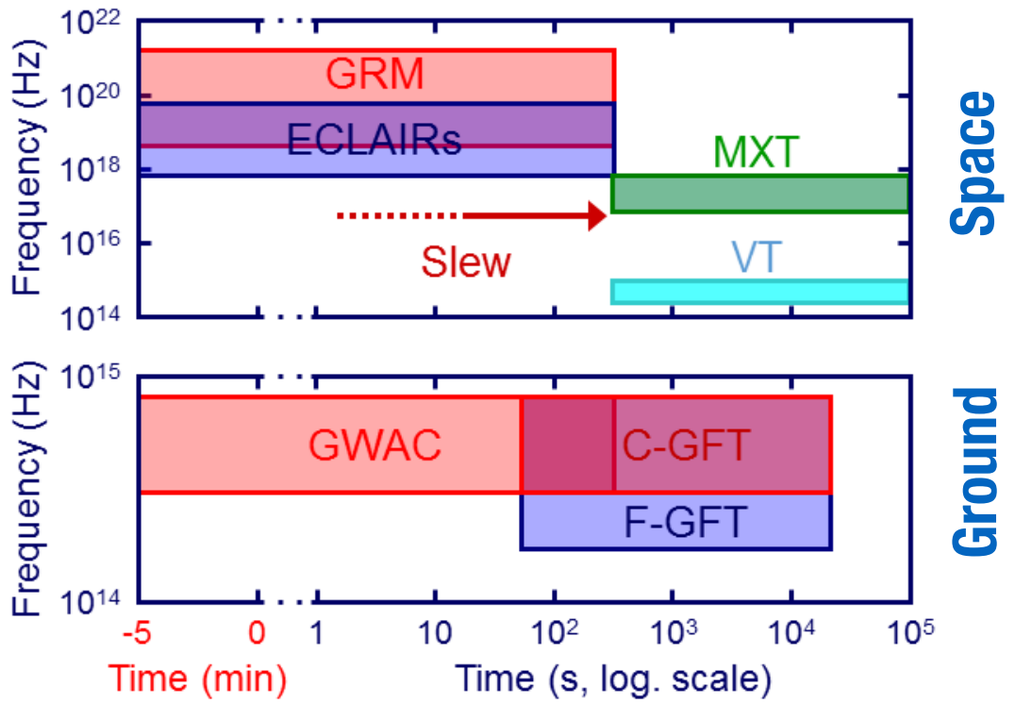


The **Space-based multi-band astronomical Variable Objects Monitor (SVOM)** is a multi-frequency observatory with rapid slew capability, ideal for studying t**ransient phenomena**

- Consortium of Chinese and French institutes (+UK, Germany and Mexico)
- Launch postponed to **spring 2024**

Core program:
GRBs and transients discovered by SVOM

- **7 instruments in space and on ground** for a complete monitoring of GRBs over 7 decades in energy and from the trigger up to the late afterglow
- Alerts and accurate location rapidly distributed to foster **synergies with external space and ground based facilities** (e.g. favor redshift measurement)



The scientific data of the SVOM mission are proprietary, and the proposals for the GO program requires the participation of a SVOM co-I. This mini-grant has the specific purpose to **support the contribution of the PI to the SVOM mission to consolidate the possibility for INAF to be directly involved in the scientific exploitation of the mission**.

Status of the project:

- **Task 1** (joint detection rates of GW triggers and short GRBs detected by SVOM): **in progress**
  First results have been published in Patricelli, Bernardini et al. 2022, MNRAS 513, 4159, more refined analysis in progress. We recently assigned a Master thesis (joint OAB, UniMi & GEPI, Paris) to simulate and study the population of short GRBs with extended emission as seen by SVOM
- **Task 2** (characterization of the population of SVOM GRBs that will be detectable at very high energies):
  - **2a** (number of SVOM GRBs observable by CTA sites): **done**
  - **2b** (SVOM-CTA joint spectral analysis): **in progress**
    Collaboration with F. Piron and J. Devine (LUPM, Montpellier) for joint spectral analysis with CTA, Fermi/LAT and SVOM
- **Other activities related to the project** (contribution to the SVOM mission to grant the co-I status):
  - Contribution to the scientific validation of the pipelines for the temporal and spectral analysis of GRBs using the data from the two high-energy instruments onboard
  - Preparation for the Burst Advocate (BA) activities
  - Participation to the working group for the preparation of a MoU between SVOM and MAGIC for the scientific exploitation of the common science cases

Meetings and visits supported by the mini-grant:

- “Multi-frequency behaviour of high-energy cosmic sources” (participation by invitation only), June 2023
- “SVOM BA Workshop”, September 2023
- Visit to LUPM (Montpellier, France, October 2023)
- Visitors: B. Patricelli (OAB, June 2023)

Critical aspects:

- SVOM launch has been delayed, loosing a large part of the overlap with O4. Thus, the work on joint GW-EM detection rate is now projected to O5
- Issues in the pipeline that needed to be fixed with higher priority w.r.t. science papers, which slowed down Task 2b

Favorable points:

- Unique opportunity to support this kind of activity. An application to the next INAF grants call, envisaging the possibility to add manpower to SVOM activities after the launch, will surely be considered