

SVOM White Paper

Introduction

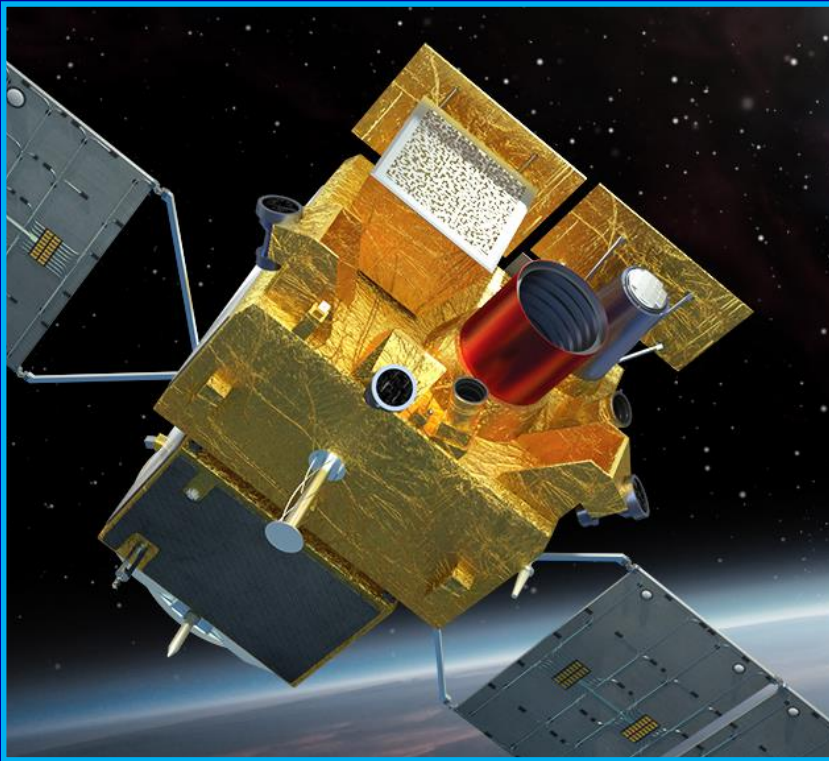
Jacques Paul
SVOM Scientific Adviser

11/04
2016

SVOM Scientific Workshop
Introduction

École des
Houches

2005-2016: from Dream to Reality



Latest artist's impression of the SVOM payload (2015)



Structural and thermal model of the SVOM payload (March 2016)

Objectives assigned to the SVOM Mission

Due to a very specific programmatic context, it took almost a decade to implement the SVOM Mission.

Considering the astrophysical potential of GRBs, this long gestation period enabled the SVOM scientists to design a mission aiming to:

- Permit the detection of all known types of GRBs
- Provide fast, reliable GRB positions
- Measure the spectral shape of the GRB prompt emission (from visible to MeV)
- Measure the temporal properties of the GRB prompt emission (from visible to MeV)
- Promptly identify the afterglows of detected GRBs in X-ray and visible
- Measure the spectral shape of the early and late GRB afterglows in X-ray and visible
- Measure the temporal evolution of the early and late GRB afterglows in X-ray and visible

The SVOM Instrumentation

Major advances in GRB studies have resulted from the synergy between space and ground observations.

The SVOM mission implements space and ground instrumentation.

The SVOM space segment includes:

- A wide field-of-view hard X-ray imager and spectrometer
- A wide field-of-view soft gamma-ray spectrometer
- A narrow field-of-view low-energy X-ray telescope
- A narrow field-of-view visible/near infrared (NIR) telescope

The SVOM ground segment includes:

- Two follow-up telescopes (one featuring efficient NIR capabilities)
- An array of wide field-of-view visible cameras

SVOM: a Multi-Wavelength Facility

Primarily designed for GRB studies, the SVOM instrumentation composes a unique multi-wavelength observatory available to the whole astronomy community beyond the specific objectives linked to GRBs.

The sharing of observing time that has been envisaged for the SVOM mission anticipates the possibility of operating SVOM as a multi-wavelength observatory for the transient sky.

The SVOM GRB detection sensitivity and the GRB occurrence rate are such that **only 25%** of the observation time could be actually devoted to GRB studies.

The remaining observation time will be dedicated to:

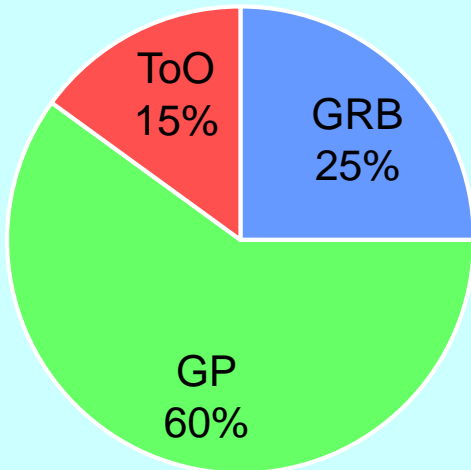
- Pre-defined targets, the *General Program* (GP) in the SVOM jargon
- Transient phenomena (ToO)

Evolution of the Observation Time Sharing

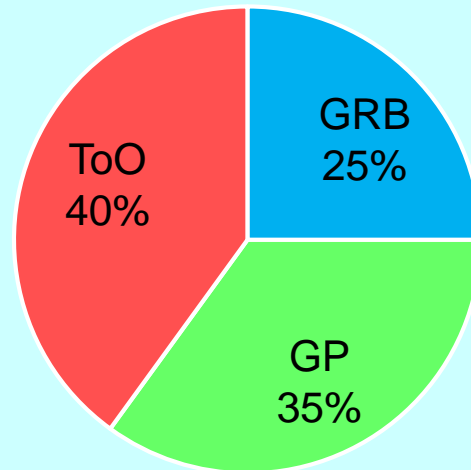
SVOM will operate in conjunction with wide field telescopes (as e.g. LSST and Advanced VIRGO/LIGO) able to discover many transients.

Thanks to the SVOM ability to catch transient events, more and more scientists will ask for SVOM ToO observations.

Nominal Mission



Extended Mission



The evolution of the *Swift* mission follows the same trend

The *SVOM White Paper*

The SVOM System Requirements Review (SSR), held in Beijing in late June 2015, emphasized the requirement that the SVOM Mission take a more active role in the international scientific community.

The SSR has then endorsed the proposal of SVOM scientists to prepare a dedicated *SVOM White Paper* to inform about SVOM the scientific community possibly concerned with SVOM observations.

Written for the information of the scientific community, the *SVOM White Paper* will be a public document, part of the Preliminary Definition Review (PDR) to be held at the beginning of July 2016 in Yantai.

It is also intended that the *SVOM White Paper* will be made public at the same date through the website astro-ph (astro-ph.IM).

Workshop Management Issues

The chief benefit of this Workshop is to provide for the first time the opportunity to meet to the many scientists which constitute the core of the SVOM Science Community.

The prime objective of this workshop is however to write and endorse the final draft of the *SVOM White Paper*.

For this purpose, pairs of coordinators have been designated to draft the 21 sections of the document.

Coordinators who have not yet provided their text are asked to give them to **Sarah Antier** and **Laura Gosset** who are in charge of editing tasks.

Pairs of coordinators have been also required to make a short (20 min.) presentation of the content of their section.

Slide of the presentations must be included in a PDF file to be given to **Stéphane Schanne** and **Volker Beckmann**.