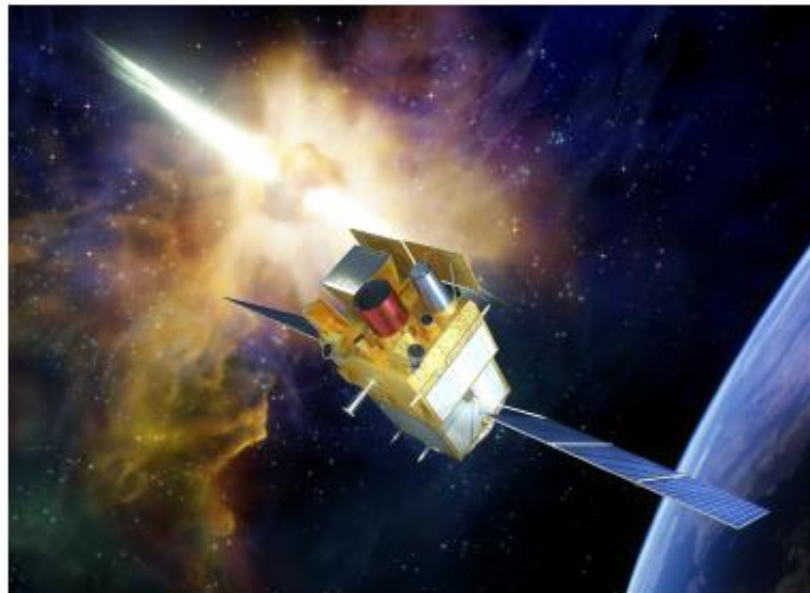


# The Deep and Transient Universe: New Challenges and Opportunities

Scientific prospects of the *SVOM* mission

J. Wei, B. Cordier, et al.

(Version of 05-10-2016, for full list of contributors see overleaf)



Frontispiece : Artist view of the *SVOM* satellite

# SVOM White Paper : summary



## Introduction

### Context

Time-domain astrophysics: the discovery space after Swift  
The astronomical panorama in 2020

## SVOM mission

SVOM mission profile  
SVOM instrument characteristics

## SVOM advances on GRB science [SVOM Core Program]

The population of classical long GRBs: physical mechanisms  
The population of classical long GRBs: characterization of the population (luminosity function, rate...)  
The population of short GRBs (includes the synergy with GWs)  
The diversity of stellar explosions (X-ray flashes, sub luminous GRBs, etc...question of the progenitor and the link with the supernovae)  
GRBs as particle accelerator (link with CR and neutrinos)  
GRBs at high redshift  
GRBs to study the evolution of star formation  
GRBs to study galaxies  
Absorption spectroscopy on the line of sight of GRBs (IGM reionization, etc.)  
GRBs as standard rulers

## SVOM advances on rapid follow-up observations [SVOM ToO program]

Search for SVOM counterparts on multi-wavelength triggers  
Search for SVOM counterparts on multi-messenger triggers

## SVOM advances on observatory science [SVOM General Program]

Active Galactic Nuclei  
Other extragalactic sources  
Galactic sources  
Miscellaneous topics (e.g. CXB)  
Studies of extrasolar planets and solar system bodies

The three channels of data access, with their own scientific objective, are presented :  
Core Program, General Program and Target of Opportunity

# Improvement proposal: Qiannan 2017



- To enhance the instrumental part with for each instrument an updated drawing and a figure illustrating the scientific performances → leader Stéphane Schanne
- To add a paragraph on the S-GRB less /X-ray transient → leader Bing Zhang
- To update the paragraph on the Ultra long GRBs → leader Diego Götz → Nicolas Dagoneau
- To update the paragraph on the GRB sample potentially observable by SVOM → leader Frédéric Daigne
- To update the paragraph on the Virgo cluster survey in the TDE section → leader Christian Motch **Ok**
- To integrate in the ToO chapter a paragraph on the FRBs and to develop what could be the contribution of SVOM to the science of the FRBs → leader Christian Gouiffes

# Improvement proposal: Chamonix 2018



- In the chapter “Search for SVOM counterpart on multi messenger trigger” add a paragraph on what SVOM would have detect on GW170817 → leader ?
- Upgrade the chapter “the population of short GRB (including the synergy with GW)” taking into account the GW170817 event → leader ?
- The synergies with Einstein probe. In the future we plan to study at system level the possible synergies between the two missions. I propose to add a chapter on this topic, the study will not be completed for the newt version of the WP but the work will be underway → leader Bertrand Cordier

# Groups and rooms

- Instrumental part – Amphiteather- Stéphane Schanne & Bertrand Cordier
  - Update of the instrument description
  - ToO MM tiling description
- Core Program + GW170817 – Library- Bing Zhang & Frédéric daigne
  - GRB sample observable by SVOM (Core Program section)
  - ULGRB (Core Program section)
  - SGRB + GW170817 (Core program and ToO program section)
  - .....
- General Program- class room – Christian Gouiffes & Jérôme Rodriguez
  - FRBs
  - AGNs
  - .....

# Road MAP



- I collect all the contribution for end of July (except the synergy with EP?)
- We edit a new version for September-October

# Notes of the instrumental part group

- Update of the panorama figure
- Update of the scenario figure
- Introduce a PIM picture ?
- ECLAIRS image of the last design? Stéphane
- GRM possible to have a better picture?
- GWAC upgrade the text, the numbers and the table. Add a real picture.
- MXT update some numbers (effective area) and check the error radius curve and add a sensitivity curve.
- VT image of the last design? Add a sensitivity curve versus exposure time.
- FGFT Check figure 14
- C-GFT – rewrite the paragraph and introduce the new facility in Jiling
- Include the FTT in the F-GFT
- Ground segment - change the image of the C-GFT in the figure
- Introduce the ToO MM in the introduction of the ToO
- Develop the versatile astronomy satellite section (slew and ToO manoeuvres), describe the delay to upload a new target plan
- Enhance the GW part, the ToO-MM description, introduction of the tiling...Cyril and Nicolas
- Annex on what SVOM would have done (Stéphane and Bertrand)