

PLANetary Transits and Oscillation of stars



PLATO Phase A/B1 Status Scientific Evaluation of AO

Berlin 24-25 Feb 2011

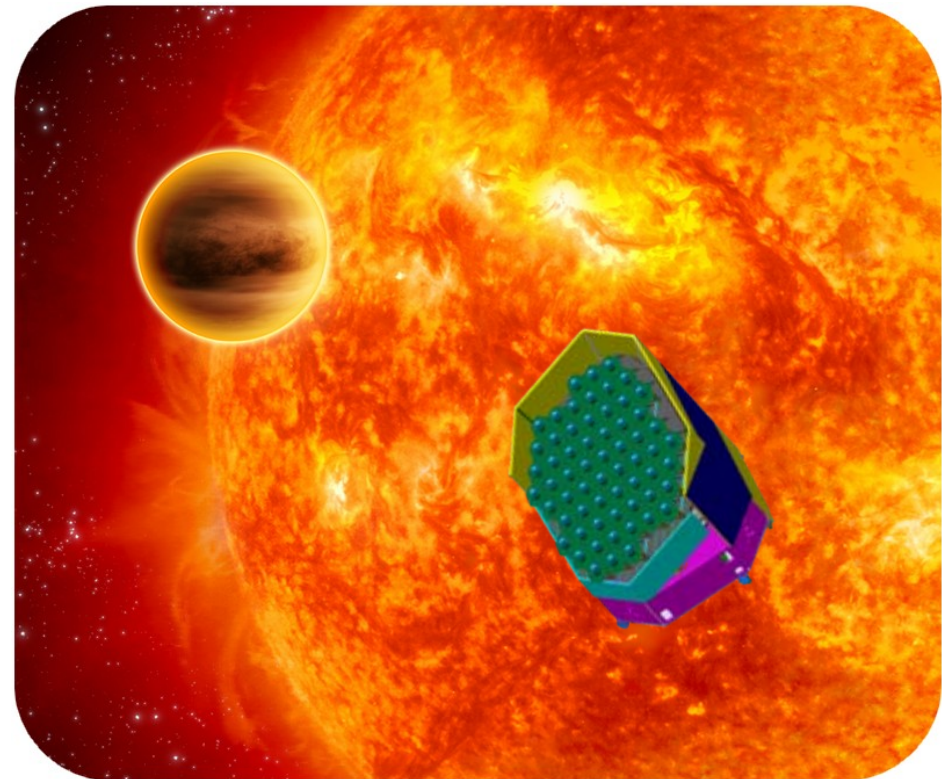
- ✓ **Launch from French Guiana by a Soyuz 2-1b launch vehicle**
- ✓ **Max launch mass: 2100 Kg plus adapter (GAIA baseline).**
- ✓ **Operations in a large orbit around the Earth-Sun Lagrange Point 2 (L2)**
- ✓ **Nominal mission duration of 6 years after commissioning**
- ✓ **Spacecraft sized for 8 years**
- ✓ **Long observation runs above +60 degree and below -60 degree ecliptic latitude**
- ✓ **Step-and-Stare Phase with observation at any ecliptic latitude and longitude subject to Sun in favourable direction**
- ✓ **Quarterly 90deg rotation around the mean Line of Sight of the Spacecraft**

- ✓ **Three days autonomy without ground contact**
- ✓ **Seven days in Survival Mode**
- ✓ **Communication with S/C via X band**
- ✓ **Use of 15 m antenna in Kourou**
- ✓ **Use of 35 m antenna in Cebreros and New Norcia**
- ✓ **24 hours coverage during LEOP**
- ✓ **During science operations up/downlink is time-limited**
- ✓ **4 hours per day coverage during nominal operations**
 - *3.5 hrs / day for data downlink*
 - *0.5 hrs / day for setup / ranging*

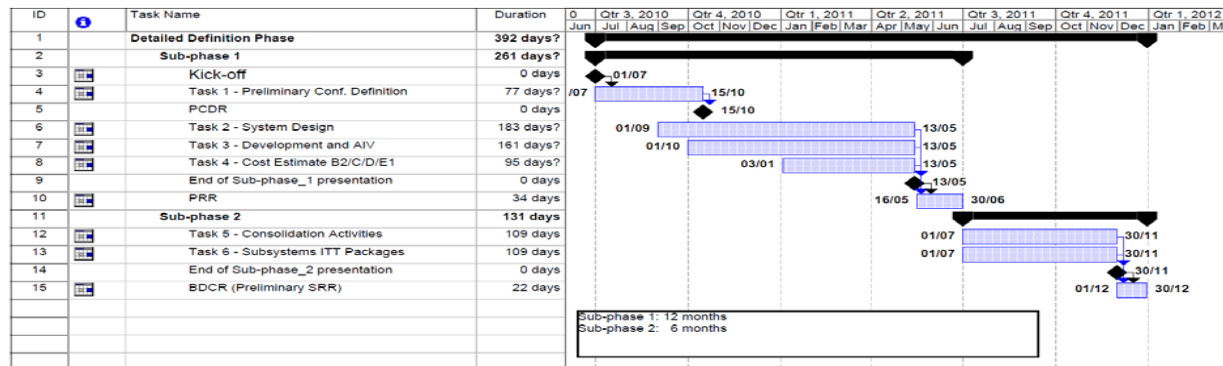
Program Milestones

- ✓ Assessment Phase in 2008- Aug 2009 (Completed)
- ✓ ESA internal review: Sep – Oct 2009 (Completed)
- ✓ First down-selection of M-class missions to enter the Definition Phase (A/B1): Feb 2010 (Completed)
- ✓ Definition Phase (A/B1) K.O.: 01 July 2010 (Done)

- Second down-selection for M1/M2: **October 2011**
- Completion of the Definition Phase (A/B1): 31 December 2011
- Final adoption for the Implementation Phase (B2/C/D/E1): before Feb 2012
- Start of the Implementation Phase: by July 2012
- Launch: by end 2018



- PLATO is in the Definition phase (A/B1) which is conducted according to the following plan



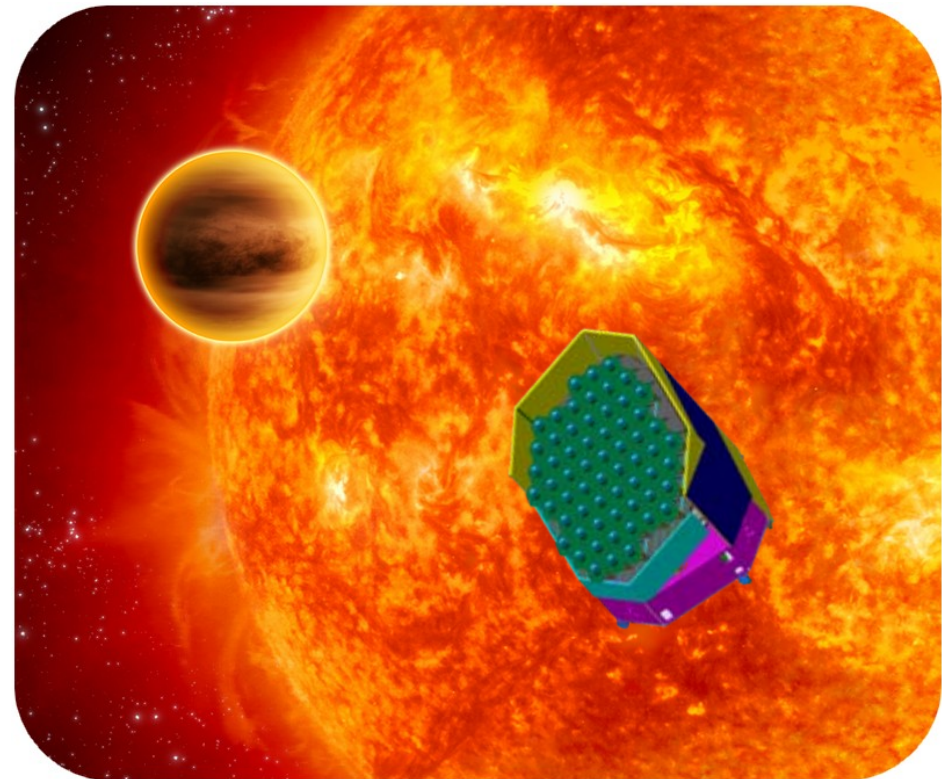
- Two parallel and competitive studies are performed
- The studies are conducted by EADS Astrium (SAS) and Thales Alenia Space which were selected as result of the tenders evaluation
- Both studies are progressing nominally.

- The Preliminary Configuration Definition Review (PCDR) was successfully completed in week 42 (18-22 Oct) for both Contractors with identified criticalities and recommendations
- Spacecraft Configurations capable of accommodating the payload and consistent with the established mission requirements have been identified
- Preliminary analyses have demonstrated consistency of the design with the established ESA requirements
- Go-ahead has been given to initiate the post PCDR tasks i.e. detailed system design, programmatic aspects and costs evaluation
- All Phase A activities shall be completed by May 15, 2011 and will be subject to the planned PRR.

- A response to the published Announcement for PLATO Payload and Science Ground Segment components was received on October 29.
 - The proposal was submitted by the PLATO Mission Consortium led by Mr C. Catala from OBSPM
 - The payload configuration is based on 32 normal cameras and 2 fast cameras which is fully consistent with the science requirements
 - The AO response has been evaluated by the appointed Committee on technical and programmatic aspects and science performances
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- ➔ **The study team is working with the Consortium on the implementation of the of Evaluation Committee recommendations**
 - ➔ **Special attention shall be given to the programmatic aspects and industrialisation**
 - ➔ **intermediate report in March 2011.**

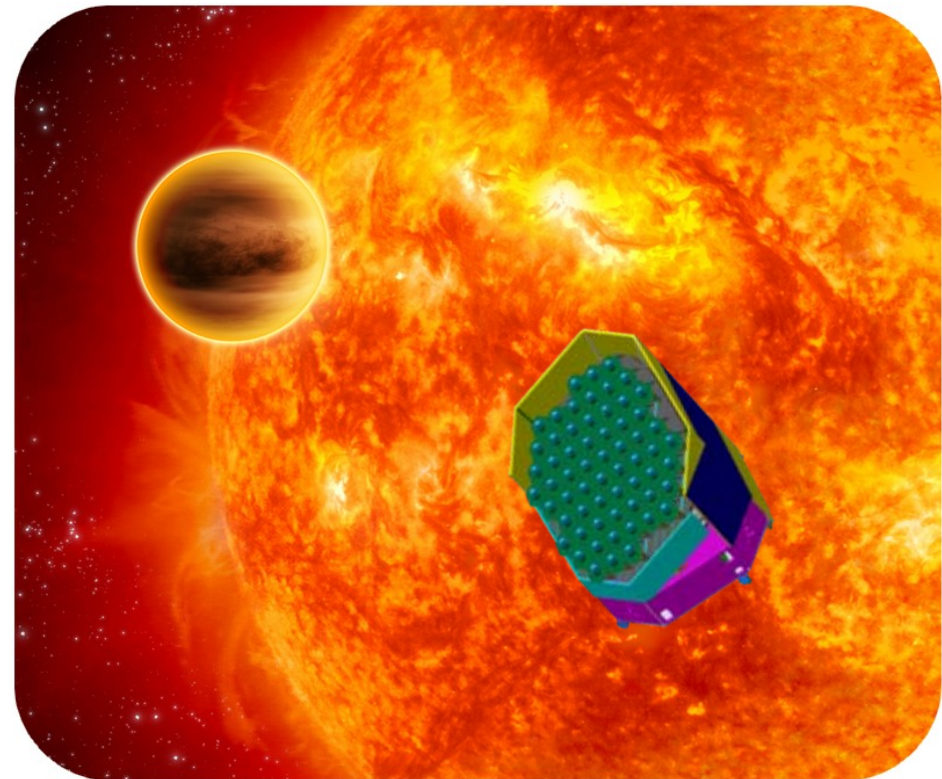
General

- ✓ **The Committee find that the PLATO AO Proposal is robust and with a high level of detail,**
- ✓ **It is found that the current design is sound and accurate with adequate safety margins on resources like mass, power and data transmission**
- ✓ **The proposal for the ground segment was found to be robust and complete. All issues can be addressed and solved during the definition phase in close collaboration with ESA**



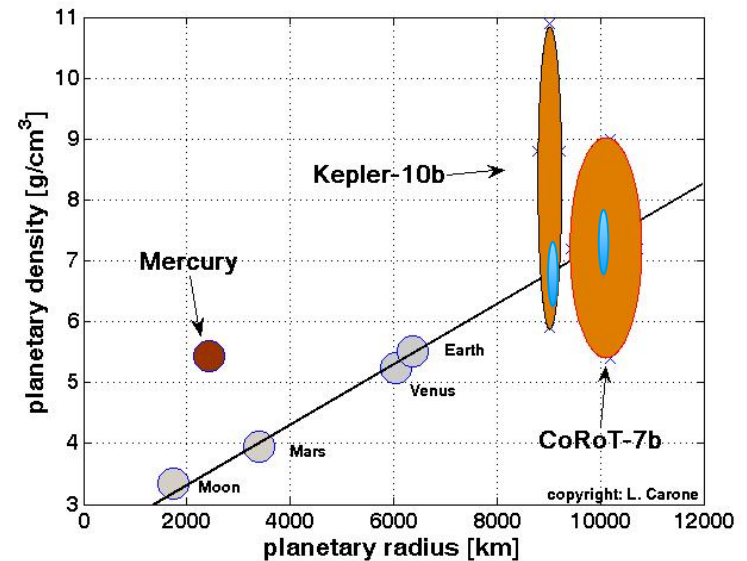
The evaluation of the response from the PLATO Consortium finished on time and the report has been issued on 15 Dec 2010. The subgroups within the evaluation committee were:

1. Payload (Chair G. Sarri, ESA)
2. Science (Chair A. Moitinho de Almeida, AWG)
3. Ground segment Chair N. Hanofski (ESA)



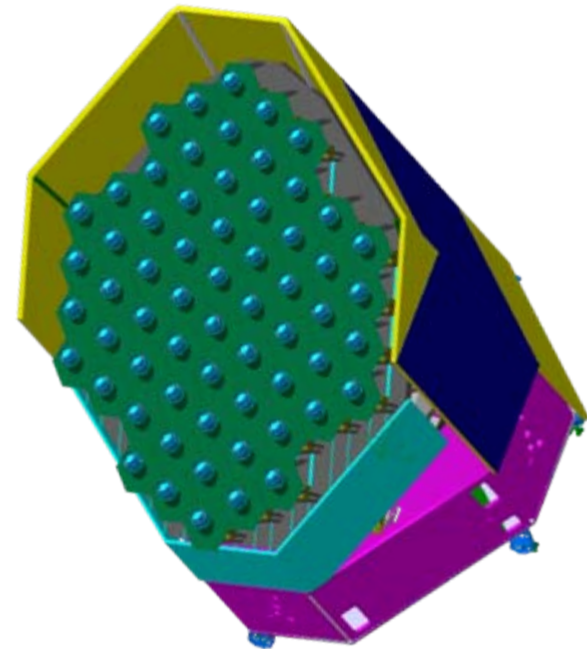
Science Specific

- ✓ The work package structure need to be straightened up and overlapping/duplicating packages cleaned out
- ✓ A more detailed calculation of the number of false positives, and the necessary follow-up strategy is required

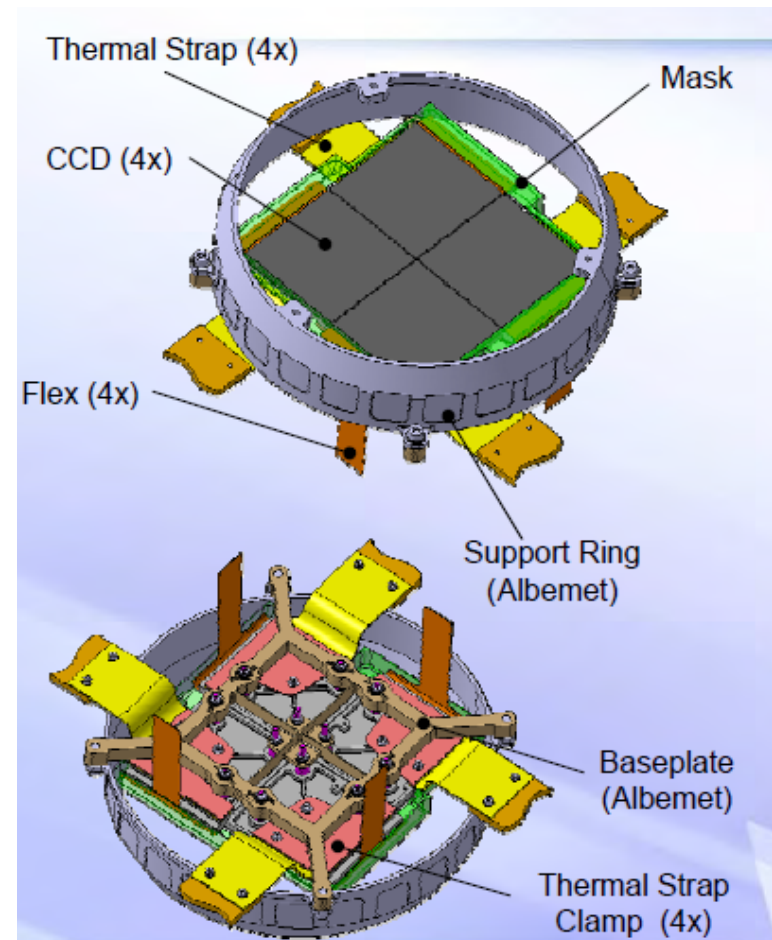


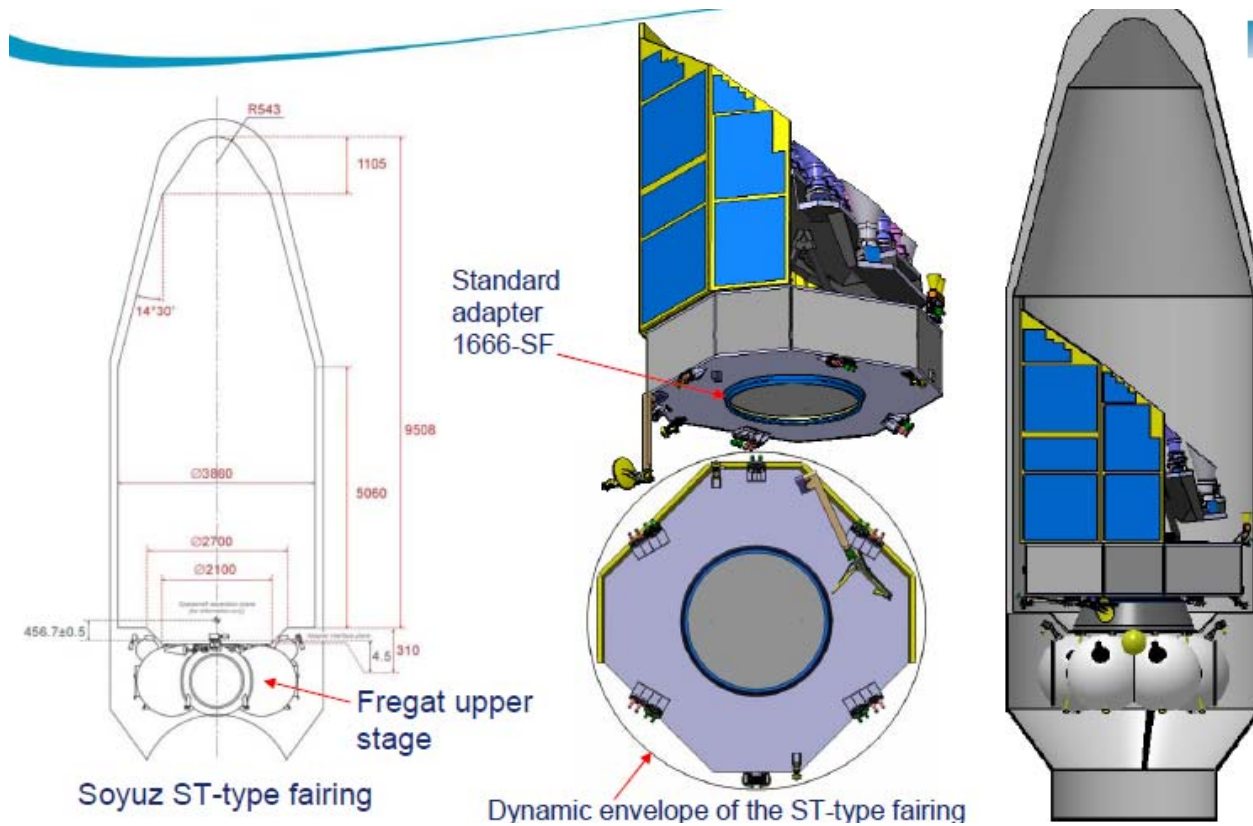
Science Ground Segment

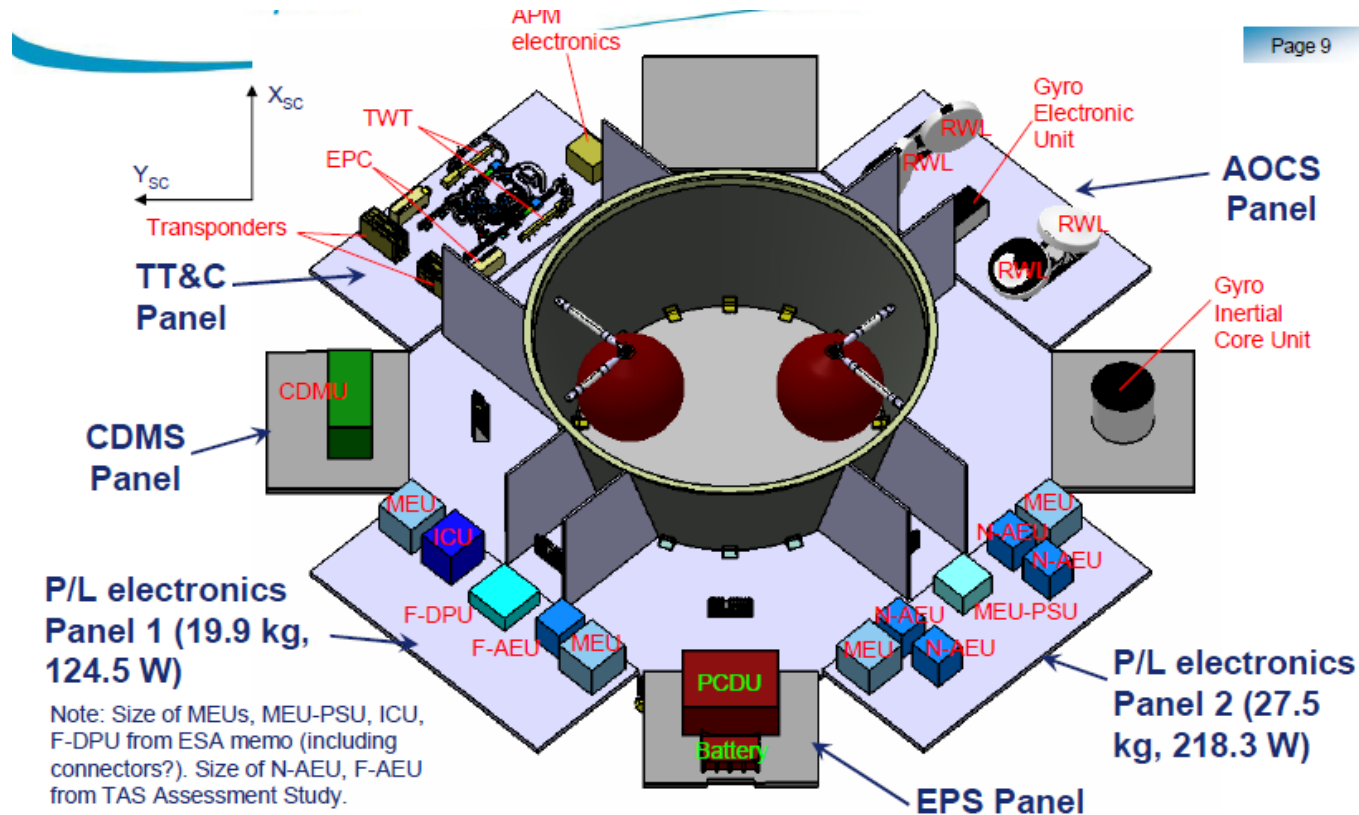
- ✓ **The proposed team structure is unnecessary complex and an outline of the intended activities need to be generated in collaboration with the Study Scientist and the ESA part of SGS**
- ✓ **Several vaguely described topics in the proposal need to be elaborated upon.**
- ✓ **Make the work package structure more focused working with the StudyScientist + ESA part of SGS**



- A contract was placed to e2v for the development of the detectors (CCDs) for the cameras of PLATO.
- Overall objective of this development is to get demonstration of the technology and the production capability needed for the Instruments
- **The Baseline Design Review was successfully completed in December 2010.**
- **Go-ahead has been given for batches production.**
- **EM CCDs will be delivered to support the development of the cameras**
- **The work is progressing nominally.**







Units accommodation in the SVM

Conclusions

- ✓ All PLATO activities are progressing nominally
- ✓ No show-stoppers have been identified

To come:

- Spacecraft detailed design (on going)
- AO intermediate review: in March
- Issue of the updated AO: in April
- Spacecraft PRR and Consortium PIRR (from mid May)
- Phase A conclusion: end June
- Updated AO response and evaluation: in July

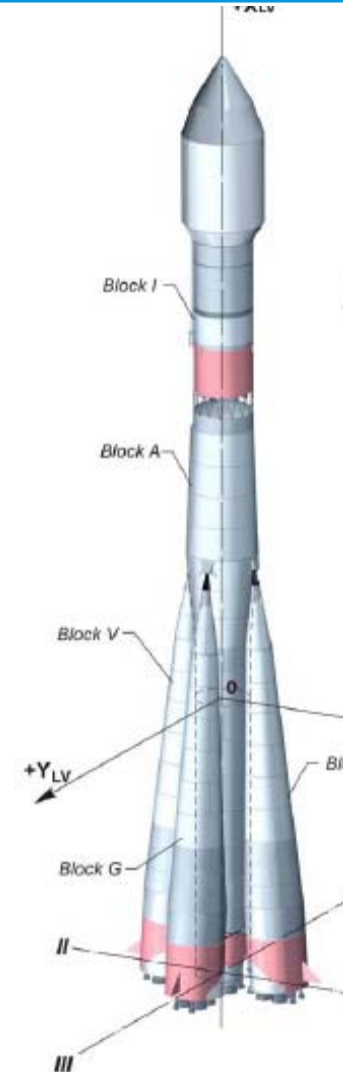
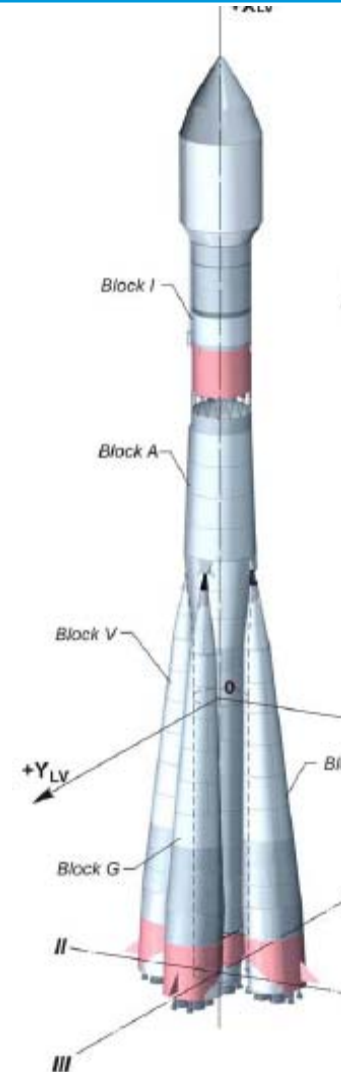


Figure 1

Conclusions

- ✓ The evaluation Committee recommended the pre-selection for the definition phase of the PLATO Mission Consortium as described in the proposal and that the Consortium proceeds with the proposed activities.



Figure

Outcome (Ref. to Proposal Evaluation Committee Report)

1. The proposal is robust
2. The documentation is of good quality and the response to the questions posed by the panels was generally complete and satisfactory.
3. The Committee has recognised the competence and experience of the Consortium
4. The mission requirements are well defined and the flow down in the documentation is properly done.
5. The description of the payload hardware is sound and accurate.
6. The presented design is found to be already well defined. It is not expected that the upcoming detailed design activities will lead to significant difficulties in terms of complexity or technical criticality, which can be considered show stoppers.

Major recommendations

1. Complete with priority the industrialisation plan, finalise the definition of the planned interactions between the PLATO Mission Consortium and industry and define as early as possible the industrial resources needed for the “chain productions” of i.e., lenses, telescopes AIV, parts and material procurements.
2. Consider cooperation with industrial partners as early as possible during the Definition phase to ensure a solid industrial basis for the Implementation phase proposal.
3. Reassess the Consortium schedule based on realistic deliveries for CCDs, Telescope Optical Units and Front End Electronics. Interact closely with the ESA Study Team for a consistent integration in the schedule of the CCD development and spacecraft integration planning
4. Other recommendation: refer to the report

Conclusions

1. The Evaluation Committee recommends the pre-selection for the Definition phase of the PLATO Mission Consortium constituted as described in the proposal. The Evaluation Committee recommends that the pre-selected PLATO Mission Consortium proceeds with the activities leading to the elaboration and update of the proposal for the Implementation phase, following closely the guidelines given in this report.
2. The Evaluation Committee requests an intermediate review in the March 2011 timeframe to assess the status of the major findings and of the implementation of the recommendations in preparation of the Implementation phase proposal.