

Workshop on an Optical Clock Mission in ESA's Cosmic Vision Program
Düsseldorf 8. - 9. 3. 2007



**Call for Missions
in
Cosmic Vision 2015-2025**

<http://sci.esa.int/cv2015>



Cosmic Vision theme selection

- ◆ April 2004: call for Science *Themes*
- ◆ 1 June 2004: deadline for proposals
- ◆ July 2004: analysis of proposals by ESA's advisory structure
- ◆ Nov. 2004: workshop in Paris (400+ participants)
- ◆ Spring 2005: presentation of Cosmic Vision to scientific community
- ◆ *Cosmic Vision Call for Proposals*

The Cosmic Vision Plan

The list below indicates the major scientific questions which are then subdivided into topics where important progress can be expected in the Cosmic Vision 2015-2025 timeframe.

3. What are the fundamental physical laws of the Universe?

3.1 Explore the limits of contemporary physics

Use stable and weightless environment of space to search for tiny deviations from the standard model of fundamental interactions

Call for CV Mission Proposals

- ◆ The first of 3 Calls (TBC) for implementation of CV2015-2025
- ◆ Available budget per call: ~1 B€
- ◆ The Call will nevertheless be fully open:
 - ◆ **No a priori size restriction, but clear cost guidelines**
 - ◆ Mission could be a **small/medium size S/M mission** (≤ 320 M€)
 - ◆ S/M could be **larger but collaborative** (≤ 320 M€ to ESA)
 - ◆ Or, could be a **large ESA alone L mission** (≤ 650 M€)
 - ◆ Selection of L mission will serve for **long term technological development** for mission launch in ≥ 2020
- ◆ **Up to 2 S/M + 1 L missions will eventually be implemented**

The Call

2.1 Mission Categories, cost envelopes and launch timeframe

The Director of the ESA Scientific Programme invites proposals for the competitive selection of medium missions (Class M missions) to be included into the first planning cycle of Cosmic Vision 2015-2025. The aim is to eventually implement one Class M mission for launch in the period 2015-2017, whose cost to ESA should not exceed a financial envelope¹ of 300 M€ at 2006 economic conditions. **The mission proposals should be based on existing technologies** in order to meet the schedule and minimize the programmatic risk. Scientifically visible ESA contributions to other agency's missions can also be proposed in this category. Past examples of such contributions are the Huygens probe on NASA's Cassini mission or the NIRSpec Instrument for NASA's James Web Space Telescope (JWST).

In addition, the Director of Science invites proposals for mission concepts for more ambitious projects of the flagship category (Class L mission concepts). Contrary to Class M, these are concepts for large missions that will require an extended preparation phase and specific technology developments. The aim is to eventually implement one Class L mission for launch in late 2018, whose cost to ESA should not exceed a financial envelope¹ of 650 M€ at 2006 economic conditions.

Proposals exceeding the above M and L limits can also be submitted if presented as cooperation with international partners but the cost to ESA must remain within the said limits (cf. section 5).

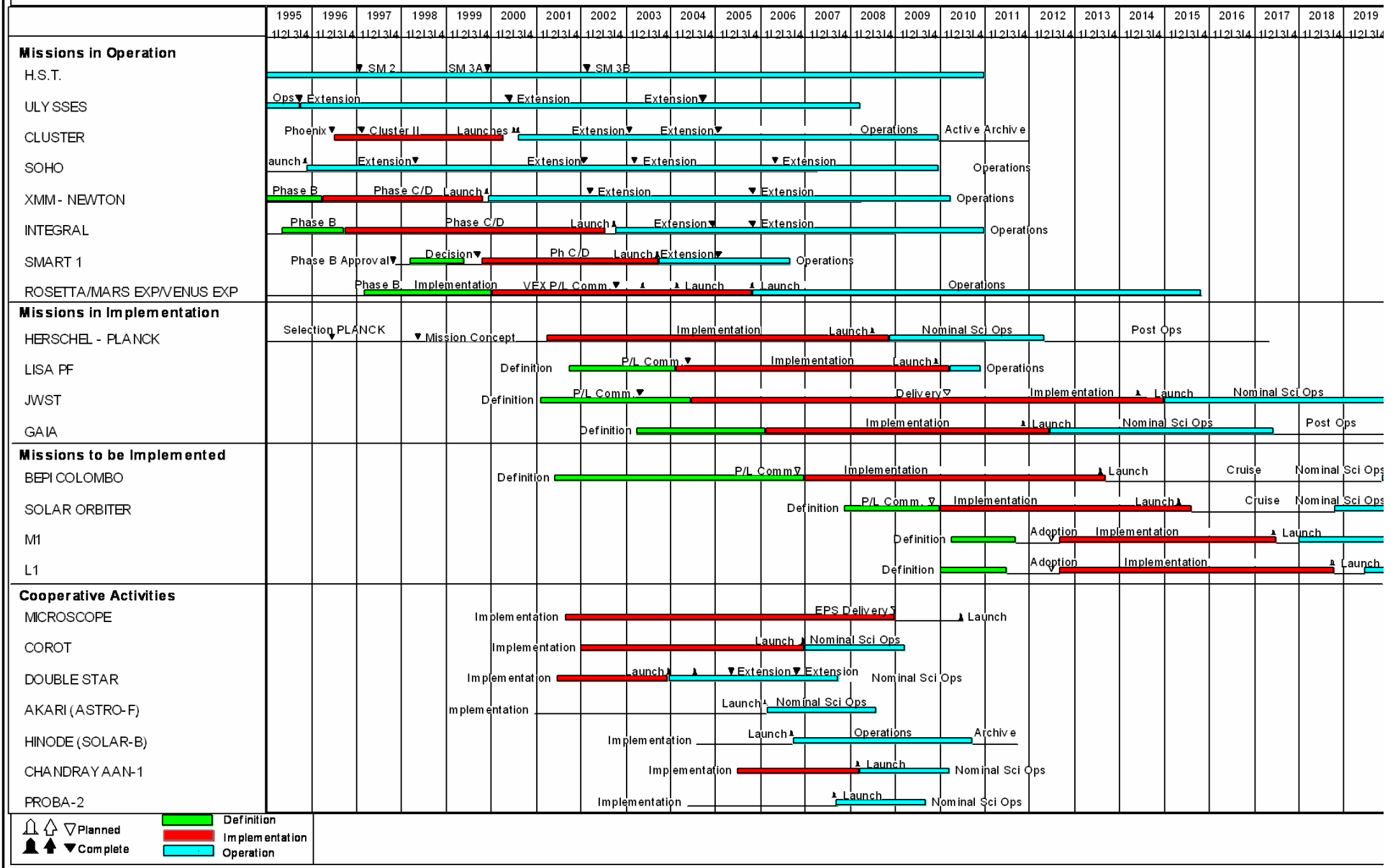
¹ *The envelopes are ceilings for the mission costs to ESA. Therefore, the envelopes do not include the costs of payload instruments to be funded by national agencies.*

Activity	Date
Release of 1 st Call for mission proposals of Cosmic Vision 2015-2025	5 March 2007
Letters of Intent due	30 March 2007
Briefing to proposers at ESTEC	11 April 2007
Mission Proposals due	29 June 2007
Proposal evaluation process by ESA and Peer Review Teams	July to end September 2007
Working group/SSAC evaluation and selection of: 3 Class M mission proposals and 3 Class L concept proposals	October 2007

Activity	Date
ESA Internal Assessment Phase	November 2007 - end May 2008
Industrial Assessment Phase (emphasis on payload, cost and risk)	June 2008 - August 2009
Open presentation of study results & Working Group recommendation for Definition Study Phase	September - October 2009
SSAC down selection to 2 missions for Definition Phase	October 2009
SPC confirmation of 2 missions for Definition Phase	November 2009
2 missions in competitive Definition Phase	April 2010 - September 2011
Working group/SSAC evaluation and recommendation for <u>adoption of one mission</u>	September 2011-October 2011
SPC Confirmation of one mission for ITT release *	November 2011
SPC mission adoption (CaC and Payload Formal Agreement)	July 2012
Mission enters Implementation Phase	September 2012
Mission Launch	mid 2017

* Two missions may continue into the implementation phase subject to size, cost and complexity.

The missions which fail to enter the implementation phase will be removed from the plan. However they may be re-proposed in response to the next Call for mission proposals of the Cosmic Vision 2015-2025 plan (second selection cycle).



Deadlines:

- Letters of Intent (LoIs) have to be submitted by: **30 March 2007**
- Mission proposals must be submitted by: **29 June 2007**

Format:

- Letters of Intent should not exceed two A4 pages in length and should briefly address the topics listed in Appendix 2 and 3.
- Proposals should not exceed 36 (thirty-six) A4 pages in length and should address the same topics more in depth (as described in detail in Annexes 2 and 3), plus any other topics as suggested by the Executive at the April 2007 briefing.

- Annex 2: General Proposal Content
- Annex 3: Detailed Format of the Proposal

- Annex 4: Costs

Table 5a: Main Cost Elements for Class M Missions

Activity	% of Total ESA CaC
Pre-Implementation Phase	2
Total spacecraft industrial activities	38
Launch services from CSG (Soyuz Fregat-2B launcher) *	13
Ground segment (MOC and SOC)	18
ESA internal costs	11
Contingency	18

- It is assumed that the technology preparation is performed outside of the mission CaC. For the ESA contribution, this would be covered under the ESA Science Core Technology Programme.

- Technological Maturity

Table 6 summarizes the ESA Technology Reference Levels used in any assessment of the technological maturity for both spacecraft and payload units.

Table 6: Technology Readiness Levels (TRL)

Level	Description
1	Basic principles observed and reported
2	Technology concept and/or application formulated
3	Analytical and experimental critical function and/or characteristic proof-of concept
4	Component and/or breadboard validation in laboratory environment
5	Component and/or breadboard validation in relevant environment
6	System/subsystem model or prototype demonstration in a relevant environment (ground or space)
7	System prototype demonstration in a space environment
8	Actual system completed and "flight qualified" through test and demonstration (ground or space)
9	Actual system "flight proven" through successful mission operations