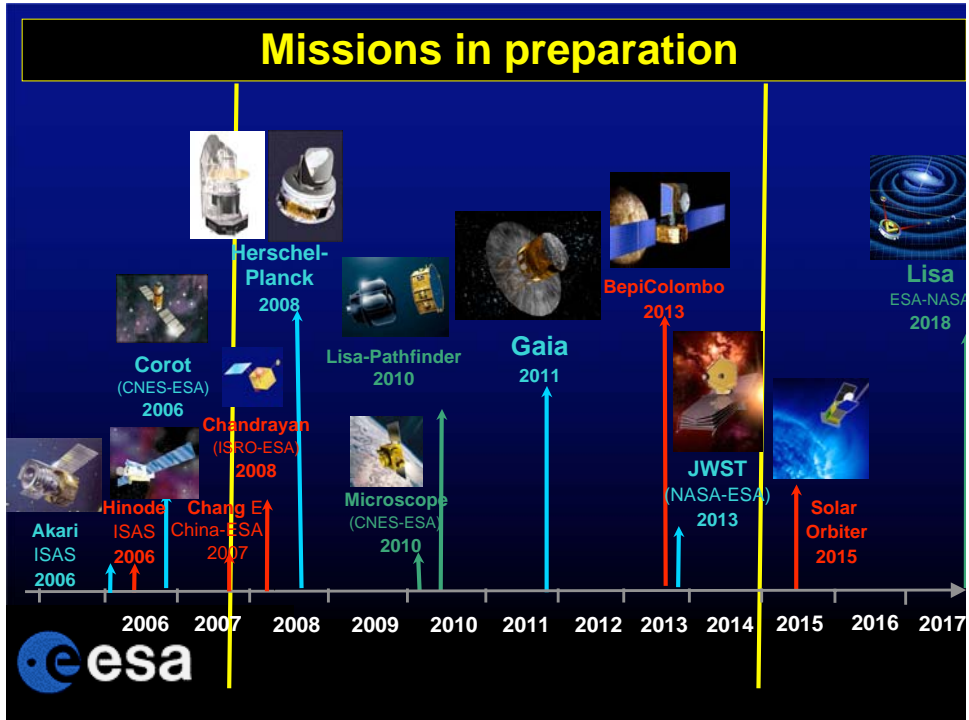


First call for missions for the Cosmic Vision plan 2015-2025 (CV1)

Programmatic Context

Planning and Coordination Office
Directorate of the Scientific Programme
ESA HQ, Paris



2007 Call for CV Mission Proposals

- First call covers slice 2015 – 2018 of CV plan – released 5 March 2007.
- Available budget for first slice: ~ 950 M€.
- 50 proposals received
- Aims at adoption of 1 medium (M) & 1 large (L) mission for launch in 2017 & 2018. No mission package.
- Subsequent Calls:
 - every 3-4 years, structured to meet needs (mix of missions, balance of disciplines, etc.) and financial planning of Cosmic Vision.



Programmatic context

The case of LISA

- LISA shifted to the Cosmic Vision plan 2015-2025 to compete as class L mission candidate for first launch opportunity (L1) in 2018.
- Preparatory techno will continue as planned



Programmatic context

The case of LISA

- **Future decision for LISA based on;**
 - **Successful in-orbit performance of LPF (2010),**
 - **TRL of new LISA-specific technologies,**
 - **Confirmation of NASA level of involvement,**
 - **Overall Science Programme financial outlook.**
- **Decision to adopt LISA not before 2010 at earliest.**
 - **Tied to LISA-PF launch, overall programme schedule and financial constrains.**



Proposals Overview

- Total of 50 proposals.
- Astrophysics: 19 proposals:
 - 4 'L' and 15 'M' class.
- Fundamental Physics:
 - 1 'L' and 11 'M' class.
- Solar System: 19 proposals
 - 5 'L' and 14 'M' class.
- About half involve international collaboration outside ESA member States.



Selection criteria

- | | |
|---|-------------|
| • Scientific excellence | WG/SSAC |
| • Scientific return | WG/SSAC |
| • Compatibility with CV scientific priorities | WG/SSAC |
| • Timeliness of the mission | WG/SSAC |
| • Need to go to space | WG/SSAC |
| • "Science for money" rating | WG/SSAC-ESA |
| • Technology maturity and technical feasibility | ESA |
| • Compatibility with Class M or L envelopes | ESA |
| • Cost to Member States (payload, etc.) | ESA |
| • Overall project risk | ESA |
| • Status of international cooperation | ESA |
| • Communication potential | WG/SSAC-ESA |



M Missions schedule

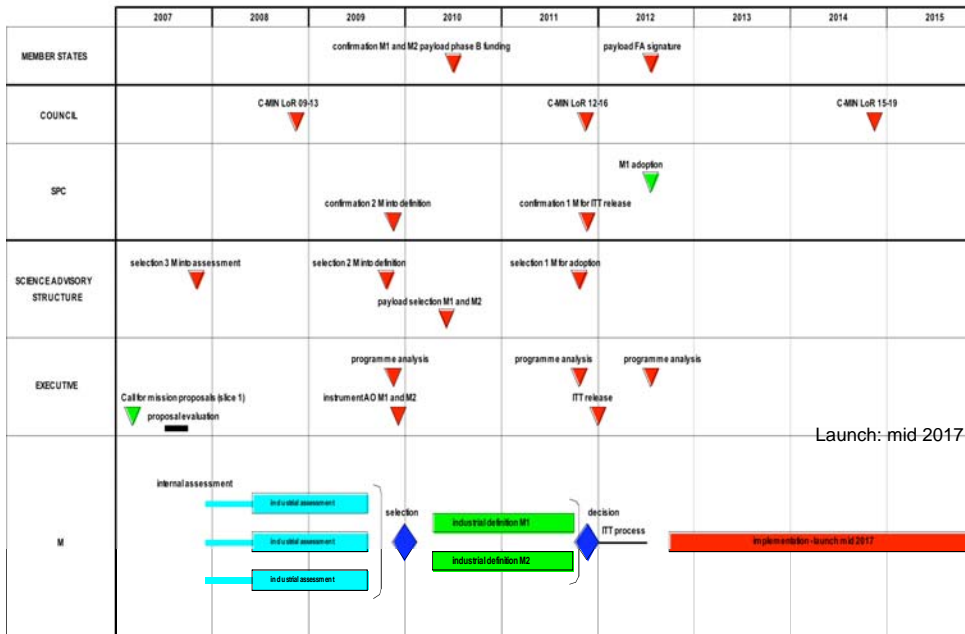
- | | |
|---|------------------|
| • Assessment Phase of up to 3 proposals | |
| – Internal Assessment Phase | Nov 07- May 08 |
| – Competitive Industrial Assessment | June 08-Aug 09 |
| – (emphasis on payload, cost and risks) | |
| • Presentation of study results & | |
| • WG/SSAC recommendation for selection | Sept 09-Oct 09 |
| • SPC confirmation of 2 missions for Definition study | November 09 |
| • 2 missions in competitive Industrial Definition studies | April 10-Sept 11 |
| • WG/SSAC recommendation for 1 mission | Sept 11-Oct 11 |
| • SPC confirmation of 1 mission for ITT issue | November 2011 |
| • SPC approval of CaC and P/L formal agreement | July 2012 |
| • Industrial Implementation Phase | Sept 2012 |
| • Launch | mid 2017 |

N.B. Mission eventually not selected by SPC will be removed from plan. May be re-proposed in response to next call.



M Missions schedule

IMPLEMENTATION PLAN FOR M MISSIONS (ESA/SPC(2007)3, February 2007)



L Mission Concepts Schedule

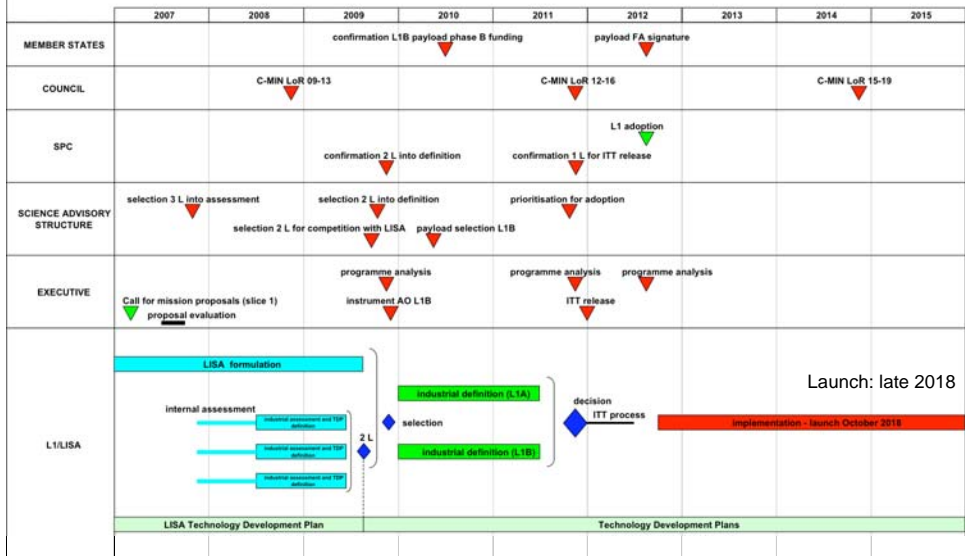
- Internal Assessment Phase and identification of key technology areas for up to 3 proposals Nov 2007-May 2008
- Industrial Assessment Phase and definition of the required Technology Development Plans (TDP) June 2008-June 2009
- WG/SSAC evaluation and down selection to 2 missions to compete with LISA to enter 2 Definition Phases (TDP activated for the 2 selected missions and the remaining Class L mission concept - includes LISA) July 2009-Oct 2009
- SPC confirmation of 2 missions for definition study November 2009
- 2 competitive Industrial Definition studies Jan 2010-June 2011
- WG/SSAC evaluation/prioritisation July 2011-Oct 2011
- SPC confirmation of 1st mission for ITT issue* November 2011
- SPC mission adoption (CaC and P/L formal agreement) July 2012
- Industrial Implementation Phase September 2012
- Launch of 1st L mission (L1) October 2018

* "Loosing" mission + 3rd mission with activated TDP kept in plan to compete later for L2 slot.



L Missions schedule

IMPLEMENTATION PLAN FOR L MISSIONS (ESA/SPC(2007)3, February 2007)



Important remarks

- L mission study schedule will be driven by the evolution of TRL of mission elements and payload instruments.
- As instrument AO will be issued at the beginning of the Definition Phase prior to mission adoption by SPC, assessment studies of payload instruments to be supported by participating member states.
- Schedule of collaborative mission studies will be adjusted in coordination with the international partner(s).



SSAC Selection

	<u>M Class</u>	<u>L Class</u>	<u>Mission of Opportunity</u>
<u>Solar System</u>	Space Plasmas (CROSS-SCALE) Neo sample return (MARCO POLO)	Giant planets (TANDEM – Saturn)/ LAPLACE – Jupiter)	
<u>Astrophysics</u>	Dark Energy (DUNE/SPACE) Asteroseismology/ Exoplanets (PLATO)	X-ray astronomy (XEUS)	IR astronomy (SPICA)



Brief Mission Summary I

LAPLACE is proposed as a mission to the Jovian system based on three orbiting platforms to perform coordinated observations of Europa, the Jovian satellites, Jupiter's magnetosphere and its atmosphere and interior. The mission is proposed as a collaboration with NASA and JAXA.

TANDEM is a mission to Saturn, Titan and Enceladus composed of an orbiter and a carrier which will deliver a balloon and three probes onto Titan. The mission will investigate the Titan-Enceladus systems, their origins, interiors and evolution as well as their astrobiological potential. The mission is based on a collaboration with NASA.

XEUS, X-ray Evolving Universe Spectroscopy, is a next-generation X-ray space observatory to study the hot, million-degree universe (e.g. supermassive black holes, evolution of galaxies and large-scale structures and matter under extreme conditions). The XEUS concept is based on two satellites (a telescope satellite and a detector satellite) that would fly in formation in a halo orbit around the second Lagrangian point.



Brief Mission Summary II

CROSS-SCALE proposes to employ 12 spacecraft to make simultaneous spatial and temporal measurements of the plasma near Earth to address fundamental questions such as how shocks accelerate and heat particles or how magnetic reconnection phenomena generate or convert energy.

MARCO POLO consists of a mother spacecraft which carries a lander, sampling devices, re-entry capsule and associated instruments. The mission objectives are to characterise a near-earth object at multiple scales and return a sample to study the origins and evolution of the Solar System, the role of minor bodies in the process, the origin and evolution of Earth and of life itself.



Brief Mission Summary III

The two proposals addressing the study of dark matter and dark energy (**DUNE**, the dark universe investigator and **SPACE**, the near-infrared all-sky cosmic explorer) are based on two different techniques. DUNE is proposed as a wide-field visible and near-infrared imager, while SPACE is conceived as a near-infrared all-sky spectroscopic surveyor.

PLATO is a proposal for the proposed next-generation planet finder is a photometry mission that will detect and characterise transiting exoplanets as well as measure the seismic oscillations of their parent stars. It will be capable of observing rocky exoplanets around brighter and better characterized stars than its predecessors. Observations of the mission will be complemented by ground- and space-based follow-up observations to derive the planet's masses and study their atmospheres.

SPICA is a proposed medium- and far-infrared observatory with a large-aperture cryogenic telescope. The mission is conceived to perform wide field, high sensitivity photometric mapping at high spatial resolution, spectral analysis and coronagraphy of planets and planetary disks as well as the origin of the universe.

