

The context of EChO: the Cosmic Vision programme

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➤ **Science-driven**

both long-term science planning and mission calls are bottom-up processes, relying on broad community input and peer review.

➤ **Mandatory**

all member states contribute pro-rata to GDP providing budget stability, allowing long-term planning of its scientific goals and being the backbone of the Agency.



ESA MEMBER STATES AND
COOPERATING STATES

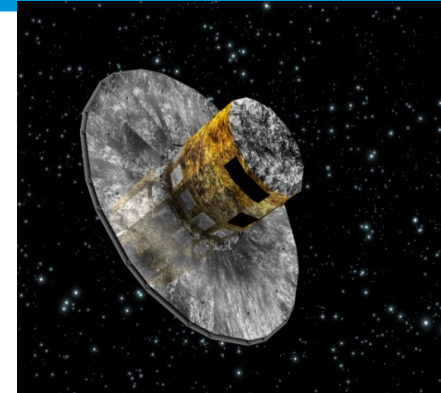
European Space Agency

OBJECTIVES for coming years



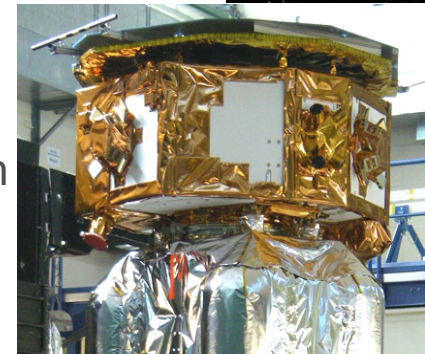
Launch of GAIA

To create the largest and most precise three dimensional chart of our Galaxy by providing unprecedented positional and radial Velocity measurements for about one billion stars in our Galaxy and throughout the Local Group



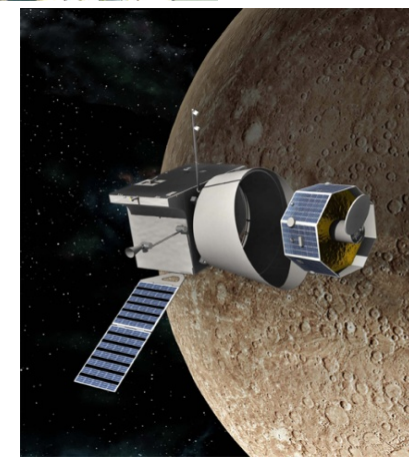
Launch of LISA Pathfinder

LISA Pathfinder is to demonstrate the key technologies to be used in future missions for gravitational wave detection



Launch of BepiColombo

Investigate origin and evolution of a planet close to the parent star; study form, interior, geology, composition; examine exosphere; probe magnetosphere structure and dynamics and determine origin of magnetic field; perform a test of Einstein's theory of general relativity

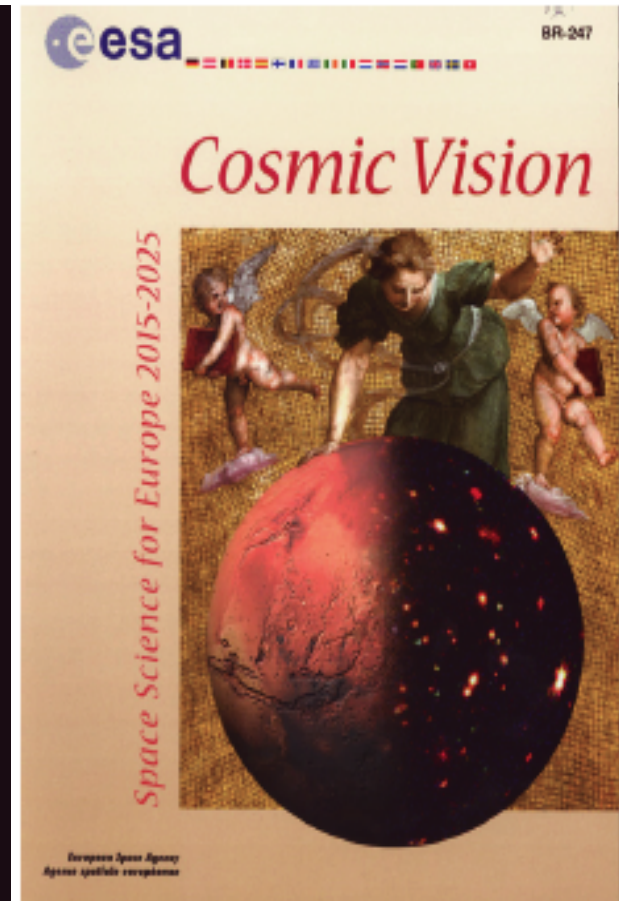


In 2005, a new programme was introduced to replace H2000+, for one more decade (until 2025) with the name Cosmic Vision (2015-2025).



What are the themes for space science?
A call to the European Science Community

150 Ideas Proposed



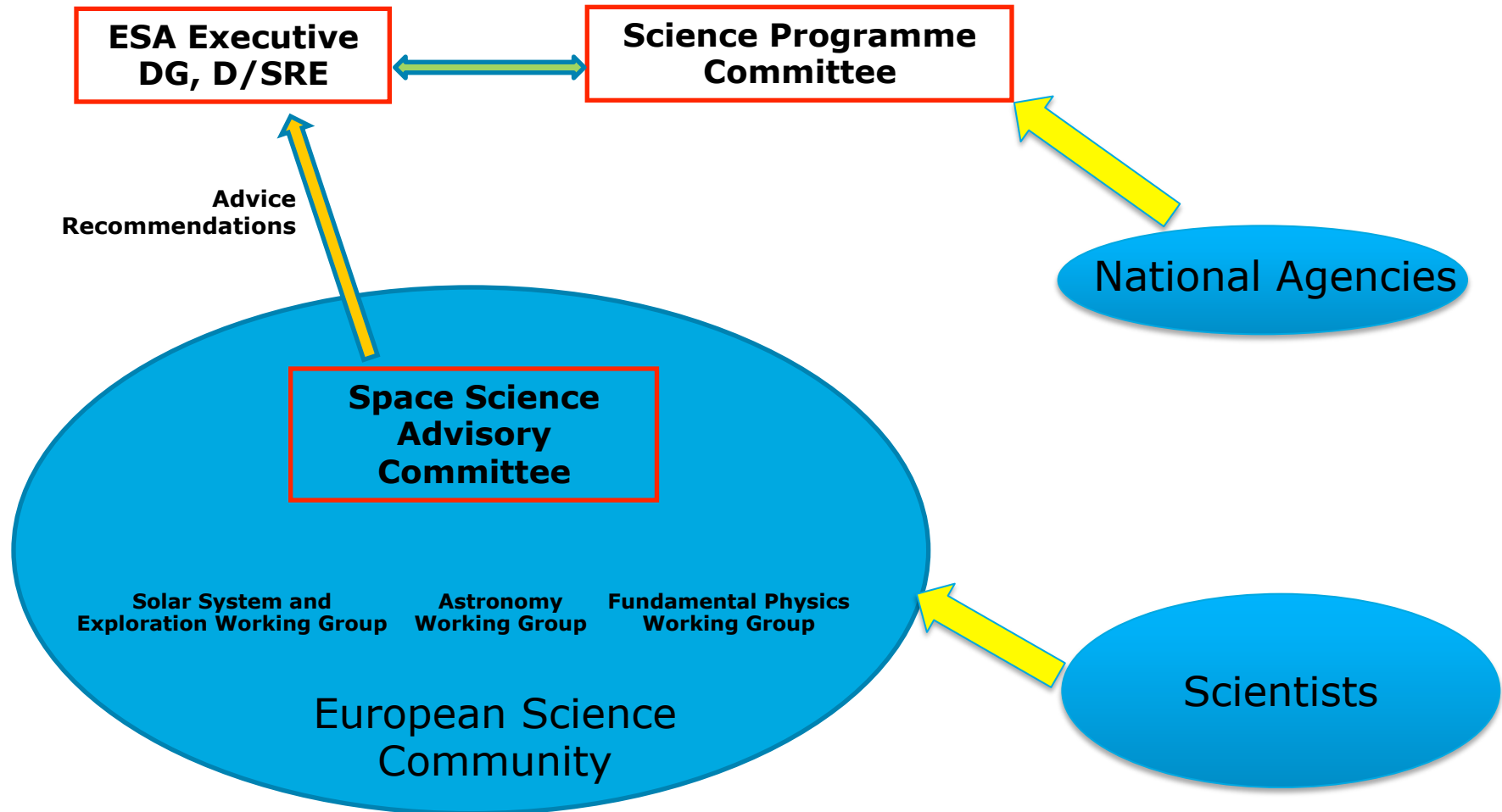
The COSMIC VISION “Grand Themes”

1. What are the conditions for planetary formation and the emergence of life ?
2. How does the Solar System work?
3. What are the physical fundamental laws of the Universe?
4. How did the Universe originate and what is it made of?



COSMIC VISION

A bottom-up approach

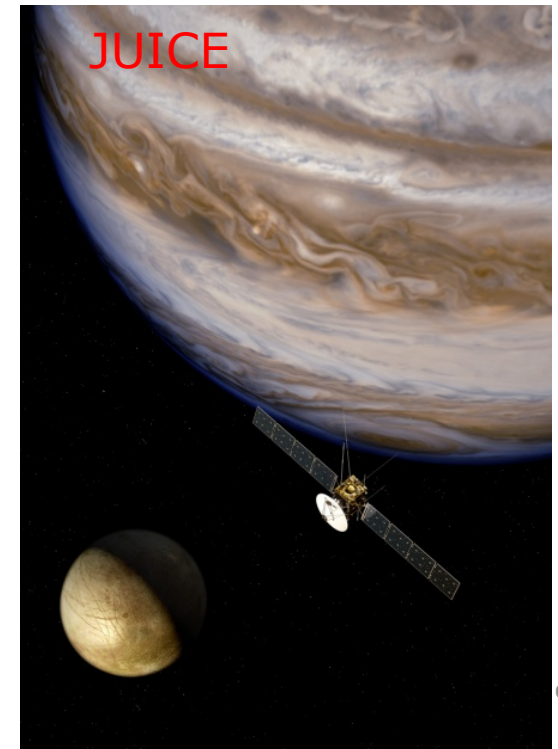
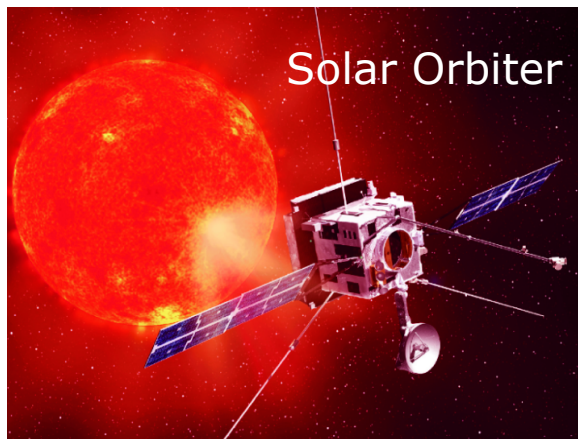


COSMIC VISION (2015-2025)

Step 1



- Proposal selection for assessment phase in October 2007
 - 3 M missions concepts: Euclid, PLATO, Solar Orbiter
 - 3 L mission concepts: X-ray astronomy, Jupiter system science, gravitational wave observatory
 - 1 MoO being considered: European participation to SPICA
- Selection of Solar Orbiter as M1 and Euclid as M2 in 2011.
- Selection of Juice as L1 in 2012.

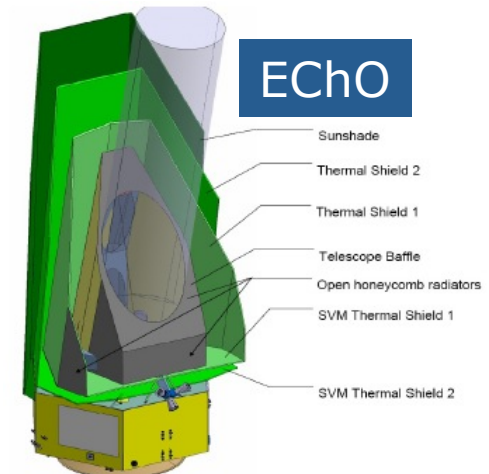
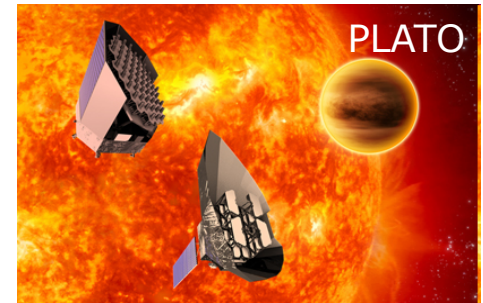
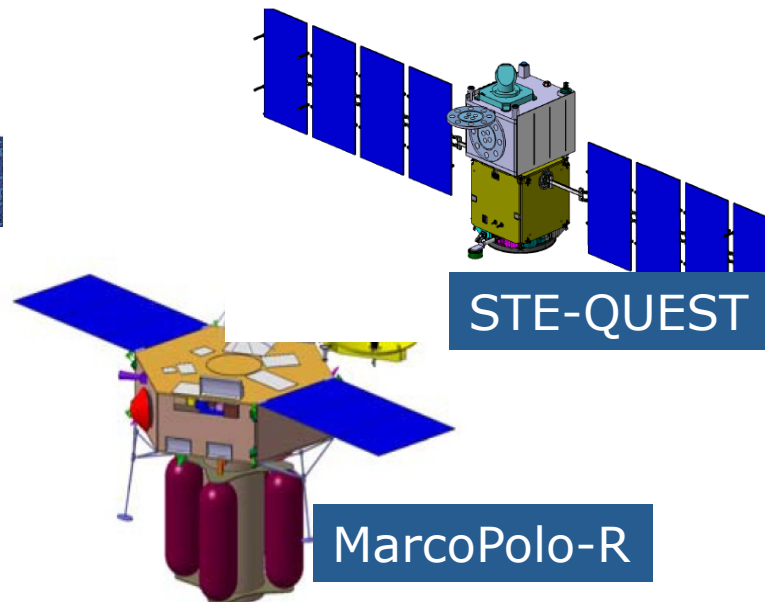
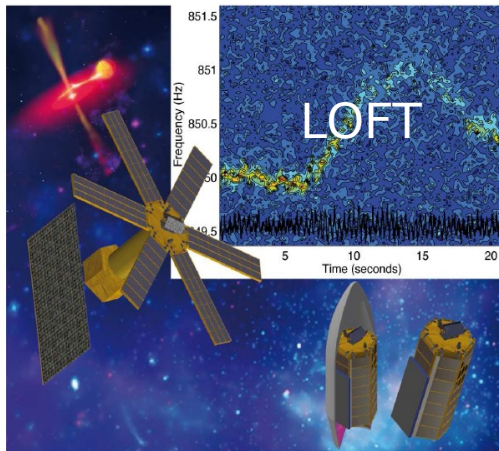


COSMIC VISION (2015-2025)

Step 2



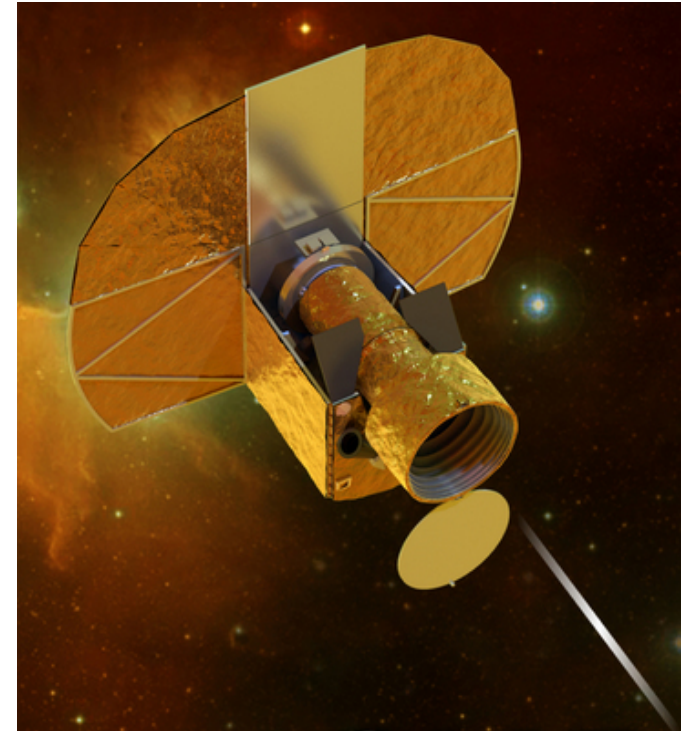
- Second “Call for Missions” issued in 2010
- Only M mission proposals solicited
- EChO, MarcoPolo-R, LOFT, STE-QUEST selected for assessment with PLATO retained from previous round
- Selection planned for early 2014



gency

- Novel component within the ESA Science Programme
- Call to the scientific community for novel ideas and explore approaches complementary to the current (L-M) components of the ESA Science Programme (**March 2012**)
 - **26 proposals submitted**
- The Call imposed strict limits on the cost of the missions that can be implemented under the advertised scheme
- Small-size missions with a development time not exceeding 4 years
- Proposals can address all areas of space science

Cheops mission selected (October 2012)



Characterize transiting exoplanets on known bright and nearby host stars

Targets: Known exoplanet host stars with a V-magnitude < 12.5 (goal: 13) anywhere on the sky

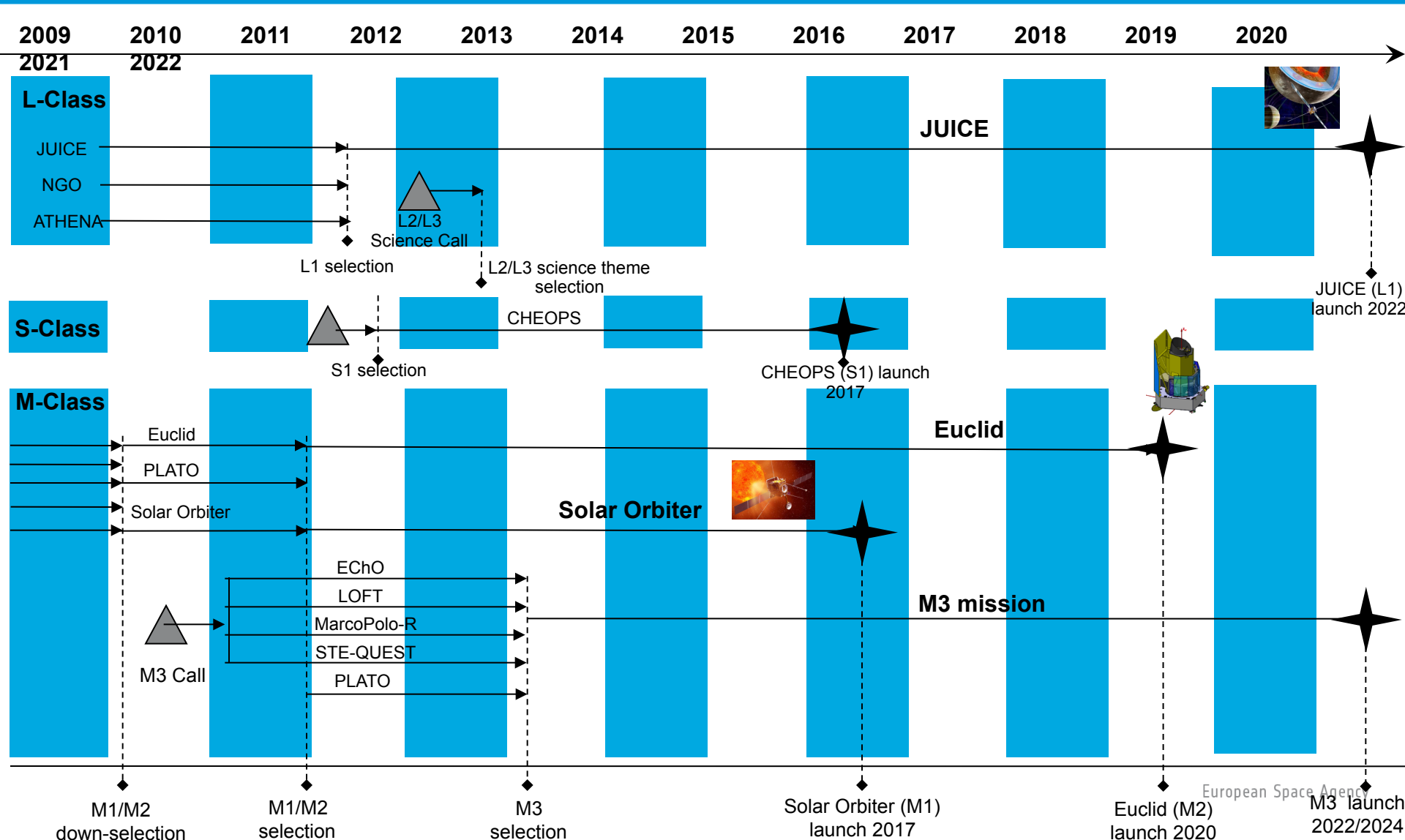
Wavelength: Visible range: 400 to 1100 nm (Option: NIR to 1700 nm)

Telescope: 33 cm reflective on-axis

Orbit: Low Earth Sun-synchronous orbit
6am, altitude 800 km

Lifetime: 3.5 years

COSMIC VISION TIMELINE



Courtesy: F. Safa



- ESA Science Program budget is decided at ministerial-level conferences with a 5 yr horizon
- Ministerial conference in November 2012
- Planning horizon 2013-2017 - “Flat cash” settlement at 2013 e.c. (507.9 M€ p.a. with no inflation correction)
- For 2013, modest increase w.r.t. CMIN08 decision (10 M€, part of the PL+ RO contribution)
- Yearly purchasing power decrease from 2014 to 2017, amount will depend on actual inflation level (2.5% assumed for planning purposes)

1. Large missions, L
2. Medium missions, M
3. Small missions, S
4. Opportunity missions, O (previously known as cooperative)
5. Extensions of missions in operation
6. Basic activities
 - a. Preparation for the future
 - b. Technology development
 - c. Science management support
7. Programme-level contingency



- Development times (from call to launch):
 - L missions: >13 years
 - M missions: 11 years
- Cost envelopes:
 - L missions => order of 2 years of LoR
 - M missions => order of 1 year of LoR

COSMIC VISION – Next Large missions L2-L3 white papers



Call page: <http://sci.esa.int/Call-WP-L2L3>

Release of Call for White Papers	5 March 2013
White Paper submission deadline	24 May 2013
Open workshop	3-4 September 2013
Director's proposal to the SPC concerning the L2/L3 science themes	Late October 2013
Selection of L2/L3 science themes by SPC	November 2013

L2 and L3: currently planned for launch in 2028 and 2034

White Papers advocating science themes and questions for the L2 and L3 flight opportunities.

- the science questions that are proposed to be addressed by an L-class flight opportunity
- one (or more) strawman mission concept(s), or possible approaches to obtaining the necessary measurements, that could provide the answers to the science questions proposed



European Space Agency

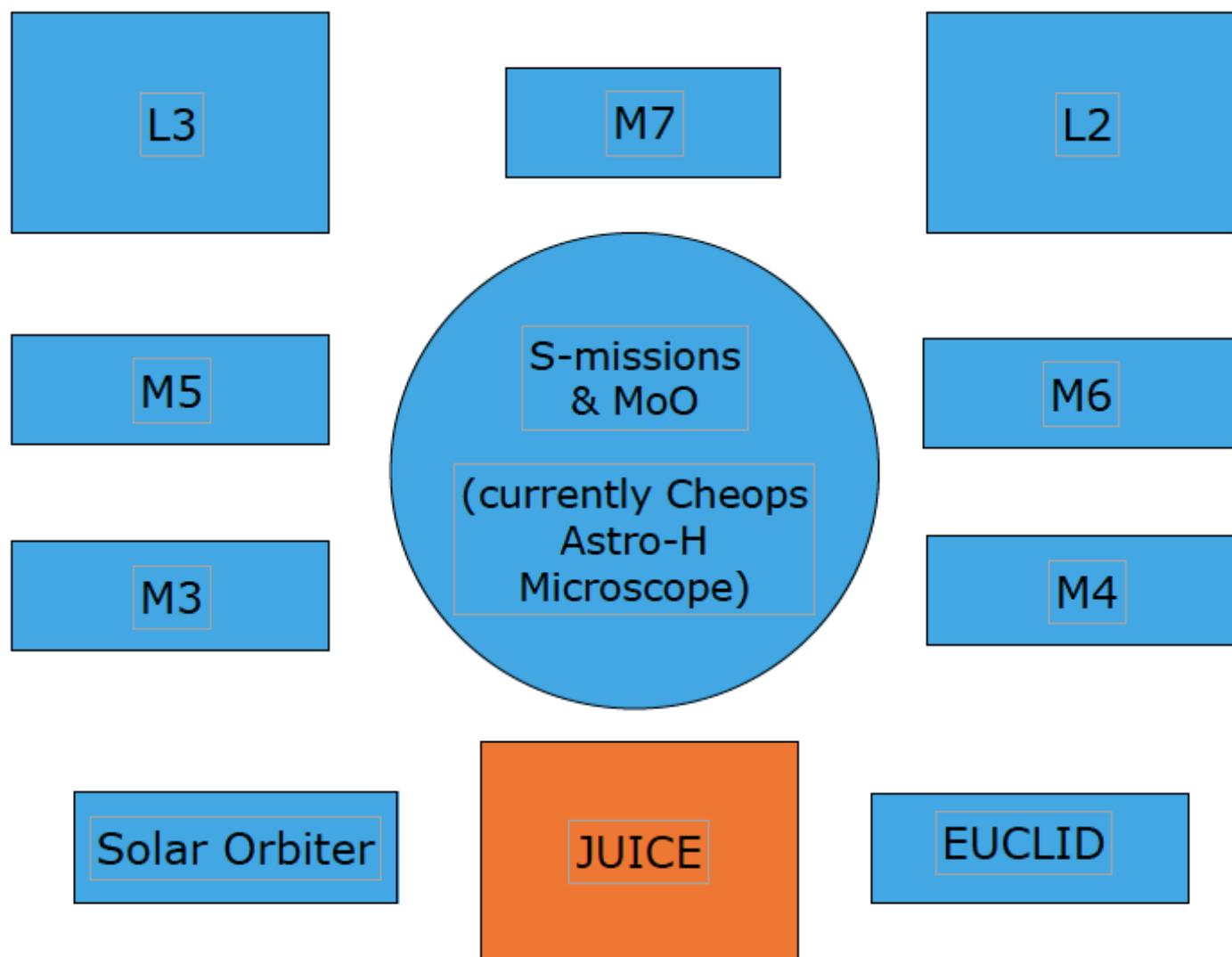
M3 Selection timeline



Call for M3 launch opportunity	July 2010
Selection of M-class candidate missions for assessment	February 2011
ESA internal assessment phase of candidate missions	Mar. – Oct. 2011
Industrial assessment phase and parallel definition studies of model payload	Feb. 2012 – Dec. 2013
Call for proposals for scientific P/L	Sep. 2012
SPC selection of scientific P/L	Feb. 2013
Definition studies on selected payloads	Feb. – Sep. 2013
Public presentation of missions	29 Jan. 2014 (TBC)
Recommendations of Advisory Structure	29-31 Jan. 2014 (TBC)
SPC selection of one mission for the M3 launch opportunity	Feb. 2014
SPC adoption of mission	Q4 2015
Mission launch year target	2022 – 2024



COSMIC VISION (2015-2035)



CONCLUSION

