

Small Missions and the Science Programme of ESA

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soho
Facing the Sun

venus express
Studying Venus' atmosphere

juice
Characterising the conditions of
ocean-bearing moons around Jupiter

bepicolombo
Exploring Mercury

proba-2
Observing coronal
dynamics and solar eruptions

cassini-huygens
Studying the Saturnian system
and landing on Titan

mars express
Investigating the Red Planet

cluster
Measuring Earth's magnetic shield

solar orbiter
The Sun up close

rosetta
Chasing a comet

→ ESA'S FLEET IN THE SOLAR SYSTEM

The Solar System is a natural laboratory that allows scientists to explore the nature of the Sun, the planets and their moons, as well as comets and asteroids. ESA's missions have transformed our view of the celestial neighbourhood, visiting Mars, Venus, and Saturn's moon Titan, and providing new insight into how the Sun interacts with Earth and its neighbours. The Solar System is the result of 4.6 billion years of formation and evolution. Studying how it appears now allows us to unlock the mysteries of its past and to predict how the various bodies will change in the future.



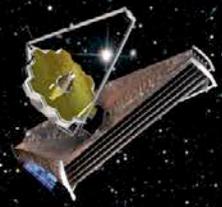
planck
Looking back
at the dawn of time



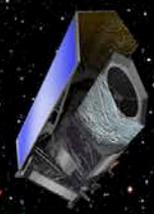
herschel
Unveiling the cool
and dusty Universe



just
Observing the first light



euclid
Probing dark matter, dark energy
and the expanding Universe



gaia
Surveying a billion stars



hst
Expanding the frontiers
of the visible Universe



xmm-newton
Seeing deeply into the hot
and violent Universe



integral
Seeking out the extremes
of the Universe



Cos-B



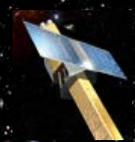
Exosat



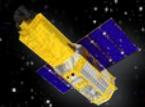
IUE



Astro-H



suzaku



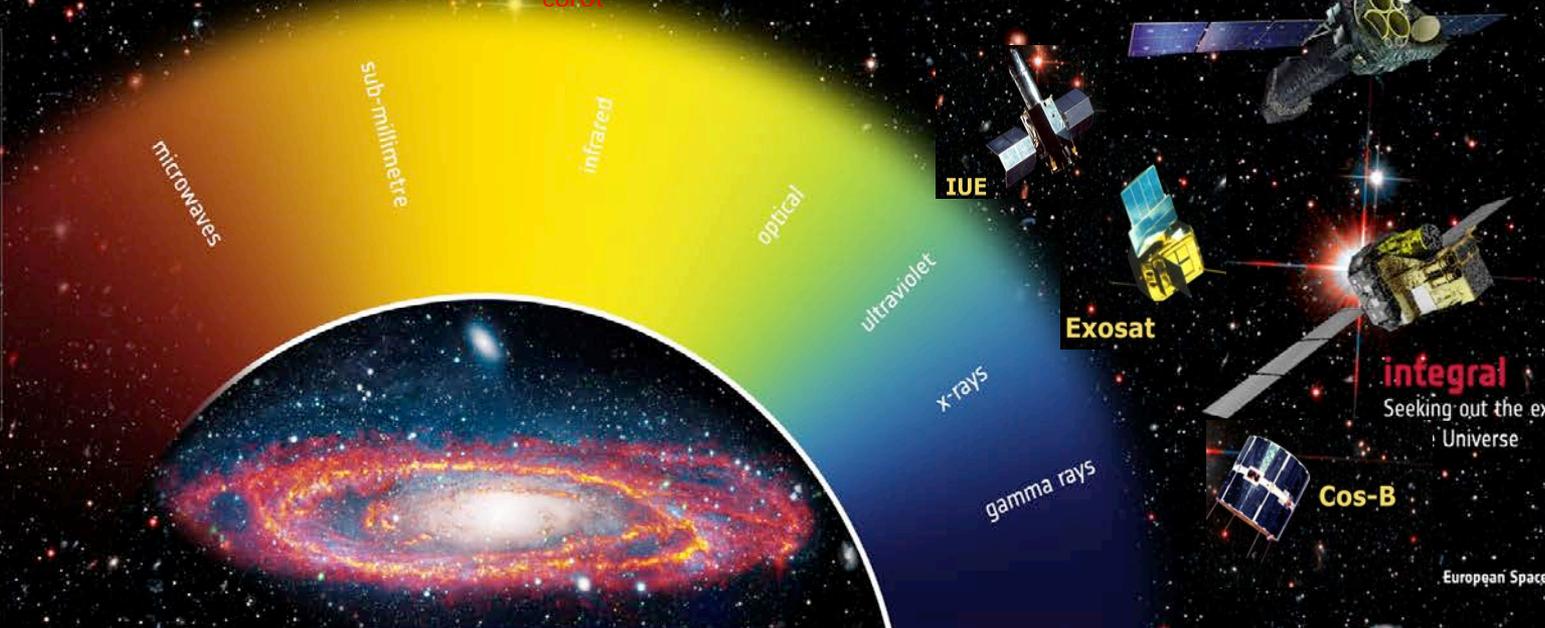
corot



ISO



**lisa
pathfinder**
Testing the technology
for gravitational
wave detection



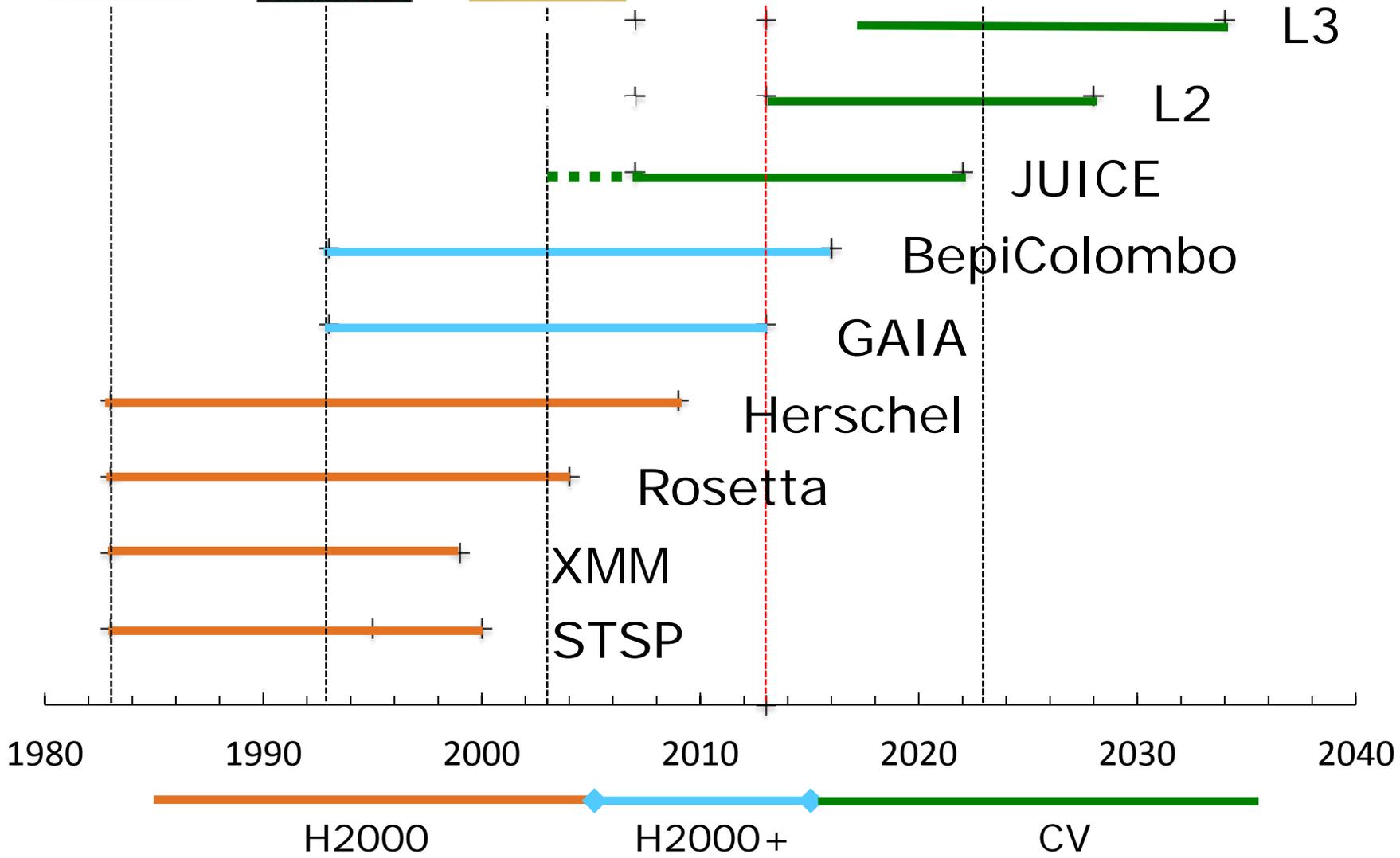
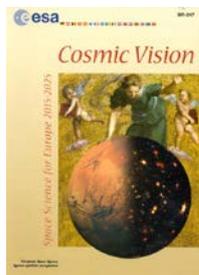
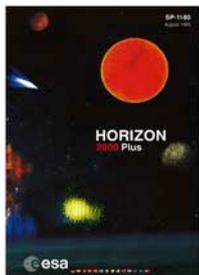
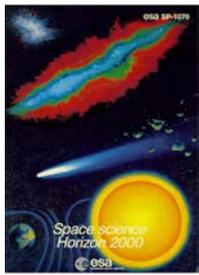
Science Programme building blocks

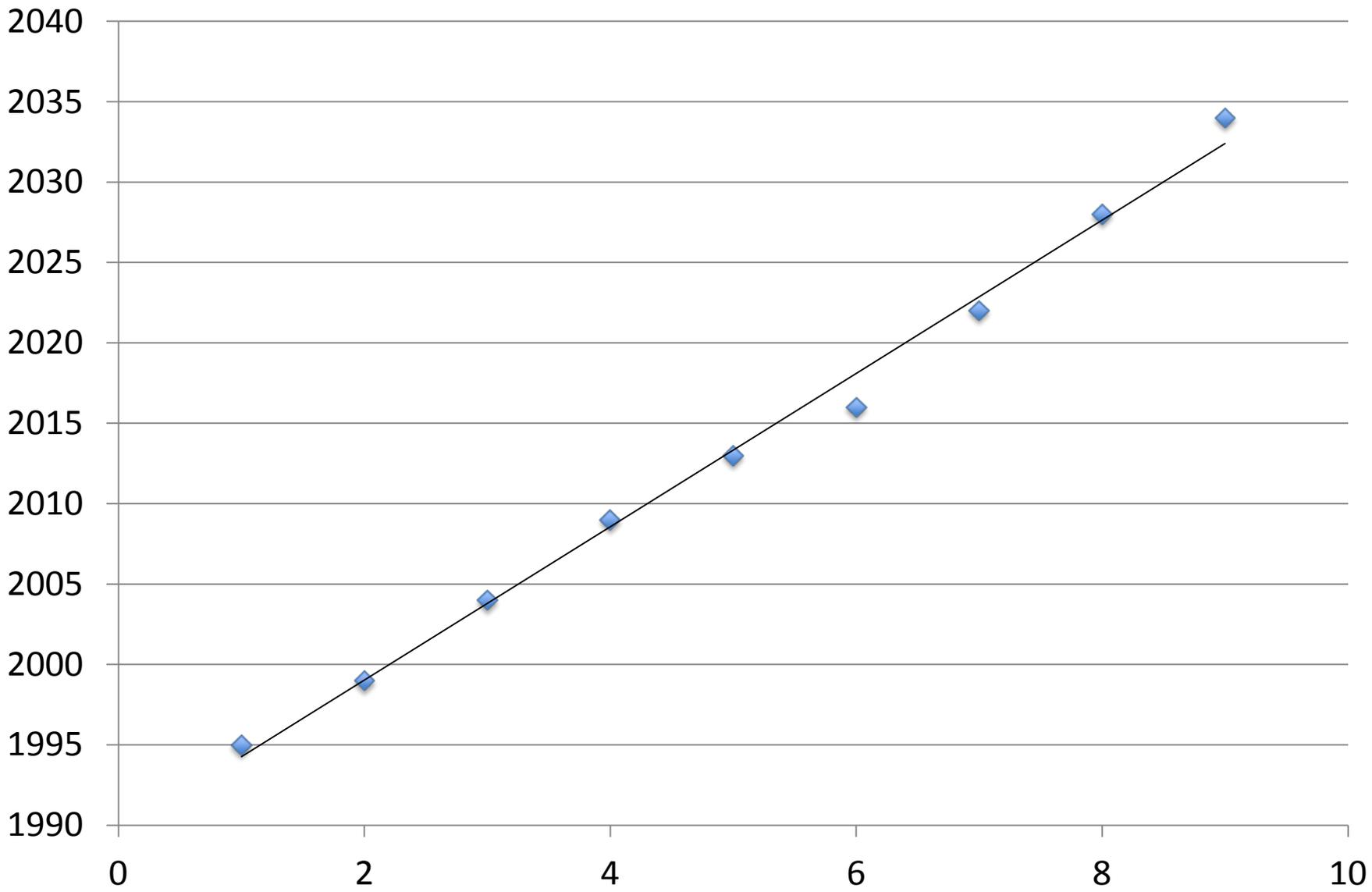
“Large” (Ariane 5-class) missions



1. High innovation content
2. European flagships
3. 1 B€ class
4. 3 per 20 years

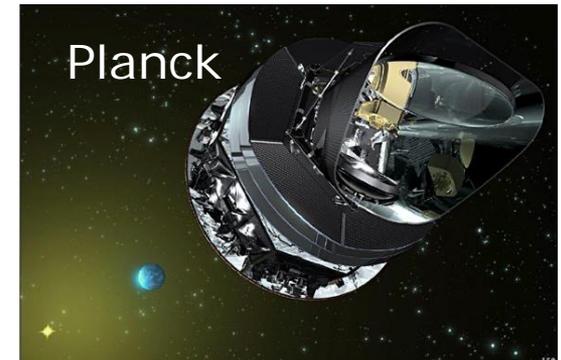


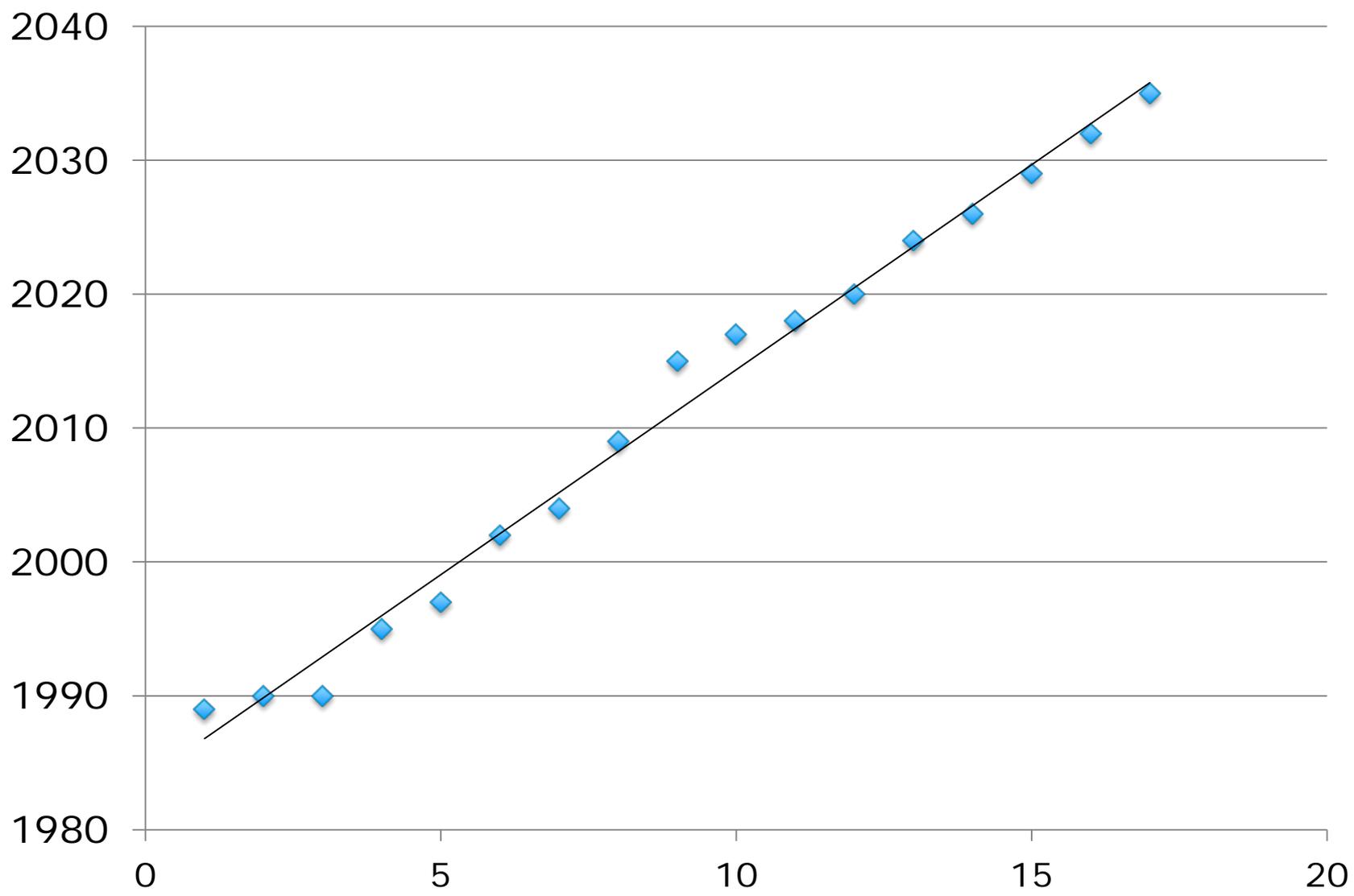




Science Programme building blocks “Medium” (Soyuz-class) missions

1. Makes use of current cutting-edge technology
2. Programme workhorse
3. 500 M€ class
4. 3-4 per 10 years



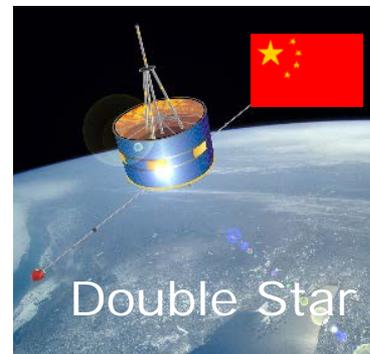
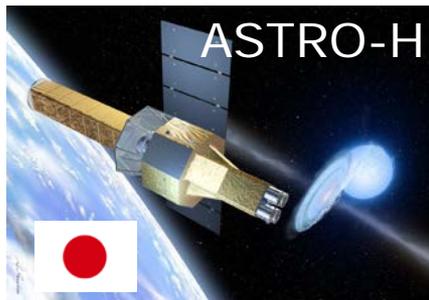


Science Programme building blocks

Missions of Opportunity



1. Moderate-size participation of the ESA Science Programme in missions led by partners
2. Format can vary
3. Increase flight and science opportunities for European scientists

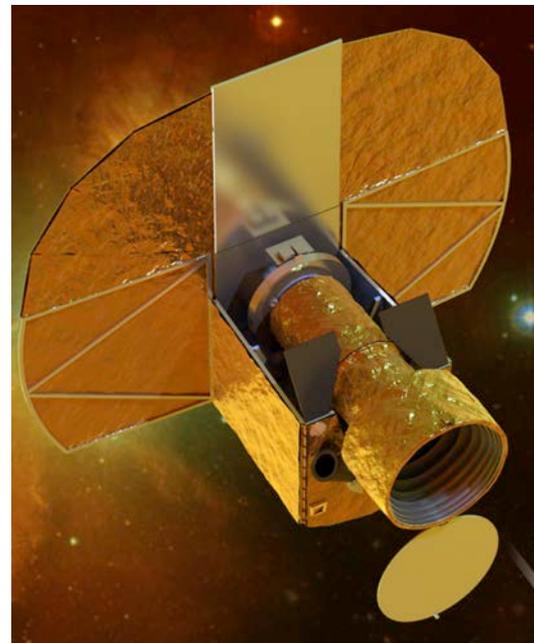


Science Programme building blocks

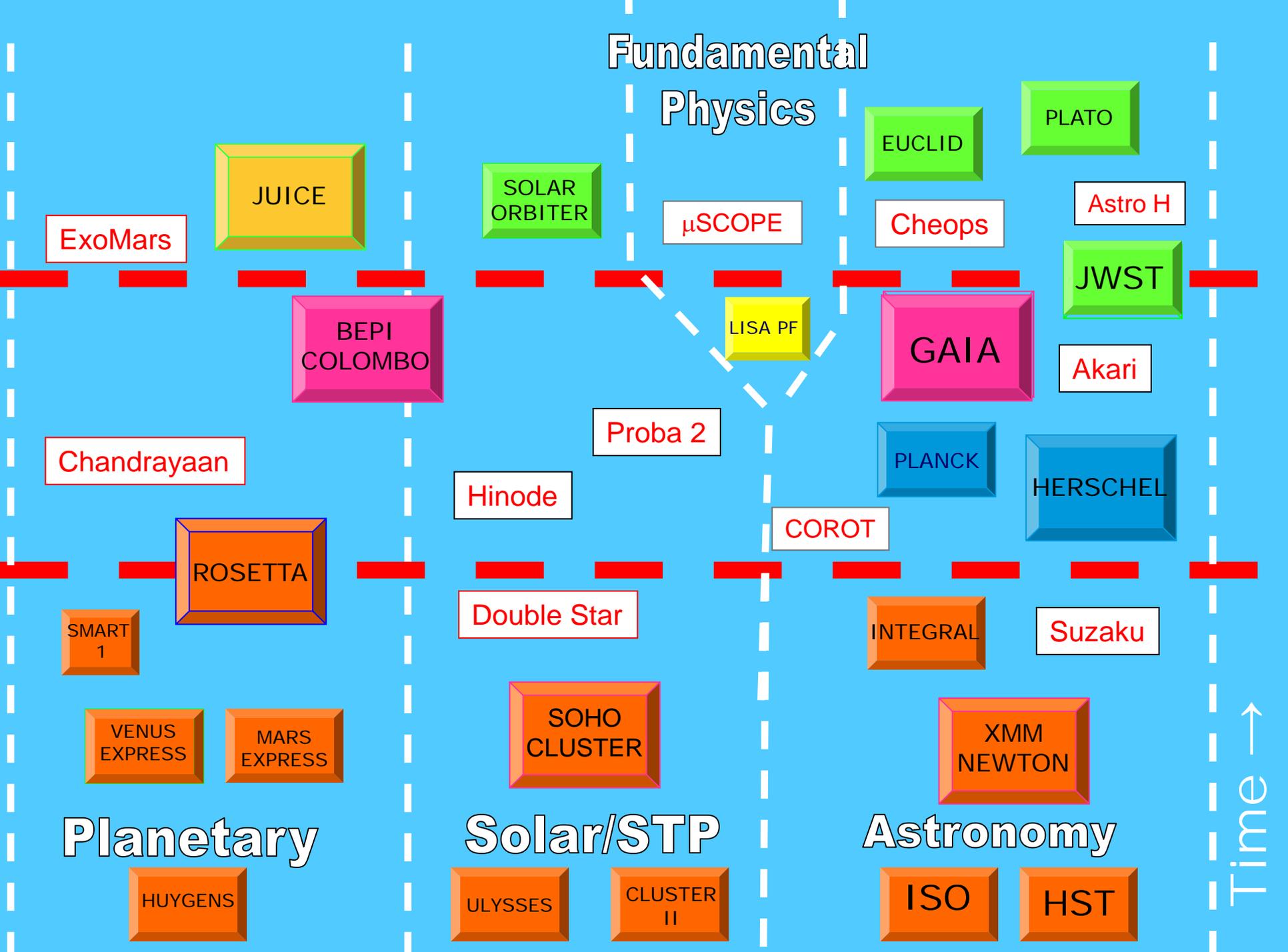
Small missions

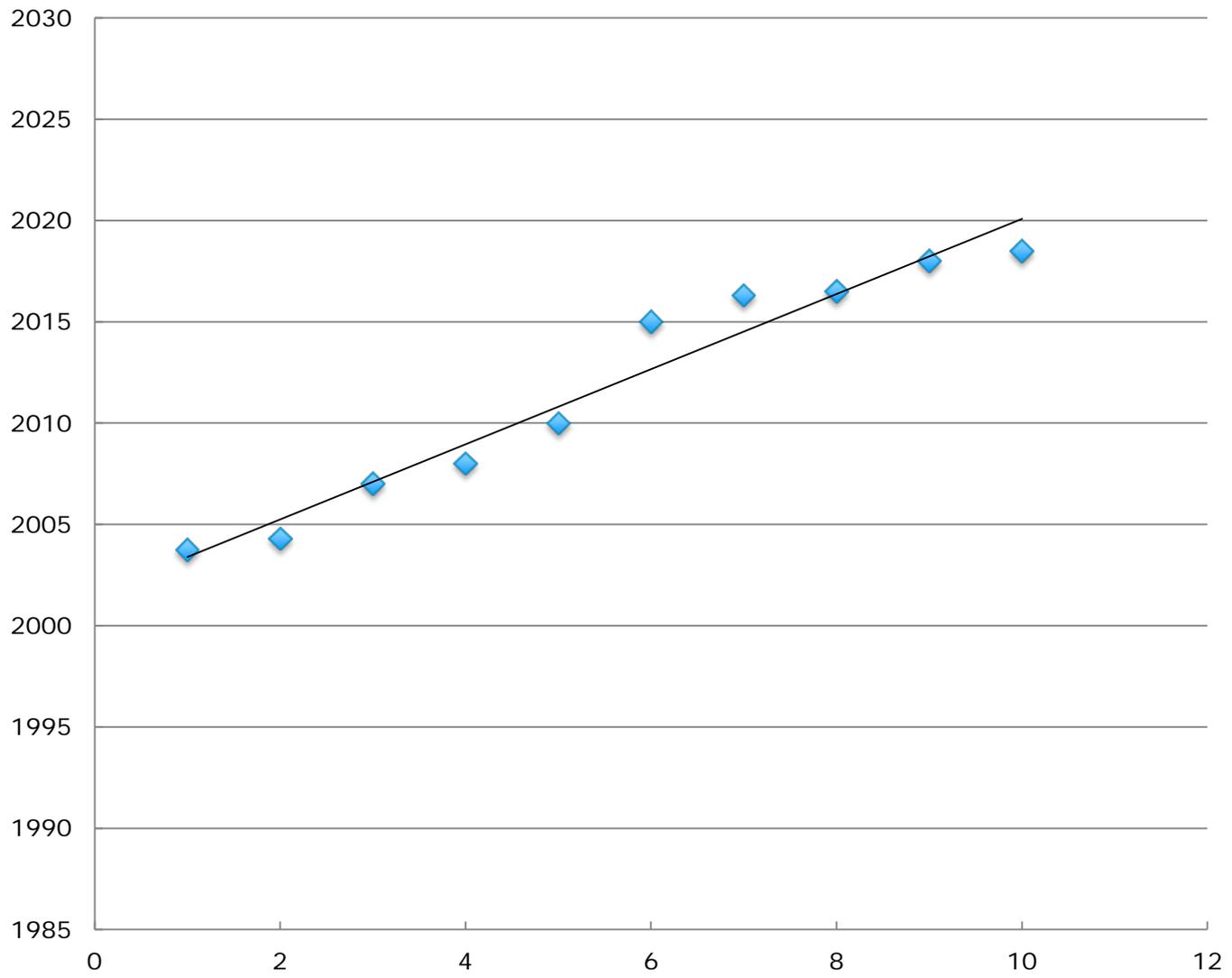


- a. New Programme element, still “experimental”
- b. Fast and with ESA CaC = 0.1 yearly budget
- c. Increase flight opportunities for European scientists
- d. Example: CHEOPS



Fundamental Physics







- a. Provide flexibility to fill “science gaps”
- b. Increase flight opportunities
- c. Fast developments
- d. Need to restrict technical ambitions
- e. Flexibility for cooperation:
 - With MS -> Cheops
 - With China -> New Mission !



Thank you!

www.esa.int/science

