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Department of Physics & Astronomy

UV Astronomy in Europe: The Current Scene and Future Propects

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ESA - 20 MEMBER STATES & GROWING

- 18 EU states (AT, BE, CZ, DE, DK, ES, FI, FR, IT, GR, IE, LU, NL, PT, PL, RO, SE, UK) plus NO & CH
- Cooperation Agreements: Estonia, Slovenia, Hungary, Cyprus, Latvia, Lithuania, Malta & Slovak Republic; Bulgaria negotiating; Discussions ongoing with Croatia
- Canada takes part in some programmes under a long-standing Cooperation Agreement

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OBJECTIVES

- Provide best space tools possible for scientific community to achieve & sustain excellence, leading the world with discoveries and innovation.
  - Choice of projects by scientific excellence
  - Selection by competition in a bottom-up process (peer review)
  - Stability for scientific research teams
  - Reference science framework for the community, national agencies and international partners
- Contribute to sustainability of space capabilities & infrastructures in Europe
  - Provide continuity to industry
  - Foster technological innovation
  - Attract bright minds to space activities
  - Provide perspective to launch services and operations

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BASICS OF THE SCIENCE PROGRAMME

- Programme is science driven
  - Bottom-up processes, relying on broad community input & peer review
- Programme is mandatory
  - All member states contribute pro-rata to GDP
- ESA funds spacecraft, launcher, spacecraft operations & part of the science operations
- Member States fund payloads and rest of science ops.
  - Missions are partnerships

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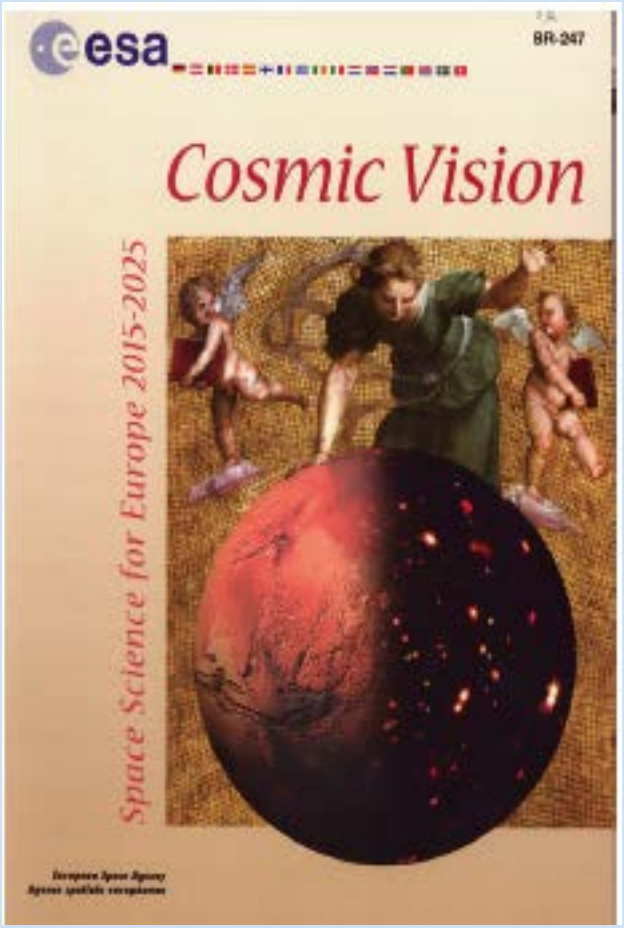
COSMIC VISION "GRAND THEMES"

- Follows on from "Horizon 2020" and "Horizon 2020+"
  - What are the conditions for planetary formation & the emergence of life ?
  - How does the Solar System work?
  - What are the physical fundamental laws of the Universe?
  - How did the Universe originate and what is it made of?
- Four different mission types: Large ("L"), Medium ("M"), Small ("S"), Opportunity ("O")



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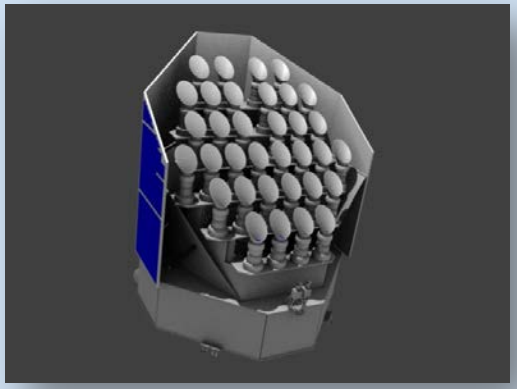
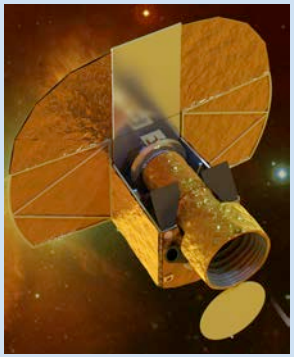


MISSIONS

- Large - high innovation content
  - European flagships, with non-enabling contributions from international partners
  - 1 B€ class, 1 every 7-8 years
- Medium - use of current cutting-edge technology
  - Can have substantial international contributions, or can be a contribution to a mission from another agency
  - 500 M€ class, 1 every 3-4 years
- Small – New element, still “experimental”
  - Fast and with ESA CaC = 50 M€
  - Increase flight opportunities for European scientists
- Opportunity – contribution to other agencies



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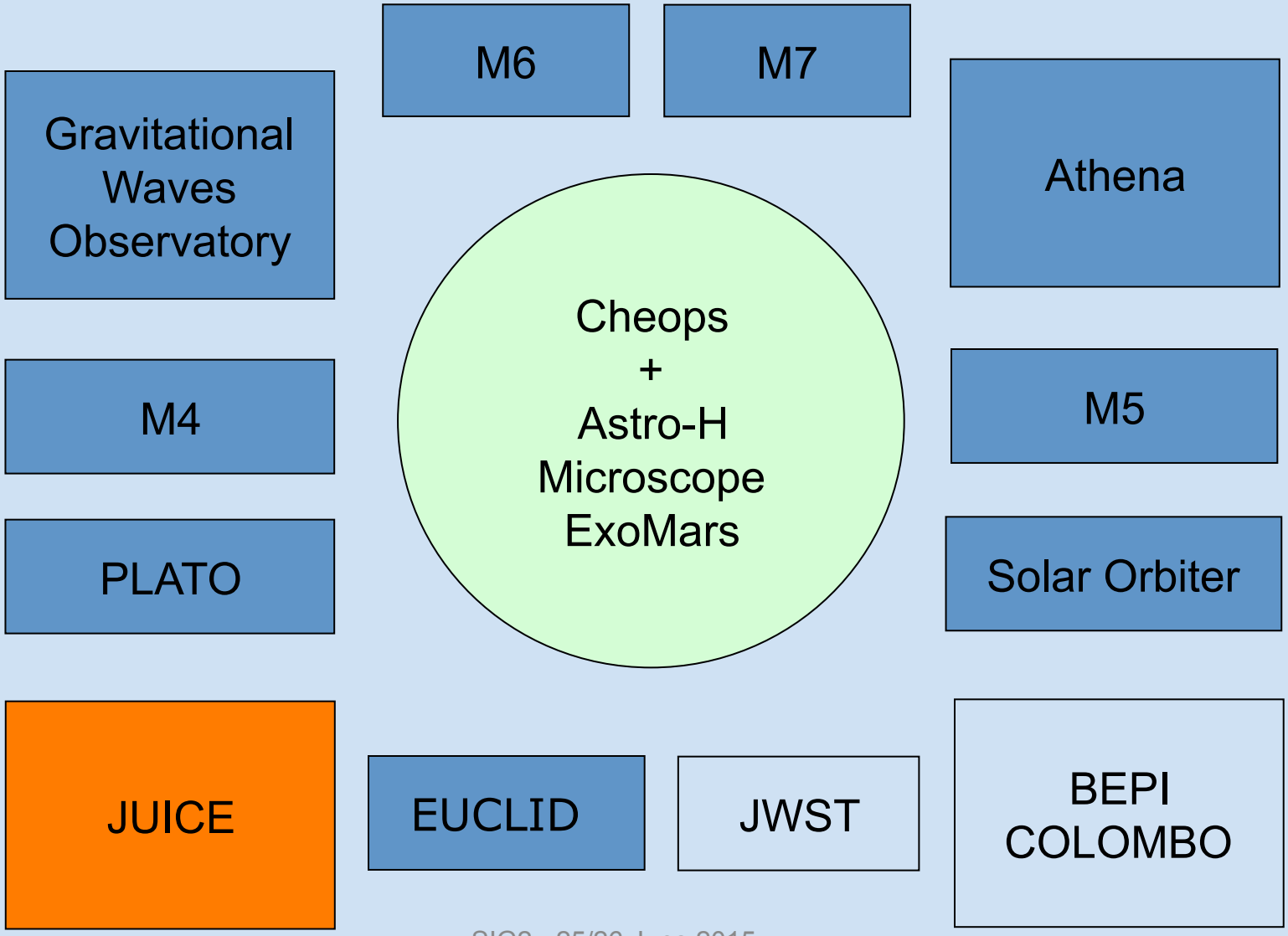
COSMIC VISION (2015-2035)



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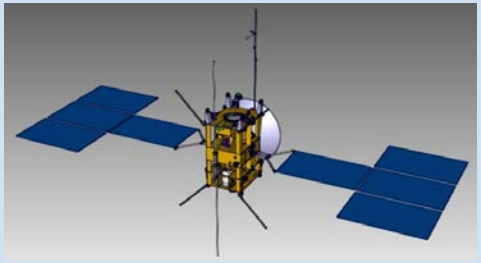
COSMIC VISION – THE MISSIONS

- The approved missions in the Cosmic Vision programme, in order of launch date, are:
  - Solar Orbiter (M1) – study of the SUN
  - CHEOPS (S1) – transits from known exo-planets
  - Euclid (M2) – search for dark energy

- The missions that have been selected, but have not yet received final approval are:
  - JUICE (L1) – Jupiter & its icy moons
  - PLATO (M3) – search for exo-planets down to Earth masses
  - Athena (L2) – X-ray observatory
- The Science theme has been selected for:
  - Gravitational wave mission (L3)



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Potential for future UV missions

- EUVO submitted to L theme selection process
  - Recognised low likelihood of success
  - Placeholder to keep UV in ESA consciousness
- Strong interest in UV remains present in EU
  - Arago proposal for M4
  - SIRIUS EUV proposal for S1 and S2
  - Other ideas under discussion
- M4 in down-select now
  - No UV interest, Arago did not make technical cut

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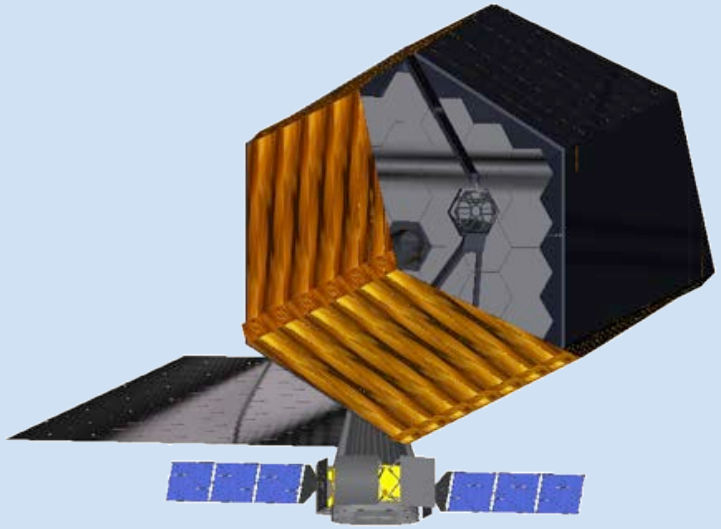
Future ESA prospects



- M5 call later in 2015
  - Arago will be resubmitted
  - Maybe other ideas, but not flagship scale
- Appetite within ESA hiearchy for flagship involvement
  - Along the lines of ESA contributions to HST & JWST
- We have set up an adhoc committee to promote EU links to ATLAST/HDST
- Future M calls provide capacity for ESA contributions