Cosmic Vision 2015-2025
Technology Plan

Industry day, Estec 21 November 2008

This file corresponds to one of a series of presentations made during this meeting. The complete set of presentations is available to download from:

http://sci.esa.int/CVIndustryDay2008

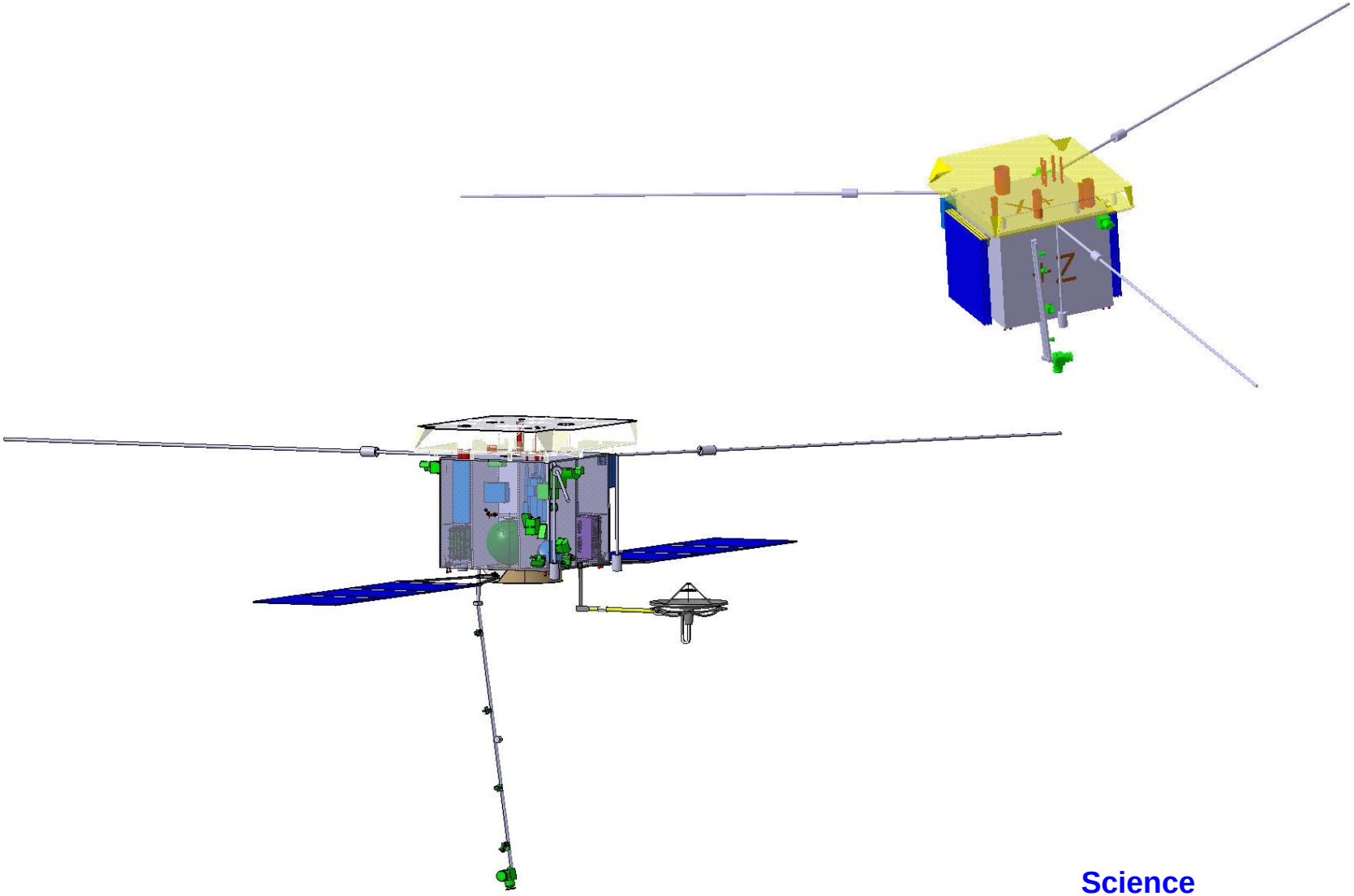
Directorate of Science
and Robotic Exploration

Overview of M-class missions

Current Industrial Work

- Preliminary Definition Phase B1 initiated in March 2008.
- Astrium Ltd, with Astrium GmbH and Alenia.
- Design Definition of Spacecraft, Heat Shield, Instrument Accommodation, **Definition of Technology Development Activities**.
- Programmatics, BepiColombo equipment re-use, Equipment Requests for Information, Schedule, Costing.
- Preliminary Requirements Review scheduled in Dec. 2008.
- System Requirements Review scheduled in Fall 2009.
- Slightly re-directed to fit **Cosmic Vision milestones**: down-selection end 2009, Phase B2/C/D start in January 2012, **target launch in January 2017.**

Spacecraft Baseline



Spacecraft Critical Items

- SOLAR GENERATOR
  - ✓ Hot case sized by temperature and solar flux
  - ✓ Cold case sized by far-sun power demand
    => New, dual-side design needed
    Heritage from BepiColombo? (Array / PVA / Cell / diodes etc)
- HIGH GAIN ANTENNA
  - ✓ Inherited from BepiColombo but must be adapted (Pointing Mechanism, coating, mounting frame), higher mass than originally budgeted
  - ✓ Crucial for critical data downlink. MUST BE FOLDED REPEATEDLY.
- HEAT SHIELD with its BAFFLES, DOORS, MECHANISMS
  - ✓ Openings, interfaces, diaphragms, materials - Already well underway
- AOCS SENSORS and FDIR ITEMS
  - ✓ Sun Sensors, adapted Star Trackers, specific FDIR
- THERMAL CONTROL MATERIALS
  - ✓ Heritage from BepiColombo? (HTMLI / Heat Pipes etc)
- HIGH SOLAR FLUX TEST FACILITY
  - ✓ Moderate size, to check filters, materials, interfaces and local effects

Payload Critical Items

- HEAT REJECTING ENTRANCE WINDOW
  - ✓ Development already well underway (ESA CPT)
  - ✓ To be continued: IR coating cycle life improvement, mounting frame design, qualification testing higher mass than originally budgeted
  - ✓ Crucial for thermal control of instrument and whole spacecraft
- DETECTORS
  - ✓ Some development underway (commercial visible-light APS under ESA CTP; EUV detectors under ESA TRP)
- POLARIZERS
  - ✓ Space application of LCVRs, getting going
- OTHER ITEMS
  - ✓ Very instrument and design specific (e.g. specific ASIC), not underway yet, expected to be covered by Instrument teams