

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>

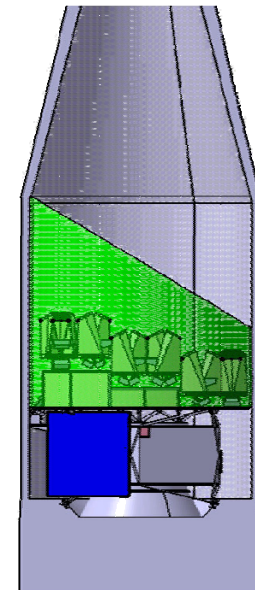
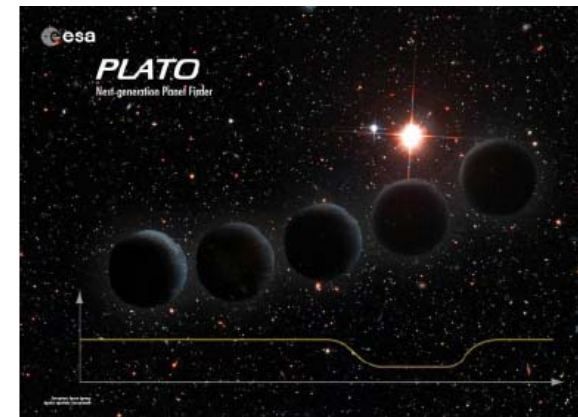
Overview of M-class missions

- **Industrial system studies:**

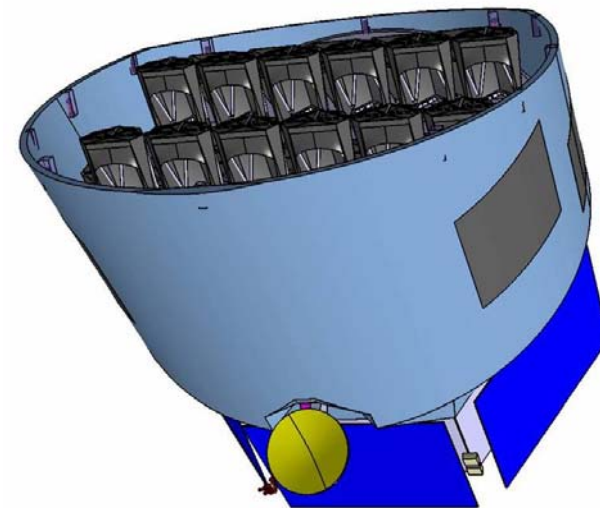
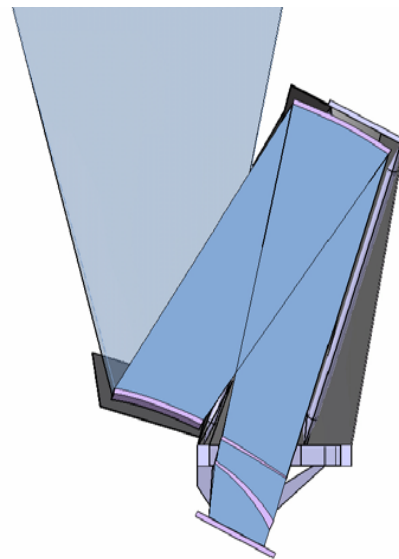
- ✓ Two parallel contracts, Astrium-F & TAS-I
- ✓ **'Staring mode' baseline from ESA study:**
- ✓ Two fields of view explored (e.g. 3 yrs + 2 yrs)
- ✓ SF2-1b launch, direct transfer to L2
- ✓ 28 identical telescopes
- ✓ Total collecting area $\sim 0.3 \text{ m}^2$, FOV $> 550 \text{ deg}^2$
- ✓ 4 CCD's / focal plane (compatible with realistic detector procurement constraints), 3.5k x 3.5k, 18 μm pixel
- ✓ Early procurement of CCD's required in 2010

- **National instrument studies:**

- ✓ Single consortium in place
- ✓ Work on instrument design, performance analyses and on board data reduction

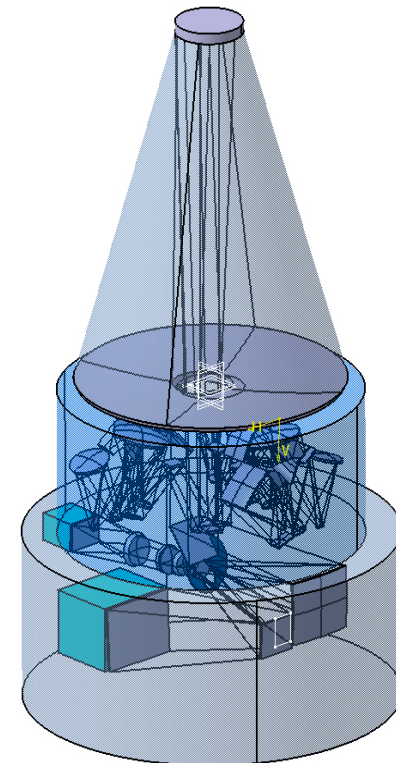


- **Relevant technology activities in the current plan**
 - ✓ High processing power DPU (onboard processing of science data)
 - ✓ Optimised high speed, high dynamic range CCD.
 - ✓ High speed, 16 bit CCD signal processor / ADC.



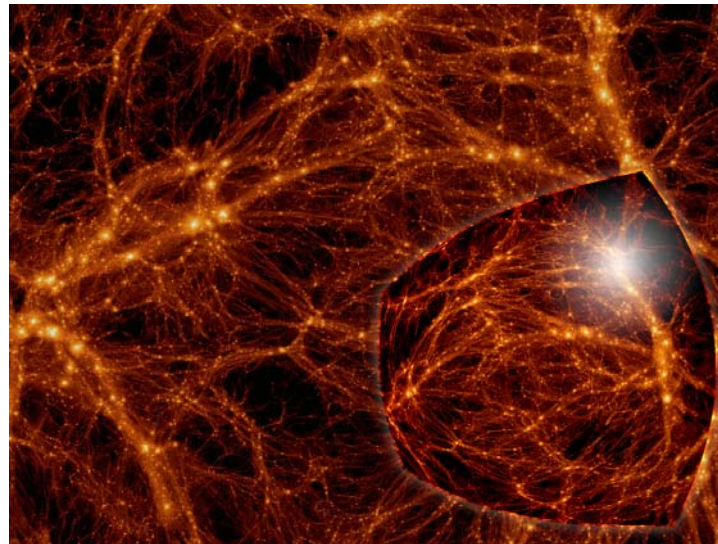
- **Industrial system studies:**
 - ✓ Two parallel contracts, Astrium GmbH & TAS-I.
 - ✓ Feature 1.2 m telescope.
 - ✓ Focal plane instruments:
 - VIS path with large focal plane for weak lensing.
 - NIR path for accurate wide-band photometry.
 - NIR path with 3 instruments for high resolution spectroscopy.

- **National instrument studies - Two consortia are in place:**
 - ✓ Euclid Imaging, on the VIS imaging and NIR Photometer channels.
 - ✓ Euclid NIS, on NIR spectrometer channel.

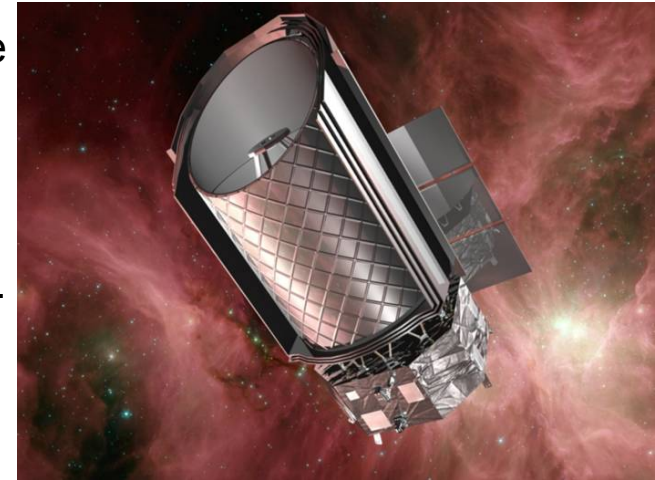


Relevant technology activities in T.D.P.

- ✓ K-band down-link capability from L2 (space and ground segment).
- ✓ CCD radiation characterisation (of relevance to VIS).
- ✓ Digital Micro-mirror Device for multi-object spectrometers (of relevance to NIS, evaluation of commercial component ongoing).
- ✓ NIR/SWIR large format array detector and associated ASIC read-out.

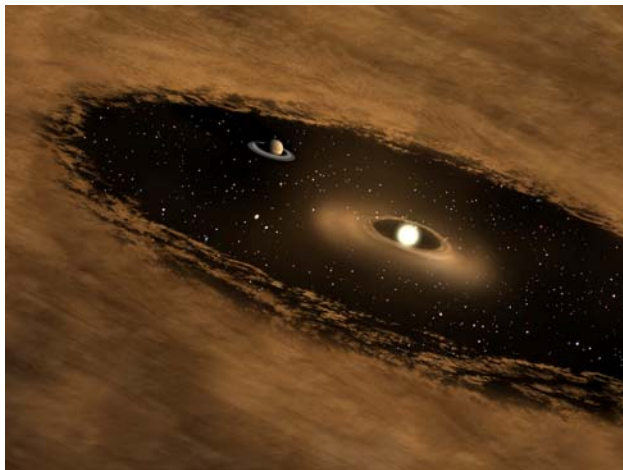


- **JAXA led mission. ESA provision: 3.5 m telescope + SAFARI instrument**
 - ✓ SPICA in “pre-project phase” in JAXA, 2 years Phase A study and review milestones in line with CV15-25 process.
- **Industrial studies on Telescope Assembly:**
 - ✓ Two parallel industrial contracts: TAS-F & Astrium-F.
 - ✓ Baseline design from ESA study: Ritchey-Chrétien design, ~5K operations, 700 kg, re-focussing mechanism at M2, ~ 5 yrs development schedule.
 - ✓ Coronagraph related requirements treated as delta to baseline telescope design.
- **SAFARI CDF study (ESA + instrument team) completed**
 - ✓ Four candidates for detector technology, down-selection expected by 2nd half 2009.
 - ✓ Interferometer mechanism to be traded-off.
 - ✓ Instrument hybrid sorption/ADR cooler.
 - ✓ Heat load budget to be consolidated with JAXA.



Relevant technology activities in T.D.P.

- ✓ Focusing mechanism for secondary mirror (3 DOF, operating at 5K).
- ✓ Light-weight mirror demonstrator breadboard (addressing specific critical areas).
- ✓ Telescope Assembly verification & Testing: demonstration of critical areas (e.g. verification of optical performance at representative temperature).



ACTIVITY	
■	NON_GEOMETRIC
■	RAD_ACTIVE
■	THIN_ACTIVE
■	ACTIVE
■	INACTIVE

