

# 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>**

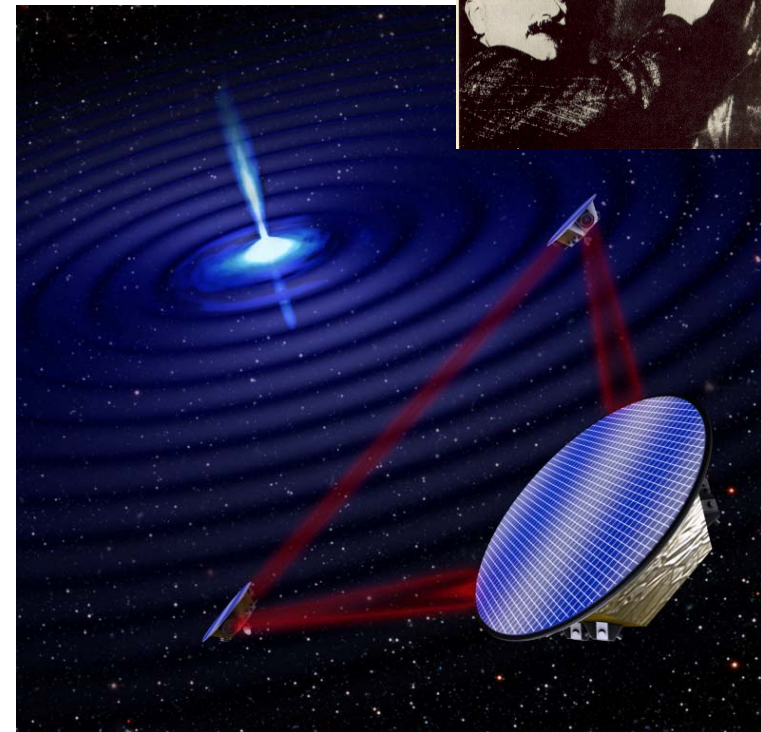
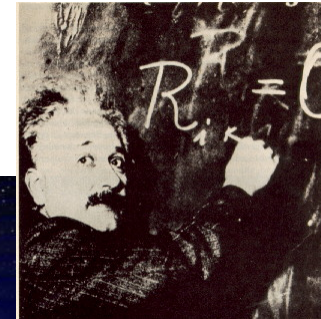
# Overview of L-class Missions

## LISA mission

- ✓ ESA/NASA collaboration
- ✓ Measurement of gravitational wave using laser interferometry
- ✓ Constellation of 3 spacecraft separated by 5 million km

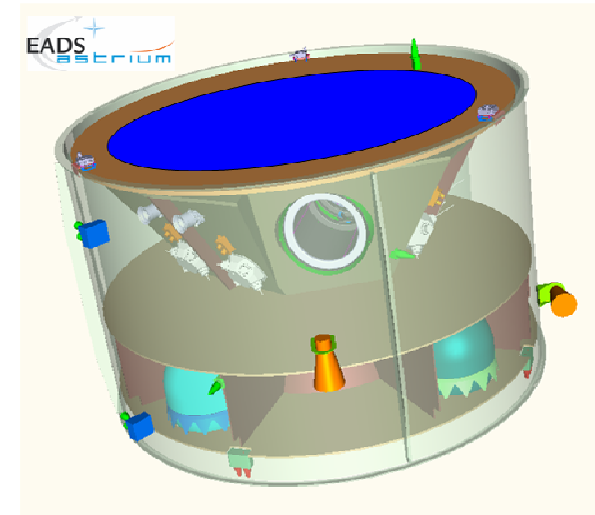
## Critical areas

- ✓ 6 drag-free test masses
- ✓ micropropulsion system
- ✓ **interferometrically** measuring variations in distance between couples of test masses at the **picometre** level
- ✓ **LISA Pathfinder technology validation** mission to be launched in **2010/11**



## Technology required by LISA

- Low-noise, high stability mechanisms (point-ahead and optical articulation)
- Highly stable materials for telescope assembly (CFRP, zerodur, inserts ...)
- Low-noise electronic components for GRS front-end electronics (voltage references ..)
- Light sources for charge management discharge (LEDs, laser diodes ...)
- Metrology system
- High-power laser system (1-2 W EOL, redundant)
- Outgassing & contamination issues
- Micropropulsion (lifetime characterization)



## LISA technology

- **The majority of LISA technology will be flight-validated by LISA Pathfinder (LPF)**
- **Main differences w.r.t. LPF:**
  - ✓ lower operative frequency band ( $10^{-3}$  to  $10^{-4}$  Hz)
  - ✓ Interferometry (polarizing vs. non polarizing)
  - ✓ Laser output power
  - ✓ Material stability (CFRP, ZERODUR ...)
- **Workshop on technology will be organized in Jan/Feb 2009 for consolidating Member State involvement**
- **CTP activities will be issued in 2008/2009**