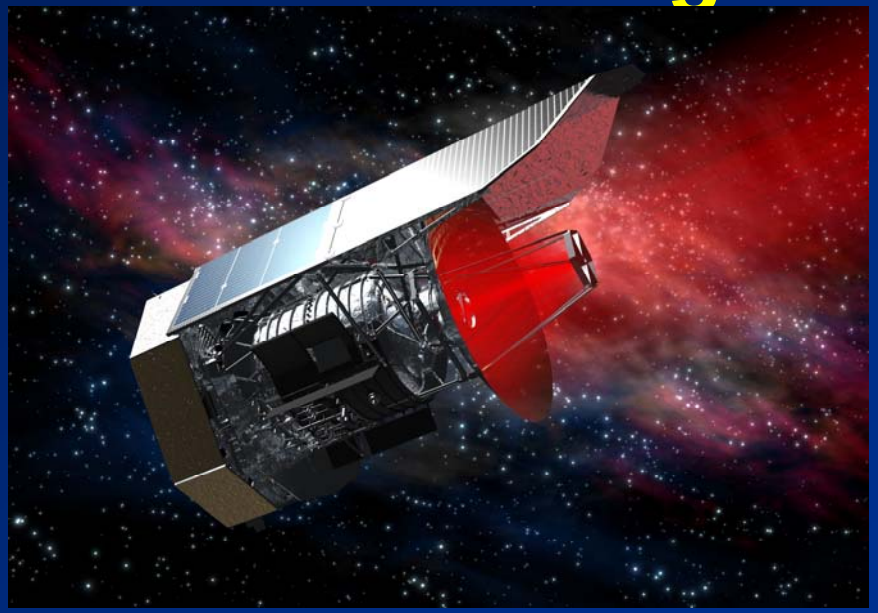
Major Challenges of the Herschel Payload Module & Satellite Test Program



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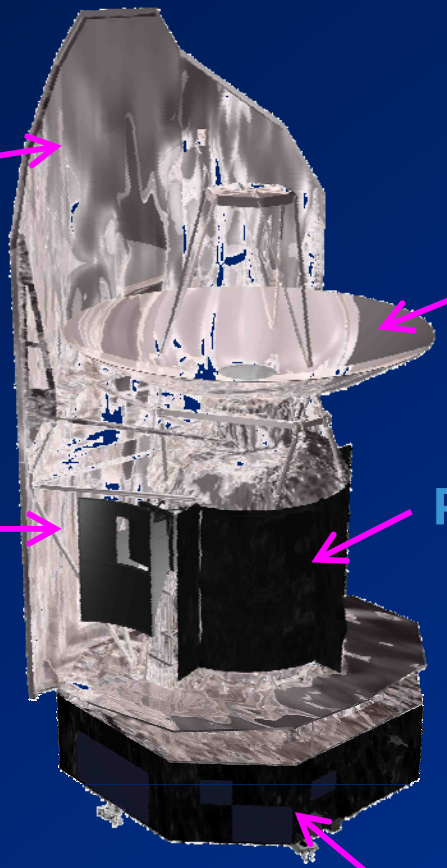
Herschel Satellite Overall Design



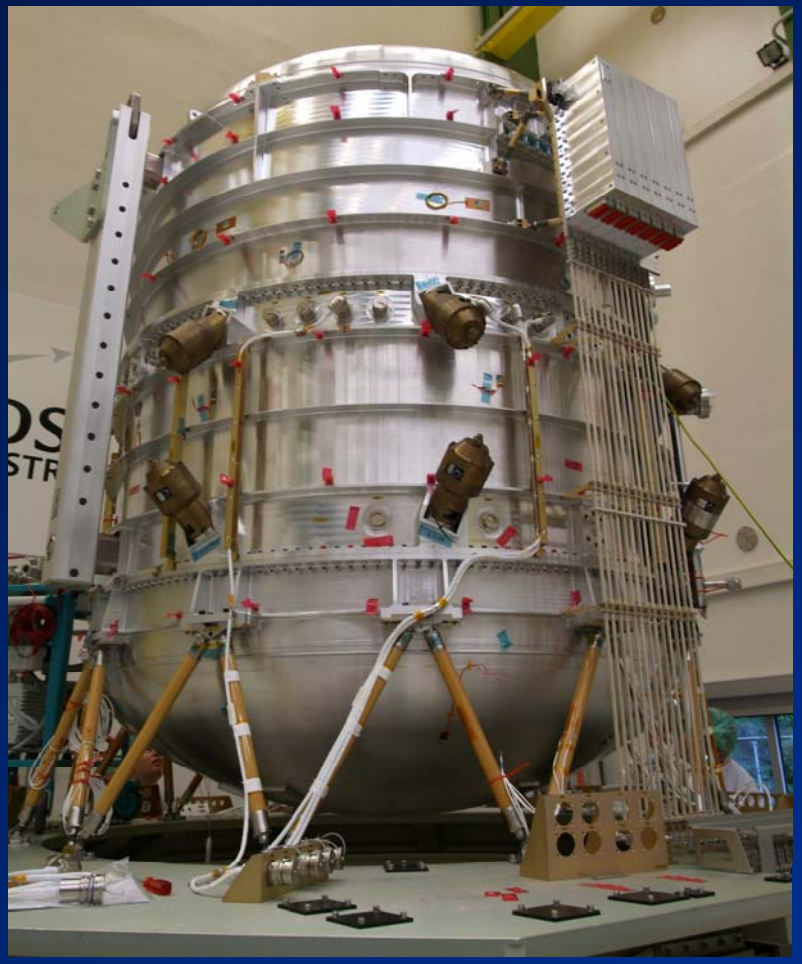
Astrium is responsible for:

- Extended Payload Module
  - cryostat
  - optical bench
  - scientific instrument harness
  - Solar Array & Sun Shade
  - telescope & SVM interface structure
- Satellite integration & testing
- Telescope

Herschel Satellite - Project Overview

- project starts in **April 2001**
- contractual price is **181 Mio. €**
- average number of people is **60**
- cryostat heritage is based on **ISO (**flown 1996 – 1998)
  - lifetime doubled from 27 to 55 months by nearly the same amount of helium (2.250 vs. 2.367 liters)

Challenges of the Cryostat



- extreme isolation of helium tank
  - external heat load on He2 tank 40 mW
- 2.367 liter super fluid liquid helium
- instrument & cryostat control harness with about 8.600 cables & shields (wire diameter 0,1 mm)
- precise adjustment of instruments

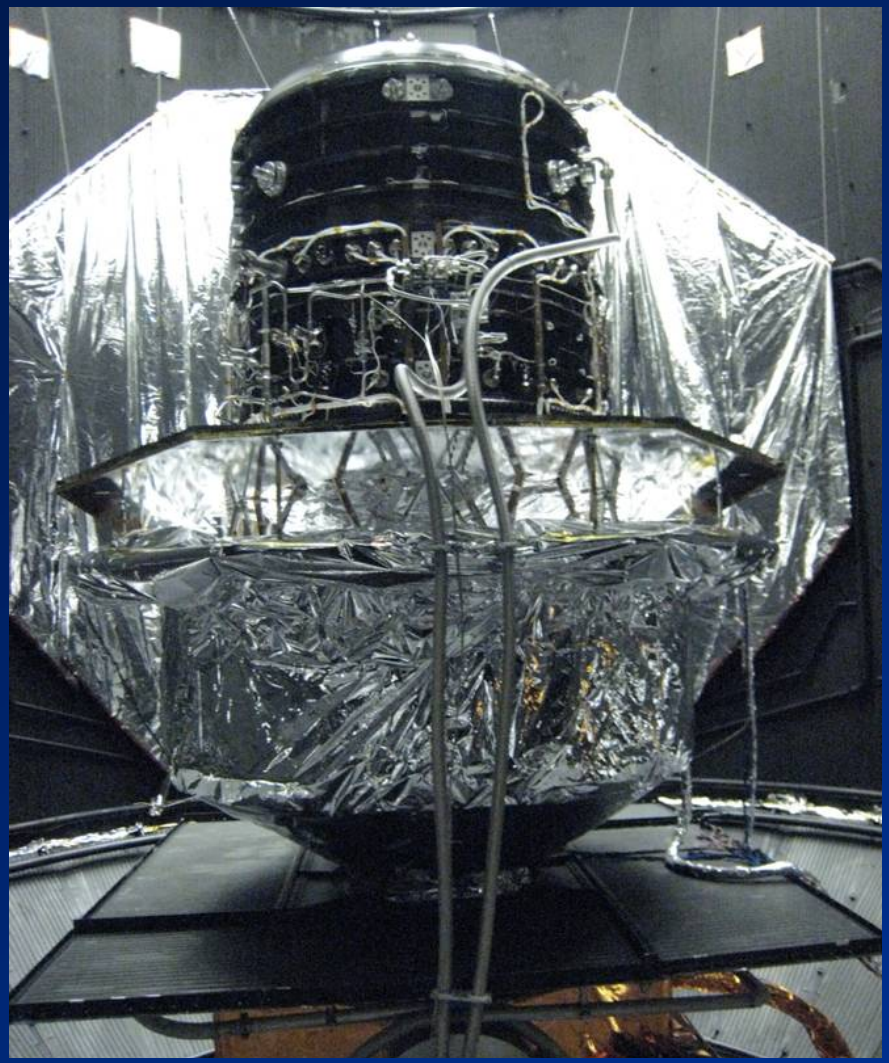
Challenges of the Telescope

- novel silicon carbide technology
- dimensions
  - diameter: 3.5 m
  - weight: 350 kg
- build by joining 12 pieces together

Challenges of Satellite AIT (Assembly, Integration and Testing)

- S/C assembly & integration with super liquid helium filled cryostat tank
- complex TB/TV test due to helium vaporization

Today's and Future Herschel Key Events



- mating payload & service module (done)
- integration of telescope & solar array / sun shade
- satellite acceptance test program
- flight acceptance review
- launch in Kourou