

Zukünftige Programme

Programm-Status und Möglichkeiten der Zusammenarbeit

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DLR - Raumfahrt-Industrietage in Friedrichshafen
13./14. Mai 2009

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Übersicht der Programme

■ ESA:

- Science Missions (incl. Cosmic Vision Program)
- Earth Explorer Program

■ ESA / Eumetsat:

- Post-EPS Programm (Metop Follow-On)

■ DLR:

- DEOS – Deutsche Orbitale Servicing Mission

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ESA Science Missions

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ESA Science Missions: Roadmap 2010 to 2020

Present status, launch dates and Cosmic Vision (CV) selection uncertain

- 2011 LISA Pathfinder / LTP Earth/Sun L1
- 2014 JWST / NIRSpec Earth/Sun L2
- 2014 Bepi Colombo Mercury
- 2015 ExoMars/Rover Mars

- 2016 CV M1 (Solar Orbiter) 0.3 AU
- 2017 CV M2 (Plato/ Euclid/ MacoPolo/ Crosscale)
- 2018 CV M3 (Plato/ Euclid/ MacoPolo/ Crosscale)

- 2020 L1 (LISA, IXO, JGO)

- After 2020 ExoPlanets (DARWIN), Saturn/Titan Mission

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Major ESA Science Missions

In preparation in Astrium Friedrichshafen

- LISA LFP LISA Technology LTP
(Impl. Phase; launch 2011)
- NIRSpec Infrared Spectrometer
(Impl. Phase; launch 2013 on NASA, JWST Telescope)
- LISA Laser Gravitational Wave
(Definition Phase 2010; launch 2020)
- EUCLID Dark Energy Probe
(Candidate for CV M1 in 2016/17)
- Marco-Polo Asteroid Mission
(Candidate for CV M1 in 2016/17)
- Plato Exo-Planets Detection
(Candidate for CV M1 in 2016/17)
- IXO X-ray Telescope
(Candidate for CV L1 in 2020)
- Jupiter Mission To the Jovian System
(Candidate for CV L1 in 2020)

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ESA Cosmic Vision Program

Astrium Friedrichshafen as Prime

■ Technologies Needs and Cooperation Potential

■ EUCLID Mission:

- Precision Pointing / AOCS (relative error < 25 milli-arcsec)
- Large data volumes and extensive on-board data handling, compression and K-Band-communications equipment (Specs. TBD)
- Large area Infrared-Detector-Arrays (8 arrays for Near Infrared Spectrometer NIS and 18 for Near Infrared Photometer NIP) and ASIC read out
- Cryogenic (100 K) refractive optical systems (lens based etc.)
- Already technology developments ongoing in institutes and KMU for data processing and detectors (GAIA heritage in institutes AIM, Sofradir and Selex).
- Opportunity: Cryogenic systems / optics

- **For all other Cosmic Vision candidates please refer to ESA's technology programme. Contact in Astrium: Ulrich Johann)**



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ESA Earth Explorer Missions

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Next Earth Explorer Missions

- 3 Missions selected in January 2009 at Lisbon Conference for Phase A studies:

- **BIOMASS**

- P-Band radar land mission

- **PREMIER**

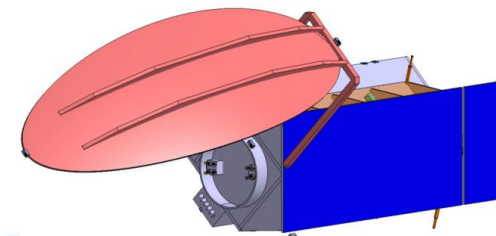
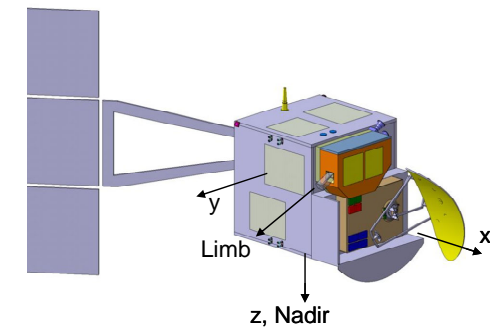
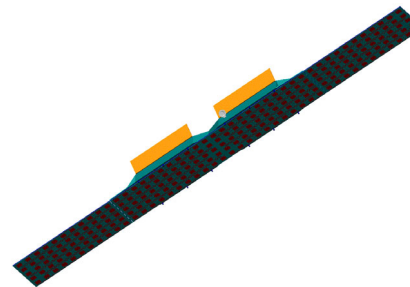
- Atmospheric mission with IR and MW limb sounder

- **CoReH2O**

- Snow detection mission with X- and Ku-Band radar

- Final mission selection in early 2011

- B-C/D Programme start late 2011



Next Earth Explorer Missions

Technology Needs and Cooperation Potential

■ CoReH2O

- Multi feed array (MFA)
 - Ku-Band MFA BB
 - X-Band MFA BB
- RF high power switches and beam forming networks
 - Development and BB of beam forming network subsystem and/or the latching circulators
- Ku-band HPA
 - BB of Ku-band HPA

■ PREMIER

- IRLS / IRCI Band A (LW) detector
- IRLS / IRCI Data Processing, in particular Spatial Co-addition with optical breadboarding

■ BIOMASS

- P-Band sub-array: RF radiators and feed lines
- System calibration components, design and development
- Ground processor and associated algorithms

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Post-EPS Programm

Metop Follow-On

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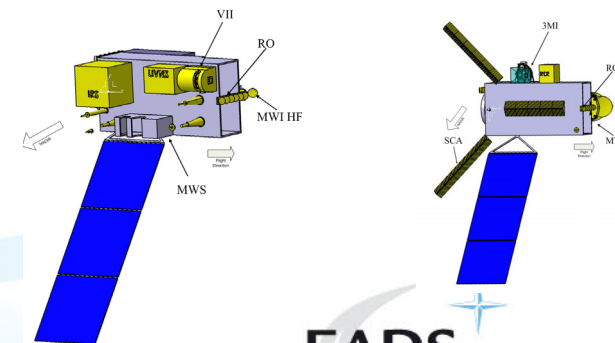
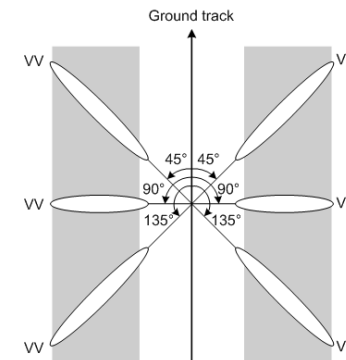
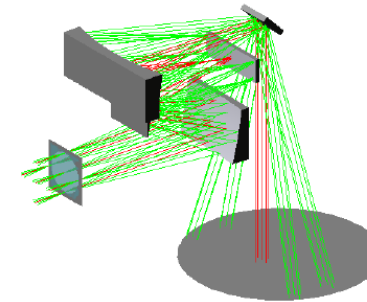
Post-EPS Programm

■ Payload

- 10 missions to implement :
 - 5 Optical Missions : **IRS**, VII, 3MI to study and UVNS, RER
 - 3 Passive Microwave Missions : MWS, MWI and RO
 - 1 Radar Mission: **SCA (Scatterometer)**

■ Space segment

- Main Trade-Off: Single satellite vs. Multiple satellite concept



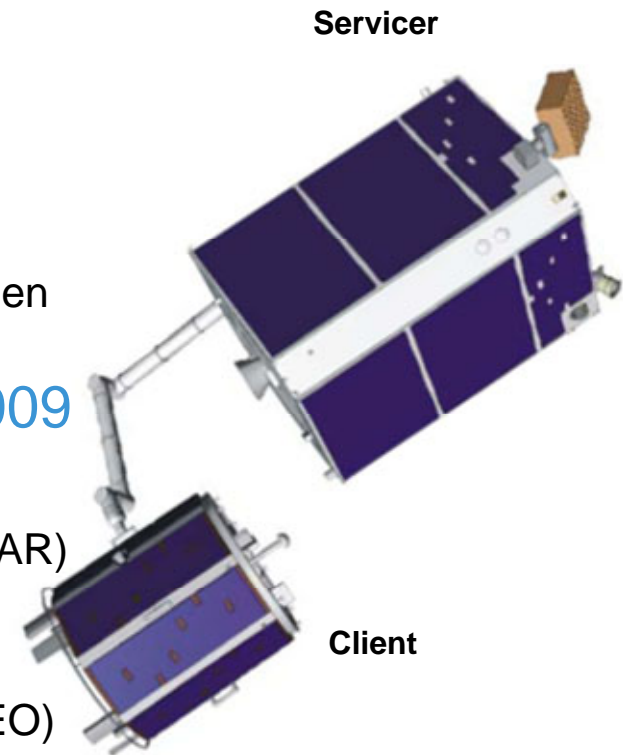
Post-EPS Programm

- Technologie-Bedarf und Kooperations-Potentiale
 - Scatterometer
 - Antenna
 - High Power Amplifier
 - Rotary joint for RFSCAT
 - IRS
 - MCT photovoltaic (PV) detectors for all spectral bands.
 - Active detector cooling with redundancy.
 - On-board processing: Decimation of IFGs, no on-board Fourier transformation.

DLR: Nationale Vorhaben

DEOS: Deutsche Orbiting Servicing Mission

- Technologie Demonstrations- und Verifikations-Mission
- Primäre Ziele:
 - Anflug und Einfangen eines mitgebrachten, „unkooperativen“ und taumelnden Satelliten
 - Gezielter Wiedereintritt und Verglühen eines über einen Manipulator gehaltenen Satellitenverbundes
- Phase B Ausschreibung erwartet in Mai 2009
- Technologie-Bereiche:
 - Passive und aktive optische Instrument (VIS und LIDAR)
 - Detektor-Technologien
 - Bilddaten-Kompression / Analyse-Programme
 - Space-to-Space Satelliten-Kommunikations (LEO-GEO)
 - Guidance, Navigation and Control Algorithms



Ansprechpartner

- Zukünftige Programme, Optische und Mikrowellen Instrumente

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