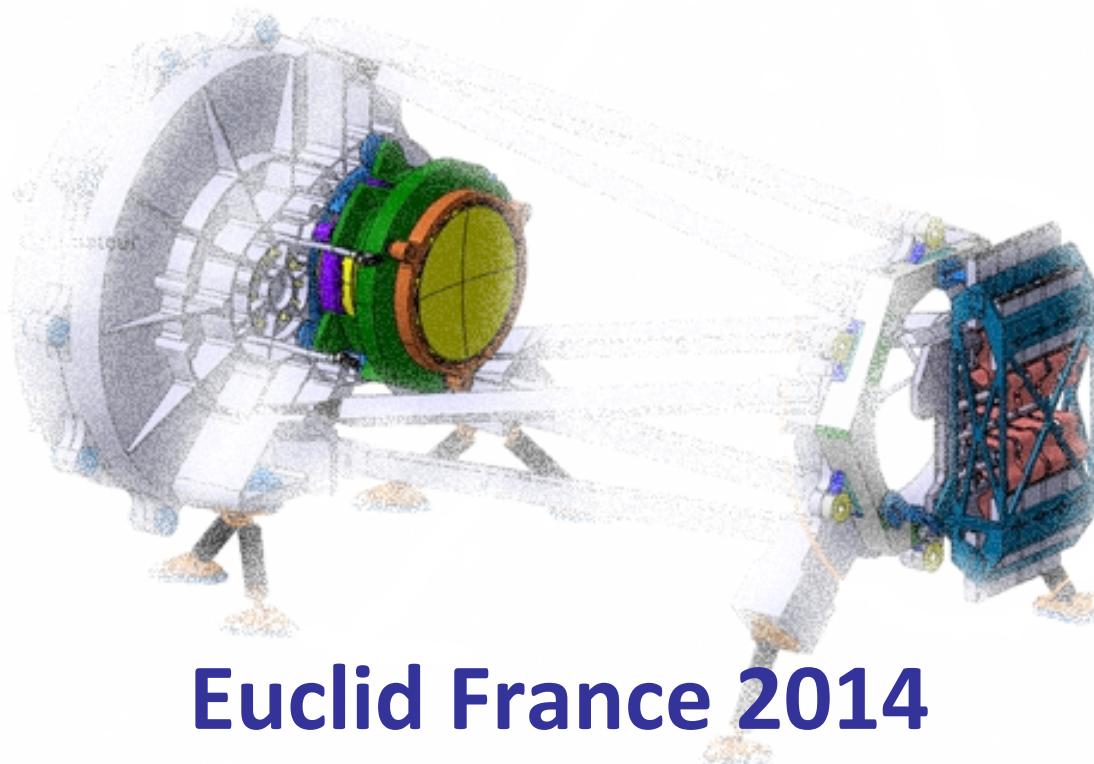
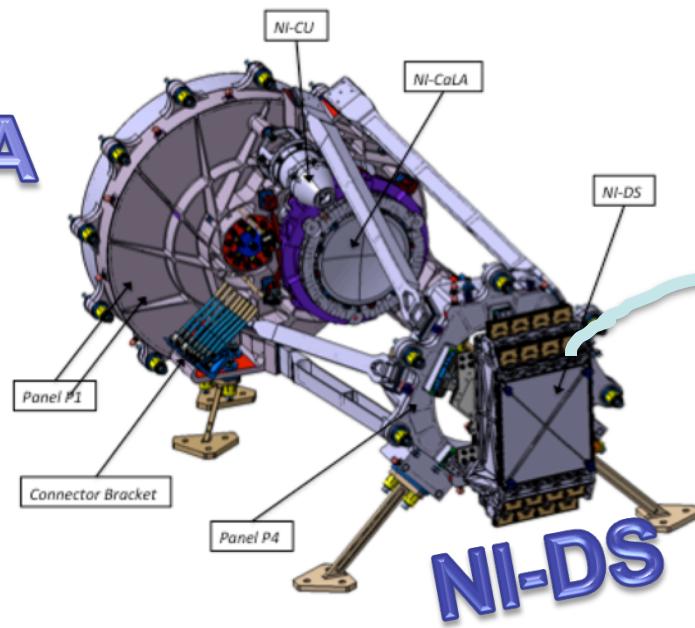
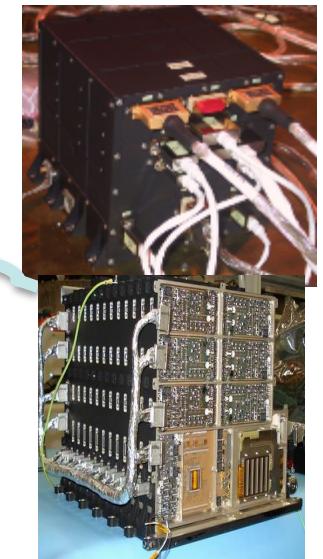


NISP Progress Status

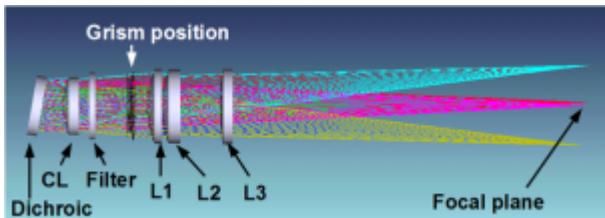


Euclid France 2014
4/5 December @ Lyon

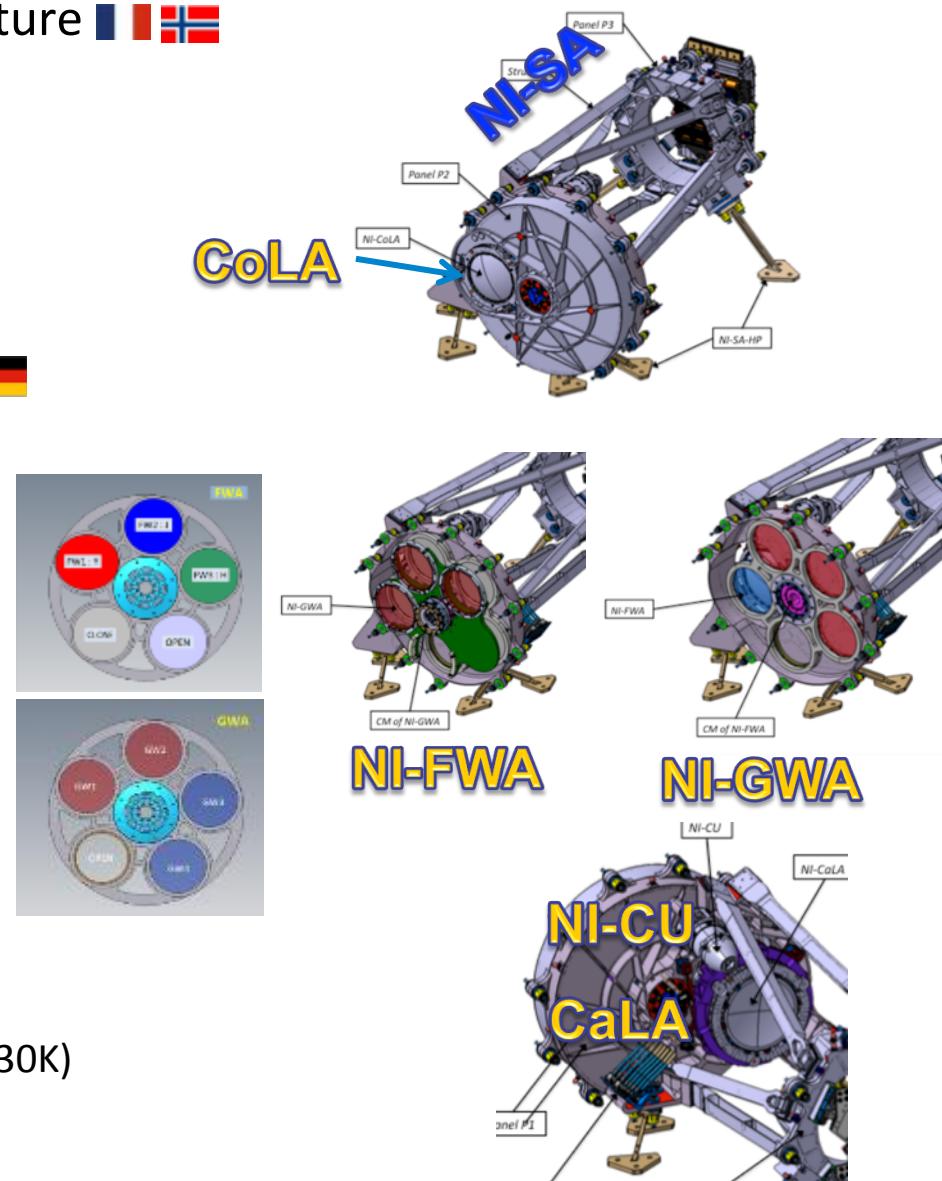
- **NISP is a Large Field Photometer & SlitLess Spectrograph [0.9-2.0]μm**
- 0.55Deg²; MASS < 160Kg ; POWER < 200W; TELEMETRY < 240 Gbit/day;
1mx0.5mx0.5m
- 3 main assemblies :
 - ❖ NI-OMA : Opto Mechanical Assembly in the satellite Cold PayLoad Module
 - ❖ NI-DS : Detection System mounted on NI-OMA
 - ❖ NI-WE : Warm Electronics in the warm satellite Service Module

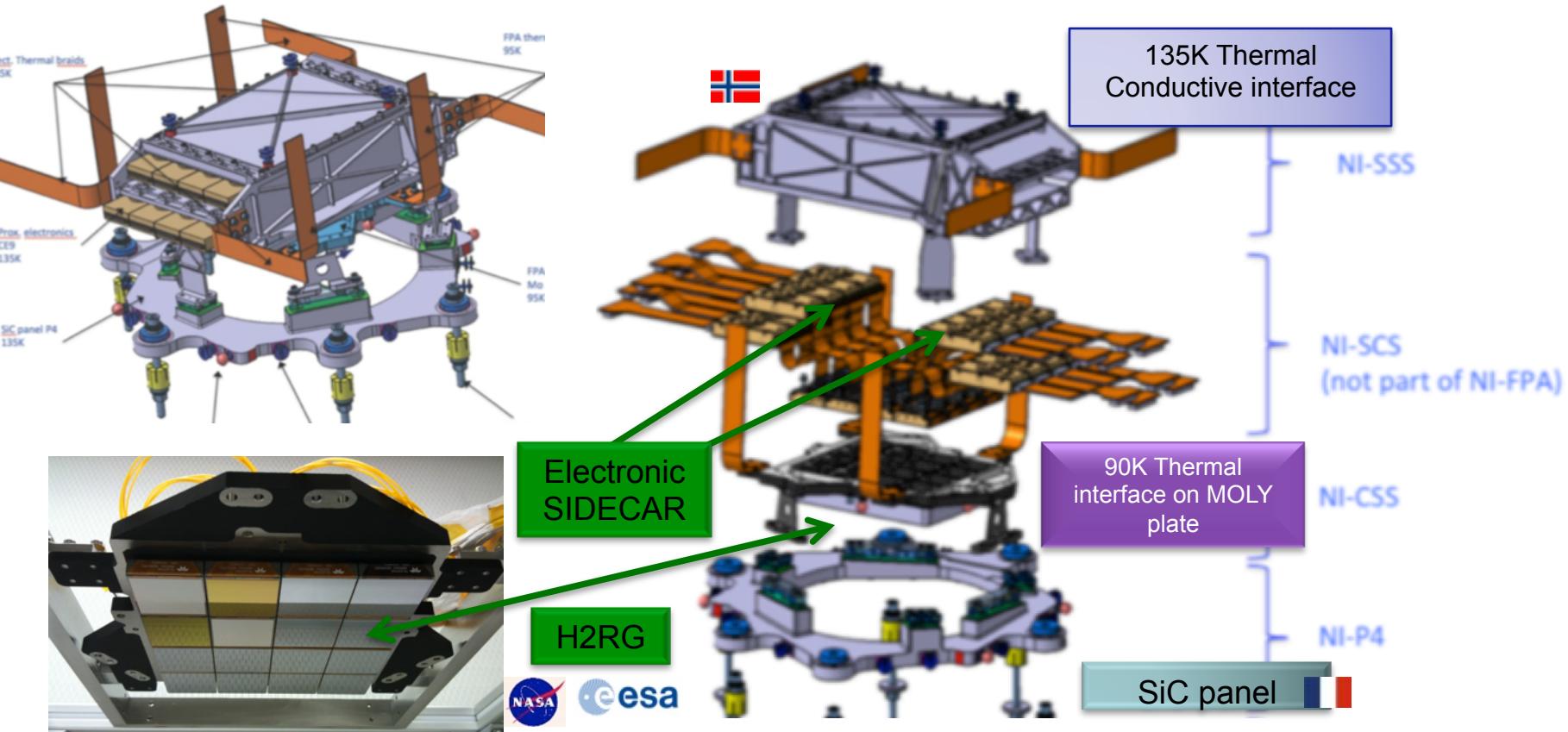
NI-OMA**Harness****NI-WE****Cold Payload Module****Warm Service Module**

- NI-SA : Structure Assembly ; SiC Structure   
- NI-OA : Optical Assembly 

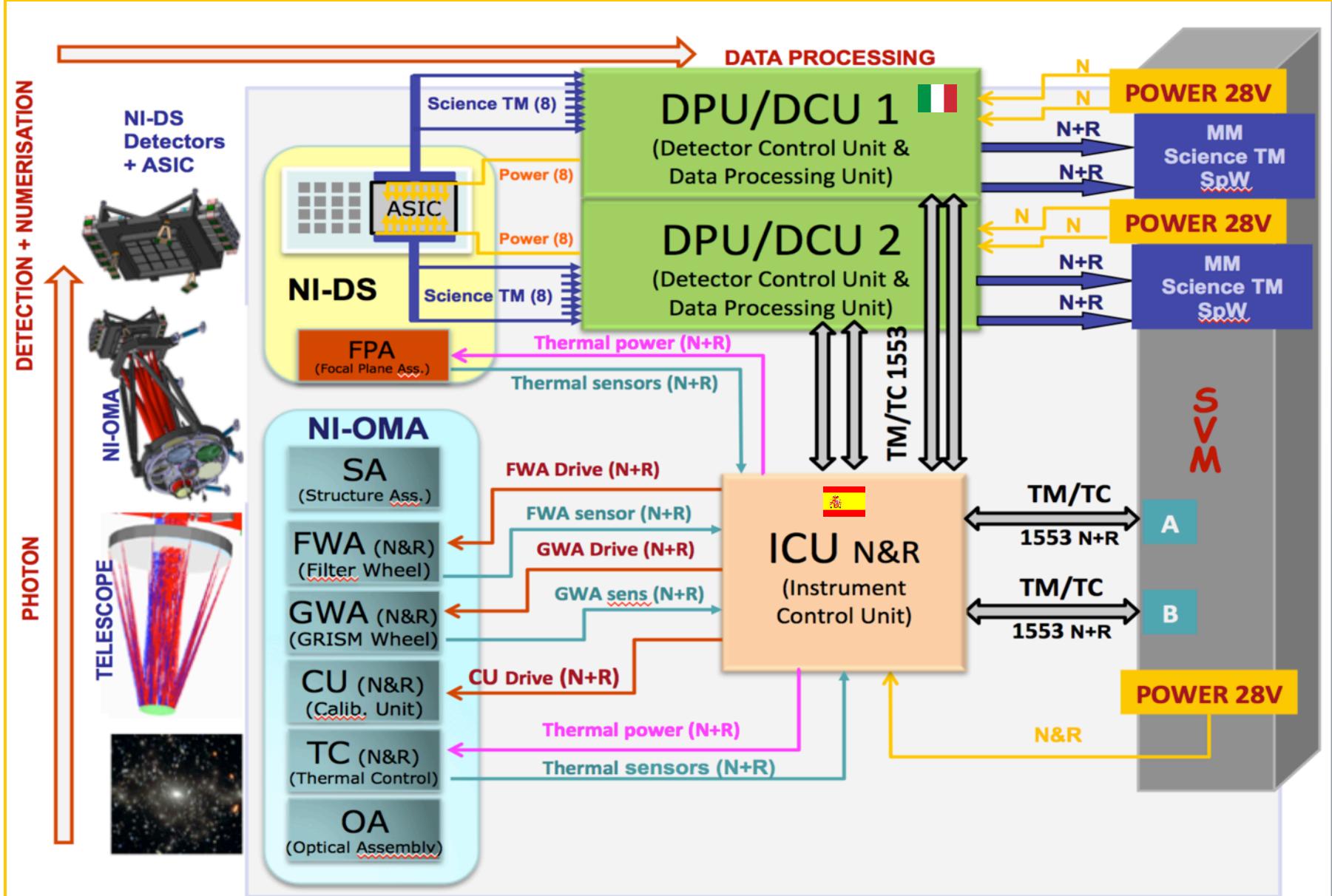


- ✓ CoLA : Corrector Lens Assembly 
- ✓ CaLA : Camera lens Assembly 
- NI-FWA : Filter Wheel Assembly 
 - ✓ Cryo mechanism  
 - ✓ 3 Filters + CLOSE + OPEN 
- NI-GWA : Grism Wheel Assembly 
 - ✓ Cryo mechanism  
 - ✓ **4 Grisms (3 red; 1 blue) + OPEN**  
 - ✓ 0.92-1.3um; 1.25-1.85um
- NI-CU : Calibration Unit 
 - ✓ 5 wavelength's
- NI-TC : Thermal Control  
 - ✓ To control the optics at +/-0.3K all life ($\approx 130K$)

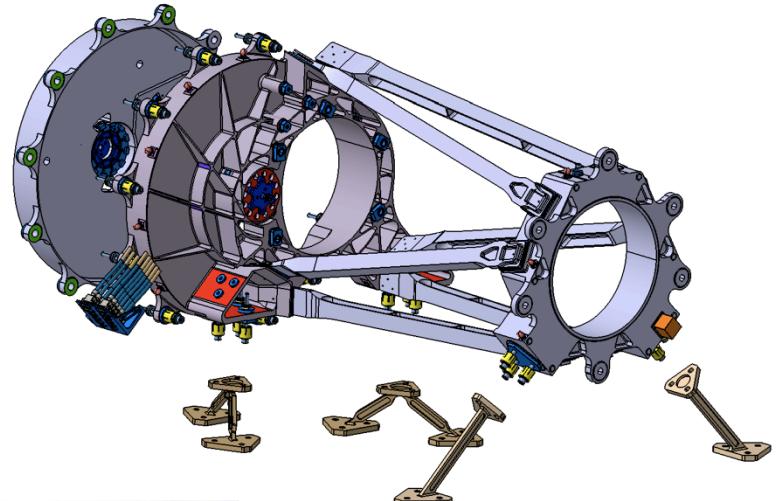
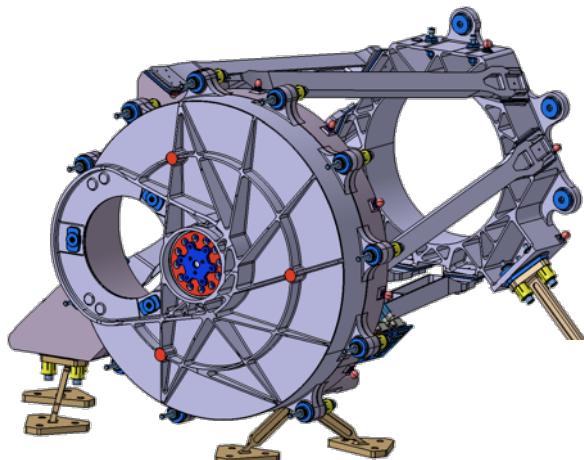




- NI-SCS (Sensor Chip System) : 16 H2RG Detectors with Molybdenum package + Flex + SIDECAR ASIC (2Kx2K with 2.3 μ m cutoff)
 - ❖ Provided to the consortium by ESA (development and qualif) & by NASA for FM

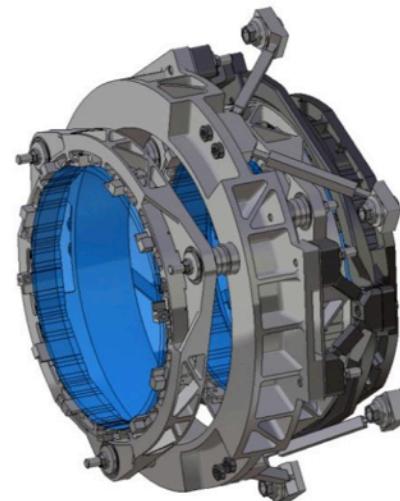
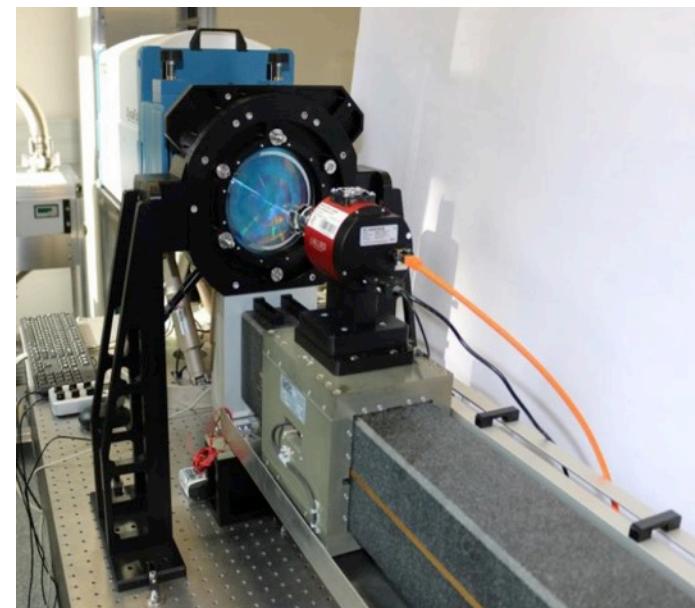
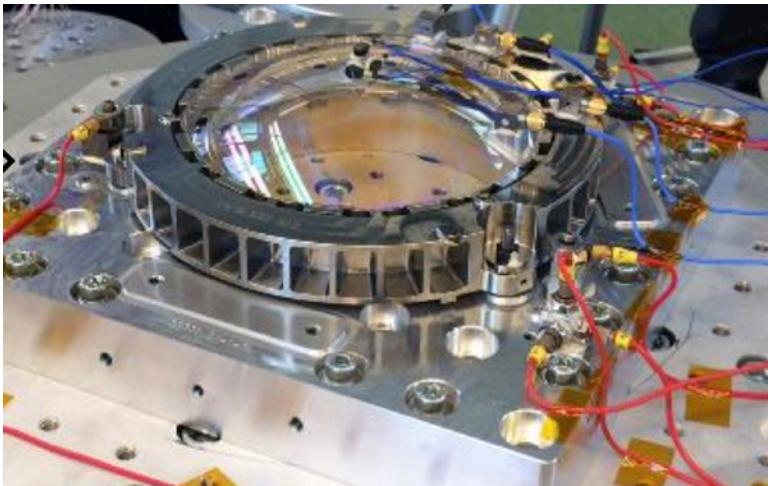


- PDR (Preliminary Design Review) NISP : Done and OK
- NI-SA
 - PDR done
 - DM in progress



- NI-TC
 - PDR done

- NI-OA
 - PDR done
 - NI-OA BBM in progress



- NI-CM
 - PDR done
 - 2 STM delivered
 - BBM in integration
 - Clutch removal “almost” decided

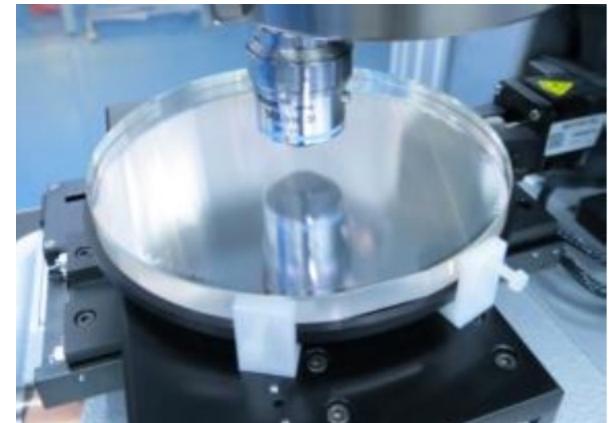


- NI-GWA
 - PDR in January
 - STM done and ready



➤ NI-GRISM

- PDR done
- 2 process are still in competition for the grating : Resin & Direct ion etching
- good performances achieved
- complete BBM scale one with grating, prism and filter in progress



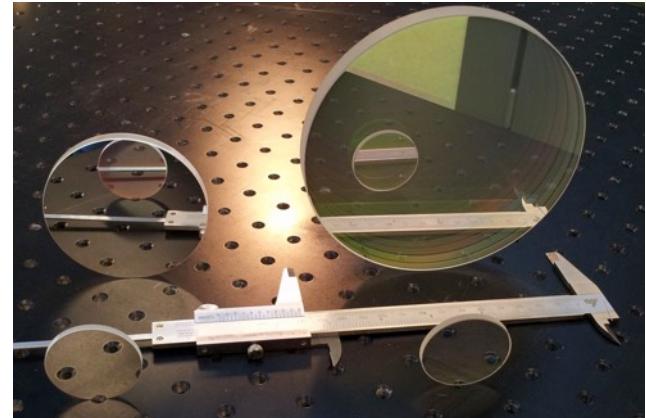
➤ NI-FWA

- PDR in January



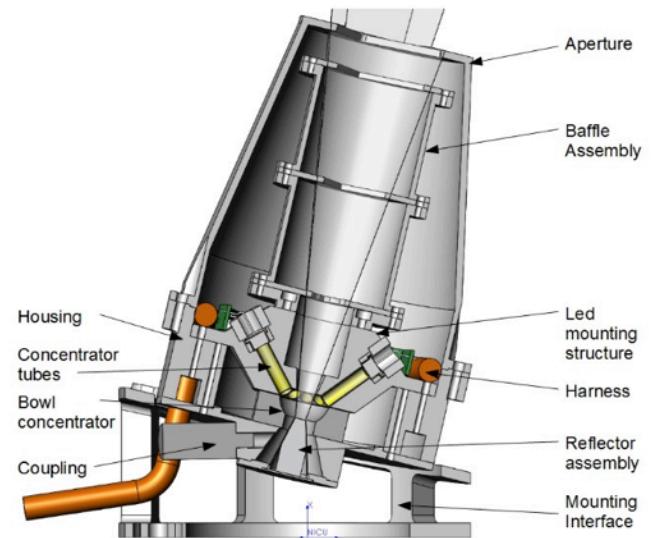
➤ NI-FILTER

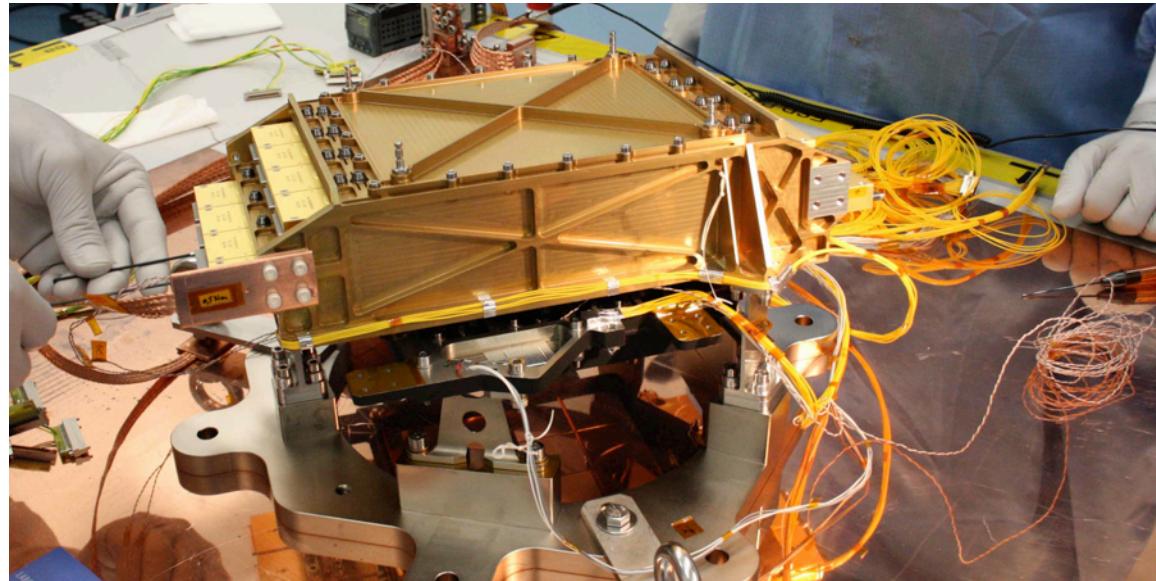
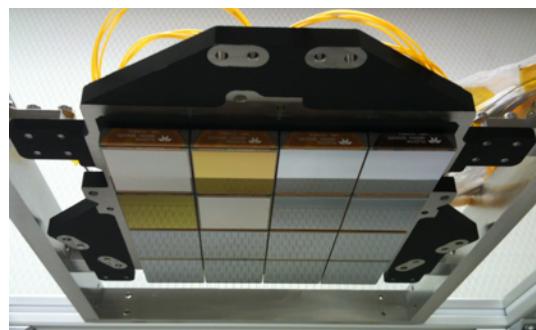
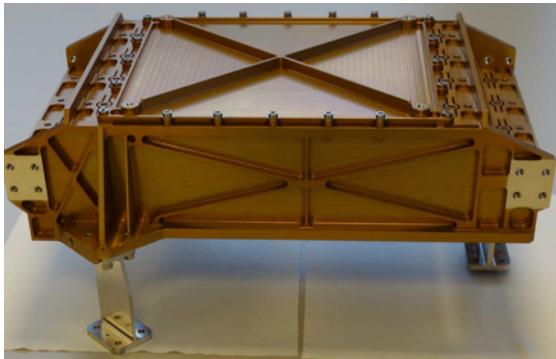
- PDR in January
- good performances achieved on samples
- complete BBM scale one in progress



➤ NI-CU

- PDR done
- LED's for flight not yet selected

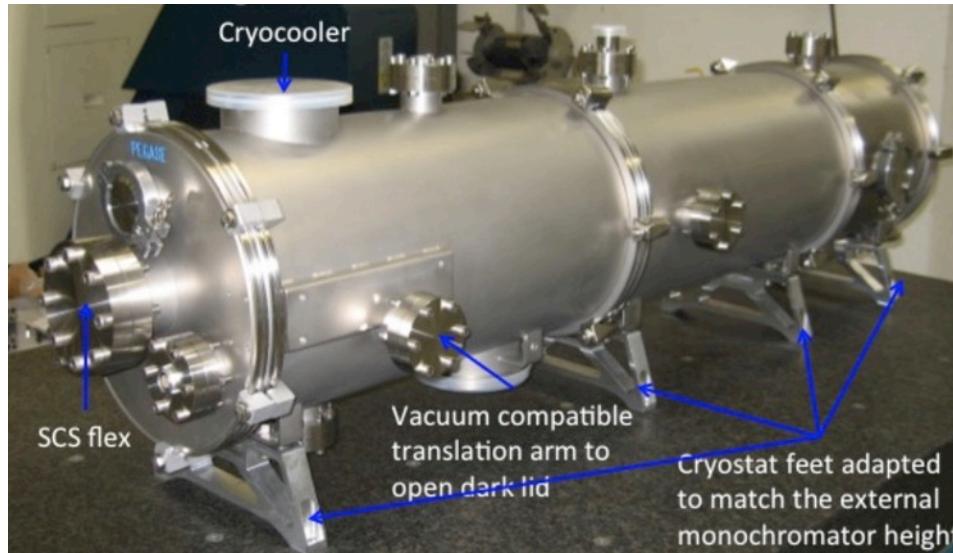




➤ NI-DS

- DM with 4 detectors built and tested
- TB/TV done. Good noise and dark performances achieved; no crosstalk measured
- Low EMC conducted sensitivity
- Vibration done (30g)
- Cold deformation measurement done (negligible)

- NI-DS Detector characterization
 - CPPM, IPNL ready in due time for the detector characterisation

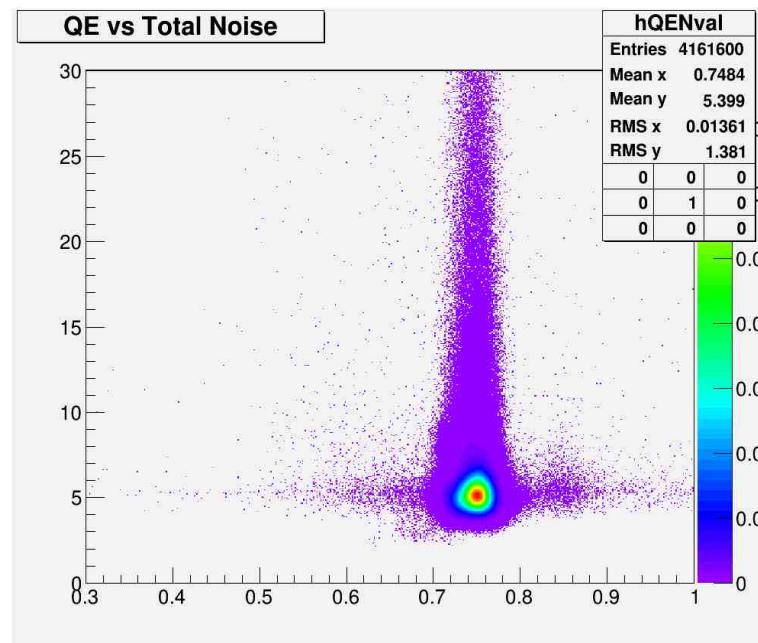


- NI-SCS (Detectors + flex + electronic sidecar)
 - MANY ISSUES between ESA/NASA and TELEDYNE
 - significant delay expected for the FM delivery
 - GOOD QE, Noise and dark performances measured for Engineering model
 - Persistence issue

- NI-ICU HW
 - PDR done
 - BBM started
- NI-DPU HW
 - PDR in January
 - DPU Baseline selected now ; 1 FPGA per detector; 1 Maxwell board (GAIA one) for 8 detectors in cold redundancy
- NI-DPU SW
 - PDR in February
 - On board data processing agreed
- NI-ICU SW
 - PDR in February



- VERY GOOD detector performances demonstrated for 8 Engineering detectors (2.3um) produced by TELEDYNE under ESA contract
- Total Noise (Fowler 16 and 100s integration) AND QE are compliant for 95% of pixels with the NISP requirement



- The optical performances (Encircled Energy) are close to the NISP requirements

➤ A DM (Demonstration Model):

- ✧ Present flight design for mechanics and thermal
- ✧ 4 detectors
- ✧ NO optic
- ✧ to do all the environment test sequences : vibrations, thermal vacuum, EMC
- ✧ **DM activities expected to be completed for end 2015**
- ✧ This model will be delivered to ESA as STM (Structure & Thermal Model) in due time

➤ A EQM (Qualification and Engineering Model)

- ✧ Flight design for ALL the instrument subsystems with the following restrictions:
 - 4 detectors
 - Only one filter
 - Only 1 red grism
 - No electronic redundancy
- ✧ to do all the environment qualification test sequences : vibrations, thermal vacuum, EMC
- ✧ To measure the end to end instrument performances and to prepare the instrument ground calibration to be done on FM
- ✧ EQM activities expected to be completed for end of 2016

➤ THE FM (Flight Model)

- ✧ FM to be delivered before for the end of 2017 (ESA need date sept 2017)

✧ **SCHEDULE WITHOUT MARGIN → DELAYS ARE OBVIOUS**

CONCLUSION

➤ MAIN OPEN POINTS

- ✧ LVDS (loss of clock)
- ✧ STRAYLIGHT (Telescope and internal NISP)
- ✧ Detector persistence

➤ CONCLUSION

- ✧ GOOD PROGRESS

THANK YOU FOR YOUR ATTENTION