

# The Euclid Visible Instrument: An International Engineering Collaboration

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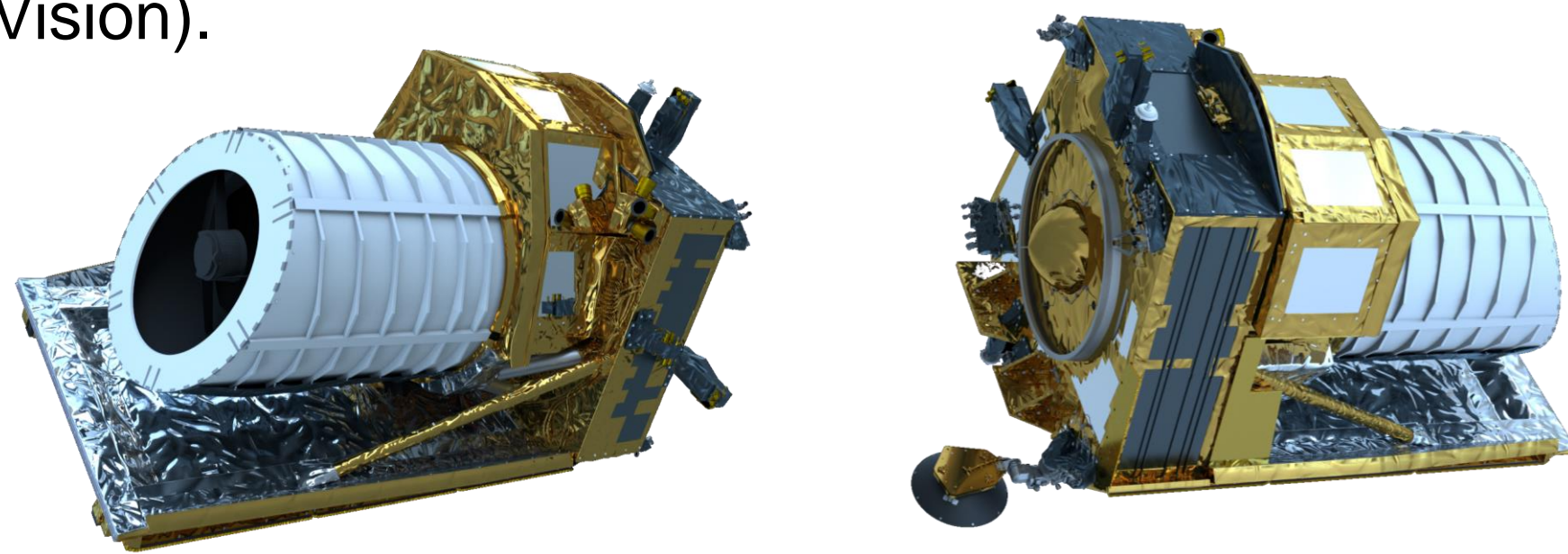
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## KEY POINTS

- Groundbreaking scientific discovery is the fruit of international scientific / engineering collaborations.
- Interface management is key (mechanical, electrical, optical).
- Milestone-based development approach is the infrastructure of these international efforts.

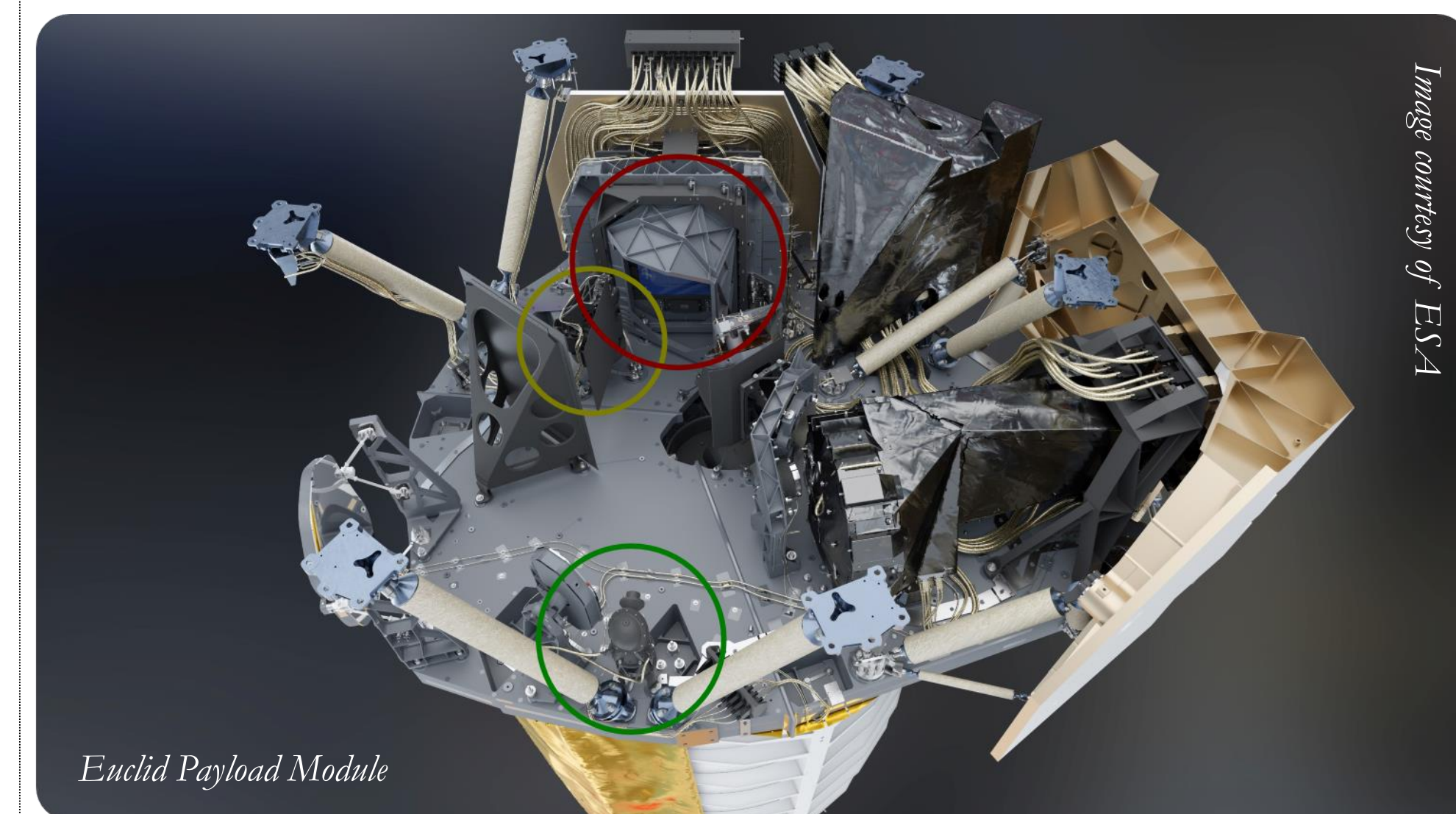
## 1. INTRODUCTION

- Euclid: Exploring the Dark Universe (ESA Cosmic Vision).

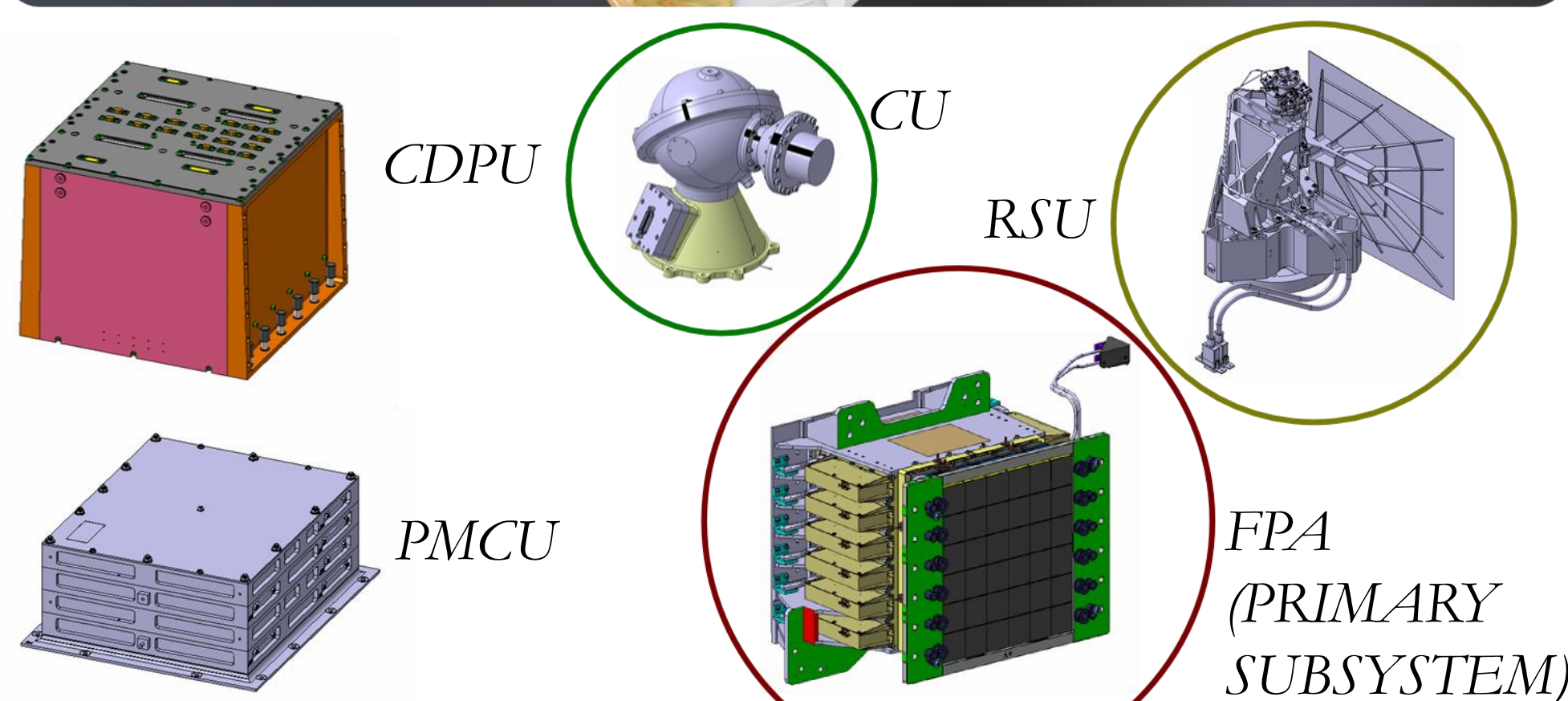


Rendering of Euclid (Image courtesy of ESA)

- VIS + NISP: Weak gravitational lensing measurements to study dark energy and dark matter.
- VIS instrument consists of five subsystems:

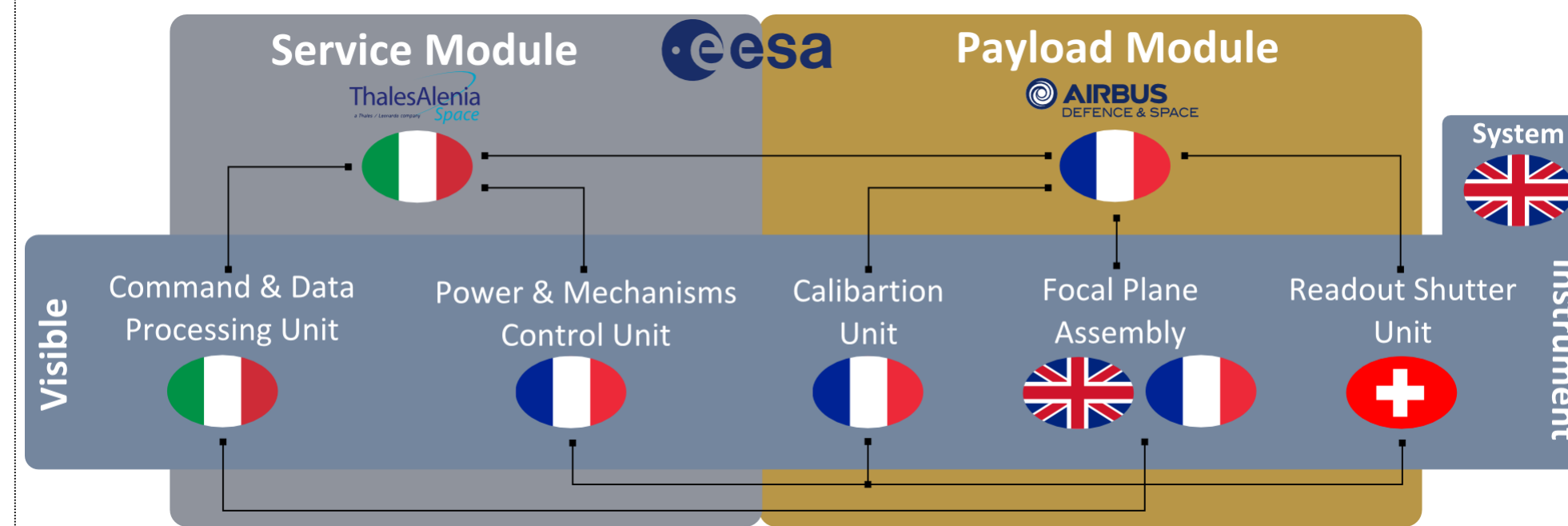


Euclid Payload Module



- Design, manufacture, analysis, testing and assembly of VIS and integration into Euclid requires involvement of engineers and scientists from different disciplines.

## 2. INTERNATIONAL CONSORTIUM

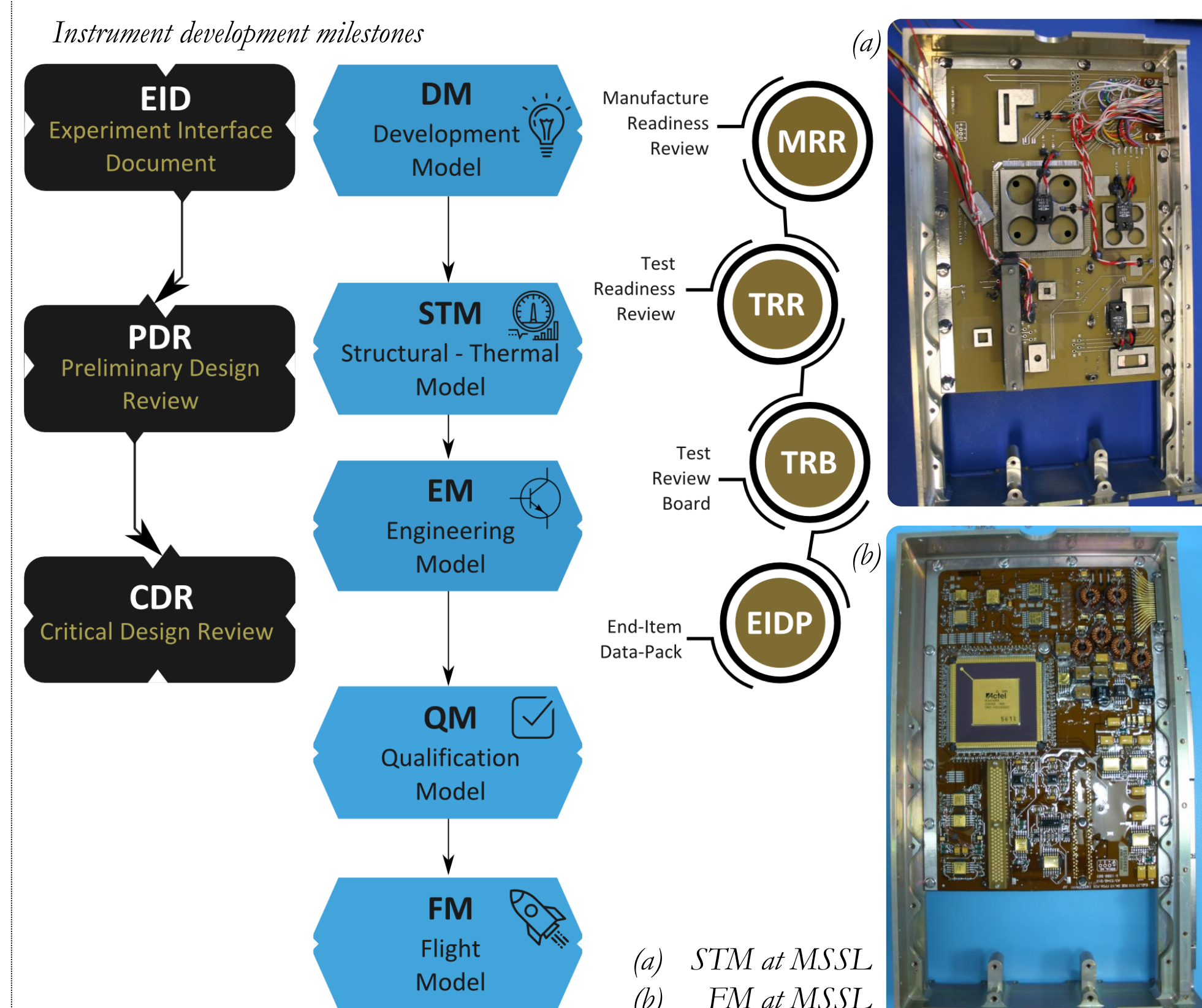


VIS Consortium and Interfaces

- VIS developed in a consortium with combined efforts across Europe and the world:
  - Universities,
  - Governmental space authorities,
  - Industrial bodies.
- Several *subsystem* institutes.
- One *system level* body.
- Management of interfaces between instruments is key to seamless integration.
  - Instruments developed in parallel.

## 3. DEVELOPMENT MILESTONES

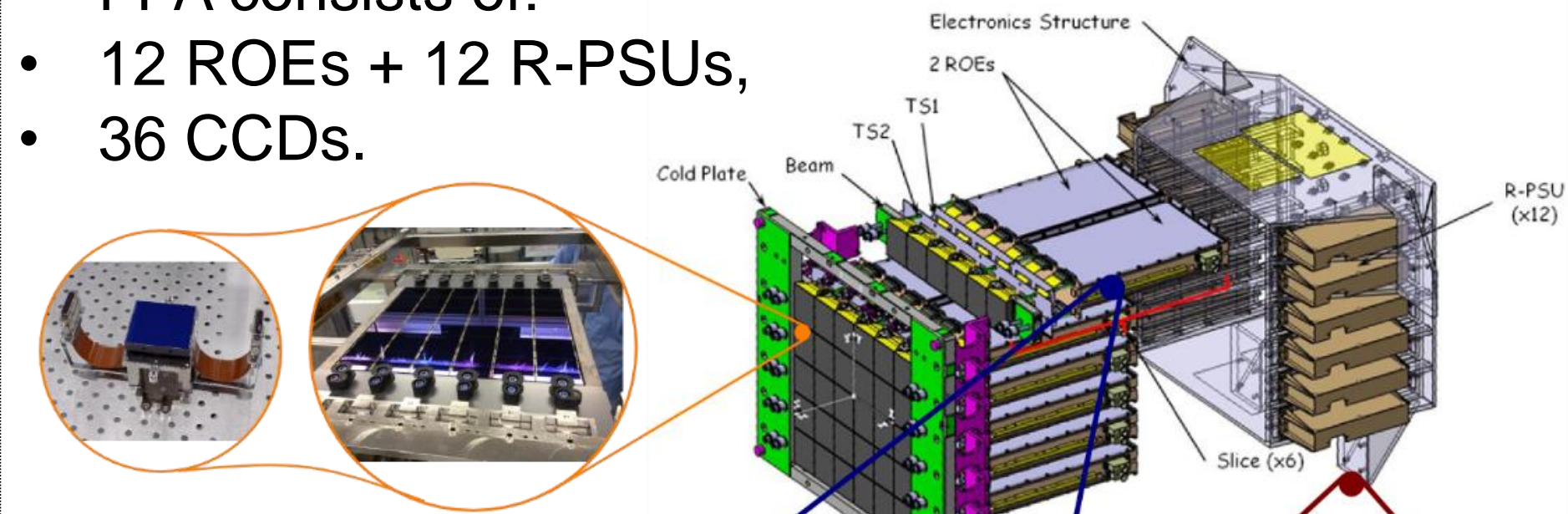
- Milestone-based approach ensures mission requirements are captured in instrument design.
- Design matures with each stage.
- All model iterations go through review processes.
- All relevant bodies/interfaces participate in reviews.



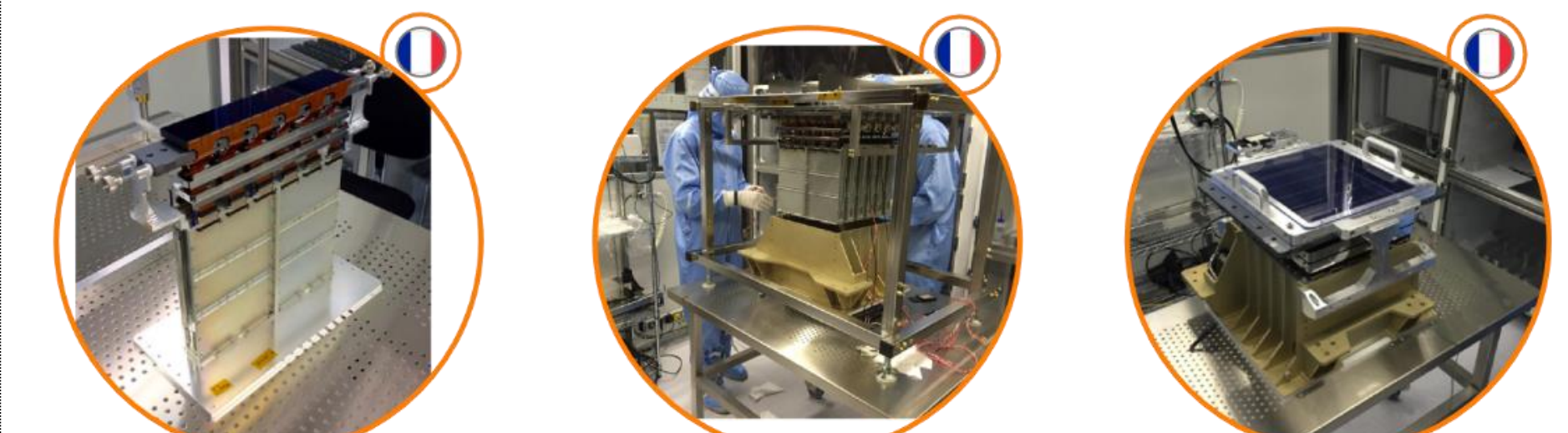
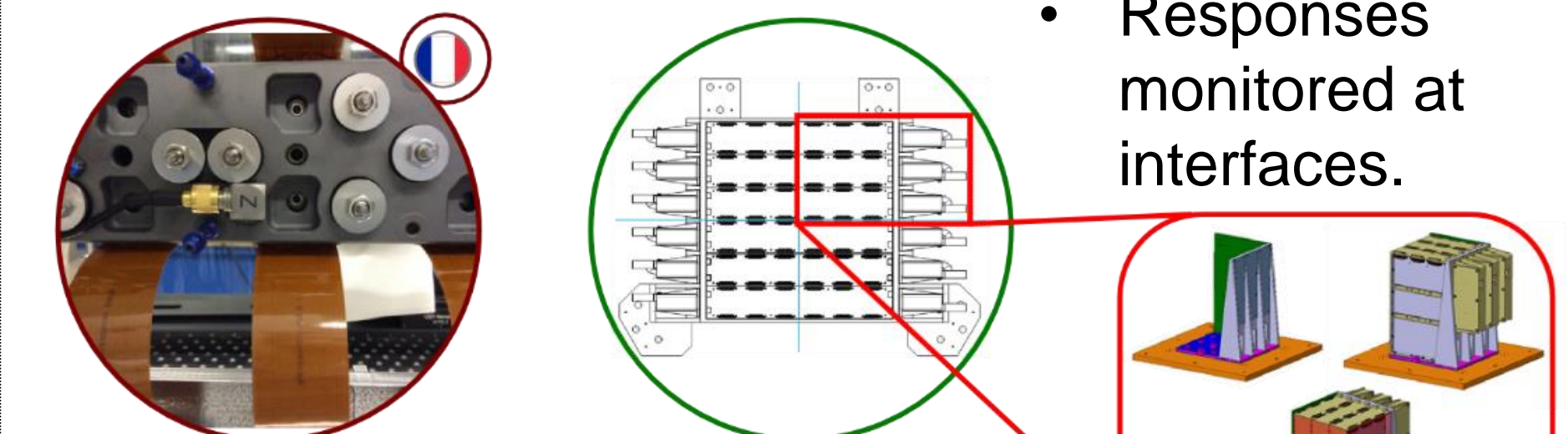
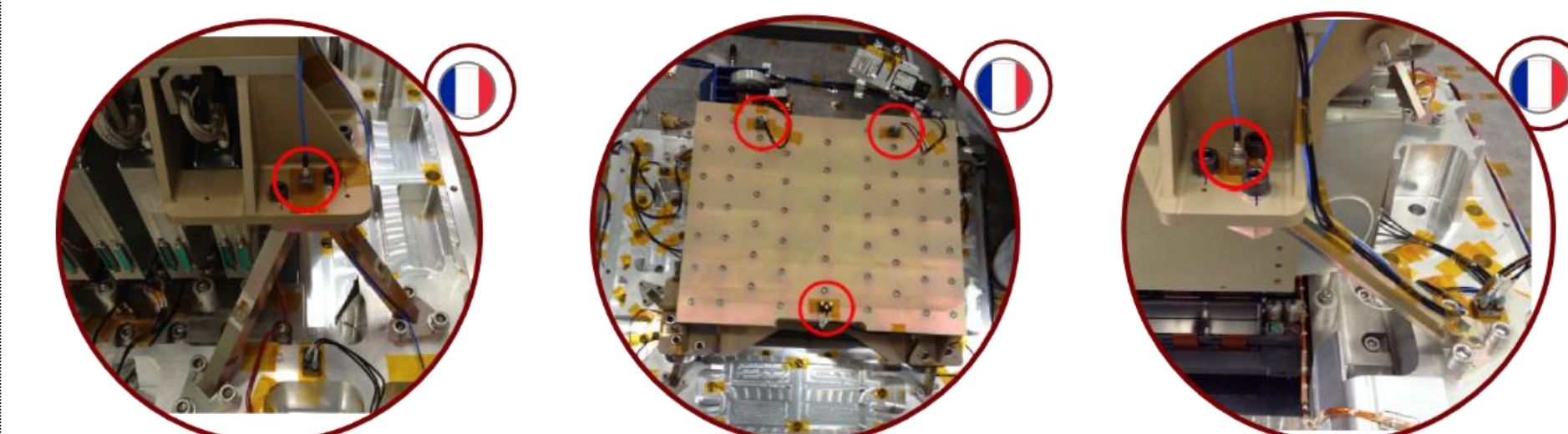
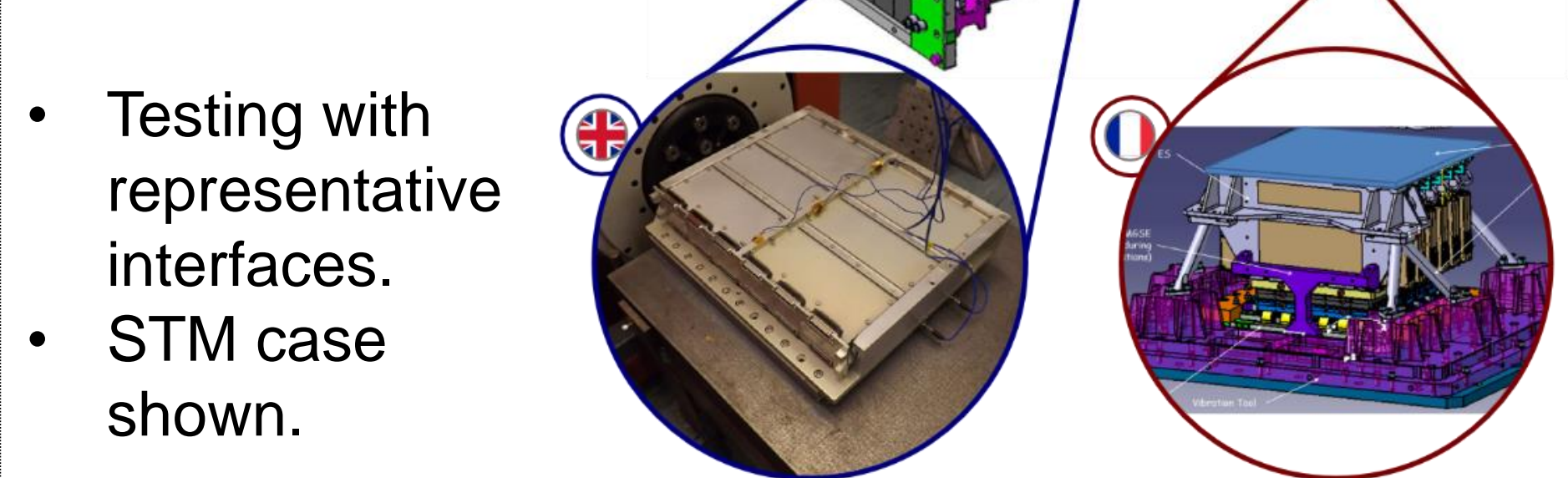
(a) STM at MSSL  
(b) FM at MSSL

## 4. DEVELOPING THE FOCAL PLANE ASSEMBLY


- FPA consists of:
  - 12 ROEs + 12 R-PSUs,
  - 36 CCDs.





- Testing with representative interfaces.
- STM case shown.



- Tested & calibrated slices integrated into FPA.
- FPA integrated into PLM.
- Testing repeated at PLM.

 Image source: MSSL

 Image source: CEA

 Image courtesy of Airbus

