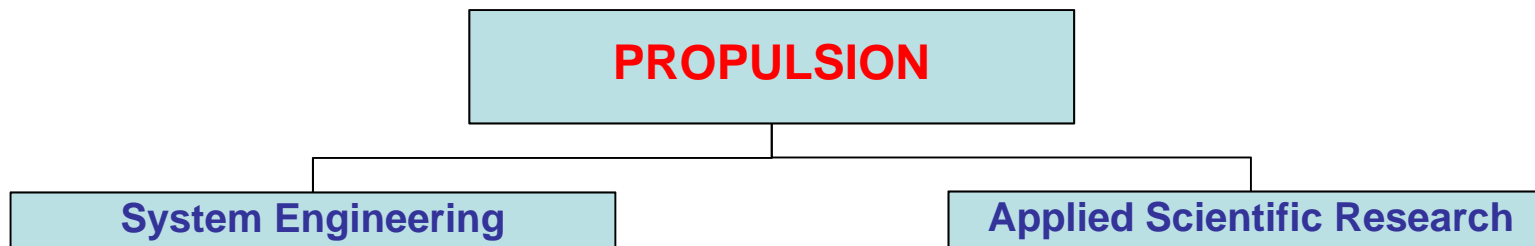


Space Propulsion Unit

CIRA is willing to aggregate national competencies and infrastructures in the framework of Space Propulsion, therefore space propulsion unit has to:

- *provide support to national industry propulsion technologies development focused on liquid, hybrid and others propulsion systems;*
- *realize demonstrators, develop design/analysis instruments and experimental capabilities;*
- *acquire know-how, system and manufactory capabilities to aim to a primary role in the future space transportation systems activities.*



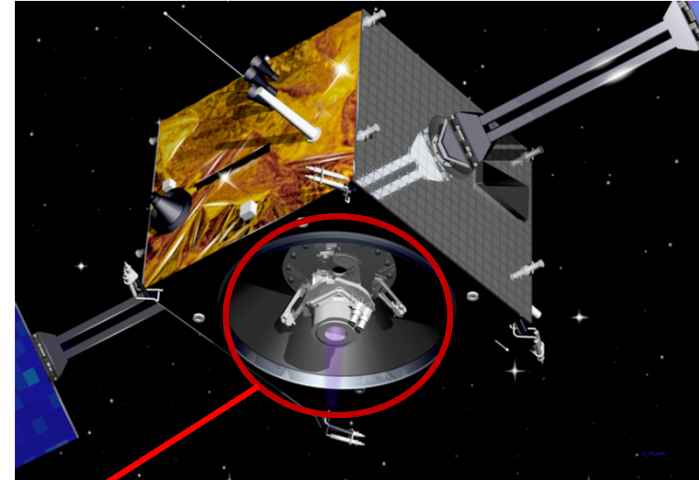
- *Design of Propulsion Systems*
- *.....*
- *Development of / Requirements for -
Instruments/Methodologies for Space Propulsion
Systems design*
 - *Concurrent Design Facility for 0/A phase design of
Aerospace Propulsion*

CIRA Background

Launch System



Satellite / Space Platform



Propulsion System

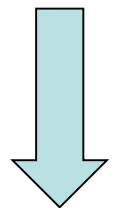


*Concurrent Engineering Approach is applied to the propulsion subsystem (not to the entire system)
CIRA CDF shall be:*

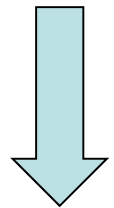
- *Firstly devoted to liquid rocket propulsion*
- *further updated to design additional propulsion systems (i.e., hybrid, electric, etc.) and space systems (vehicles, control systems, etc.)*
- *interoperable with ASI and others CDF according to current ECSS standard (evolution of the standard is also presently envisaged)*
- *capable to achieve the space propulsion domain for other CDF devoted to Satellite/Space platform and launch system*

STUDY LOGIC

Specialist



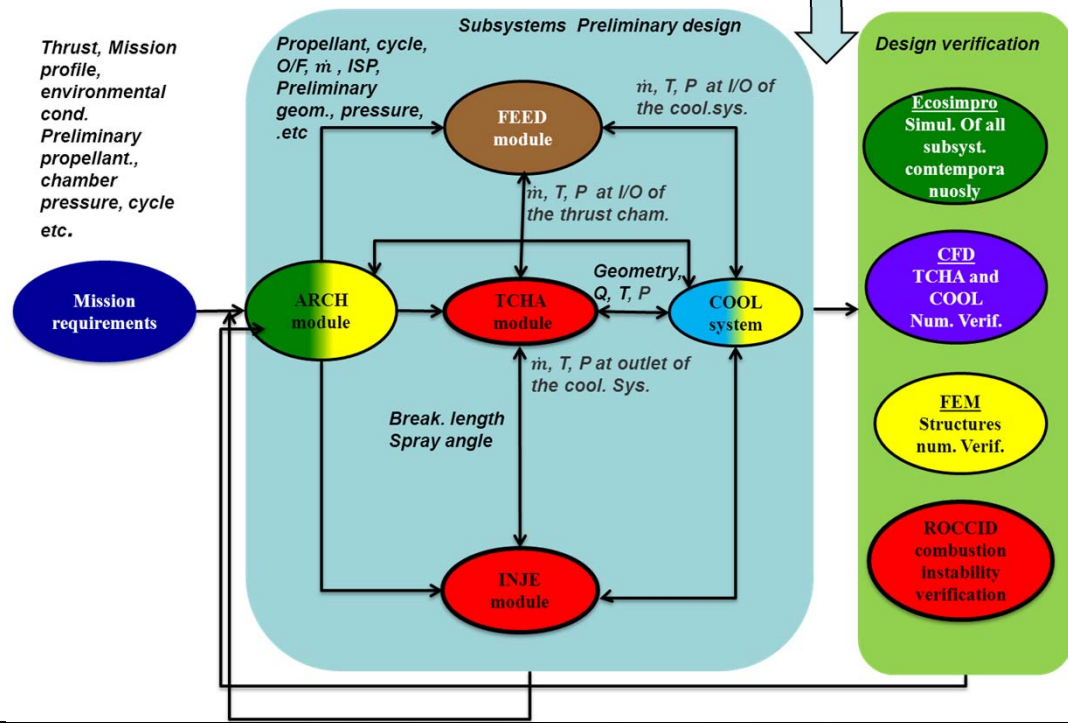
Domains



Process

- Space propulsion architectural designer
- Thrust Chamber analyst
- Feeding/Turbopumps designer/analyst
- Cooling system designer/analyst
- Thermostructural analyst
- Computational Fluid Dynamics (CFD)

- | |
|-----------------------------------|
| Customer |
| Team Leader |
| Architecture (ARCH+ECOSIMPRO) |
| Thrust Chamber (TCHA+INJE+ROCCID) |
| Feeding System (FEED) |
| Cooling System (COOL) |
| Thermostructures (FEM) |
| CFD |
| Schedule and planning |
| CAD |





CFD equipment requirements

- **10 workspaces located in a of 50 m2 room**
- **U Shape table**
- **equipped with proper audio/video conference devices for internal and external meetings**
- **Compatibility with CDF assured by ECSS standards**
- **Configuration control system of a space propulsion project guaranteed by dedicated Server and Software**