

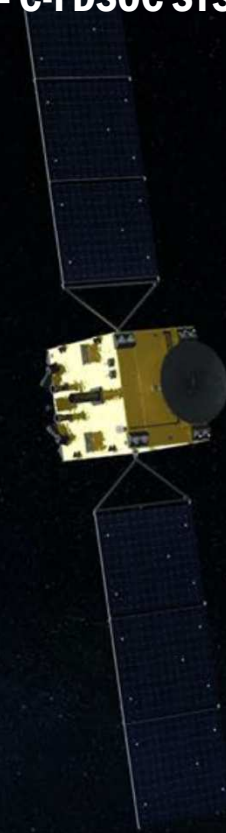


FRENCH ACTIVITIES FOR PLANETARY DEFENSE

SMPAG meeting – 2023/02/09

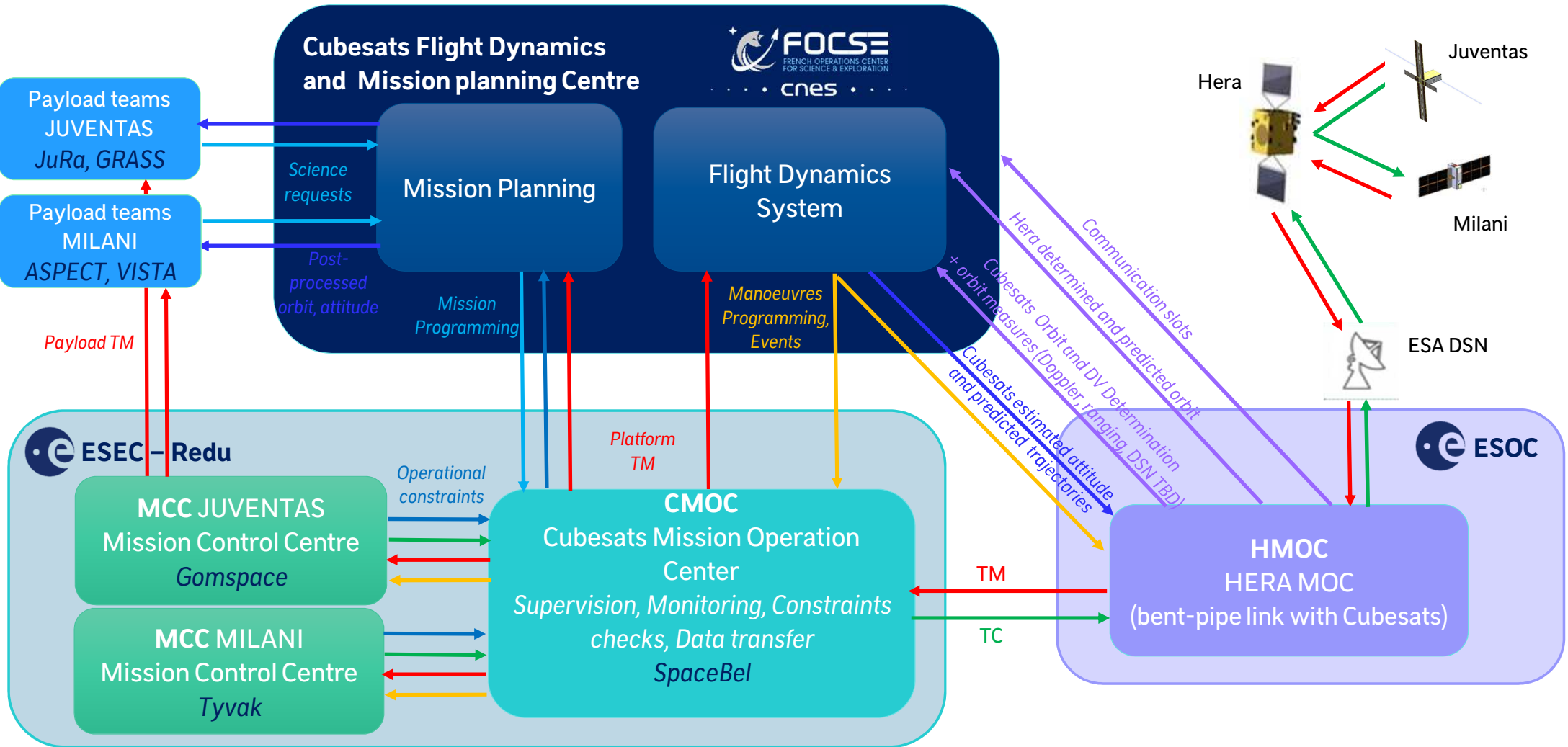
Pierre BOUSQUET

AURÉLIE MOUSSI - C-FDSOC PROJECT MANAGER
PÂMINI ANNAT - C-FDSOC SYSTEM ENGINEER



**CNES SUPPORTS JUVENTAS AND MILANI
SCIENCE OPERATIONS FOR HERA**

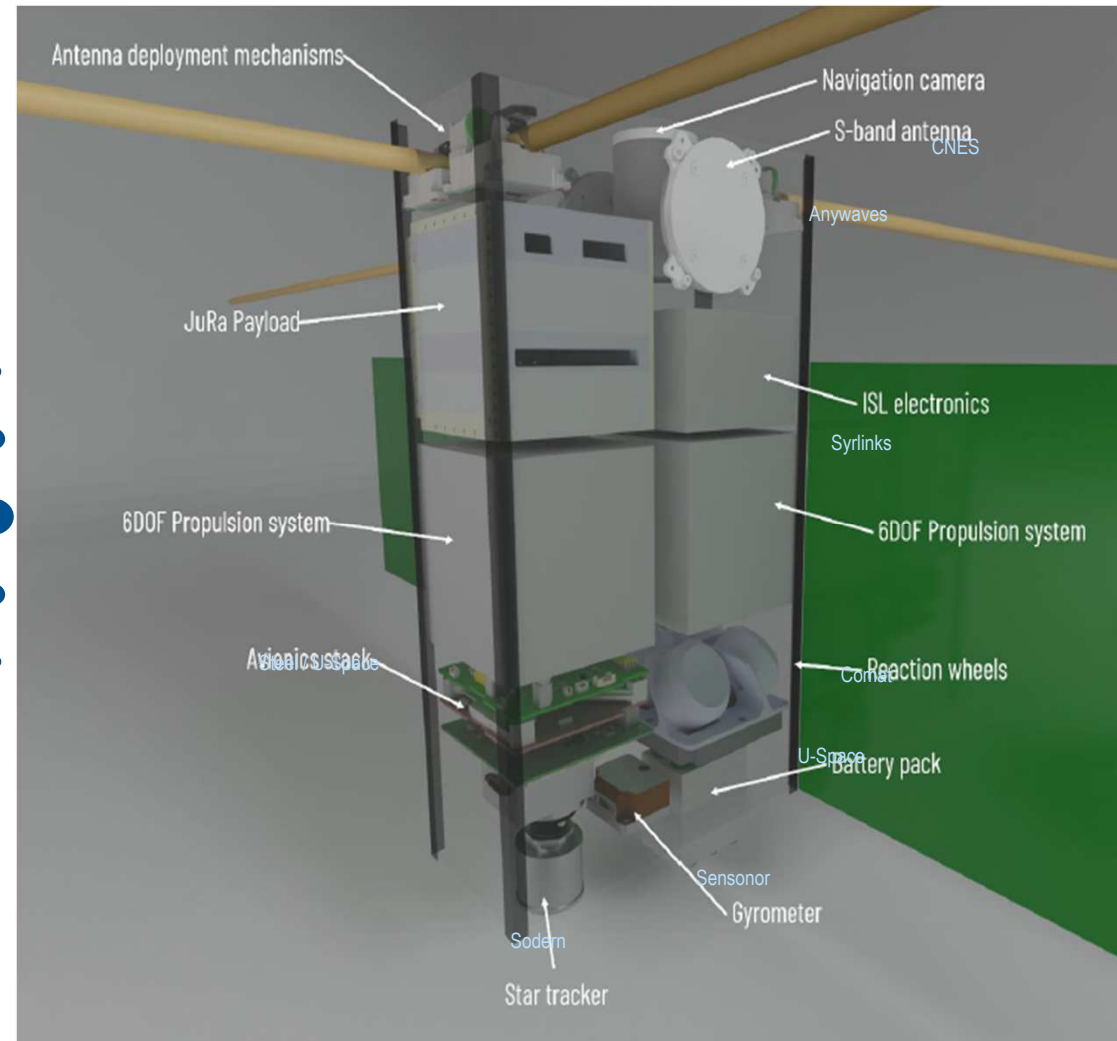
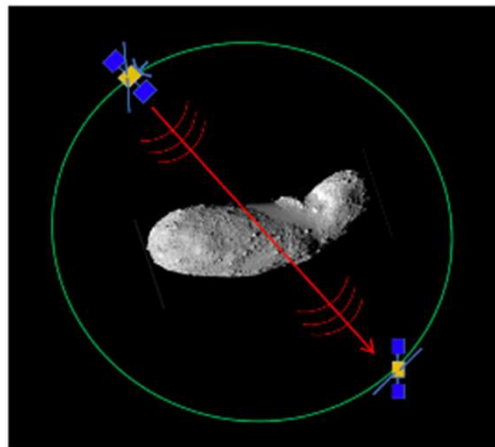
Support to HERA's cubesat operations



Overview of DROID cubesat design

6 to 8 U format

- ❖ Cold gas propulsion
- ❖ Stringent synchronisation requirement between cubesats through ISL loop with mothership
- ❖ Autonomous navigation to maintain the cubesats at opposite $\pm 15^\circ$ around Apophis



We have compiled different asteroid rubble pile hypotheses and created the means to generate models of interior block distribution (B. Davidsson)

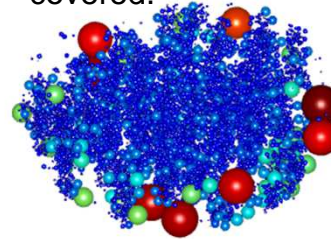
There are several hypothesized interior configurations for asteroid rubble piles.

One of the goals of the mission is to resolve these hypotheses.

These models inform that the radar needs to resolve interior features down to 20 m.

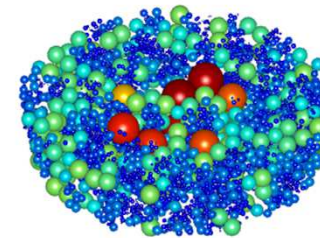
“Leinhardt-Stewart”

Large blocks accumulate near the surface but are covered.



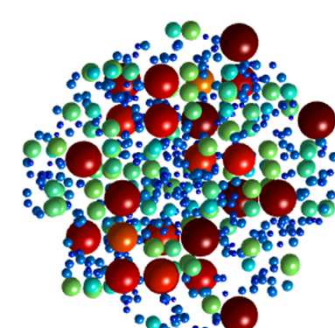
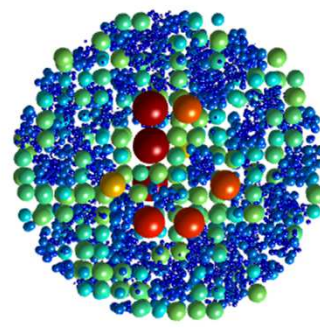
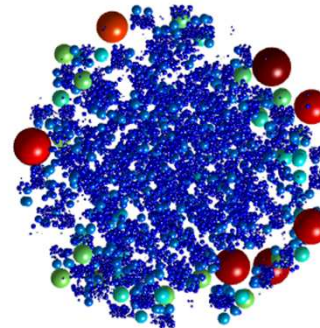
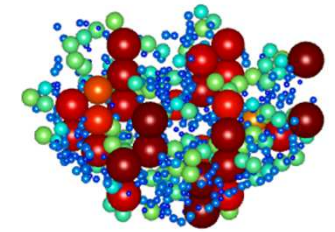
“Wilson”

Large blocks clustered at the center



Uniformly Random

No preferred location for small and large blocks



Slice cuts through 3D rubble piles of hypothesized interiors (color corresponds to block size)