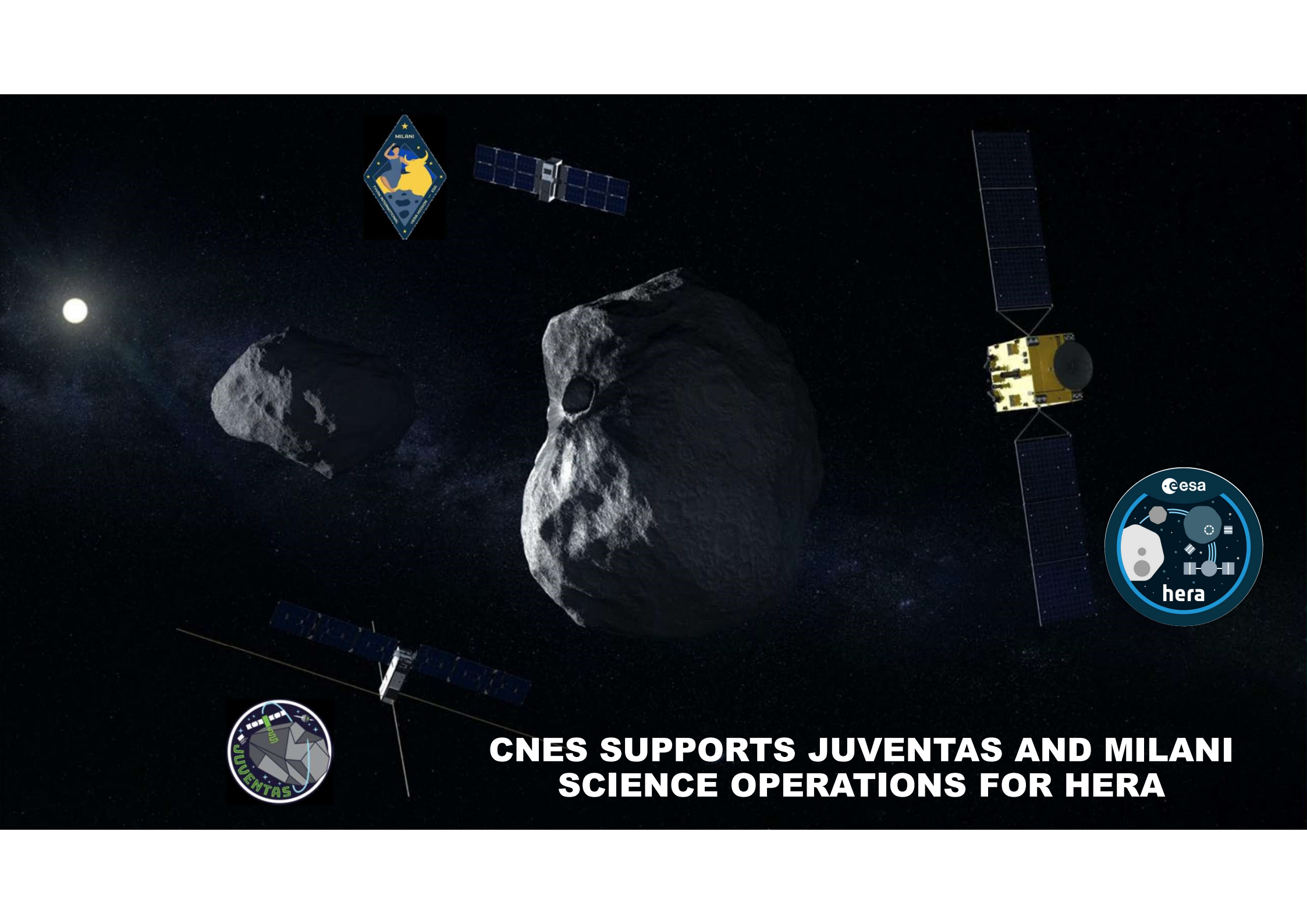




## **FRENCH ACTIVITIES FOR PLANETARY DEFENSE**

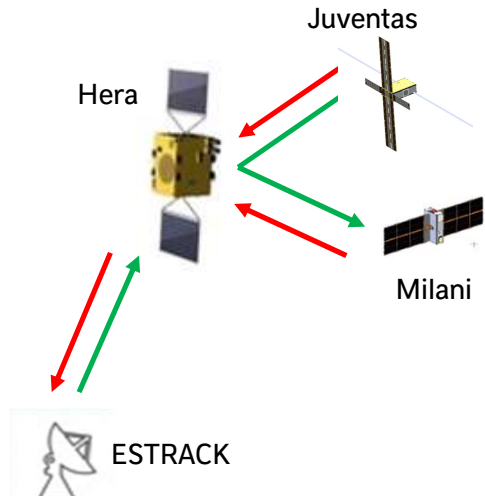
SMPAG meeting – 2024/02/06

Pierre BOUSQUET



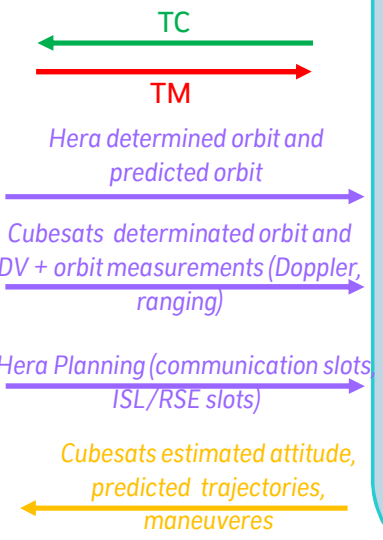
**CNES SUPPORTS JUVENTAS AND MILANI  
SCIENCE OPERATIONS FOR HERA**

# Support to HERA's cubesat operations



**ESOC - Darmstadt**

**HMOC**  
HERA Mission Operation Centre  
(bent-pipe link with Cubesats) r



**ESEC – Redu**

**CMOC**  
Cubesats Mission Operation Center  
Supervision, TM/TC Monitoring, Constraints checks, Data transfer  
*SpaceBel*

Platform operational constraints (blue arrow up), TM (red arrow down), TC (green arrow up)

**CMCC JUVENTAS**  
Mission Control Centre  
*Gomspace*

**CMCC MILANI**  
Mission Control Centre  
*Tyvak*

**FOCSE - Toulouse**  
C-FDSOC Cubesats  
Flight Dynamics and Science Operation Centre

**Flight Dynamics System**

**Mission Planning System**

Maneuvers, Events, predicted orbit (yellow arrow left)

Platform operational constraints (blue arrow right)

Science requests (blue arrow right)

Mission Planning (blue arrow right)

Mission Planning status (blue arrow left)

System DataBase (red arrow right)

Hera orbit, attitude, planning (purple arrow right)

Post-processed orbit, attitude (blue arrow left)

Platform TM (red arrow right)

Payload TM (red arrow right)

Maneuvers, Predicted orbit (yellow arrow right)

Platform operational constraints (blue arrow right)

Science requests (blue arrow left)

Payload TM (red arrow right)

Post-processed orbit, attitude (blue arrow right)

**Payload teams JUVENTAS**  
JuRa, GRASS

**Payload teams MILANI**  
ASPECT, VISTA

### **Contribution to Caltech's mission to Apophis**

On going talks on a French contribution to the bi-static radar,  
and for the ISL equipment

### **Contribution to RAMSES**

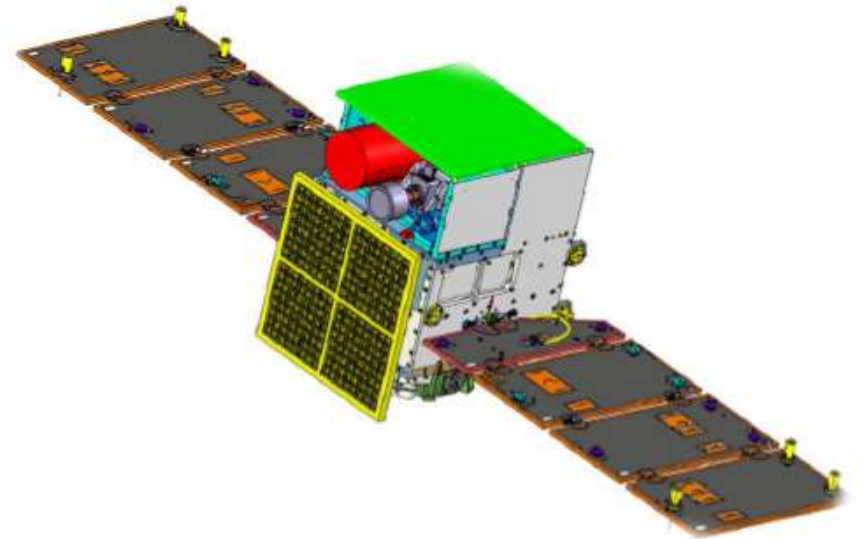
Mono-static radar (follow-up of JuRa on HERA)

Sismology based on geophones from ISAE

Preparation of Call for opportunity on mother ship

### **CASPER flybyprobe**

To be launched with RAMSES



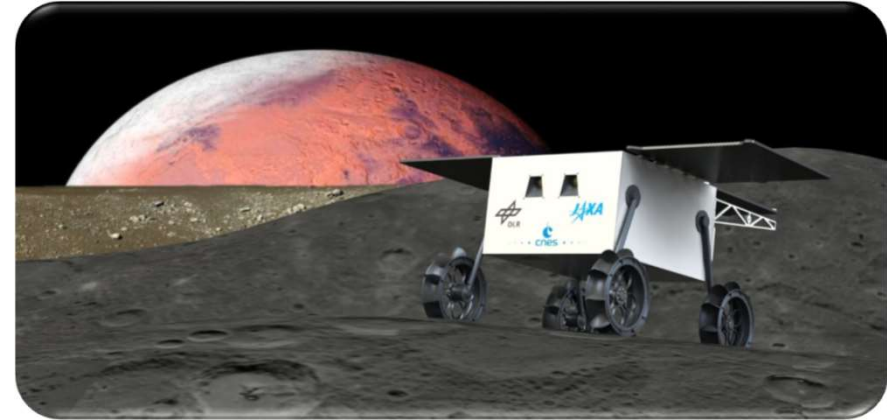
## Other missions

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### Contribution to MMX

Idefix rover with DLR

MIRS IR spectrometer instrument



Extension of Hayabusa 2 mission

Analysis of Ryugu samples with MicrOmega instrument